

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

KEA CLOUD, INC. & HI AUTO, INC.,
Petitioners,

v.

VALYANT AI, INC.,
Patent Owner.

IPR2023-00450
Patent 10,592,706 B2

Before THU A. DANG, DANIEL J. GALLIGAN, and AMBER L. HAGY,
Administrative Patent Judges.

HAGY, *Administrative Patent Judge.*

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

A. *Background and Summary*

Kea Cloud, Inc., and Hi Auto, Inc. (collectively, “Petitioner”) filed a petition requesting *inter partes* review (Paper 1, “Pet.”) of claims 1–11 (“the challenged claims”) of U.S. Patent No. 10,592,706 B2 (Ex. 1001, the “’706 patent”). See 35 U.S.C. § 311. Valyant AI, Inc. (“Patent Owner”) timely filed a Preliminary Response. Paper 7, “Prelim. Resp.”

Under 37 C.F.R. § 42.4(a), we have authority to determine whether to institute review. The standard for instituting an *inter partes* review is set forth in 35 U.S.C. § 314(a), which provides that an *inter partes* review may not be instituted unless the information presented in the Petition and the Preliminary Response shows “there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.”

Applying those standards, we determine that Petitioner has demonstrated a reasonable likelihood that it would prevail in showing unpatentability of at least one challenged claim of the ’706 patent. We institute review on all challenged claims and on all grounds raised in the Petition.

Our findings of fact and conclusions discussed below are based on the evidentiary record developed thus far. This Decision to institute trial is not a final decision as to the patentability of any challenged claim. Any final decision will be based on the full record developed during trial.

B. Real Parties in Interest

Petitioner identifies Kea Cloud, Inc., Hi Auto, Inc., and E La Carte, Inc., d/b/a/ Presto,¹ as the real parties in interest. Pet. 69.

Patent Owner identifies itself as the real party in interest. Paper 6, 2.

C. Related Matters

As required by 37 C.F.R. § 42.8(b)(2), the parties identify two district court proceedings filed by Patent Owner involving the '706 patent: *Valyant AI, Inc. v. Kea Cloud, Inc.*, CA No. 1:31-cv-01698-MN; and *Valyant AI, Inc. v. Hi Auto, Inc.*, CA No. 1:21-cv-01700-MN (collectively, the “Underlying Litigations”). Pet. 69; Paper 6, 2.

D. The '706 patent (Ex. 1001)

The '706 patent, titled “Artificially Intelligent Order Processing System,” issued on March 17, 2020. Ex. 1001, codes (43), (54). The '706 patent claims priority by way of continuation to Application No. 15,723,573, filed on October 3, 2017, and further claims priority to provisional application Nos. 62/633,240, filed February 21, 2018, and 62/478,454, filed March 29, 2017. *Id.* at codes (60), (63).

The '706 patent is directed to “an artificially intelligent order processing system.” Ex. 1001, 2:37. The '706 patent generally describes an automated order-processing system based on artificial intelligence for drive-

¹ Petitioner notes that “Presto is a customer of Hi Auto and [is] a co-defendant in one of the two pending district court litigations.” Pet. 69 n.5. Petitioner further notes that “Presto has not instructed the undersigned counsel to file this IPR petition and has not contributed financially to the IPR preparation,” but “Presto is being listed as a real party-in-interest out of an abundance of caution, although it has expressly objected to such inclusion.” *Id.*

thru restaurants that takes over the order-processing function from an onsite employee. *Id.* at 12:46–56. A human auditor can abort or intervene in the autonomous workflow, if needed, to pass order-taking back to an on-site employee. *Id.* at 12:48–53, 13:23–43.

The system operates either in an “auditor-assist mode” or “autonomous mode.” *Id.* at 6:26–34. In the auditor-assist mode, the “system operates with auditor overview,” *id.* at 8:20–23, in which an auditor is added to the “system to ensure the fidelity of the order process and recognition of speech.” *Id.* at 12:50–53. In the autonomous mode, the “system functions automatically without direct and continuous oversight by an auditor.” *Id.* at 14:31–33. The “auditor is present predominately to provide exception handling when the artificially intelligent order processing system is not functioning properly.” *Id.* at 14:27–31. For example, the “system can employ automatic error detection systems to detect deviations in orders or customer dissatisfaction.” *Id.* at 14:33–36. Upon detecting an error, the system “switch[es] back to an auditor-assist mode or control of the order processing function pass[es] back to the on-site employee.” *Id.* at 14:36–39.

Figure 4, below, depicts the system “operating autonomously” with the auditor providing “exception handling.” *Id.* at 14:25–28.

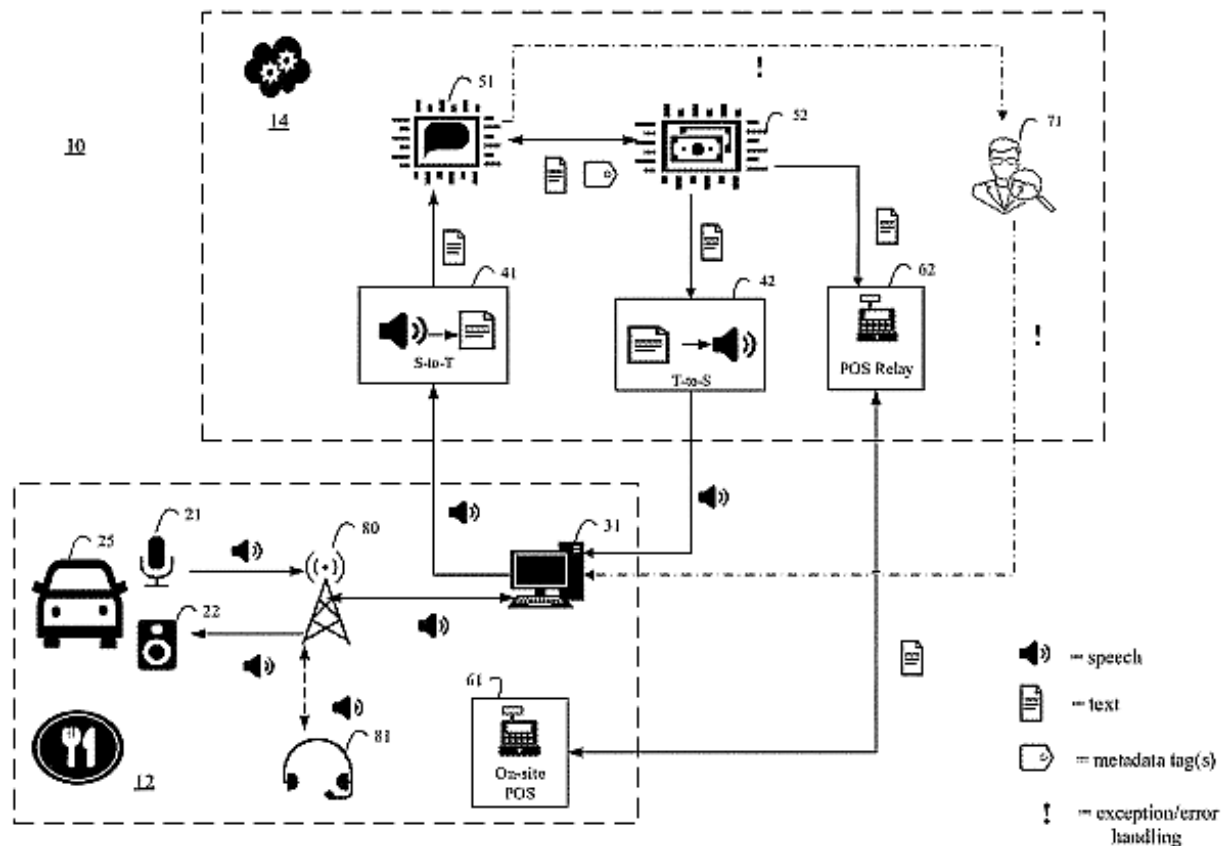


FIG. 4

Figure 4 is a diagram depicting “an artificially intelligent order processing system configured to process orders and to operate autonomously with an auditor available for error or exception handling and/or upon the detection of customer frustration or dissatisfaction.” Ex. 1001, 5:23–27.

The process begins with customer 25 speaking into microphone 21 at drive-thru order station 12 to place an order. *Id.* at 12:57–61. As the customer speaks, the system passes audio from speaker 21 to base station 80 within the restaurant. *Id.* at 9:4–7. The audio stream is passed, via computer 31, to speech-to-text module 41 that transcribes the audio into text. *Id.* at 7:29–44, 12:48–56, 13:7–16. The transcribed text is output to natural language processor (“NLP”) 51 that identifies order items from the

transcribed text. *Id.* at 13:17–23. For example, when the text “I want a cheeseburger” is “sent to the NLP 51, an instruction set adding one cheeseburger to the order is generated.” *Id.* at 13:19–23. Next, identified order items are passed to point of sale (“POS”) relay 62, which transmits the order to the on-site POS system 61 where on-site employee 81 fulfills the order by delivering the ordered food to customer 25. *Id.* at 13:53–56, 13:3–6, 9:17–39.

Figure 3 of the '706 patent, reproduced below, illustrates the system in “auditor assist” mode.

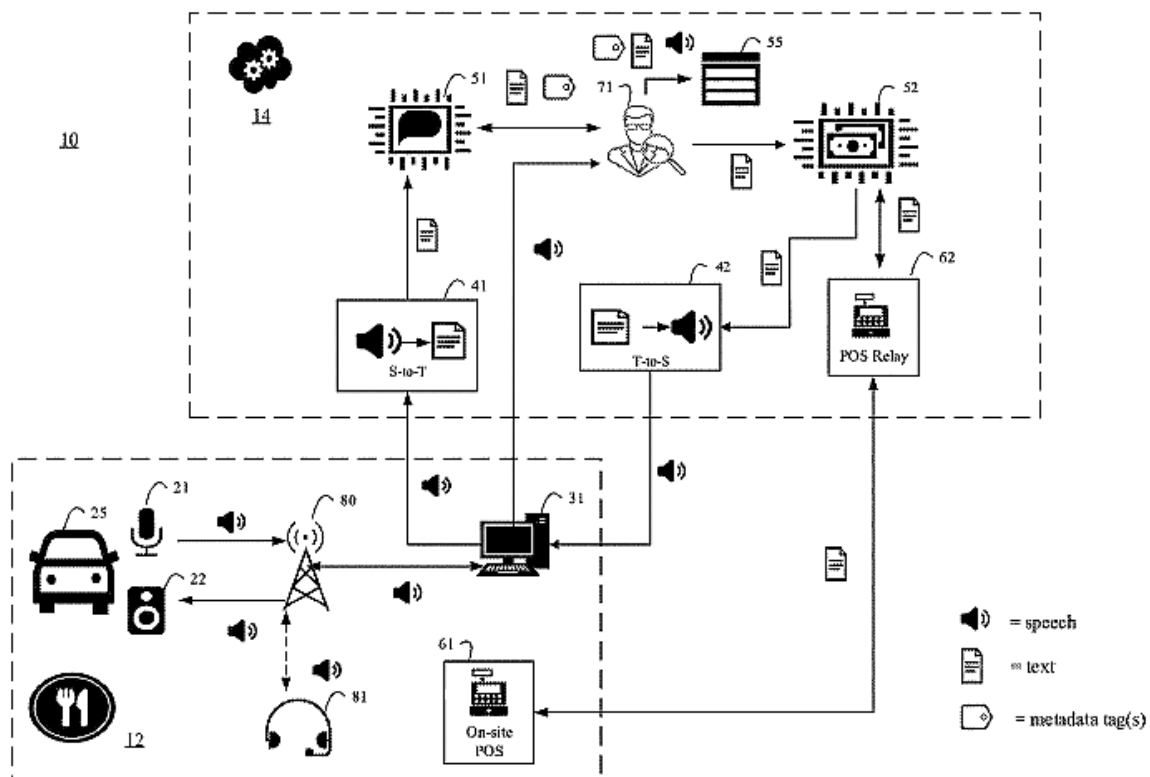


FIG. 3

Figure 3 is a diagram “depicting an artificially intelligent order processing system configured to process orders under auditor review.” Ex. 1001, 5:20–22.

In auditor-assist mode, the “audio stream from the on-site computer 31 is also optionally transmitted to an auditor 71, who is able to listen to the audio of the order.” *Id.* at 13:12–14. The “order generated by the NLP 51” is “passed to the auditor 71 for comparison with the audio feed that was passed to the auditor 71 from the on-site computer 31.” *Id.* at 13:19–27. If “the auditor 71 detects that the artificially intelligent order processing system 10 is not functioning properly,” the auditor 71 can “abort, or intervene in, the transaction and pass control back to the on-site employee 81” by “sending a notification to the employee 81.” *Id.* at 13:33–39.

According to Patent Owner, “[i]ndependent claim 1 is directed to the autonomous mode of Figure 4, and claim 4 is directed to the auditor-assist mode of Figure 3.” Prelim. Resp. 24.

E. Illustrative Claims

Of the challenged claims, claims 1 and 4 are independent. Challenged claims 2 and 3 depend from claim 1, and challenged claims 5–11 depend, directly or indirectly, from claim 4. Claims 1 and 4, reproduced below, illustrate the claimed subject matter:

1. A method comprising the steps of:
 - providing an audio stream of an order of a customer positioned on a site;
 - providing an order processor having a speech recognition module trained using artificial intelligence programs;
 - converting a word or words in the audio stream to text using the speech recognition module;
 - processing the text communication with the speech recognition module to identify a word or words in the text of the converted audio stream according to a previous spoken word training;

- providing a natural language processor having order assembly capabilities and exception detection capabilities, wherein the natural language processor receives recognized text from the order processor and creates or modifies an order based upon the recognized text;
- generating an order with the natural language processor;
- alerting an auditor of detected exceptions in the order, the auditor located off-site and connected to the order processor via a data connection;
- deactivating the order processor with the auditor in response to the detected exceptions in the order; and
- prompting an on-site employee to engage the customer and complete the order.

Ex. 1001, 18:22–45.

4. A method comprising the steps of:

- providing an audio stream of an order of a customer to a speech-to text processor, the customer positioned on a site;
- providing an order processor incorporating a speech recognition module trained using artificial intelligence programs;
- converting a word or words in the audio stream to text using the speech recognition module;
- processing the text communication with the speech recognition module to identify a word or words in the text of the converted audio stream according to a previous spoken word training;
- providing a natural language processor having order assembly capabilities and exception detection capabilities, wherein the natural language processor receives recognized text from the order processor and creates or modifies the order based upon the recognized text;
- generating an order with the natural language processor;
- providing an audio stream of a customer order to an auditor, the auditor located off-site and connected to the

order processor via a data connection;
providing the generated order to the auditor;
performing a comparison of the audio stream of a customer order with the generated order by the auditor;
switching to an auditor-assist mode in response to the comparison of the audio stream with the generated order;
updating the order processor based upon errors detected in the order by the auditor;
deactivating the order processor with the auditor; and
transmitting the generated order to an on-site employee to communicate with the customer, to collect payment from the customer, and to provide notifications to release the ordered product or service to the customer.

Id. at 18:52–19:20.

F. Prior Art and Asserted Grounds

Petitioner asserts that claims 1–11 are unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–11	103(a)	Mahaffy, ² Jasper ³
1–3	103(a)	Coleman ⁴

² U.S. Patent Pub. No. 2003/0018531 A1, published Jan. 23, 2003 (Ex. 1020, “Mahaffy”).

³ U.S. Patent Pub. No. 2007/0007331 A1, published Jan. 11, 2007 (Ex. 1021, “Jasper”).

⁴ U.S. Patent Pub. No. 2019/0108566 A1, published April 11, 2019 (Ex. 1022, “Coleman”).

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
4–11	103(a)	Coleman, Washington ⁵

As further support, Petitioner offers the Declaration of Boris Galitsky, Ph.D. Ex. 1002.

II. DISCRETIONARY DENIAL

Before we turn to the merits, we first consider Patent Owner’s requests for discretionary denial of the Petition on two bases, each of which is addressed below.

A. Prior Consideration of Art or Arguments by the Office – Section 325(d)

Patent Owner first urges us to exercise our discretion to deny institution under 35 U.S.C. § 325(d) on the basis that (1) the same prior art (Mahaffy) was previously submitted to the Patent Office during prosecution of the application that issued as the ’706 patent; and (2) Petitioners make the same arguments applying the Coleman and Mahaffy references that the Examiner considered for “nine different prior art references during prosecution” of that application. Prelim. Resp. 4–5. Petitioner argues that the Board should not deny institution under 35 U.S.C. § 325(d) because (1) although Mahaffy was cited by Patent Owner during prosecution, it was “not cited by the Examiner or used in a rejection” and, in any event, the combinations now presented were not previously presented; and (2) the Patent Office “materially erred by not considering Mahaffy.” Pet. 65–66. We address these arguments below.

⁵ U.S. Patent Pub. No. 2017/0293905 A1, published Oct. 12, 2017 (Ex. 1023, “Washington”).

1. Legal Standards

Section 325 of Title 35 of the United States Code addresses the relationship of proceedings before the Board with other proceedings in the Office, and provides, in part, that

[i]n determining whether to institute or order a proceeding under this chapter, chapter 30, or chapter 31,^[6] the Director may take into account whether, and reject the petition or request because, the same or substantially the same prior art or arguments previously were presented to the Office.

35 U.S.C. § 325(d).

In evaluating arguments under Section 325(d), we use a two-part framework, determining, first, “whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office.” *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential). If either condition of the first part of the framework is satisfied, we then determine “whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.” *Id.*

When deciding whether to exercise our discretion under Section 325(d) in view of the *Advanced Bionics* framework, we weigh the following nonexclusive factors:

- (a) the similarities and material differences between the asserted references and the prior art involved during prosecution;
- (b) the cumulative nature of the asserted references and the prior art evaluated during prosecution;

⁶ Chapter 31 (35 U.S.C. §§ 311–319) relates to *inter partes* review.

- (c) the extent to which the asserted references were evaluated during prosecution, including whether a rejection rested on any reference;
- (d) the extent of overlap between the arguments made during prosecution and Petitioner's reliance on the asserted references or Patent Owner's contentions concerning them;
- (e) whether Petitioner has pointed out sufficiently how the Examiner erred in analyzing the asserted references; and
- (f) the extent to which additional evidence and facts presented in the petition warrant reconsideration of the asserted references or arguments.

See Becton, Dickinson & Co. v. B. Braun Melsungen AG, IPR2017-01586, Paper 8 at 17–18 (PTAB Dec. 15, 2017) (precedential as to § III.C.5, first paragraph) (formatting altered); *see also Advanced Bionics*, Paper 6 at 9–11 (noting that the Board considers the *Becton Dickinson* factors in an *Advanced Bionics* analysis).

2. *Whether the Same Prior Art or Arguments Were Previously Presented*

Under the *Advanced Bionics* framework, we first consider *Becton Dickinson* factors (a), (b), and (d) in determining “whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office.” *Advanced Bionics*, Paper 6 at 8, 10. As noted above, Petitioner challenges claims 1–11 as obvious over (1) the combination of Mahaffy and Jasper, (2) the teachings of Coleman (claims 1–3), and (3) the combination of Coleman and Washington (claims 4–11). Pet. 6.

As discussed below, although we agree that Mahaffy was previously presented to the Office by Patent Owner, we determine that the combination of Mahaffy and Jasper (or a substantially similar combination) was not

previously presented. Consequently, we determine that the same or substantially the same prior art or arguments were not previously presented to the Office, and we decline to exercise our discretion under Section 325(d) to deny institution of trial.

We turn first to the parties' dispute over whether the primary reference, Mahaffy, was previously presented. Patent Owner filed Application No. 16/274,170 that became the '706 patent along with a Petition to Make Special Under Accelerated Examination Program (PTMS). Ex. 1004, 285. As part of the PTMS, the Patent Owner provided (1) an Accelerated Examination Support Document (AESD) (*id.* at 186–92) that included discussion of what Patent Owner represented were the “references deemed most closely related to the subject matter of the claim[s]” (including Mahaffy) (*id.* at 188–91); and (2) an Information Disclosure Statement (IDS) (*id.* at 180–83) citing Mahaffy and three other references. In the AESD, Patent Owner identified several limitations in claims 11 and 17 (which, after subsequent amendments, were issued as claims 1 and 4 of the '706 patent) that Patent Owner agreed were disclosed by Mahaffy. *Id.* at 188–92. The Examiner signed the IDS citing Mahaffy. *Id.* at 116–17. The Examiner did not, however, substantively discuss Mahaffy, but instead issued rejections over other references not at issue here. Ex. 1006 (Non-Final Action mailed July 26, 2019); Ex. 1008 (Final Action mailed January 8, 2020).

Petitioner acknowledges that Mahaffy was cited by Patent Owner during prosecution, but insists that part one under *Advanced Bionics* is not met because “Mahaffy was not cited by the Examiner or used in a rejection.” Pet. 65. *Advanced Bionics* does not, however, require in part one that the prior art actually have been the basis for a rejection. Rather, *Advanced*

Bionics asks, in part one, whether the same prior art or arguments were “previously presented” to the Office. *Advanced Bionics*, Paper 6 at 7. “Previously presented art includes . . . art provided to the Office by an applicant, such as on an Information Disclosure Statement (IDS), in the prosecution history of the challenged patent.” *Id.* at 7–8. Here, it is undisputed that Mahaffy was not only cited by Patent Owner during prosecution of the 706 patent, but was in fact discussed in some detail by Patent Owner. Our precedent does not require, in this first inquiry of whether the same references were “previously presented,” that the references were substantively discussed or applied by the Examiner.

Petitioner also contends that “[t]he *combination* of Mahaffy and Jasper was . . . not previously presented to the PTO, nor is it reasonably cumulative with the ‘[p]rior art of record [that] . . . fails to teach’ these same limitations.” Pet. 65 (alternations in original, emphasis added). Patent Owner acknowledges that Jasper was not previously presented, but contends that “substantially similar arguments were.” Prelim. Resp. 8. We side with Petitioner on this issue.

As discussed *infra* III.E.1.a.(8), the Petitioner relies on Mahaffy in combination with Jasper as teaching “prompting an on-site employee to engage the customer and complete the order,” as recited in claim 1 and commensurately recited in claim 4. This limitation was added during prosecution and formed a key basis for Patent Owner’s arguments over the art of record. *See* Ex. 1007, 7–8, 10 (amendment), 13–15 (arguing deficiency of the cited references “with respect to the claimed processor deactivation and customer control passing to an on-site employee”). The Examiner allowed the claims containing such a recitation, without citing or

discussing any additional art. *See* Ex. 1008, 9–10 (reasons for allowance). The Petition, in contrast to the prosecution record, presents evidence that Jasper explicitly discloses this limitation “by a failsafe via which the system defers to the in-store personnel to take the order.” Pet. 25 (citing Ex. 1021 ¶¶ 59, 61, 62). As noted below, Patent Owner does not dispute Petitioner’s characterization of Jasper’s disclosure but challenges Petitioner’s combination of Mahaffy with Jasper on the basis of allegedly insufficient motivation to combine (a point with which we disagree, as discussed below). *See infra* III.E.1.a.(9).

We determine that the same or substantially the same art or arguments were not presented to the Examiner during prosecution. Although Mahaffy was presented to the Examiner, the art of record before the Examiner did not include the teachings for which the Petition cites to Mahaffy in combination with Jasper. Patent Owner does not point out any combination of references previously before the Examiner that are the same or substantially the same as the combination of Mahaffy and Jasper now before us. *Cf.* Prelim. Resp. 9–11. Nor does Patent Owner explain how the same or substantially the same arguments were presented to the Examiner if the prior art before the Examiner was lacking material elements that Petitioner has persuasively, on this record, shown to be present in the combination of Mahaffy and Jasper (as discussed herein). Consequently, we decline to exercise our discretion under Section 325(d) to deny institution of trial.

In addition, because we decide to go forward on the Mahaffy / Jasper grounds (as explained below), and going forward on the Mahaffy / Jasper

grounds means going forward also on the Coleman grounds,⁷ we need not reach Patent Owner’s Section 325(d) arguments concerning Coleman.

B. Parallel Litigation – Section 314(a)

Patent Owner also argues that we should exercise discretion to deny institution under 35 U.S.C. § 314(a) in view of the Underlying Litigations. Prelim. Resp. 13–14 (citing *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 5–6 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv* Order”)). Petitioner argues we should not discretionarily deny institution. Pet. 67–68. For the reasons discussed herein, we do not exercise discretion to deny institution on this basis.

Under § 314(a), the Director has discretion to deny institution of an *inter partes* review (see 37 C.F.R. § 42.4(a) (“The Board institutes the trial on behalf of the Director.”); *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016) (“[T]he PTO is permitted, but never compelled, to institute an IPR proceeding.”)). In determining whether to exercise discretion to deny institution under 35 U.S.C. § 314(a), the Board considers whether the circumstances of a parallel district court proceeding are a basis for exercising such discretion. *Fintiv* Order 5–6.

On March 23, 2023, subsequent to the filing of the Petition, the district court in the Underlying Litigations entered a stipulated stay of the proceedings on two bases: (1) pending a reissue proceeding involving the

⁷ *SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1353 (2018) (“The agency cannot curate the claims at issue but must decide them all.”); see also 37 C.F.R. § 42.108(a) (“When instituting . . . review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.”).

'706 patent purportedly to correct its priority information; and (2) pending the present IPR. Ex. 2003, 1–2. In particular, the parties agreed to stay the Underlying Litigations until at least issuance of a decision on the institution of the present IPR. *Id.* at 2. Meanwhile, as Patent Owner acknowledges, these cases do not have a trial date. Prelim. Resp. 15–16.

In light of this development, it is not necessary to analyze the *Fintiv* factors in detail because the Underlying Litigations are not currently proceeding in parallel with this case. Although Patent Owner characterizes the stay of the Underlying Litigations as “neutral,” representing that the stay is “based on alleged concerns about the reissue proceeding” (Prelim. Resp. 16), we disagree. First, the stipulated stay is not merely in view of the reissue proceeding, but also in view of the present IPR. *See* Ex. 2003, 1–2. Second, our precedent in *Fintiv* recognizes that a stay of parallel litigation is not merely neutral, but weighs strongly against exercising discretion to deny institution. *See, e.g., Fintiv* Order, Paper 11 at 6 (“A district court stay of the litigation pending resolution of the PTAB trial allays concerns about inefficiency and duplication of efforts. This fact has strongly weighed against exercising the authority to deny institution under *NHK*.”); *see also Precision Planting, LLC v. Deere & Co.*, IPR2019-01052, Paper 19 at 10 (PTAB Jan. 7, 2020) (finding that the stay of the parallel district court case rendered moot the patent owner’s argument for discretionary denial of the petition). Therefore, we decline to exercise our discretion to deny institution on the basis of the Underlying Litigations.

III. ANALYSIS

A. *Principles of Law*

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 ordinary skill in the art; and (4) when in evidence, objective evidence of nonobviousness.⁸ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic*, 815 F.3d at 1363 (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

⁸ Neither party presents arguments or evidence of secondary considerations at this stage. Therefore, secondary considerations do not constitute part of our analysis herein.

B. Level of Ordinary Skill in the Art

The level of skill in the art is a factual determination that provides a primary guarantee of objectivity in an obviousness analysis. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 1324 (Fed. Cir. 1999) (citing *Graham*, 383 U.S. at 17–18; *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991)).

Relying on the declaration testimony of Dr. Galitsky, Petitioner asserts that a person of ordinary skill in the art “would have had at least a bachelor’s degree in computer science or computer engineering and at least 2 years of experience with speech-recognition and natural-language-processing technology.” Pet. 5 (citing Ex. 1002 ¶ 94). Petitioner also asserts that the ordinarily skilled artisan “would also have a general knowledge of fast-food ordering processes.” *Id.*

At this stage, Patent Owner does not propose an alternative assessment.

Based on the present record including the disclosure in the ’706 patent, we apply Petitioner’s definition of the level of ordinary skill in the art (*see* Pet. 5) with the exception of the open-ended phrases “at least,” which expand the ranges of education and experience indefinitely without an upper bound. We determine this level of skill comports with the qualifications a person would have needed to understand and implement the teachings of the ’706 patent and the prior art of record. *Cf. Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (noting that the prior art itself may reflect an appropriate level of skill in the art).

C. Claim Construction

In interpreting the claims of the '706 patent, we “us[e] the same claim construction standard that would be used to construe the claim[s] in a civil action under 35 U.S.C. [§] 282(b).” *See* 37 C.F.R. § 42.100(b) (2021). The claim construction standard includes construing claims in accordance with the ordinary and customary meaning of such claims as would have been understood by one of ordinary skill in the art in light of the written description and the prosecution history pertaining to the patent. *See id.*; *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc).

Neither party proposes any terms for construction at this stage. *See* Pet. 6; *see* Prelim. Resp. We do note, however, that the parties appear to take differing views over the meaning of the term “deactivating the order processor,” as recited in independent claims 1 and 4. We address this apparent dispute *infra* Section III.E.1.a.(7) in connection with our evaluation of the parties’ arguments and evidence regarding this term. The parties also appear to take differing views of the scope of the limitation “updating the order processor based upon error detected in the order by the auditor,” as recited in claim 4. *See infra* Section III.E.3.a.(2).

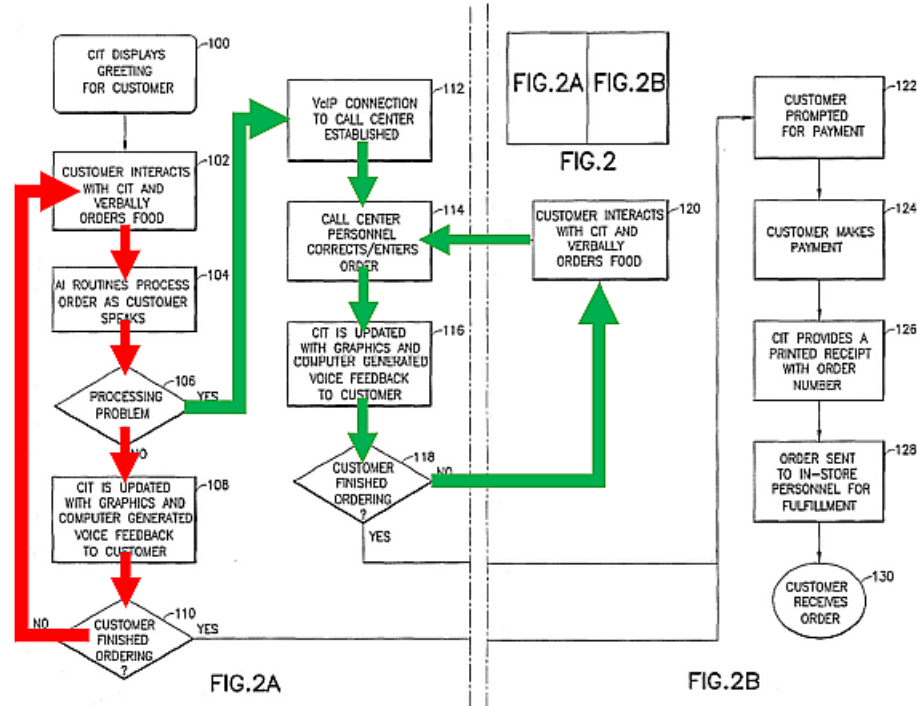
We otherwise determine, at this stage, that no explicit construction of any terms is needed to resolve the issues presented by the arguments and evidence of record. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

D. Overview of Cited References

1. Mahaffy (Ex. 1020)

Mahaffy is a U.S. Patent Application titled “Point-of-Sale Commercial Transaction Processing System Using Artificial Intelligence Assisted by Human Intervention,” published on January 23, 2003. Ex. 1020, codes (43), (54). Petitioner asserts that Mahaffy is prior art under 35 U.S.C. § 102(a)(1). Pet. 8. Patent Owner does not, at this stage, challenge the status of Mahaffy as prior art.

Mahaffy discloses a system for automating the traditional fast-food voice ordering process in which human intervention may take over in the event the automated system is unable to complete a transaction. Ex. 1020 ¶¶ 15–18. Instead of a human cashier, Mahaffy uses customer interaction terminal (CIT) 12, as shown in Figures 2A and 2B reproduced below, which is coupled to computer system 14 running software that permits the CIT to interact with the customer and process, via AI routines, orders spoken into the CIT’s microphone 22. *Id.* ¶¶ 16, 21, 30–33, 50.



Figures 2A and 2B from Mahaffy, as annotated by Petitioner, depict a flow chart of implementing a point-of-sale commercial transaction processing system. Ex. 1010 ¶ 24; Pet. 9.

In Mahaffy’s automated workflow (annotated above by Petitioner in red), the AI routines utilize speech recognition and natural language processing to identify menu items from the customer’s spoken order and to add those items to an order list. Ex. 1020 ¶¶ 30–33, 44, 50.

Mahaffy also discloses a human-assisted workflow (annotated by Petitioner above in green) for when Mahaffy’s automated workflow cannot complete an order in a satisfactory manner. Ex. 1020 ¶¶ 31, 47–48. In that case, Mahaffy allows human operators 40 data-connected to the CIT to intervene to complete, correct, or verify the order via a human-assisted workflow through the CIT. *Id.*

2. *Jasper (Ex. 1021)*

Jasper is a U.S. Patent Application titled “Order Processing Apparatus and Method,” published on January 11, 2007. Ex. 1021, codes (43), (54). Petitioner contends that Jasper is prior art under 35 U.S.C. § 102(a)(1). Pet. 10. Patent Owner does not, at this stage, challenge the status of Jasper as prior art.

Jasper discloses an order-taking system that uses voice-over-internet-protocol (“VoIP”) to connect customers at a drive-thru with a remote order-taking agent (e.g., a human at a call center or an AI) who takes their orders. Ex. 1021 ¶¶ 45, 47, 54–55, Fig. 1. In failure situations, an alternate remote agent may be selected (thus switching from AI to human, or vice versa) to step in and take the order, or the system may defer to the personnel at the restaurant to take the order via a restaurant point-of-sale system. *Id.* ¶¶ 59–62. Jasper also discloses using its remote order-taking selectively to handle overflow, such as during lunch or dinner rush or during staffing shortages. *Id.* ¶ 63.

3. *Coleman (Ex. 1022)*

Coleman is a U.S. Patent Application titled “Contextual Restaurant Ordering System,” which was published on April 11, 2019, and claims priority to a provisional application filed on October 5, 2017. Ex. 1022, codes (43), (54), (60).

Petitioner contends that Coleman is prior art under 35 U.S.C. § 102(a)(2) because “the ’706 patent is not entitled to a priority date earlier than its February 12, 2019 actual filing date.” Pet. 36. In particular, Petitioner contends that the ’706 patent claims recite “automated order-taking involving a human auditor intervening in an ongoing order-taking

transaction,” but the parent applications to the ’706 patent “do not disclose this *human auditor* intervening in an automated order-taking process.” *Id.* at 37–38. At this stage, Patent Owner does not argue to the contrary. On this record, for purposes of this Decision, we agree that Coleman is prior art to the ’706 patent.

Coleman discloses a system for automated drive-thru voice ordering, shown in Figure 1 below (as annotated by Petitioner), where drive-thru ordering area 1 has microphone 8 into which customer 6 speaks an order that is entered into restaurant information system 3 for processing. Ex. 1022 ¶¶ 29, 34–36, 80. Coleman re-routes this ordering process to human agents, however, if the automated workflow is not capably working. *Id.* ¶¶ 5, 20, 23.

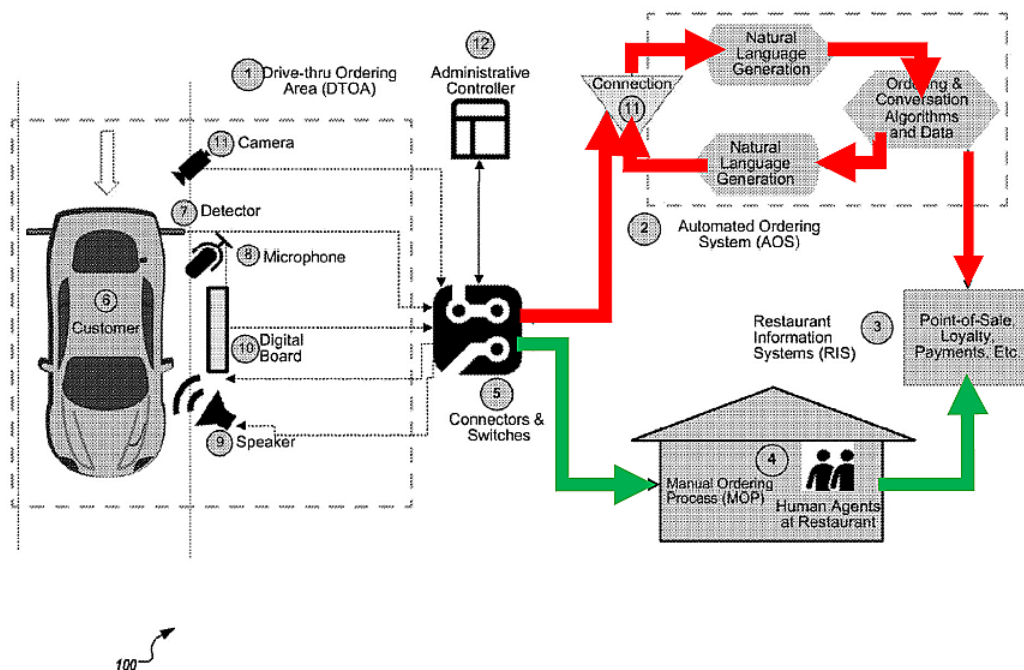


FIG. 1

Figure 1 of Coleman, as annotated by Petitioner (Pet. 12), is a block diagram illustrating a drive-thru system with an automated ordering and interaction environment. Ex. 1022 ¶ 17.

As depicted above, in an automated workflow (annotated by Petitioner in red), automated order system (“AOS”) 2 uses a natural language understanding (“NLU”) component to process the customer’s order by converting it into transcribed text and intent. Ex. 1022 ¶¶ 34–35, 70–71. In a human-assisted workflow (annotated by Petitioner in green), human agents take the customer’s order via manual order process system (“MOP”) 4 by interfacing with the customer. *Id.* ¶¶ 35–36, 68. Switch 5 controls whether the order is to be taken via the AOS or via the MOP. *Id.* ¶¶ 38, 41, 45, 63, 68–69.

4. Washington (Ex. 1023)

Washington is a U.S. Patent Application titled “Voice Recognized Data Analysis and Corrective Action Systems and Methods,” and was published on October 12, 2017, claiming priority to a provisional application filed on April 7, 2017. Ex. 1023, codes (43), (54), (60). Petitioner contends that Washington is prior art under 35 U.S.C. § 102(a)(2). Pet. 13. At this stage, Patent Owner does not challenge the status of Washington as prior art.

Washington discloses an order processing system 100 that facilitates the order-taking process at a drive-thru restaurant via a speech-to-order (“STO”) system 106. Ex. 1023 ¶¶ 21–22. The STO system converts customer speech into an order that is displayed to an operator. *Id.* ¶¶ 30–37, 39–45, 68–73. An operator also listens to the customer speech and can confirm or make corrections to the order. *Id.* ¶¶ 38, 68–70, 20.

E. Asserted Obviousness

1. Ground 1: Obviousness of Claims 1–11 over Mahaffy and Jasper

Petitioner contends that claims 1–11 are unpatentable under 35 U.S.C. § 103(a) over the combined teachings of Mahaffy and Jasper. Pet. 13–36. For the reasons explained herein, we are persuaded that Petitioner has established a reasonable likelihood of establishing unpatentability of at least one of these claims on this basis.

a. Claim 1⁹

(1) [1a] “providing an audio stream of a customer positioned on a site”

Petitioner presents evidence that Mahaffy teaches this limitation by disclosing ““a customer order [that] is verbally provided into the microphone 22 of the CIT at 102,’ which is then reproduced for the operator.” Pet. 16 (citing Ex. 1020 ¶¶ 31, 33) (alteration added by Petitioner). Petitioner also presents evidence that Mahaffy’s customer is “positioned on a site” because “the CIT can be placed at the drive-thru of a restaurant.” *Id.* at 16–17 (citing Ex. 1020 ¶ 29). Petitioner further asserts that “Patent Owner also admitted that Mahaffy discloses these features.” *Id.* at 17 (citing Ex. 1005, 4).

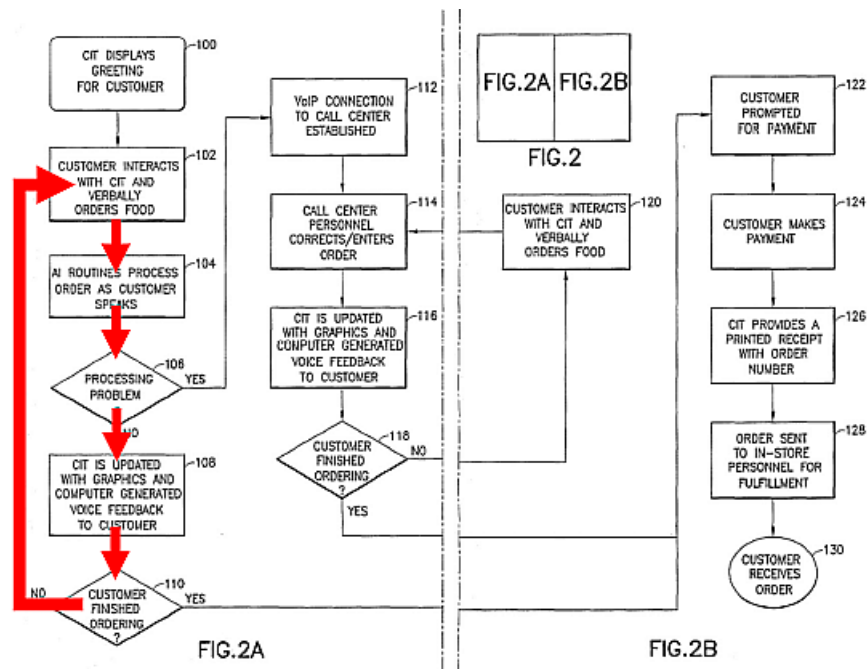
Patent Owner does not, at this stage, challenge Petitioner’s arguments or evidence as to this limitation.

At this stage, and on this record, we determine that Petitioner’s evidence and arguments are sufficient to show a reasonable likelihood that this limitation would have been obvious over Mahaffy.

⁹ Bracketed references preceding the limitations of the claims are those provided by Petitioner in the Claim Appendix. See Pet. Appx-ii – vi. Patent Owner has adopted the same references. *E.g.*, Prelim. Resp 25.

- (2) [1b] “providing an order processor having a speech recognition module trained using artificial intelligence programs”

Petitioner presents evidence that Mahaffy teaches this limitation by disclosing a “computer system with AI routines that parse customers’ utterances to determine what the customer wants.” Pet. 17 (citing Ex. 1020 ¶ 33). Petitioner contends that “Mahaffy’s CIT is coupled to that computer system, which permits the CIT to interact with customers and process, via the AI routines, orders spoken into its microphone.” Pet. 17 (citing Ex. 1020 ¶¶ 30, 33). In Mahaffy’s automated workflow (annotated by Petitioner in red in Figures 2A and 2B, reproduced below), the AI routines use ASR and NLP to identify and add spoken menu items to an order list. See Pet. 18 (citing Ex. 1020, Figs. 2A, 2B, ¶¶ 34, 37–38, 40, 44).



Figures 2A and 2B from Mahaffy, as annotated by Petitioner, depict a flow chart of implementing a point-of-sale commercial transaction processing system. Ex. 1010 ¶ 24; Pet. 18.

By way of example, in Mahaffy, the AI routines may recognize the words “three” and “SuperBurgers” from a customer’s utterance, which the AI routines would interpret “as an order for three SuperBurgers.” Ex. 1020 ¶ 40. Petitioner contends that the ordinarily skilled artisan “would understand that this describes using speech-recognition for automated order-taking, and is no different from the structure identified in the ’706 patent.” Pet. 18 (citing Ex. 1001, 1:25–32 (“Speech recognition systems are systems that utilize a machine to identify words or phrases in spoken language and convert them into machine readable text or instructions.”); Ex. 1002 ¶¶ 131–134).

Petitioner further contends that the ordinarily skilled artisan would have understood “that the AI routines of Mahaffy would be ‘trained using artificial intelligence programs.’” Pet. 18 (citing Ex. 1002 ¶¶ 135–146) (emphasis omitted). Petitioner bases this contention on two assertions. First, Petitioner asserts that “Mahaffy’s AI routines are optimized based on conditioning data collected at the POS that is used to train the AI routines on a ‘continual basis,’ suggesting a ‘supervised learning’ approach that involves training using artificial intelligence.” *Id.* at 19 (citing Ex. 1020 ¶ 34; Ex. 1002 ¶¶ 136–139). In that regard, Petitioner notes that “Mahaffy indeed suggests using speech-to-text software (e.g., Dragon NaturallySpeaking software) that was known to be trained using AI according to a supervised learning approach.” *Id.* (citing Ex. 1020 ¶ 38; Ex. 1002 ¶ 136). Petitioner further notes that “[t]he Dragon software corresponds to the speech-to-text software identified in the ’706 patent.” *Id.* (citing Ex. 1001, 7:37–41; Ex. 1002 ¶ 138). Petitioner next asserts that the ordinarily skilled artisan would have understood that “all speech-recognition routines, including

Mahaffy's, would be developed by training a neural network's ability to pattern match against incoming audio by providing a corpus of sample audio that has been assigned text words or phrases." *Id.* (citing Ex. 1002 ¶¶ 141–143).

Patent Owner contends that Petitioner's showing as to this limitation is deficient because "*Mahaffy* does not disclose that the AI routines are trained using multiple '*artificial intelligence programs.*'" Prelim. Resp. 25–26. Patent Owner acknowledges that Mahaffy discloses AI routines "trained on data," but insists that such training does not correlate with being trained on artificial intelligence *programs.* *Id.*

Patent Owner does not elaborate on the difference between being trained on "data" versus being trained on "programs." In our view, and in the context of the record before us, any difference is merely a matter of semantics. The portion of the '706 patent identified by Patent Owner regarding the claimed training describes receiving previously transcribed text and audio clips and transmitting them to a Deep Neural Network (DNN), "where they are used to develop a Speech-to-Text System 41. . . . The DNN receives the audio, text and metadata and runs specific training programs on each of these items." Ex. 1001, 11:14–21. The substance of the "training programs" is not described in the '706 patent. Rather, the '706 patent describes the training only very broadly, noting that, as a result of the "training" with previously transcribed text and audio clips, the system "can quickly relate the audio clip [received in an order] to other audio clips encountered during training, and then cross-reference the accompanying text with those audio clips." *Id.* at 11:24–31. As such, the "training" described

by the '706 patent is based on pattern-recognition and correlation with previously-collected data.

As Petitioner notes, Mahaffy's AI training, albeit not expressly described as being based on multiple "programs," is very similar in concept to that described in the '706 patent. In particular, Mahaffy discloses training the AI routines based on pattern-recognition gleaned from previously-collected conditioning data:

The AI routines are preferably optimized based on conditioning data collected from conversation over a period of time (e.g., a few days) at a conventional cashier point of sale terminal and examined for recurring patterns, and then used to train the AI routines. AI routine training and optimization is preferably performed on a continual basis, with reports of misunderstood communications regularly analyzed and used to improve the performance of the system.

Ex. 1020 ¶ 34. Petitioner also presents evidence in the form of expert testimony that the ordinarily skilled artisan would have understood that "all speech-recognition routines, including Mahaffy's, would be developed by training a neural network's ability to pattern match against incoming audio by providing a corpus of sample audio that has been assigned text words or phrases," and also noting that this training is the same as described in the '706 patent. Pet. 19 (citing Ex. 1002 ¶¶ 141–143).

Petitioner also points out that Mahaffy suggests using speech-to-text software such as "Dragon's NaturallySpeaking software," which "corresponds to the speech-to-text software identified in the '706 patent." *Id.* (citing Ex. 1020 ¶ 38; Ex. 1001, 7:37–41; Ex. 1002 ¶ 138). Patent Owner does not dispute that the '706 patent identifies "Dragon Dictation" as a suitable speech-to-text processor, but asserts that Petitioner fails to

adequately show how Dragon NaturallySpeaking actually worked at the time Mahaffy was filed. Prelim. Resp. 28–29. We disagree that the lack of such level of detail undermines Petitioner’s showing, in view of the similar lack of any corresponding detail in the ’706 patent.

At this stage, and on this record, we see no meaningful difference between a “speech recognition module trained using multiple artificial intelligence programs,” as claimed and described in the ’706 patent, and the speech recognition module trained as described in Mahaffy. Although Mahaffy may not explicitly describe the training in terms of multiple “programs,” this alleged distinction over the training described and claimed in the ’706 patent appears to be merely a nonsubstantive difference in terminology, as noted above.

At this stage, and on this record, we determine that Petitioner’s evidence and arguments are sufficient to show a reasonable likelihood that this limitation would have been obvious over Mahaffy.

(3) [1c] *“converting a word or words in the audio stream to text using the speech recognition module”*

Petitioner presents evidence that Mahaffy teaches this limitation by disclosing that its AI routines “recognize and parse the speech of the customer . . . such that individual menu items ordered are properly added to the customer’s order list . . . after each menu item is ordered.” Pet. 19–20 (quoting Ex. 1020 ¶ 44; citing *id.* ¶ 40). Petitioner contends that the ordinarily skilled artisan would have understood “that recognizing menu items from speech involves converting the audio to text.” Pet. 20 (citing Ex. 1002 ¶¶ 148–150). As support, Petitioner notes that “Mahaffy indeed suggests using a known speech-to-text software (*e.g.*, Dragon’s

NaturallySpeaking) that was known to convert words in the audio stream to text.” *Id.* (citing Ex. 1020 ¶ 38; Ex. 1002 ¶¶ 148–150). Petitioner further contends that the ordinarily skilled artisan would have understood that “all speech-recognition modules, including that of Mahaffy, work by converting audio into a text-based phoneme (e.g., *th*, *p*, *d*, etc.) sequence for pattern matching against known words or word sequences.” *Id.* (citing Ex. 1002 ¶¶ 151–153). Petitioner also contends that “Patent Owner also admitted that Mahaffy discloses these features.” *Id.* (citing Ex. 1005, 4).

Patent Owner argues that Petitioner’s showing as to this limitation is deficient because Petitioner argues that “the AI routines in *Mahaffy* disclose both the speech recognition module and the NLP,” but claim 1 requires the “speech recognition module” and the “natural language processor” to be “separate components.” Prelim. Resp. 30–32.

We disagree with the premise of Patent Owner’s argument—namely, that separate features in a claim cannot be rendered obvious by a single entity (such as a single software module or routine). To the contrary, as our reviewing court has recognized, in an obviousness analysis, a single element, feature, or mechanism can ordinarily satisfy multiple claim limitations, including by performing multiple claimed functions. *See, e.g., Google LLC v. Personal Audio, LLC*, 743 F. App’x 978, 985 (Fed. Cir. 2018) (“The Board’s holding [of obviousness] is consistent with the principle that in infringement or obviousness analysis, a single element, feature, or mechanism can ordinarily satisfy multiple claim limitations, including by performing multiple claimed functions.”) (underlining added); *Powell v. Home Depot U.S.A., Inc.*, 663 F.3d 1221, 1231–32 (Fed. Cir. 2011) (“[T]he specification teaches that the cutting box may also function as a ‘dust

collection structure’ to collect sawdust and wood chips generated during the wood cutting process. It does not suggest that the claim terms require separate structures.”); *Rodime PLC v. Seagate Tech., Inc.*, 174 F.3d 1294, 1305 (Fed. Cir. 1999) (“[A] particular means may perform more than one function.”).

As discussed above, Petitioner has presented persuasive evidence and argument that Mahaffy’s system, comprising AI routines, performs the functions of the claimed “speech recognition module.” As further discussed below, Petitioner has also presented persuasive evidence that Mahaffy’s AI routines also perform the functions of the claimed “natural language processor.” *See infra* Section III.E.1.a.(5). Patent Owner’s challenge to Petitioner’s showing as lacking a mapping of these claimed elements to distinct portions of Mahaffy is contrary to applicable precedent and is misplaced.

At this stage, and on this record, we determine that Petitioner’s evidence and arguments are sufficient to show a reasonable likelihood that this limitation would have been obvious over Mahaffy.

(4) [Id] “*processing the text communication with the speech recognition module to identify a word or words in the text of the converted audio stream according to a previous spoken word training*”

Petitioner offers evidence that Mahaffy teaches this limitation by disclosing that its AI routines “recognize and parse the speech of the customer . . . such that individual menu items ordered are properly added to the customer’s order list . . . after each menu item is ordered.” Pet. 21 (quoting Ex. 1020 ¶¶ 40, 44). In particular, Petitioner argues that “Mahaffy discloses using spoken-word training because its sentence parsing uses grammar learned automatically from a corpus of utterances parsed

manually.” *Id.* (citing Ex. 1020 ¶¶ 34, 42). Petitioner contends that the ordinarily skilled artisan would have understood that “this constitutes processing text communication according to a previous spoken word training.” *Id.* (citing Ex. 1002 ¶¶ 156–157). Petitioner further contends that the ordinarily skilled artisan would have understood that Mahaffy’s AI routines “would be trained ‘according to spoken-word training’ to perform pattern matching” because “all speech-recognition routines, including Mahaffy’s, would be developed by training a neural network’s ability to pattern match against incoming audio by providing a corpus of sample audio that has been assigned text words or phrases.” *Id.* (citing Ex. 1002 ¶¶ 158–159). Petitioner also contends that “Patent Owner also admitted that Mahaffy discloses these features.” *Id.* (citing Ex. 1005, 4).

As this stage of the proceeding, Patent Owner does not present arguments or evidence separately challenging Petitioner’s showing as to this limitation.

At this stage, and on this record, we determine that Petitioner’s evidence and arguments are sufficient to show a reasonable likelihood that this limitation would have been obvious over Mahaffy.

- (5) [1e] “*providing a natural language processor having order assembly capabilities and exception detection capabilities, wherein the natural language processor receives recognized text from the order processor and creates or modifies an order based upon the recognized text*” and [1f] “*generating an order with the natural language processor*”

Petitioner presents evidence that these limitations are taught by Mahaffy’s disclosure of its computer system having “AI routines that parse orders from customer speech.” Pet. 22 (citing Ex. 1020 ¶¶ 33, 50). In particular, Petitioner contends that Mahaffy discloses a system that “creates

or modifies an order,” including “order assembly capabilities” and “generating an order,” because Mahaffy discloses that “the AI routines are able to recognize and parse the speech of the customer . . . such that individual menu items ordered are properly added to the customer’s order list.” Pet. 22 (quoting Ex. 1020 ¶ 44); *see also* Ex. 1020 ¶ 50 (“The AI routines in the computer process the interaction . . . to parse and identify the elements the food order.”). Petitioner contends that the ordinarily skilled artisan would have understood that “this AI order-generating routine of Mahaffy involves ‘receiv[ing] recognized text’ corresponding to the menu item.” Pet. 22 (citing Ex. 1002 ¶ 163).

As support, Petitioner first notes that Mahaffy discloses that “[as] the AI routines processes [sic] the words of the customer’s order, the task is to recognize the customer’s request at a level sufficient to process his order,” e.g., by recognizing menu items such as “three SuperBurgers,” which “analysis is a direct result of the speech recognition.” *Id.* (quoting Ex. 1020 ¶ 40; first alteration by Petitioner). Petitioner next notes that the ordinarily skilled artisan would have understood that “all speech-recognition routines, including Mahaffy’s, work by converting an incoming audio stream into a text-based phoneme sequence for pattern matching against known words or word sequences corresponding to known intents or meanings.” *Id.* at 22–23 (citing Ex. 1002 ¶¶ 165–166; Ex. 1020 ¶ 40).

With regard to “exception detection capabilities,” Petitioner contends that this is taught by Mahaffy’s disclosure of “the ability of the AI routines of the computer system 14 to recognize when the result of the speech recognition is correct and, when it is incorrect.” Pet. 23 (quoting Ex. 1020 ¶ 39). In particular, Petitioner contends that Mahaffy explains “all current

speech recognition systems use an underlying probabilistic model” that “estimates how likely [the] particular word sequence is to have generated the acoustic signal heard.” Pet. 23 (quoting Ex. 1020 ¶ 39); *see also* Ex. 1020 ¶ 47. Petitioner also contends that “Patent Owner also admitted that Mahaffy discloses these features.” Pet. 23 (citing Ex. 1005, 4).

Patent Owner’s challenge to Petitioner’s showing as to limitation [1e] is premised on the contention that Petitioner has failed to read the speech recognition module and the natural language processor onto separate entities in Mahaffy’s system. *See* Prelim. Resp. 30–33. As discussed *supra*, this contention is based on a flawed premise, and, as such, does not undermine Petitioner’s showing as to either limitation. *See supra* Section III.E.1.a.(3). Patent Owner does not, at this stage, separately challenge Petitioner’s showing as to limitation [1f].

At this stage, and on this record, we determine that Petitioner’s evidence and arguments are sufficient to show a reasonable likelihood that these limitations would have been obvious over Mahaffy.

(6) [1g] *“alerting an auditor of detected exceptions in the order, the auditor located off-site and connected to the order processor via a data connection”*

Petitioner presents evidence that Mahaffy teaches this limitation by disclosing “human operators 40 [that] work at the call center,” which is “located on different premises than the CIT.” Pet. 23 (quoting Ex. 1020 ¶ 31). In particular, Petitioner contends that Mahaffy discloses that the human operators are “connected to the order processor via a data connection,” as recited in claim 1, based on Mahaffy’s disclosure of “a network connection,” which may be a VoIP connection, between the CIT (and the computer system) and the call center. Pet. 23 (citing Ex. 1020

¶¶ 47, 50, Figs. 2A, 2B). In addition, Petitioner asserts that Mahaffy discloses “alerting an auditor of detected exceptions in the order,” as recited in claim 1, by the VoIP connection created in response to “a problem with the order processing at 106,” and by the operator being “able to correct, verify or complete” the customer’s order. Pet. 23–24 (citing Ex. 1020 ¶¶ 47, 50). Based on this disclosure, Petitioner contends that, “per VoIP protocol, the operator would receive and need to answer an incoming VoIP call from the CIT/computer system in order to establish the VoIP connection, thus alerting the operator.” Pet. 24 (citing Ex. 1002 ¶¶ 172–174). In addition, “since the VoIP connection is established in response to the detected exceptions . . . the incoming VoIP call would alert the operator that exceptions were detected.” *Id.* (citing Ex. 1002 ¶ 174; Ex. 1020 ¶¶ 47, 50).

Petitioner also contends that “Patent Owner also admitted that Mahaffy discloses these features.” *Id.* (citing Ex. 1005, 4).

As this stage of the proceeding, Patent Owner does not present arguments or evidence separately challenging Petitioner’s showing as to this limitation.

At this stage, and on this record, we determine that Petitioner’s evidence and arguments are sufficient to show a reasonable likelihood that this limitation would have been obvious over Mahaffy.

(7) [1h] “*deactivating the order processor with the auditor in response to the detected exceptions in the order*”

Petitioner presents evidence that Mahaffy teaches this limitation by disclosing switching “to the human-assisted workflow if at any time during the customer’s order an exception is detected in the AI routine order processing, i.e., when the AI is unable to satisfactorily complete an order.”

Pet. 24 (citing Ex. 1020 ¶¶ 39, 47). In particular, referring to its contentions in the previous section, Petitioner asserts that Mahaffy initiates the human-assisted workflow by establishing a VoIP connection with the human operator, where the operator may complete the order without reversion to the AI routines. *Id.* (citing Ex. 1020 ¶¶ 31, 47, 50, Figs. 2A, 2B). Petitioner contends that the ordinarily skilled artisan would have understood that “completing the order by the human-assisted workflow to the exclusion of the automated workflow corresponds to ‘deactivating the order processor’ because the AI routines are no longer used in that transaction.” *Id.* at 24–25 (citing Ex. 1002 ¶¶ 176–178). Petitioner further contends that the ordinarily skilled artisan would have understood that “such deactivation occurs naturally ‘with the auditor,’ in the course of establishing the VoIP connection and then completing the order with the operator without reversion to the AI routines.” *Id.* at 25 (citing Ex. 1020 ¶¶ 179–180; emphasis omitted).

Patent Owner contends Petitioner’s showing is deficient as to the limitation “deactivating the order processor” because “*Mahaffy* does not teach *deactivating* any component.” Prelim. Resp. 33. Patent Owner acknowledges Mahaffy’s teaching that a human operator can take over the ordering process if there is a problem with the order processing using the AI routines, including the disclosure in Mahaffy that “[t]he operator can ‘complete the order with the customer without reversion to the AI routines.’” *Id.* at 34 (quoting Ex. 1020 ¶ 47). Patent Owner argues, however, that “even if the AI routines are not used in a transaction after the human-assisted workflow is enabled, *Mahaffy* does not teach that the AI routines are not active.” *Id.* at 35. Patent Owner further argues that because Petitioner maps

both Mahaffy's AI routines and underlying computer system 14 to the "order processor" limitation, "Petitioner would need to show that both the AI routines and computer system 14 are '*deactivated*'" to show that Mahaffy teaches this limitation. *Id.* Patent Owner contends that Petitioner cannot make such a showing because Mahaffy's computer system 14 remains active as part of the CIT that the operator uses to continue interaction with the customer. *Id.*

We disagree with Patent Owner's premise that "deactivating the order processor" in claim 1 requires physically shutting down the software and hardware running the order processor. Notably, the '706 patent does not mention "deactivating" except in the claims. Rather, the '706 patent consistently describes order deviations as resulting *in shifting control of the ordering function* from the AI to a human operator. *See, e.g.*, Ex. 1001, 13:33–40 ("If the auditor 71 detects that the artificially intelligent order processing system 10 is not functioning properly . . . the auditor 71 can abort, or intervene in, the transaction and *pass control* back to the on-site employee . . .") (emphasis added), 14:35–38 ("Such conditions can result in the artificially intelligent order processing system switching back to an auditor-assist mode or *control of the order processing function passing back* to the on-site employee.") (emphasis added). The '706 patent does mention an option in that the auditor can also "remotely switch off the on-site computer" to allow the on-site employee to take control of order processing. *Id.* at 13:40–43. However, in the overall context of the '706 patent, "deactivating the order processor" appears not to be limited to physically disabling the order processor, but more broadly covers shifting control from

the artificially intelligent order processor to a human operator in the event of detected problems with the automated ordering process.

At this stage, for purposes of this decision, we do not construe “deactivating the order processor” as limited to physically shutting down the order processing software or hardware. Instead, we construe this term consistently with the disclosure of the ’706 patent as encompassing shifting control of the ordering process from the artificially intelligent order processing system to a human operator.

Applying that construction for purposes of this Decision, we determine that Petitioner has presented sufficient argument and evidence, at this stage, that Mahaffy teaches, in the event of detected problems with the automated ordering process, shifting control from the artificially intelligent order processing system to a human operator, thus “deactivating” the order processor. *See* Pet. 24–25; Ex. 1020 ¶¶ 31, 39, 47, 50, Figs. 2A, 2B; Ex. 1002 ¶¶ 176–180.

We further note that our claim construction analysis in this Decision is preliminary and does not preclude the parties from arguing proposed constructions of the claims during trial. Indeed, the parties are hereby given notice that claim construction, in general, is an issue to be addressed at trial. Claim construction will be determined at the close of all the evidence and after any hearing. The parties are expected to assert all their claim construction arguments and evidence in the Petition, Patent Owner’s Response, Petitioner’s Reply, Patent Owner’s Sur-reply, or otherwise during trial, as permitted by our rules.

Patent Owner also argues that Petitioner’s showing is deficient because Mahaffy “does not disclose that the ‘*order processor*’ is deactivated

‘with the auditor.’” Prelim. Resp. 36. In particular, Patent Owner argues “there is no teaching in *Mahaffy* about any communication between the operator 14 of the call center 16 and the AI routines. Accordingly, the AI routines cannot be deactivated ‘with the auditor.’” *Id.* at 36–37. Patent Owner also argues that Petitioner’s showing as to this limitation is flawed in that it relies on “conclusory expert testimony.” *Id.* at 37–38.

We disagree with Patent Owner’s assessment of Petitioner’s evidence. Petitioner relies on testimony of its declarant, who opines that deactivation of the AI routines in *Mahaffy* “occurs naturally ‘with the auditor,’ in the course of establishing the VoIP connection, including the operator’s acceptance of the VoIP connection, and then the operator’s completing of the order without reversion to the AI routines.” Ex. 1002 ¶ 179. Petitioner’s expert further notes, based on *Mahaffy*’s disclosures as well as the understanding of the ordinarily skilled artisan regarding VoIP communications, that the ordinarily skilled artisan would have understood that, in *Mahaffy*, “the VoIP connection, which deactivates the automated-workflow in favor of the human-assisted workflow, is established when the operator 40 answers the incoming VoIP call from the CIT 12 / computer system 14.” *Id.* ¶ 180; *see also id.* ¶ 174 (citing Ex. 1061 (discussing VoIP call handling); Ex. 1020 ¶¶ 47, 50). Petitioner’s expert concludes that the ordinarily skilled artisan “would therefore understand that the AI routines are deactivated by the human operator 40 answering the VoIP and then completing the order without reversion to the AI routines, and that such deactivation is ‘in response to’ the detected exceptions in the order.” *Id.* ¶ 180. We view this expert testimony as finding support in the record, and not as merely conclusory.

We determine that Petitioner’s evidence and arguments are sufficient to show a reasonable likelihood that this limitation would have been obvious over Mahaffy.

(8) [1i] *“prompting an on-site employee to engage the customer and complete the order”*

Petitioner relies on Mahaffy in combination with Jasper as teaching or suggesting this limitation. Pet. 25–26. As also discussed above, Petitioner contends that Mahaffy discloses a human-assisted workflow where human operators intervene “to correct, verify or complete” the order by communicating with the customer through the VoIP connected CIT. *Id.* at 25 (citing Ex. 1020 ¶¶ 47, 50). Petitioner acknowledges, however, that Mahaffy does not disclose human operators being located on-site. *Id.* Accordingly, Petitioner relies on Jasper for that teaching, noting first that “Jasper describes an analogous order-taking system where drive-thru POS customers are connected, via a VoIP connection, with a remote order-taking agent (e.g., at a call center).” *Id.* (citing Ex. 1021 ¶¶ 47, 54–55, Fig. 1). Petitioner further notes that Jasper also discloses “a failsafe via which the system defers to the in-store personnel to take the order.” *Id.* (citing Ex. 1021 ¶¶ 59, 61–62 (describing failure situations occurring mid-order)). Petitioner contends that, in failure situations in Jasper’s system, “the order taking responsibility reverts back to the store and employees” who “pick[] up where the remote order taking agent 12a left off based on the order data transmitted thus far.” *Id.* (quoting Ex. 1021 ¶¶ 61–62). Petitioner contends that the ordinarily skilled artisan would have understood that “[t]he ‘prompting’ [in Jasper] is naturally met by the incomplete order data being sent to the on-site employee.” *Id.* (citing Ex. 1002 ¶¶ 184–188).

As this stage of the proceeding, Patent Owner’s challenge to Petitioner’s showing as to this limitation is based on Petitioner’s alleged failure to articulate a “credible motivation to combine Mahaffy and Jasper.” Prelim. Resp. 41–47. We address this point below. We determine that Petitioner’s evidence and arguments are sufficient to show a reasonable likelihood that this limitation would have been obvious over the combination of Mahaffy and Jasper.

(9) Motivation to Combine Mahaffy and Jasper

With regard to the motivation to combine the teachings of Mahaffy and Jasper, Petitioner contends that the ordinarily skilled artisan “would have found it obvious to modify Mahaffy to include the failsafe of Jasper so that, in the event the VoIP connection between the call center operator 40 and the CIT 12 fail, the order-taking reverts to an on-site employee to complete the order, as taught by Jasper.” Pet. 26 (citing Ex. 1002 ¶¶ 189–191). In particular, Petitioner notes that both Mahaffy and Jasper “relate to improvements in conventional ordering processes” at fast-food restaurants comprising automated ordering systems. *Id.* at 13; *see also id.* at 14–16 (discussing similarities in Mahaffy and Jasper’s systems). Petitioner further asserts that both Mahaffy and Jasper recognize the need for failsafe approaches in case problems arise in the automated processes. *See id.* at 14. In particular, as Petitioner notes, Mahaffy’s failsafe is a remote call center with human operators, whereas Jasper’s failsafe is a reversion to on-site personnel who can take a customer’s order conventionally. *Id.* at 14–15 (citing Ex. 1020 ¶¶ 18, 21, 47; Ex. 1021 ¶¶ 118–119). Petitioner argues that the ordinarily skilled artisan would have found it obvious to modify Mahaffy to include the same failsafe as Jasper (reversion to on-site personnel instead

of a remote call center) because Jasper’s failsafe achieves the same ultimate goal as Mahaffy’s—addressing problems with an automated system (such as customer frustration) and completing the order process with human intervention. *See id.* at 15–16 (citing Ex. 1002 ¶¶ 120–121). Petitioner also reasons that the ordinarily skilled artisan would have had a reasonable expectation of success in making the combination because “adding Jasper’s revert-to-the-on-site-employee failsafe measure to Mahaffy . . . merely requires applying known techniques from Jasper to improve the similar system of Mahaffy in the same way with predictable results (i.e., reverting to an existing and conventional on-site workflow).” *Id.* at 16 (citing Ex. 1002 ¶¶ 121–122).

Patent Owner argues that Petitioner’s showing is deficient in failing to explain why the ordinarily skilled artisan “would have been motivated to include a third failsafe mechanism when *two* failsafe mechanisms are already taught in *Mahaffy*.” Prelim. Resp. 42. Patent Owner cites Federal Circuit precedent to the effect that the ordinarily skilled artisan “would not be motivated to modify a prior art reference to address a given problem that the reference already addresses.” *Id.* at 43 (citing, *e.g.*, *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324, 1332 (Fed. Cir. 2019)). Patent Owner also asserts that Petitioner’s combination is based only on a hindsight analysis. *Id.* at 44–47.

As this stage and on this record, we disagree with Patent Owner’s assessment of the record and of applicable precedent. Turning first to precedent, we observe that Patent Owner essentially contends a motivation to combine the teachings of references cannot be found where the references each address a problem in different ways, in which case the ordinarily

skilled artisan would have had no motivation to turn to one reference to address a problem that the other reference already addresses. *See* Prelim. Resp. 43. We disagree. In fact, as the Supreme Court recognized in *KSR*, “[t]o determine whether there was an apparent reason to combine the known elements in the way a patent claims, it will often be necessary to look to interrelated teachings of multiple patents.” *KSR Int’l*, 550 U.S. at 401; *see also Cross Med. Prods., Inc. v. Medtronic Sofamor Danek, Inc.*, 424 F.3d 1293, 1323 (Fed. Cir. 2005) (“One of ordinary skill in the art need not see the identical problem addressed in a prior art reference to be motivated to apply its teachings.”). Thus, the fact that multiple references each address the same problem with different solutions does not, in itself, mean that the ordinarily skilled artisan would not have been motivated to substitute or modify a solution from one reference into another.

Moreover, with regard to the record before us, Petitioner has submitted evidence that the motivation to substitute Jasper’s on-site-personnel failsafe for Mahaffy’s call-center failsafe comes from Jasper itself. *See* Ex. 1002 ¶ 119. In particular, “Jasper . . . identifies a problem with the call-center based approach not explicitly recognized in Mahaffy but which is just as likely in Mahaffy, in that the customer-agent connection may fail, which can waste time and lead to customer frustration.” *Id.* (citing Ex. 1021 ¶ 59). Jasper also identifies a solution to this problem: if the connections between the remote order-taking agent and the customer fail for any reason, the order-taking responsibility is rerouted to on-site personnel, who can take the customer’s order via the conventional process known for decades. Ex. 1021 ¶ 59. Patent Owner does not, at this stage, address this evidence or rationale.

For purposes of this Decision, based on the record presented, we are persuaded that Petitioner has cited sufficient evidence and provided sufficient articulated reasoning to explain why, at the time of the filing of the '706 patent, one of ordinary skill would have been motivated to combine the teachings of Mahaffy and Jasper with a reasonable expectation of success.

(10) Claim 1: Conclusion

For the foregoing reasons, based on the current record, we determine that Petitioner has established a reasonable likelihood of prevailing in showing that claim 1 is unpatentable over the combination of Mahaffy and Jasper.

b. Claims 2 and 3

Claim 2 depends from claim 1, and recites “wherein the order is processed in real time.” Ex. 1001, 18:46–47.

Petitioner contends that Mahaffy teaches this limitation by disclosing that “the order is processed in real time” because the customer “interacts at 206 with the CIT 12 in real-time, verbally ordering food,” then is directed to the order pick-up area to be provided with the order. Pet. 26 (citing Ex. 1020 ¶¶ 48, 50). Petitioner further cites expert testimony that the ordinarily skilled artisan would have understood that “drive-thru orders are typically processed in real time.” *Id.* (citing Ex. 1002 ¶¶ 194–195).

As this stage of the proceeding, Patent Owner does not present arguments or evidence separately challenging Petitioner’s showing as to this claim. *See* Prelim. Resp. 47.

Claim 3 depends from claim 1 and recites “wherein the alert to the auditor prompts the auditor to switch the order processor from an

autonomous mode to an auditor-assist mode prior to deactivating the order processor.” Ex. 1001, 18:48–51.

Petitioner presents evidence that Mahaffy teaches this limitation by disclosing an automated workflow and a human-assisted workflow, as discussed *supra* Section III.E.1.a.(2). Pet. 26 (citing Ex. 1020 ¶ 47). Petitioner further contends that Mahaffy also discloses “the alert to the auditor” by the incoming VoIP call to the operator when an exception is detected, as discussed in *supra* in Section III.E.1.a.(6). *Id.* (citing Ex. 1020 ¶¶ 39, 47). Petitioner then presents evidence that Mahaffy also discloses that “the VoIP call ‘prompts the auditor to switch the order processor from an autonomous mode to an auditor-assist mode,’ because the VoIP call prompts the operator to answer the call and establish the VoIP connection via which he can correct, verify or complete the order.” *Id.* at 26–27 (citing Ex. 1002 ¶¶ 198–201; Ex. 1020 ¶ 47 (VoIP connection permits the operator to “correct, verify or complete the customer menu orders”))).

With regard to “deactivating the order processor,” Petitioner points to its arguments and evidence as discussed *supra* in Section III.E.1.a.(7). *Id.* at 27. Petitioner also argues that Mahaffy discloses that the automated workflow may continue to process additional items for the order after the operator corrects the order. *Id.* (citing Ex. 1020 ¶ 50, Figs. 3A, 3B). Petitioner contends that the ordinarily skilled artisan would have understood that “these two approaches to completing the order stem from a common event: the operator intervened to correct the AI routine.” *Id.* (citing Ex. 1002 ¶ 202). Petitioner further contends that it would therefore have been obvious to the ordinarily skilled artisan “to give the operator control over the approach to follow once the initial correction to the AI generated

order is made, namely, to either (a) revert to the automated workflow to complete the order or (b) to complete the order without reverting to the automated workflow.” *Id.* (citing Ex. 1002 ¶ 203). Petitioner reasons that “[t]he AI routines would thus not be deactivated until it is decided that the order processing is to be completed without reverting back to the automated workflow.” *Id.*

Petitioner also contends that the ordinarily skilled artisan would have recognized that “modifying Mahaffy so that the operator controls whether to continue to process the order or to revert back to the AI routines merely combines known elements of Mahaffy to achieve a predictable result,” and “doing so would be nothing more than an obvious design choice.” *Id.* at 27–28 (citing Ex. 1002 ¶¶ 204–205). Petitioner reasons that “there are a limited number of possible options (i.e., whether to complete the order with the AI or the operator can be either decided before the operator intervention, during the operator intervention, or after the operator intervention).” *Id.* at 27 (citing Ex. 1002 ¶ 205).

As this stage of the proceeding, Patent Owner does not present arguments or evidence separately challenging Petitioner’s showing as to this claim. *See* Prelim. Resp. 47.

We determine that Petitioner’s evidence and arguments are sufficient to show a reasonable likelihood that claims 2 and 3 would have been obvious over the combination of Mahaffy and Jasper.

c. Claim 4

Petitioner also contends that independent claim 4 would have been obvious over the teachings of Mahaffy and Jasper. Pet. 28–32. Petitioner asserts that the majority of the limitations of claim 4 track the limitations of

claim 1, and thus the limitations of claim 4 “are satisfied by Mahaffy for the same reasons as explained above.” *Id.* at 28. Petitioner then provides arguments and evidence supporting obviousness of the limitations of claim 4 that do not have counterparts in claim 1. *Id.* at 28–32. We have reviewed the arguments and evidence submitted by Petitioner, and we determine that they are sufficient to show a reasonable likelihood that claim 4 would have been obvious over the combination of Mahaffy and Jasper.

Patent Owner presents several arguments addressing Petitioner’s showing as to claim 4, which we address in turn below.

Patent Owner first argues that Petitioner does not explicitly map which claim 4 limitations track corresponding limitations of claim 1, and thus Petitioner has failed “to identify its challenge with particularity.” Prelim. Resp. 39. We disagree. We find that the language of most limitations of claims 1 and 4 is very similar, and thus the mapping of corresponding limitations is self-evident. In that regard, we note that Patent Owner has not identified any specific limitations of claim 4 not separately addressed by Petitioner that lack a corresponding limitation in claim 1.

Patent Owner next argues that Petitioner has failed to show that Mahaffy discloses “switching to an auditor-assist mode in response to the comparison of the audio stream with the generated order,” as recited in claim 4 (which the parties refer to as limitation [4j]). Prelim. Resp. 39. Patent Owner acknowledges Petitioner’s arguments and evidence that Mahaffy discloses “the comparison of the audio stream” and “switching to an auditor assist mode,” but asserts that “[n]owhere, however, does the Petition explain that the switching occurs *in response* to the comparison as claim 4 requires.” *Id.*

We disagree that Petitioner has failed to provide sufficient arguments and evidence as to this limitation. As Patent Owner concedes, Petitioner offers evidence of both parts (e.g., Pet. 29 (discussing comparison of audio stream) (citing Ex. 1020 ¶¶ 47, 50, Figs. 2A, 2B; Ex. 1002 ¶¶ 215–218); Pet. 29–30 (discussing switching to auditor-assist mode (citing Ex. 1020 ¶¶ 47, 50, Figs. 2A, 2B, 3A, 3B, Ex. 1002 ¶¶ 21–225)). Petitioner also presents arguments and evidence that switching to auditor assist mode “would occur on deciding that the order processing will be completed without reverting back to the automated workflow.” Pet. 30 (citing Ex. 1002 ¶¶ 221–225). This assertion and corresponding testimony of Petitioner’s expert support a finding that the “switching to an auditor-assist mode” would be “in response to the comparison of the audio stream with the generated order” because the determination that switching to auditor assist mode is necessary follows a comparison of the audio stream, and as such an ordinarily skilled artisan would have understood that the switching was made in response to the comparison. *See id.* On this record, we determine that such arguments and evidence are sufficient to demonstrate a reasonable likelihood of success on the merits.

Patent Owner next argues that the Petitioner has failed to show sufficiently that Mahaffy discloses “updating the order processor based upon errors,” as recited in claim 4 (a limitation the parties refer to as limitation [4k]). Prelim. Resp. 40. In particular, Patent Owner acknowledges Mahaffy teaches that if there is a problem with an order, the operator is able to “correct, verify, or complete” the order, and “the CIT is updated . . . to indicate the changes and additions.” *Id.* at 40–41 (citing Ex. 1020 ¶¶ 47, 50). Patent Owner argues, however, that “the CIT is not the ‘*order*

processor,” but rather Petitioner maps the “order processor” to Mahaffy’s “computer system with AI routines,” which Patent Owner asserts “are different from the CIT and are not updated with the changes to the order.” *Id.* at 41 (citing Pet. 17). Patent Owner thus takes issue with Petitioner’s failure to point to any disclosure in Mahaffy “where the computer system with AI routines is updated with the operator’s changes.” *Id.*

The parties appear to take differing views over the meaning of this limitation. Patent Owner’s view appears to be that claim 4 requires the order processor itself be updated when errors are detected, so as to improve the AI learning of the order processor. Patent Owner does not make that contention expressly in the context of Ground 1, but does so in the context of Ground 2B, where Patent Owner states:

The ’706 Patent discloses updating the *order processor* (not the order) because “errors in an order detected by the auditor can be fixed and fed back into the speech-to-text and natural language processor system to increase system fidelity and ensure that errors do not propagate or multiply through the artificially intelligent order.”

Prelim. Resp. 62 (citing Ex. 1001, 8:23–28).

Although Petitioner has pointed to disclosure where Mahaffy teaches continual AI learning based on actual usage, including “reports of misunderstood communications [which are] regularly analyzed and used to improve the performance of the system” (Ex. 1020 ¶ 34; *see* Pet. 16–19 (discussing Mahaffy’s AI-trained order processor)), on this record we agree with Patent Owner that Petitioner has not explicitly made a connection between updating the order and updating the computer system. Petitioner, instead, appears to read this limitation as requiring that the order itself be updated once a problem with the order is detected, at which point a human

operator is able to intervene and “correct, verify or complete the order.” Pet. 30 (citing Ex. 1020 ¶¶ 47, 50, Figs. 2A, 2B). We note, however, that Mahaffy appears at least to suggest the subject matter under Patent Owner’s interpretation through its disclosure of training the AI routines based on misunderstood communications. *See* Ex. 1020 ¶ 34 (“AI routine training and optimization is preferably performed on a continual basis, with reports of misunderstood communications regularly analyzed and used to improve the performance of the system.”).

At this point, we determine that the record would benefit from additional clarification on the meaning of this limitation as well as the parties’ arguments regarding this limitation. The parties are encouraged to provide additional clarification during trial, keeping in mind the requirements of our rules.

Patent Owner’s remaining arguments regarding “deactivating the order processor,” as recited in claim 4, as well as the motivation to combine the teachings of Mahaffy and Jasper are addressed *supra*, Sections III.E.1.a.(7), (8).

Subject to our note of the need for additional clarification, we determine, as this stage, and on this record, that Petitioner’s evidence and arguments are sufficient to show a reasonable likelihood that claim 4 would have been obvious over the combination of Mahaffy and Jasper.

d. Claims 5–11

Petitioner also presents evidence and argument supporting its contention that claims 5 through 11 would have been obvious over the teachings of Mahaffy and Jasper. Pet. 32–36.

As this stage of the proceeding, Patent Owner does not present arguments or evidence separately challenging Petitioner’s showing as to these claims. *See* Prelim. Resp. 47.

We have reviewed Petitioner’s evidence and arguments and we determine, at this stage and on this record, that they are sufficient to show a reasonable likelihood that claims 5–11 would have been obvious over the combination of Mahaffy and Jasper.

*2. Ground 2A: Obviousness of Claims 1–3
over Coleman and the Knowledge of a POSITA*

Petitioner also contends claims 1–3 would have been obvious over the teachings of Coleman. Pet. 36–51. Because we have already determined to institute on all claims, we limit our discussion of this ground to the current points of contention between the parties, as an aid to further development of these issues for trial.

a. Claim 1

- (1) *[1b] “providing an order processor having a speech recognition module trained using artificial intelligence programs” and [1d] “processing the text communication with the speech recognition module to identify a word or words in the text of the converted audio stream according to a previous spoken word training”*

As it does with regard to the Mahaffy ground, Patent Owner argues that Petitioner’s showing as to this ground is deficient because Petitioner has failed to show that Coleman teaches that the speech recognition module (which Petitioner maps to Coleman’s “natural language understanding”

(NLU) component) is trained using *multiple* artificial intelligence *programs* (as recited limitation [1b]) or is trained “according to a previous spoken word.” Prelim. Resp. 48–53. In particular, Patent Owner acknowledges Coleman’s disclosure of using “machine learning models,” but asserts that such models in Coleman are only in the “ordering and conversation algorithms, which are **separate and distinct** from the NLU.” *Id.* at 49–51. Patent Owner also contends that the testimony of Petitioner’s expert on this issue is “conclusory” and should be rejected. *Id.* at 52–53.

At this stage, we disagree with Patent Owner’s assessment of the record. At a minimum, Petitioner provides evidence in the form of expert testimony supporting a finding that, even assuming Coleman does not itself teach or suggest training the NLU using artificial intelligence programs and spoken word, the ordinarily skilled artisan would have been motivated to do so using known techniques to improve Coleman’s speech recognition system. *See* Ex. 1002 ¶¶ 36–47 (describing state of the art of automated speech recognition at the time of the ’706 patent) (citing Exs. 1053, 1058, 1059, 1060), 291–297 (describing Coleman’s teachings and the understanding of the ordinarily skilled artisan), 306–308 (describing speech recognition modules trained with spoken word). The expert testimony in this regard is detailed and supported by evidence of record, and hence is not merely “conclusory.”

(2) [1e] “*providing a natural language processor . . . [that] creates or modifies an order based upon the recognized text*”

Patent Owner asserts that Petitioner’s showing as to this limitation is deficient because Petitioner maps Coleman’s “ordering and conversation algorithms” to the claimed “natural language processor,” but Coleman “does

not disclose which component actually ‘creates or modifies an order’ and “generate[s] an order.” Prelim. Resp. 54 (emphasis omitted). Patent Owner acknowledges that Coleman’s “ordering and conversation algorithms . . . ‘are programmed to select actions to accurately process the customer’s order,’ with ‘the intent of optimizing the customer’s ordering experience.’” *Id.* (citing Ex. 1022 ¶ 47). Patent Owner asserts, however, that none of the actions described in Coleman for the ordering and conversation algorithms disclose that the algorithms themselves actually create, modify, or generate an order. *Id.* at 54–55. Patent Owner also argues that the expert testimony offered by Petitioner in support of its showing is “conclusory.” *Id.* at 56.

At this stage, we disagree with Patent Owner’s assessment of the record. Petitioner does not limit the mapping of this limitation to the ordering and conversation algorithms, as Patent Owner contends. *See* Prelim. Resp. 54. Rather, Petitioner more broadly maps this limitation to the AOS, which includes the ordering and conversation algorithms. *See* Pet. 44. In particular, Petitioner contends that Coleman discloses “ordering and conversation algorithms that process the inputs from the NLU . . . to determine or select the next action to be taken by the AOS . . . to accurately process the customer’s order.” Pet. 44 (citing Ex. 1022 ¶¶ 34, 47). Petitioner further asserts that “Coleman also discloses the AOS can perform ‘modifications to the order or confirm[] certain aspects of the order.’” *Id.* (citing Ex. 1022 ¶ 59); *see also* Ex. 1002 ¶¶ 310–311.

We determine, at this stage and on this record, that Petitioner has sufficiently shown for purposes of institution that Coleman’s description of use of these components to “process” and “modif[y]” or “confirm” a customer’s order based on spoken input from a customer teaches or suggests

a natural language processor with “order assembly capabilities” that “creates or modifies an order,” as recited in claim 1.

(3) [1e] “*providing a natural language processor having . . . exception detection capabilities*”

Patent Owner also argues that Petitioner’s showing as to limitation [1e] is deficient because the portion of Coleman that Petitioner maps to the natural language processor (the ordering and conversation algorithms) do not, themselves, have “exception detection capabilities.” Prelim.

Resp. 56–57. Rather, according to Patent Owner, the portion of Coleman that can perform dynamic determinations related to control and transfer of the system from automated mode to manual mode is the AOS 2, but Patent Owner insists that Petitioner “did not map the AOS 2 to the ‘natural language processor.’” *Id.* at 57 (emphasis omitted).

At this stage, we disagree with Patent Owner’s assessment of the record. As noted above, Petitioner does not limit the mapping of the natural language processor to the ordering and conversation algorithms, as Patent Owner contends, but does in fact map this limitation more broadly to the AOS. *See* Pet. 44. With regard to “exception detecting capabilities,” Petitioner presents evidence that Coleman teaches that limitation by disclosing “an automatic transfer from the automated (AOS) process to a manual (MOP) process” based on “its determination of ‘suitable reasons’ to make the transfer,” including “‘whether the customer 6 is speaking or providing inputs in an unclear manner,’ ‘whether the monitored customer behavior is particularly unusual or negative,’ whether connection has been lost or there is an ‘internal error,’ or whether a human at the restaurant

interrupted the connection.” *Id.* at 45 (citing Ex. 1022 ¶¶ 71–75; Ex. 1002 ¶ 316).

We determine, at this stage and on this record, that Petitioner has sufficiently shown for purposes of institution that Coleman teaches or suggests “providing a natural language processor having . . . exception detection capabilities,” as recited in claim 1.

(4) [1h] *“deactivating the order processor with the auditor in response to the detected exceptions in the order”*

Patent Owner argues that Petitioner’s showing as to this limitation is deficient because the portions of Coleman that Petitioner maps to the claimed “order processor” (the AOS and the restaurant information system (RIS)) “remain active” after the switch from an automated to a manual process. Prelim. Resp. 58–59. This argument is similar to Patent Owner’s argument regarding this limitation in connection with Petitioner’s Ground 1 (based on Mahaffy). As noted above, we disagree with Patent Owner’s premise that “deactivating the order processor” in claim 1 requires physically shutting down the software and hardware running the order processor. Rather, as explained *supra* Section III.E.1.a.(7), we construe “deactivating the order processor” consistently with the disclosure of the ’706 patent as encompassing shifting control of the ordering process from the artificially intelligent order processing system to a human operator.

Petitioner presents evidence that Coleman teaches “deactivating the order processor” by disclosing its automatic transfer of the ordering process by the AOS to the MOP, in which the ordering process is switched (or re-routed) between an automatic workflow (AOS) and a human-assisted workflow (MOP). Pet. 46–47 (citing Ex. 1022 ¶¶ 23, 38–46, 63, 67, Fig. 1;

Ex. 1002 ¶¶ 328–329). Thus, Petitioner presents evidence that Coleman discloses shifting control of the ordering process from an artificially intelligent order processing system to a human operator. With regard to deactivating “in response to the detected exceptions in the order,” Petitioner further contends:

Coleman also describes that the human agents are “able to listen to the automated interactions with a customer” and “interrupt[] the connection to the AOS 2 using the administrative controller 12 or by manually manipulating or interacting with the connectors or switches 5.” EX1022, ¶[0076]. More particularly, the human agents can determine a “new context” which justifies interrupting the AOS 2 “[i]f the automated process is not completing successfully, such as due to poor interactions or understanding of the customer.” *Id.*, ¶[0089]. These circumstances correspond to the “detected exceptions” that are suitable reasons for transferring the ordering process from the AOS to the MOP, which are discussed in [1e]. Coleman therefore further discloses that the human agent deactivates the AOS “in response to the detected exceptions.” *See also* EX1002, ¶¶330-331.

Id. at 48 (emphasis omitted).

We determine, at this stage and on this record, that Petitioner has sufficiently shown for purposes of institution that Coleman teaches or suggests “deactivating the order processor with the auditor in response to the detected exceptions in the order,” as recited in claim 1.

b. Claims 2 and 3

Petitioner also presents evidence and argument supporting its contention that claims 2 and 3 would have been obvious over the teachings of Coleman and Washington. Pet. 49–51.

As this stage of the proceeding, Patent Owner does not present arguments or evidence separately challenging Petitioner’s showing as to these claims. *See* Prelim. Resp. 48.

*3. Ground 2B: Obviousness of Claims 4–11
over Coleman and Washington*

Petitioner contends claims 4–11 would have been obvious over the combination of Coleman and Washington. Pet. 51–65. As noted above, because we have already determined to institute on all claims, we limit our discussion of this ground to the current points of contention between the parties, as an aid to further development of these issues for trial.

a. Claim 4

Patent Owner first argues, as it did for Ground 1, that Petitioner does not explicitly map which claim 4 limitations track corresponding limitations of claim 1, and thus Petitioner has failed “to identify its challenge with particularity.” Prelim. Resp. 60. We disagree. As noted above, we find that the language of most limitations of claims 1 and 4 is very similar, and thus the mapping of corresponding limitations is self-evident. In that regard, we note that Patent Owner has not identified any specific limitations of claim 4 not separately addressed by Petitioner that lack a corresponding limitation in claim 1.

(1) [4h] “*providing the generated order to the auditor*”

Patent Owner argues that Petitioner’s showing is deficient as to the recitation in claim 4 of “providing the generated order to the auditor.”

Prelim. Resp. 60. Patent Owner acknowledges Coleman’s teaching of a human agent listening in to interactions between a customer and the AOS, but asserts that none of those interactions describe the generated order and thus Coleman does not disclose “providing the auditor with the generated order.” *Id.* Patent Owner also addresses Petitioner’s reliance on the knowledge of the ordinarily skilled artisan “that the interactions would include ‘customer adding menu items’ which are the ‘intents.’” *Id.* at 61 (citing Pet. 55). Patent Owner asserts that Petitioner’s argument in that regard is inadequate because Coleman does not disclose that the “intents” are provided to the auditor (human agent), but instead are provided to the “ordering and conversation algorithms.” *Id.* (citing Ex. 1022 ¶ 34).

We disagree with Patent Owner’s assessment of the record at this stage. Petitioner presents evidence that Coleman teaches this limitation by disclosing its human agents “listening in . . . through a listing of interactions performed so far.” Pet. 55; *see* Ex. 1022 ¶ 36. Petitioner further contends that the ordinarily skilled artisan “would understand that, in the context of a drive-thru ordering system, the interactions include those for the customer adding menu items to the order.” Pet. 55 (citing Ex. 1002 ¶¶ 367–368; Ex. 1022 ¶ 70 (“The AOS 2 will continue to interact with the customer 6 by processing the voice input . . . and generating responses . . . to complete an order.”)). Petitioner further notes that “such processing of the voice input includes the AOS converting the voice input into ‘transcribed text and intents,’ where the intents, in the context of a drive-thru ordering system,

include adding menu items to the order.” *Id.* (citing Ex. 1022 ¶ 34; Ex. 1002 ¶¶ 369–370). At this stage, and on this record, we disagree with Patent Owner’s assessment that Coleman discloses the “intents” being provided only to the ordering and conversation algorithms. As Petitioner notes, Coleman discloses the human agents not only listening in to the interactions, but also being provided with a “listing of interactions performed so far” as well as “contextual information,” and the human agent has the ability to “follow an ongoing automatic transaction.” *See id.* at 52 (citing Ex. 1022 ¶¶ 36, 77, 89). A fair reading of such description includes at least a suggestion that the human agents are provided with the generated order, so that they have the necessary contextual information (e.g., the system’s interpretation of the customer’s order (the generated order)) should human intervention be necessary.

We determine, at this stage and on this record, that Petitioner has sufficiently shown for purposes of institution that Coleman teaches or suggests “providing the generated order to the auditor,” as recited in claim 4.

(2) [4k] *“updating the order processor based upon error detected in the order by the auditor”*

Patent Owner argues that Petitioner’s showing as to this limitation is deficient because Petitioner’s showing is based on updating the order, and not the order processor. Prelim. Resp. 62. As noted above (Section III.E.1.c), Patent Owner asserts that this claim requires updating the order processor itself, and not just the order, as a means of “increas[ing] system fidelity and ensur[ing] that errors do not propagate or multiply through the artificially intelligent order.” *Id.* (citing Ex. 1001, 8:23–28).

Petitioner, on the other hand, apparently views this limitation as requiring that errors in the order itself be corrected. *See* Pet. 58–59 (discussing disclosure in Washington that would allow a human agent to correct an order if an “order in accuracy” were detected) (citing Ex. 1023 ¶¶ 22, 38, 69–70; Ex. 1002 ¶¶ 392–396).

At this point, we determine that the record would benefit from additional clarification on the meaning of this limitation as well as the parties’ arguments regarding this limitation. In particular, if this limitation does require updating the order processor, and not just the order itself (which we think is likely the better position), it is unclear if Petitioner has attempted to show that the combination of Coleman and Washington discloses this limitation. The parties are encouraged to provide additional clarification during trial, keeping in mind the requirements of our rules.

(3) Motivation to Combine Coleman and Washington

In arguing that the ordinarily skilled artisan would have been motivated to combine the teachings of Coleman and Washington, Petitioner notes that both references “relate to automating drive-thru interactions using an automated speech-to-order system,” and both “also recognize that failing to accurately take the customer’s order is undesirable.” Pet. 51 (citing Ex. 1022 ¶¶ 20–21; Ex. 1023 ¶¶ 20–22). Petitioner contends that Coleman “minimizes potential order inaccuracies by, among other things, having a human agent ‘listen in or otherwise follow an ongoing automatic interaction,’” such that the agent can interrupt the transaction as needed. *Id.* at 52. To aid that process, Petitioner notes, Coleman’s human agent is provided with a “listing of interactions” as well as other “contextual information” and can also be provided with a “summary of instructions

received,” although Petitioner concedes that “Coleman is not explicit about whether this happens before or after” the system switches over from an automatic to a manual process. *Id.* (citing Ex. 1022 ¶¶ 36, 71–76, 89, 90). Petitioner cites Washington’s solution as giving the human agent “more flexibility to correct the automated system,” by disclosing (“whereas Coleman only suggests”) that “the operator can take the additional step of comparing the customer’s actual audio order with the autonomously generated order.” *Id.* at 52–53 (citing Ex. 1023 ¶¶ 22, 38, 70). Petitioner also asserts that “Washington also discloses, whereas Coleman only suggests, that if the operator determines there to be failures with the autonomously generated order, the operator can correct those failures.” *Id.* at 53 (citing Ex. 1023 ¶¶ 23, 38–39, 69–70).

Petitioner then argues that the ordinarily skilled artisan would have found it obvious to modify Coleman with Washington’s teachings “in line with what Coleman already suggests” to give Coleman’s human agent “the explicit ability to compare the automatically generated order with the customer’s spoken order prior to the switchover to Coleman’s auditor-assist mode.” *Id.* (citing Ex. 1002 ¶ 360). Petitioner reasons that this combination “would allow for more immediate intervention by Coleman’s human agent when the AOS is not accurately interpreting the customer’s order than if the human agent were to only listen for audio-only indications that the AOS is inaccurately interpreting the customer’s order.” *Id.* at 54.

Patent Owner contends that Petitioner’s showing as to a motivation to combine the teachings of Coleman and Washington is deficient because (1) Petitioner fails to explain why the ordinarily skilled artisan would have been motivated to update the *order processor*, as opposed to the order itself;

and (2) Petitioner does not explain why the ordinarily skilled artisan would have been motivated to apply Washington's method of verifying the accuracy of a speech-generated order "when *Coleman* already guards against order inaccuracies using multiple 'suitable reasons' for moving to a manual ordering mode that are . . . automatically determined by AOS 2 and . . . by a human agent." Prelim. Resp. 65. As it does for Ground 1, Patent Owner posits that Federal Circuit precedent counsels against finding a motivation to combine two references to solve a problem if each reference discloses its own solution to that problem. *See id.* at 67. In that regard, Patent Owner contends Petitioner has "not shown (1) why a POSITA would have had a reason to combine *Coleman* with *Washington* when each reference operates effectively to process customer's order, or (2) why *Washington*'s manual approach that compares an audio order to a generated order is more accurate than . . . *Coleman*'s approach." *Id.* Patent Owner concludes that "Petitioners' attempt to combine two independently and effectively operating systems is nothing but hindsight motivation that uses the claims as a road map to find prior art references that fit claim parameters and should be rejected." *Id.* at 68.

As this stage and on this record, we disagree with Patent Owner's assessment of the record and of applicable precedent. As noted *supra*, we disagree with Patent Owner's legal premise. The fact that multiple references each address the same problem with different solutions does not, in itself, mean that the ordinarily skilled artisan would not have been motivated to substitute a solution from one reference into another. *See, e.g., KSR Int'l*, 550 U.S. at 401 ("To determine whether there was an apparent reason to combine the known elements in the way a patent claims,

it will often be necessary to look to interrelated teachings of multiple patents.”).

Here, with regard to the record before us, Petitioner has submitted evidence that the motivation to combine Coleman with Washington is at least suggested in Coleman because Coleman discloses that the human agent can be provided with “a summary of instructions received” from the automated system (*i.e.*, a summary of the order taken by the automated system to that point), but Coleman is not explicit about whether this happens before or after Coleman switches to the manual order process. Ex. 1022 ¶ 90; Ex. 1002 ¶¶ 354–356. Washington further discloses, whereas Coleman only suggests, that the operator can take the additional step of comparing the customer’s actual audio order with the autonomously generated order. Ex. 1023 ¶ 38. Thus, as Petitioner notes, Coleman recognizes that a “suitable reason” for interrupting the autonomous order-taking process can be that the speech recognition is inaccurately interpreting the customer’s order. Ex. 1022 ¶¶ 71, 80. Washington teaches that a human operator auditing an automated order processing can identify such inaccurate interpretations and minimize inaccuracies in the order-taking by overriding the automated order processing and manually correcting the order when a comparison of the entered menu items with the customer’s order reveal that they do not correspond. Ex. 1023 ¶ 38.

For purposes of this Decision, based on the record presented, we are persuaded that Petitioner has cited sufficient evidence and provided sufficient articulated reasoning to explain why, at the time of the filing of the ’706 patent, one of ordinary skill would have been motivated to combine the

teachings of Coleman and Washington with a reasonable expectation of success.

b. Claims 5–11

Petitioner also presents evidence and argument supporting its contention that claims 5 through 11 would have been obvious over the teachings of Coleman and Washington. Pet. 60–65.

As this stage of the proceeding, Patent Owner does not present arguments or evidence separately challenging Petitioner’s showing as to these claims. *See* Prelim. Resp. 59.

IV. CONCLUSION

For the foregoing reasons, we determine Petitioner has established a reasonable likelihood of prevailing in showing that one or more claims are unpatentable over the cited prior art.

V. ORDER

For the reasons given, it is:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review is *instituted* on all challenged claims with respect to all grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(a), *inter partes* review of the ’706 patent is instituted commencing on the entry date of this Order, and pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is given of the institution of a trial.

IPR2023-00450
Patent 10,592,706 B2

PETITIONER:

Vincent Galluzzo
Kainoa Asuega
CROWELL & MORING LLP
vgalluzzo@crowell.com
kasuega@crowell.com

Guy Yonay
Zeev Peral
Kyle Auteri
PEARL COHEN ZEDEK LATZER
gyonay@pearlcohen.com
zpearl@pearlcohen.com
kauteri@pearlcohen.com

PATENT OWNER:

Dina Blikshteyn
Stephanie Sivinski
HAYNES AND BOONE LLP
dina.blikshteyn.ipr@haynesboone.com
stephanie.sivinski.ipr@hanesboone.com