

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SHENZHEN TUOZHU TECHNOLOGY CO., LTD.,

Petitioner

v.

STRATASYS, INC.

Patent Owner.

Case No. IPR2025-00354
U.S. PATENT NO. 8,747,097

**BRIEF IN SUPPORT OF PATENT OWNER'S REQUEST FOR
DISCRETIONARY DENIAL**

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EXHIBIT LIST

Exhibit No.	Description
2001	Docket Navigator – Judge Rodney Gilstrap Motion Success for Stay Pending IPR and Time to Milestones
2002	United States District Courts — Judicial Caseload Profiles for Eastern District of Texas (Sept. 30, 2024 and Dec. 31, 2024), available at https://www.uscourts.gov/data-news/reports/statistical-reports/federal-court-management-statistics
2003	Minute Entry for proceedings held before District Judge Gilstrap on Nov. 7, 2024, <i>Stratasys, Inc. v. Shenzhen Tuozhu Technology Co. Ltd.</i> , No. 2:24-cv-00644-JRG (E.D. Tex. Nov. 14, 2024)
2004	Discovery Order, <i>Stratasys, Inc. v. Shenzhen Tuozhu Technology Co. Ltd.</i> , No. 2:24-cv-00644-JRG, Dkt No. 35 (E.D. Tex. Dec. 2, 2024)
2005	Protective Order, <i>Stratasys, Inc. v. Shenzhen Tuozhu Technology Co. Ltd.</i> , No. 2:24-cv-00644-JRG, Dkt No. 36 (E.D. Tex. Dec. 3, 2024)
2006	e-Discovery Order, <i>Stratasys, Inc. v. Shenzhen Tuozhu Technology Co. Ltd.</i> , No. 2:24-cv-00644-JRG, Dkt No. 41 (E.D. Tex. Dec. 19, 2024)
2007	Invalidity and Ineligibility Contentions, <i>Stratasys, Inc. v. Shenzhen Tuozhu Technology Co. Ltd.</i> , No. 2:24-cv-00644-JRG, (E.D. Tex. Jan. 30, 2025)
2008	Transcript of Hearing on the Nomination of Howard Lutnick, of New York, to be Secretary of Commerce (Jan. 29, 2025)
2009	Complaint for Patent Infringement, <i>Stratasys, Inc. v. Shenzhen Tuozhu Technology Co. Ltd.</i> , No. 2:24-cv-00645-JRG, Dkt No. 1 (E.D. Tex. Aug. 8, 2024)

I. INTRODUCTION

Pursuant to the March 26, 2025 Memorandum by the Director that addresses “Interim Processes for PTAB Workload Management” (Director Memo), Patent Owner respectfully requests the Director exercise discretionary denial of institution. This filing is being made well before the April 26, 2025 deadline as the original time for filing discretionary-denial briefing had elapsed by the March 26 Director Memo. As explained below, several considerations favor discretionary denial of institution in this IPR.

First, the Director should exercise discretion to deny institution under 35 U.S.C. § 314(a) and the *Fintiv* factors. Among other reasons, the parallel district court litigation will reach a final resolution in a jury trial before any final written decision in this forum. Not surprisingly, significant progress has already been made in the parallel litigation, including the completion of Infringement Contentions, Invalidity Contentions, and numerous fact discovery requests, and the production of tens of thousands of pages of documents.

Second, the Director should exercise its discretion to deny institution under 35 U.S.C. § 325(d) and the factors set forth in *Advanced Bionics* and *Becton, Dickinson*. Petitioner's arguments related to the *Anderson* reference in the *Knighton-Luo-Anderson* combination of Ground 1A were previously presented to the Patent Office during prosecution of the application leading to U.S. Patent No.

8,747,097 (“’097 Patent”) . After careful consideration of *Anderson* and other cited art, the Patent Office allowed the ’097 Patent. Despite relying on *Anderson* for substantially the same reasons, Petitioner has failed to show that the Patent Office made a material error. Further, Petitioner’s combination in other principal ground (Ground 2A) is cumulative of the combination in Ground 1A as both combinations suffer from the same deficiency of not teaching a machine vision system that captures and analyzes image content from a three-dimensional scanner to provide status of a print job for remote display.

In summary, there are two independent reasons for discretionary denial. The exercise of discretionary denial power is appropriate under § 314 and under § 325(d). “To ensure that the PTAB continues to meet its statutory obligations as to *ex parte* appeals, while continuing to maintain its capacity to conduct AIA proceedings,” Patent Owner respectfully requests the Director to exercise her discretion to deny institution of IPR in this proceeding. *See* Director Memo at 1.

II. THE *FINTIV* FACTORS FAVOR DISCRETIONARY DENIAL

Institution of *inter partes* review is discretionary. 35 U.S.C. § 314 states that the “Director *may not* authorize an *inter partes* review to be instituted unless the Director determines that the information presented in the petition . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a) (emphasis

added¹). As the Supreme Court has explained, § 314(a) “invests the Director with discretion on the question *whether* to institute review.” *SAS Inst., Inc. v. Iancu*, 584 U.S. 357, 366 (2018). Pursuant to the Director’s discretion, the Board is “permitted, but never compelled, to institute an IPR proceeding.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016); *see also Cuozzo Speed Techs. v. Lee*, 579 U.S. 261, 273 (2016) (“the agency’s decision to deny a petition is a matter committed to the Patent Office’s discretion”) (citing 35 U.S.C. § 314(a)). Irrespective of whether the minimum standards for institution are met, other reasons, such as “events in other proceedings related to the same patent,” may favor denying a petition. Consolidated Trial Practice Guide (84 Fed. Reg. 64,280 (Nov. 21, 2019)) (“Practice Guide”) at 58 (citing *NetApp, Inc. v. Realtime Data LLC*, IPR2017-01195, Paper 9 at 12–13 (PTAB Oct. 12, 2017) and explaining that the Board in *NetApp* denied institution under § 314(a) where “the Board likely would not have been able to rule on patentability until after the district court trial date”). Further, the Director’s Memo has set forth additional considerations, including:

- Whether the PTAB or another forum has already adjudicated the validity or patentability of the challenged patent claims;
- Whether there have been changes in the law or new judicial precedent issued since issuance of the claims that may affect patentability;
- The strength of the unpatentability challenge;

¹ Emphasis added throughout unless otherwise stated.

- The extent of the petition's reliance on expert testimony;
- Settled expectations of the parties, such as the length of time the claims have been in force;
- Compelling economic, public health, or national security interests; and
- Any other considerations bearing on the Director's discretion.

Director's Memo at 2–3. Additionally, the Director also considers “the ability of the PTAB to comply with pendency goals for *ex parte* appeals, its statutory deadlines for AIA proceedings, and other workload needs.” *Id.* at 3 (citing 35 U.S.C. § 316(b)).

In determining whether to exercise its discretionary power under § 314(a), the Board balances a set of six factors, as articulated in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11, at 6 (PTAB “Precedential” Mar. 20, 2020) (“*Fintiv* Precedent”). On balance, the six *Fintiv* factors favor discretionary denial in this proceeding. A co-pending litigation in the Eastern District of Texas² (“Related Litigation”) involving both Petitioner and Patent Owner, substantially the same claims of the same patent, and invalidity challenges to the same patent (including the same prior art references as this Petition) will outpace this proceeding. The

² The Court in the Related Litigation consolidated two cases (2:24-cv-00644-JRG and 2:24-cv-00645-JRG) between the same parties for pretrial issues under the lead case (2:24-cv-00644-JRG). *See Stratasys, Inc. v. Shenzhen Tuozhu Technology Co., Ltd.*, No. 2:24-cv-00644-JRG, Dkt. No. 19 (E.D. Tex. Oct. 22, 2024).

Petition fails to cite any credible reason why the “efficiency and integrity of the system” would not be “best served” by discretionary denial. *Fintiv* Precedent at 6.

A. The exercise of discretionary denial under the *Fintiv* Precedent is proper

As an initial matter, the exercise of discretionary denial under the *Fintiv* Precedent is proper and should be followed. Petitioner's bare, unsupported assertions that the *Fintiv* Precedent “exceeds the Director's authority, is arbitrary and capricious, and was adopted without notice-and-comment rulemaking” are without merit. Pet. at 81. The Federal Circuit has already considered and rejected similar statutory and arbitrary-and-capriciousness challenges against *Fintiv*. See *Apple Inc. v. Vidal*, 63 F.4th 1, 12–14 (Fed. Cir. 2023) (affirming dismissal of plaintiff's challenges to *Fintiv* as being contrary to statute or arbitrary and capricious under 5 U.S.C. § 701(a)(1)).

Further, a U.S. District Court has already considered and rejected a similar challenge claiming that notice-and-comment rulemaking is required. *Apple Inc. v. Vidal*, Case No. 20-CV-06128-EJD, 2024 WL 1382465, at *13 (N.D. Cal. Mar. 31, 2024). As the Court explained, “the APA expressly excludes three categories of rulemaking from the notice-and-comment requirement: (1) interpretative rules; (2) general statements of policy; and (3) rules of agency organization, procedure, or practice.” *Id.* at 5 (citing 5 U.S.C. § 553(b)(4)(A)). Consistent with the APA,

“Courts have formulated this distinction to hold that ‘[t]he notice-and-comment requirements apply ... only to so-called “legislative” or “substantive” rules.’” *Id.* (quoting *Lincoln v. Vigil*, 508 U.S. 182, 195 (1993) (citations omitted)). Under this framework, the Court determined that “the *NHK-Fintiv* standard is a general statement of policy, rather than a substantive or legislative rule.” *Id.* at 13. Accordingly, “the Director was not required to conduct notice-and-comment rule making prior to designating the *NHK* and *Fintiv* decisions as precedential.” *Id.* (concluding that “the lack of such rule making does not render the *NHK-Fintiv* standard unlawful”) (citing 5 U.S.C. § 706(2)(D)).

Thus, the *Fintiv* Precedent is proper—it does not exceed the Director’s authority, is not arbitrary and capricious, and does not need to be adopted with notice-and-comment rule making.

B. Factor 1: Whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted

Factor 1 weighs in favor of discretionary denial. In the Related Litigation involving both Petitioner and Patent Owner, there has been no request for a stay pending *inter partes* review and the judge in the case, Judge Rodney Gilstrap, has not granted a stay.

Petitioner contends that this factor is neutral because there is purportedly “no evidence that, if the action is maintained and a stay is requested, the court will

deny a stay.” Pet. at 81–82. However, Petitioner ignores the reality that it is highly unlikely that Judge Gilstrap will grant a stay in the Related Litigation pending IPR. As an initial matter, Judge Gilstrap denies the vast majority of motions to stay pending IPR. Since 2019, over 85% of such motions were denied. EX2001 at 1.

In past decisions denying a stay pending IPR, Judge Gilstrap has made it clear that motions to stay will be denied if filed before the “last of the patents-in-suit to be acted upon by the PTAB.” Order Denying Motion to Stay Pending Inter Partes Review, *Acorn Semi, LLC v. Samsung Elecs. Co.*, No. 2:19-CV-00347-JRG, 2020 WL 10284981 at *2 (E.D. Tex. Sept. 14, 2020). Similarly, Judge Gilstrap has denied motions to stay pending IPR when the IPR proceedings do not challenge every patent asserted in the case. *See, e.g., Uniloc USA, Inc. v. Motorola Mobility LLC*, 2:16-cv-00992-JRG, Dkt. No. 125 at 3 (E.D. Tex. Apr. 5, 2017) (denying a stay “given that the pending IPR petitions do not challenge every patent asserted in this case”).

Petitioner fails to provide any reason why the Court in the Related Litigation would depart from its practice of denying motions to stay filed before the last of the patents-in-suit are acted upon by the PTAB and before every one of the patents-in-suit are challenged in IPR. Indeed, Petitioner has overlooked the fact that the Related Litigation involves multiple patents besides the '097 Patent, which are challenged in separate IPRs with different filing dates. *See, e.g.,* EX2009 at 30

(listing four other patents); IPR2025-00311, IPR2025-00438, IPR2025-00585, IPR2025-00611 (related IPRs for the other asserted patents). Thus, the reality is that Judge Gilstrap is highly unlikely to grant a stay in the particular Related Litigation due to facts specific to the case and parallel IPR proceedings.

Accordingly, factor 1 of the *Fintiv* analysis weighs in favor of discretionary denial because a stay in the related proceeding has not been requested and the evidence indicates that the Court in the Related Litigation will not grant a stay even if Petitioner were to request one.

C. Factor 2: Proximity of the court's trial date to the Board's projected statutory deadline for a final written decision

Given that trial in the Related Litigation is set to begin before any final written decision would be due, factor 2 favors discretionary denial. PTAB precedent makes clear that factor 2 favors discretionary denial “[i]f the court's trial date is earlier than the projected statutory deadline.” *Fintiv* Precedent at 9.

Here, the Court's trial date in the Related Litigation is earlier than the projected statutory deadline. The Court set a trial date for June 1, 2026. EX1019 at 1. The projected statutory deadline for any final written decision is July 14, 2026. *See* Notice of Filing Date Accorded to Petition and Time for Filing Patent Owner Preliminary Response, Paper 6 (setting preliminary response date for April 14, 2025); 35 U.S.C. § 314(b) (setting expected decision whether to institute review

for 3 months after a preliminary response); 35 U.S.C. § 316(a)(11) (requiring a final determination by 1 year after the decision whether to institute review, extendable by 6 months).

In general, the Court's trial date is consistent with both the U.S. court case statistics for the United States District Court for the Eastern District of Texas and statistics for patent cases before Judge Gilstrap, specifically. Since 2021, the median time from filing to trial for civil cases has varied between 19.0 and 23.0 months depending on the year and measurement period (e.g., by fiscal year or calendar year). *See* EX2002 at 1-2 ("From Filing to Trial (Civil Only)"). Applying these median timings to the present case, which was filed in August 2024 (*see* EX2009), trial would be expected between March 2026 and July 2026.

For patent cases before Judge Gilstrap, specifically, the median time from filing to trial is 21.7 months for cases filed since January 2008 (107 cases), 21.7 months for cases filed since January 1, 2019 (41 cases), and 23.2 months for cases filed since January 2022 (small sample size of 13 cases). EX2001 at 3, 5, 7. Applying these median timings to the present case, trial would be expected between May 2026 and July 2026. Thus, the median time to trial statistics are consistent with the actual trial date the Court set for the Related Litigation, which is set for six weeks in advance of an expected final written decision deadline.

Petitioner asserts that this factor is neutral because any final written decision will be “nearly contemporaneous” with the trial date. However, Petitioner ignores numerous PTAB decisions that have weighed factor 2 somewhat in favor of discretionary denial when trial is expected to begin many weeks in advance of the expected final written decision deadline. For example, the PTAB exercised discretionary denial in the *Apple Inc. v. Fintiv, Inc.* case in part because trial was scheduled to begin “approximately two months” before a final written decision. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 15, at 12–13 (PTAB “Informative” May 13, 2020).

Other PTAB decisions have exercised discretionary denial with even shorter periods between a trial and final written decision. For instance, in *EClinicalWorks, LLC v. Decapolis LLC*, the PTAB denied institution where trial would begin “roughly one to two months before any final decision.” Decision Denying Institution of Inter Partes Review, *EClinicalWorks, LLC v. Decapolis LLC*, IPR2022-00229, Paper 10 at 9 (PTAB Apr. 13, 2022). In *EClinicalWorks*, the PTAB recognized that jury selection was set to begin approximately six weeks before a final written decision was expected and determined that factor 2 “weighs somewhat in favor of denial.” *Id.* (citing *Apple*, IPR2020-00019, Paper 15 at 13). Consistent with previous PTAB decisions, such as those in *Apple* and *EClinicalWorks*, finding that a trial date set shortly before any final written

decision weighs somewhat in favor of denial, factor 2 of the *Fintiv* analysis in this proceeding weighs somewhat in favor of discretionary denial, because it is likely that the jury trial in the Related Litigation will occur six weeks before a final written decision would be due. *See also* Decision Denying Institution of Inter Partes Review, *10X Genomics, Inc. v. President and Fellows of Harvard College*, IPR2023-01299, Paper 15 at 17 (PTAB Mar. 7, 2024) (finding factor 2 weighing in favor of discretionary denial where district court trial would occur at least one month before a final written decision would be due).

D. Factor 3: Investment in the parallel proceeding by the court and the parties

The proceedings of the Related Litigation are well underway and remain in progress. Petitioner asserts that “there has been little investment by the court and the Markman hearing is scheduled for December 3, 2025, well after institution.” Pet. at 82. However, Petitioner fails to address the efforts undertaken by the Court and parties thus far and efforts that will be undertaken before any decision on institution. Thus far, the Court has held a scheduling conference with the parties (EX2003) and entered numerous orders in the case, including a docket control order, discovery order, e-discovery order, and protective order. EX1019, EX2003, EX2004, EX2005, EX2006. In addition, the parties in the Related Litigation have (a) negotiated and proposed numerous orders, including the aforementioned orders,

(b) exchanged initial disclosures (EX1019 at 6); (c) exchanged additional disclosures (EX1019 at 6); and (d) exchanged infringement, invalidity, and subject-matter eligibility contentions totaling well over 2,000 pages (*see* EX1019 at 5–6). Fact discovery is well underway with the parties having exchanged over 100 document requests, exchanged requests and responses to over 30 interrogatories, and produced documents exceeding 56,000 pages, and third-party discovery. In addition, the parties have briefed issues related to party joinder. *Id.*

Besides these existing substantial investments in the Related Litigation, the parties will make further substantial investments in the Related Litigation before a decision whether to institute review is expected. Source code review and amended infringement contentions are anticipated based on the Court's local patent rules. *See* EX1019 at 5-6. Moreover, as explained above for factor 2, the parties and Court in the Related Litigation will make additional substantial investments by starting a jury trial prior to the expected final written decision deadline. Thus, any final written decision would simply revisit the jury's earlier findings regarding validity. Such duplicative efforts contradict the main purpose of *inter partes* review—to provide “quick and cost effective *alternatives* to litigation.” Practice Guide at 56 (quoting H.R. Rep. No. 112–98, pt. 1, at 40 (2011), 2011 U.S.C.C.A.N. 67, 69). Given the substantial investments made by the Court and parties, factor 3 weighs in favor of exercising discretionary denial.

E. Factor 4: Overlap between issues raised in the petition and in the parallel proceeding

The overlap in patent validity issues between the Petition (challenging claims 1-5 and-19) and the Related Litigation is significant. There is significant overlap in claims with the vast majority of claims (claims 1, 2, 4, 5, 8-12, 14-18) involved in the Related Litigation. *See* EX1016. There is also significant overlap in invalidity references and grounds. As explained above, the Petition asserts 14 grounds involving various combinations of *Knighton*, *Luo*, *Anderson*, *Mazumder*, and *Bonassar*, among other references. Each of these references in the Petition is included in the Invalidity Contentions along with many others. *See* EX2007 at 37–38, 117–27. Accordingly, there can be no dispute that all of the asserted grounds and references in this IPR are also at issue in the Related Litigation and that additional asserted grounds and references are at issue in the Related Litigation.

Petitioner asserts that this factor “favors institution as Petitioner has made a stipulation not to pursue the IPR grounds in District Court.” Pet. at 82. Since the filing of the Petition, Petitioner has shifted its position and now offers a stipulation not to pursue in district court the IPR grounds or any other ground that was raised or could have been reasonably raised in an IPR. However, as the Director recently clarified, such a stipulation “does not ensure” that an IPR proceeding would be a “true alternative” to the district court proceeding. *See* Order Granting Director Review, Vacating the Decision Granting Institution, and Denying Institution of

Inter Partes Review, *Motorola Sols. v. Stellar, LLC*, IPR2024-01205, Paper 19 at 3–4 (PTAB Mar. 28, 2025) (denying institution despite Petitioner's *Sotera* stipulation, in part, because "Petitioner's stipulation does not ensure that the[] IPR proceedings would be a 'true alternative' to the district court proceeding" and because "Petitioner's invalidity arguments in the district court are more expansive and include combinations of the prior art asserted in these proceedings with unpublished system prior art, which Petitioner's stipulation is not likely to moot"). Here, any stipulation by Petitioner is unlikely to address Petitioner's invalidity arguments in district court based on unpublished system prior art. In particular, Petitioner's invalidity contentions identify five system art references: *Álvares System*, *Charliex*, *i.materialise*, *Keegan*, and *Trumpf*. *See* EX2007 at 31–32. Petitioner's contentions also identify numerous combinations involving the references in this IPR and system art, including:

- "Knighton in combination with Luo, Anderson, and" each one of the five system art references;
- "Mazumder in combination with Bonassar and" each one of the five system art references;
- each one of the five system art references "in combination with Luo, Anderson, and Bonassar;" and

- each one of the five system art references “in combination with Luo, Anderson, and Mazumder”

Id. at 122–23. Petitioner also asserts the Álvares System in combination with “any of the anticipatory references or exemplary combinations.” *Id.* at 123; *see also id.* at 124–25. As a result, Petitioner is not restrained from asserting very similar obviousness theories in the Related Litigation that include only minor differences from the Grounds raised in this Petition by including unpublished system art. Given this advantage, it appears that Petitioner has presented an opportunity for it to have two bites at the apple. As such, nothing prevents Petitioner from simply asserting the same reference or references repackaged in different permutations or a nearly identical theory challenging the claims of the '097 Patent with simple variations that add unpublished system art. Indeed, Petitioner's invalidity contentions reflect Petitioner's ability to game the system with at least 20 such variations adding system art. *See* EX2007, 31–32, 122–25. Thus, Petitioner's stipulation is not likely to moot Petitioner's numerous invalidity arguments in the District Court with unpublished system art.

While Petitioner's stipulation can reduce some of the overlapping issues, it does not eliminate the risk of overlap between the Related Litigation and this proceeding. Thus, when factor 4 is considered with the other factors of the *Fintiv* analysis, discretionary denial is still favored.

F. Factor 5: Whether the petitioner and the defendant in the parallel proceeding are the same party

Factor 5 favors discretionary denial. In the Related Litigation, Patent Owner is plaintiff and Petitioner is a defendant. As the PTAB explained in *Apple*, factor 5 weighs in favor of discretionary denial where “the petitioner and the defendant in the parallel proceeding are the same party.” *Apple*, IPR2020-00019, Paper 15 at 15. Petitioner failed to address this factor in its Petition. *See* Pet. at 82. On its face, *Fintiv* indicates that this factor, which favors discretionary denial, should be considered. *See Fintiv* Precedent at 6.

G. Factor 6: Other circumstances that impact the Board's exercise of discretion, including the merits

The sixth factor of the *Fintiv* analysis also favors discretionary denial. Petitioner's sole argument for Factor 6 is premised upon pure speculation—the *prospect* of its Motion to Dismiss in the Related Litigation being granted. *See* Pet. at 82. The Court has not ruled on the Motion to Dismiss, which is premised on the failure to join another party. *See* Defendant's Motion to Dismiss, *Stratasys, Inc. v. Shenzhen Tuozhu Technology Co., Ltd.*, Case No. 2:24-cv-00644-JRG, Dkt. No. 38 (E.D. Tex. Dec. 9, 2024). As Patent Owner explained in response to the Motion, the Motion fails to recognize “established principles,” including “as th[e] Court [in the Related Litigation] has repeatedly acknowledged, a plaintiff ‘is not required to accuse all infringers in the same action.’” *See* Plaintiff's Response to Defendant's

Motion to Dismiss, *Stratasys, Inc. v. Shenzhen TuoZhu Technology Co., Ltd.*, Case No. 2:24-cv-00644-JRG, Dkt. No. 43 (E.D. Tex. Dec. 19, 2024) (internal citations omitted). As such, it is pure speculation whether the Court will grant the flawed Motion to Dismiss, much less whether the Court will do so before any decision on whether to institute review is due. Such speculation should not receive any weight under factor 6 and cannot “tip the balance in favor of Petitioner.” *See Apple*, IPR2020-00019, Paper 15 at 17.

Although the Petition fails to raise an argument regarding the merits of its Petition under factor 6, as explained below, Petitioner's asserted grounds lack merits as they each have identified weaknesses. *See Apple*, IPR2020-00019, Paper 15 at 15–17 (finding that merits “do not tip the balance in favor of Petitioner and instead also weigh in favor discretionary denial in a balanced assessment of all the circumstances”).

Further, several additional considerations³ weigh in favor of discretionary denial. The Petition relies extensively on a 151-page expert declaration with well over 150 citations to the declaration. *See* Petition and EX1003. Aside from content on the expert's background, materials considered, and discussion of applicable legal standards, the declaration largely mirrors the wording and argument made in

³ Whether considered part of factor 6 under the *Fintiv* framework or separately, the Director may consider such additional factors in discretionary denial. *See* Director Memo at 2–3.

the Petition. *Compare, e.g.,* EX1003, ¶166 *with* Pet. at 53, both arguing “a POSITA would have recognized that the substrate” and “the work space” is “a build volume” without further explanation; *see generally* EX1003. Thus, Petitioner effectively seeks to rely on expert testimony that repeats its attorney argument to supplant the teachings of the references themselves. *See Facebook v. Windy City Innovations, LLC*, 973 F.3d 1321, 1340-41 (Fed. Cir. 2020) (affirming PTAB’s decision upholding a claim as “the Board considered Facebook’s expert’s testimony but determined that it did not add materially to Petitioner’s unpersuasive attorney argument”); *see also Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 15–17 (PTAB Aug. 24, 2022) (designated precedential) (according “little weight” to testimony that contains a verbatim restatement of a petition’s conclusory assertions without additional supporting evidence or reasoning).

Further, the ’097 Patent has been in force for over 10 years, which has set the expectations of the parties that it is valid and enforceable.

In addition, there have been no new changes in the law or new judicial precedent issued since the issuance of the ’097 Patent that could affect patentability. Nor has Petitioner identified any such changes. The Petition cites to only five Federal Circuit cases and a single PTAB case. It cites two Federal Circuit cases and one PTAB case for Petitioner’s argument on printed publications and three cases for claim construction—two issues that are not contested in Patent

Owner's responses before institution. *See* Pet. at 2, 7. Petitioner has failed to provide any basis to assert that a change in law or judicial precedent warrants revisiting the patentability of the '097 Patent.

Additionally, compelling economic or national security interests may warrant discretionary denial. To the extent current or future directives from the Commerce Secretary, or his subordinates at the USPTO, instruct the Director to consider whether to exercise discretionary denial when a foreign company seeks to use the PTAB (a USPTO tribunal) to revisit the validity of a duly issued U.S. patent invented by an individual in the United States and owned by a U.S. company, Patent Owner seeks to preserve any argument under such directives. Testimony by the Secretary of Commerce indicates that his directive may be that foreign entities, such as the Petitioner, are not permitted to use the PTAB, a tribunal of the United States Patent and Trademark Office, to challenge the duly issued '097 Patent, that was invented by an inventor in the United States and assigned to companies in the United States. *See* EX2008 at 57; *see also* Video of Hearing on the Nomination of Howard Lutnick, of New York, to be Secretary of Commerce (Jan. 29, 2025) at 1:56:15, available at https://www.commerce.senate.gov/2025/1/full-committee-nomination-hearing_2_3. Accordingly, Patent Owner preserves its argument under any such directive for the Director to consider whether to exercise discretionary denial when

a foreign company seeks to use the PTAB (a USPTO tribunal) to revisit the validity of a duly issued U.S. patent invented by an individual in the United States and owned by a U.S. company when the foreign company will receive due process on the validity of the patent in the U.S. federal court system.

While Petitioner will undoubtedly receive due process on validity of the '097 Patent in the U.S. federal court system, Petitioner effectively seeks to benefit from a duplicative proceeding before the PTAB. Doing so would tie up the PTAB's limited resources for Petitioner's benefit at the expense of patent owners in this and other PTAB proceedings, including *ex parte* appeals and other AIA proceedings. As a consequence, Petitioner's request for review in this proceeding would frustrate the PTAB's ability to comply with pendency goals for *ex parte* appeals and statutory deadlines for other AIA proceedings. See 35 U.S.C. § 316(b). For this additional reason, the Director should exercise her discretion to deny institution.

III. THE DIRECTOR SHOULD EXERCISE DISCRETION TO DENY INSTITUTION UNDER SECTION 325(D)

As explained, institution of *inter partes* review is discretionary. Section 325(d) permits the Director to elect not to institute review if the challenge to the patent is based on matters previously presented to the Office. 35 U.S.C. § 325(d); *see also* 37 C.F.R. § 42.4(a). In particular, section 325(d) states:

In determining whether to institute or order a proceeding under this chapter, chapter 30, or chapter 31, 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.

Under § 325(d), the Board follows a two-part framework:

- (1) 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; and
- (2) if either condition of first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.

Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential). Thus, the Director may exercise discretion not to institute *inter partes* review if the petitioner fails to show that the Office erred in a manner material to patentability. *See, e.g., Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 at 24 (Dec. 15, 2017) (precedential as to § III.C.5, first paragraph) (“*Becton, Dickinson*”).

In determining whether to exercise its discretionary power under § 325(d), the Director considers the following non-exclusive factors, as articulated in *Becton, Dickinson*:

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

- (c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection;
- (d) the extent of the overlap between the arguments made during examination and the manner in which petitioner relies on the prior art;
- (e) whether petitioner has pointed out sufficiently how the examiner erred in its evaluation of the asserted prior art; and
- (f) the extent to which additional evidence and facts presented in the petition warrant reconsideration of the prior art or arguments.

See *Becton, Dickinson*, Paper 8 at 17–18; see also *Advanced Bionics*, Paper 6 at 9, n.10. “If, after review of factors (a), (b), and (d), it is determined that the same or substantially the same art or arguments previously were presented to the Office, then factors (c), (e), and (f) relate to whether the petitioner has demonstrated a material error by the Office.” *Advanced Bionics*, Paper 6 at 10.

A. Factors (a), (b), and (d): the Patent Office already considered substantially the same art and arguments, and thus these factors weigh in favor of discretionary denial

The Petition raises two sets of grounds. The first set of grounds (Grounds 1A–1H) are based on *Knighon*, *Luo*, and *Anderson* and the second set of grounds (Grounds 2A–2F) are based on *Mazumder* and *Bonassar*.

The Patent Office reviewed *Anderson* during examination of the '097 Patent and found that the '097 Patent was patentable over *Anderson*'s teachings and disclosures. The examiner initially rejected the claims as obvious over *Adusumilli* (US2009/0287332) and *Anderson*, alone or in view of additional references. EX1002, 88–94. The examiner asserted that *Adusumilli* teaches a 3D printer with a

3D scanner and machine vision system, but relied on *Anderson* for the remaining claim elements, including the network interface, web server, and providing status. In particular, the examiner asserted that *Anderson* teaches a “system for fabricating 3D objects” that connects to an interface controller that “receives information from the printer and then provides this information to a user’s computer via a web page.” EX1002, 89 (citing *Anderson* (EX1012) at [0016], [0018]). On this basis, the examiner initially concluded that it “would have been obvious to one having ordinary skill in the art at the time of the invention to include a network interface and a web server motivated by a desire to give remote users access to the 3D printer.” *Id.* The examiner also asserted that “Fig. 1 of *Anderson* shows the GUI of a remote user connected to the 3D printer through network interface 104” and that “*Anderson* teaches a print server that polls the status of the printer [0018] and teaches the use of a remote interface (fig 1). The information in the interface is updated with respect to the information gained in the polling process.” EX1002 at 89–90 (citing EX1012, Fig. 1).

In response, the applicant explained to the examiner that the applicant devised a 3-D printing system with a scanner that captures 3-D information from an object being fabricated within the build volume during a print job, a machine vision system that captures and analyzes image content from the scanner to provide the status of the print job, which is viewable through a web server and network

interface by a remote user. EX1002, 106. The applicant also pointed out that *Anderson* does not obtain information about the status of the print job with a three-dimensional scanner, explaining that the “‘print progress information’ in *Anderson* is determined by a status register that uses the ‘number of passes completed by the printhead’ and compares this to ‘how many passes are required to complete the job.’” *Id.* at 106–07 (quoting EX1012 at [0018]). These teachings of *Anderson* of a progressively filled-in wireframe model based on the number of passes completed by the printhead did not lead to the claims, which require a three-dimensional scanner and a machine vision system configured to capture and analyze image content from the scanner to provide a status of the print job executing on the printer for remote display. *See id.*

Thereafter, the examiner dropped the rejection of the claims under obviousness grounds and asserted non-statutory double patenting based on a related patent in the same family as the '097 Patent, U.S. Patent No. 8,562,324. EX1002, 121–23. The claims were allowed with the filing of a terminal disclaimer. *Id.*, 168.

Petitioner argues that the examiner never considered the combination of *Anderson* with *Knighon* and/or *Luo* (Pet. at 81) but wholly fails to address the overlap between the examiner's reliance on *Anderson* during prosecution and its reliance on *Anderson* in the Petition. Petitioner relies on the same teachings of

Anderson in the *Knighton-Luo-Anderson* combination as the examiner did in the *Adusumilli-Anderson* combination. Similar to the *Adusumilli* reference cited during prosecution that allegedly teaches a 3D printer with a 3D scanner and machine vision system (EX1002, 88), the Petition relies on *Knighton* and *Luo* to assert that the combination teaches a 3D printer with a 3D scanner and machine vision system (Pet. at 21 (relying on *Knighton*'s scanner), 22–23 (relying *Knighton*'s purported machine vision system and *Luo*'s purported suggestion for a solution with a “remote user”)). And, similar to the examiner's abandoned reliance on *Anderson*'s progressively filled-in wireframe model, the Petition repeatedly relies on *Anderson* to assert that it suggests the display of information with a progressively filled-in wireframe model based on the number of passes completed by the printhead. See Pet. at 10–11 (citing *Anderson* (EX1012), [0015], [0018], Fig. 1), 16–17 (citing EX1012, [0018], Fig. 1); Pet. at 23 (citing EX1012, Fig. 1); Pet. at 11, 28 (reproducing wireframe model). Thus, the Petition suffers from the same issue already addressed and eventually rejected by the examiner—*Anderson*'s teachings about a wireframe model fail to teach providing a status of the print job for remote display by capturing and analyzing image content from a three-dimensional scanner, and there is not a motivation to combine *Anderson*'s teachings with another reference that discloses such a scanner used for other purposes to arrive at the claimed invention (whether that other reference is *Adusumilli*, as used by the

examiner, or *Knighton*, as used by Petitioner). Because *Knighton*'s teaching of a three-dimensional scanner are cumulative of the same teachings in *Adusumilli*, the inclusion of *Knighton* in the ground to teach a three-dimensional scanner does not avoid retreading the same ground already addressed by the examiner.

Further, similar to *Anderson*, the references in Ground 2A (*Mazumder* and *Bonassar*) do not teach providing a status of the print job for remote display by capturing and analyzing image content from the scanner. Like *Anderson*, *Mazumder* does not teach a three-dimensional scanner and in the combination both *Mazumder* and *Bonassar* do not teach providing status for remote display by capturing and analyzing image content from a three-dimensional scanner. Thus, Ground 2A of the Petition is cumulative because it suffers from the same issue before the examiner with respect to *Anderson* and *Adusumilli*.

As such, factors (a), (b), and (d) favor denying institution.

B. Factors (c), (e), and (f): Petitioner has failed to show any material error by the Patent Office

As discussed above, Petitioner relies upon *Anderson* in its argument that the Patent Office make an error in granting the '097 Patent. Not only was *Anderson* evaluated during prosecution, it was used as the basis for the examiner's rejection in a very similar manner as Petitioner asserts in the Petition. Combining *Anderson* with different references (*Knighton* and *Luo* in the Petition) for the 3D scanner and

machine vision system limitations instead of using *Adusumilli* does nothing to change the fact that Petitioner uses *Anderson* in the same manner as the examiner.

Similarly, Ground 2A of the Petition is cumulative over combinations with *Anderson* as they too fail to teach providing a status of the print job for remote display by capturing and analyzing image content from a three-dimensional scanner for similar reasons.

Thus, factor (c) favors denial of institution.

Further, as discussed, Petitioner failed to address why it believes the examiner erred in its evaluation. Petitioner relies solely on *Knighton* not being considered by the examiner and other grounds in the Petition to argue that there was somehow a material error during prosecution. *See* Pet. at 81. However, as discussed above, Petitioner does not address the fact that it relies on *Anderson* in a manner that is the same or similar to how it was used by the examiner during prosecution. Nor does Petitioner address the fact that the other grounds (Grounds 2A-2F) of the Petition are cumulative over combinations with *Anderson* because they too fail to teach providing a status of the print job for remote display by capturing and analyzing image content from a three-dimensional scanner. As discussed below, the grounds of the Petition fail on the merits. Thus, Petitioner has not sufficiently demonstrated that the examiner erred in its evaluation. Factor (e) favors denial of institution.

Petitioner has not provided any additional evidence or facts in the Petition that would warrant reconsideration of *Anderson* or arguments on the teachings of *Anderson*. Other grounds (Grounds 2A-2F) of the Petition are cumulative over combinations with *Anderson* because they too fail to teach providing a status of the print job for remote display by capturing and analyzing image content from a three-dimensional scanner. Thus, Petitioner has not provided any additional evidence or facts in the Petition that would warrant reconsideration. Thus, factor (f) favors denial of institution.

On balance, the *Becton, Dickinson* factors weigh in favor of discretionary denial of institution under § 325(d) and thus the Director should decline to institute review of this Petition.

IV. THE MERITS OF THE PETITION ARE WEAK

Under the *Fintiv* framework, the Board and Director consider a balanced assessment of all relevant circumstances, including the merits of the Petition. As explained below, each of the asserted Grounds for claim 1 (and thus each challenged dependent claim) contain substantive flaws and fail to show that any claims are unpatentable.

A. The '097 Patent and the Challenged Claims

1. Summary of the '097 Patent (EX1001)

The '097 Patent “relates to three-dimensional fabrication using networked resources.” EX1001 at 1:15-16. The patent explained that “a more recent trend has emerged toward low-cost three-dimensional prototyping devices suitable for hobbyists and home users. As these resources become more readily and widely available, a need has emerged for networking capabilities and network management for three-dimensional printers.” *Id.* at 1:21-29.

Figure 3 of the '097 Patent shows a networked three-dimensional printing environment 300 that includes multiple 3-D printers 304 interconnected with multiple devices via a data network 302.

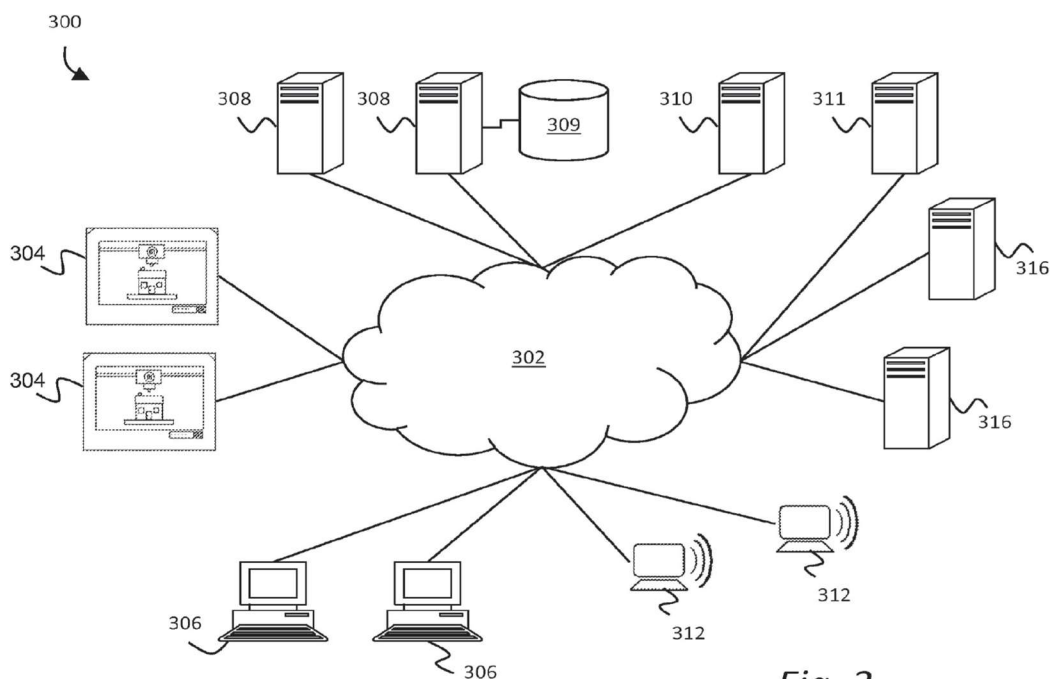


Fig. 3

Id. at 8:7-15, Fig. 3. The devices in Figure 3 include servers (e.g., print server 308, content sources 310, web server 311, other resources 316) and devices (e.g., client devices 306 and mobile devices 312). *Id.* at 8:12-15, 12:28-39, Fig. 3.

A diagram of a 3-D printer 100 is shown below in Figure 1 with a build platform 102, extruder 106, positioning assembly 108, and controller 110 “that cooperate to fabricate an object 112 within a working volume 114.” *Id.* at 2:18-22.

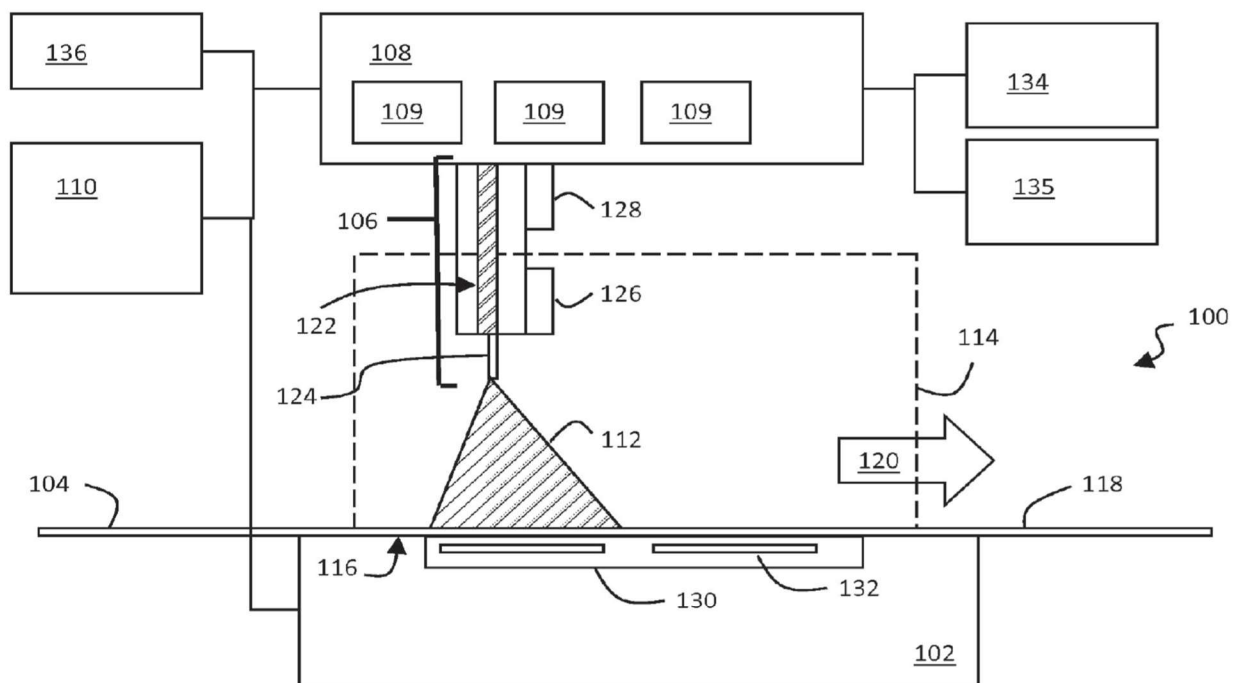


Fig. 1

Id. at Fig. 1. The printer includes one or more sensors 134, such as a three-dimensional scanner that uses sensing and processing hardware to capture three-dimensional information. *Id.* at 6:34-40. A “two-dimensional projection may be

dynamically updated to correspond to a state of physical completion of the object in order to provide real time, or quasi-real time visual status information.” *Id.* at 24:58-65. For example, the two-dimensional projection may be obtained from the three-dimensional scanner to visualize the model and current state of completion. *Id.*

In addition, the sensors 134 may include a machine vision system that captures and analyzes “image content to obtain information about the status of a job, working volume 114, or an object 112.” *Id.* at 6:40-50. In addition to providing status by capturing and analyzing image content, the machine vision system can support a variety of imaging-based automatic inspection, process control, and/or robotic guidance functions, including “pass/fail decisions, error detection (and corresponding audible or visual alerts), shape detection, position detection, orientation detection, [and] collision avoidance.” *Id.*

To operate the 3-D printer with a video, the '097 Patent illustrates a flowchart in Figure 7. *Id.* at 24:24-28.

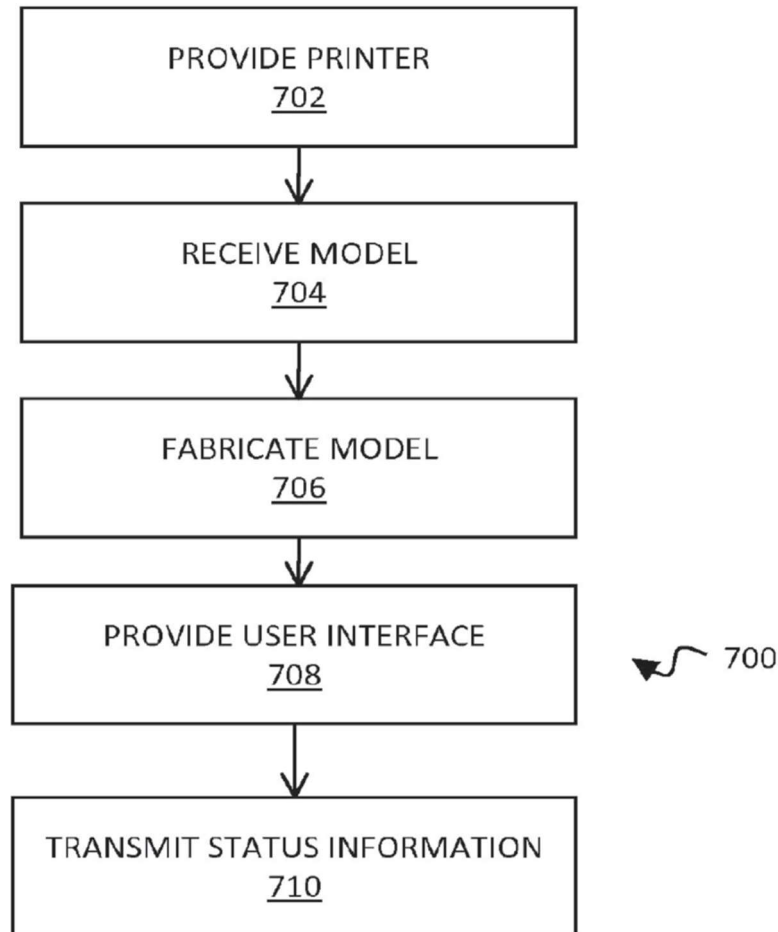


Fig. 7

Id. at Fig. 7. At step 702, a printer is provided. *Id.* at 24:29-35. At steps 704 and 706 the model is received by the printer and fabricated, and at Step 708, the method includes “providing a user interface to a remote user accessing the device through the network interface” where the interface presents “a two-dimensional projection of the three-dimensional model.” *Id.* at 24:47-52. For example, the two-dimensional projection can be a “visualization of the model and its current state of

completion.” *Id.* at 24:58-61. The projection may be obtained from a “three-dimensional scanner” (*id.* at 24:61-64) and may be “dynamically updated to correspond to a state of physical completion of the object” (*id.* at 24:64-25:3). At step 710, status information is transmitted over the data network. *Id.* at 25:6-17. A user interface may show the status information during a build process. *See id.* 25:62-26:4.

Numerous claims embody these solutions, including independent claim 1. For instance, claim 1 recites “a three-dimensional scanner configured to capture three-dimensional information from an object being fabricated within the build volume during a print job executing on the three-dimensional printer,” “a machine vision system configured to capture and analyze image content from the three-dimensional scanner thereby providing a status of the print job executing on the three-dimensional printer,” and “a web server configured to transmit the status of the print job for display at a remote client through the network interface.” EX1001 at 27:21-34.

As explained below, the asserted grounds fail to teach the elements of claim 1. Because claims 2-5 and 8-19 depend from claim 1, the asserted grounds also fail to teach the elements of dependent claims 2-5 and 8-19 for at least the same reasons.

2. Summary of the Prosecution History of the '097 Patent (EX1002)

As discussed above, the examiner issued the claims of the '097 Patent over *Anderson* and other cited art. *See* EX1002, 106–107, 122, 168. *Supra* § III.A (“Factors (a), (b), and (d): the Patent Office already considered substantially the same art and arguments . . .”).

As explained below, the combinations in the Petition suffer from the same deficiencies as those raised during prosecution and do not teach all elements of independent claim 1 of the '097 Patent.

B. Level of Ordinary Skill

For the purpose of this request for discretionary denial, a personal of ordinary skill in the art (a “POSITA”) in relation to the subject matter of the '097 Patent would have had a bachelor's degree in Mechanical Engineering, Computer Engineering, Electrical Engineering, Materials Science, or a comparable field and at least two years of experience related to 3D printing, with additional experience potentially being a substitute for a formal degree or training (and vice versa).

As explained below, the Petition has failed to show that the claims of the '097 Patent are unpatentable irrespective of the level of skill of a skilled artisan.

C. Claim Construction

For the purposes of this request for discretionary denial, Patent Owner submits that the Board does not need to construe any claim terms in any particular way to conclude that the Petition is deficient and thus institution of review is not warranted. *See Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) (“need only be construed ‘to the extent necessary to resolve the controversy’”).

D. Applicable Legal Standards For Determining Patentability

As explained above, institution of *inter partes* review is discretionary under 35 U.S.C. § 314. At a minimum, Petitioner must show there is a reasonable likelihood of prevailing with respect to at least one challenged claim. *See* 35 U.S.C. § 314(a); 37 C.F.R. § 42.108(c); Practice Guide at 3 (“The Board, acting on behalf of the Director, may institute a trial where the petitioner establishes that the standards for instituting the requested trial are met”)

Each of Petitioner's grounds relies on obviousness under 35 U.S.C. § 103. A claim cannot be considered obvious if even one element of the claim is absent from the prior art. *See CFMT, Inc. v. YieldUp Int'l Corp.*, 349 F.3d 1333, 1342 (Fed. Cir. 2003) (“Obviousness requires a suggestion of all limitations in a claim.”) (citing *In re Royka*, 490 F.2d 981, 985 (C.C.P.A. 1974)); *In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993) (reversing obviousness rejection as not all claim

elements were taught or suggested); *Garmin Int'l, Inc. v. Patent of Cuozzo Speed Techs. LLC*, IPR2012-00001, Paper 15 at 15 (PTAB Jan. 9, 2013) (denying institution of IPR in part as prior art did not disclose all claim limitations in obviousness challenge).

Obviousness is resolved based on several factual determinations including the scope and content of the prior art, any differences between the claimed subject matter and the prior art, and the level of ordinary skill in the art. *See Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). IPR petitions “must address the *Graham* factors.” *Eizo Corp. v. Barco N.V.*, IPR2014-00358, Paper 11 at 29-30 (PTAB July 23, 2014) (citing *Graham*, 383 U.S. at 17-18) (faulting Petitioner for its failure to identify differences between the claimed subject matter and the prior art and its conclusory assertions about the teachings of the prior art); *see also Moses Lake Indus., Inc. v. Enthone, Inc.*, IPR2014-00243, Paper 6 at 18 (PTAB June 18, 2014); *Moses Lake Indus., Inc. v. Enthone, Inc.*, IPR2014-00246, Paper 6 at 17 (PTAB June 18, 2014); *eBay, Inc. v. Paid, Inc.*, CBM2014-00125, Paper 15 at 21 (PTAB Sept. 30, 2014).

The conclusion of obviousness based on the combination of references must be supported by an explicit analysis of a reason to combine such references. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). Mere conclusory statements are insufficient. Instead, “there must be some articulated reasoning with some rational

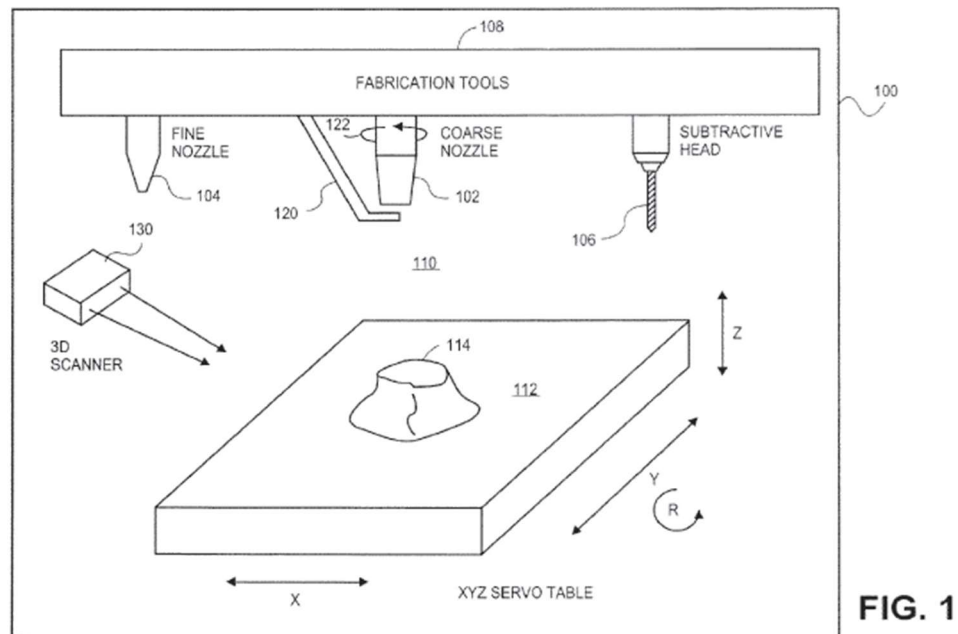
underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006); *see also LG Elecs., Inc. v. Cellular Commc'ns Equip. LLC*, IPR2016-00197, Paper 7 at 7-11 (PTAB Apr. 29, 2016) (petition's conclusion of obviousness lacked sufficient articulated reasons with rational underpinnings for modifying references to achieve specific elements of the claims).

The reason to combine references in the combination should not resort to hindsight bias. It is hindsight to use “the invention to define the problem the invention solves” because “when someone is presented with the identical problem and told to make the patented invention, it often becomes virtually certain that the artisan will succeed in making the invention.” *Mintz v. Dietz & Watson, Inc.*, 679 F.3d 1372, 1377 (Fed. Cir. 2012); *see also AT&T Services Inc. et. al. v. Innovative Sonic Ltd.*, IPR2024-01143, Paper 15 at 38 (PTAB Feb. 11, 2025) (denying institution after finding no motivation to combine because of an overly broad conclusion that “suffers from hindsight bias”).

E. The Petition Does Not Show That Claims 1-2, 4-5, 9-10, 12, 15-16, and 18-19 Are Unpatentable Under Ground 1A

1. Overview of *Knighton* (EX1005)

Knighton discloses a hybrid scanner fabricator. EX1005, Title, Abstract.



Id. at Fig. 1. Knighton explains that the data from the scanner, known as scan data, is provided to monitoring software to “conduct an analysis” to automatically determine whether to modify the build, such as by doing additional detailing with fine nozzle 104. *Id.* at 3:1–18; *see also id.* at 3:42–43, Fig. 3; 4:58–67 (claim 5).

2. Overview of *Luo* (EX2006)

Luo discloses an Internet accessible rapid prototyping system. EX1006, Title. Figure 1 of *Luo* shows a hardware configuration of the system.

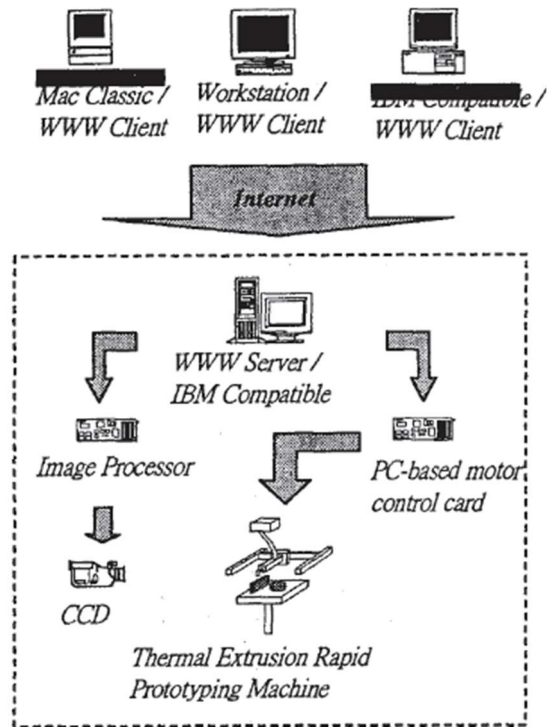
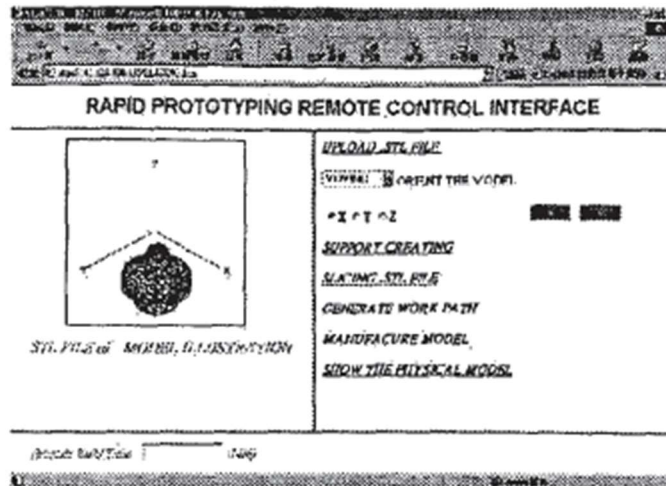


Figure 1. The Hardware Configuration of The Automated Tele-Manufacturing System.

Id. at Fig. 1. The system includes a thermal extrusion rapid prototyping machine, WWW server, CCD cameras, as well as “remote computer accesses” and “several computers.” *Id.* at 1. As shown below, a user interface in *Luo* includes a link to show the physical model.



Id. at Fig. 3. When selected, the user interface links to a separate CGI program that “can show live images captured by the CCD.” *See id.* at 4.

3. Overview of *Anderson* (EX1012)

Anderson discloses a user interface, method, and apparatus for providing three-dimensional object fabrication status. EX1012 at Title. Figure 1 of *Anderson* illustrates an interface controller and graphical user interface (GUI).

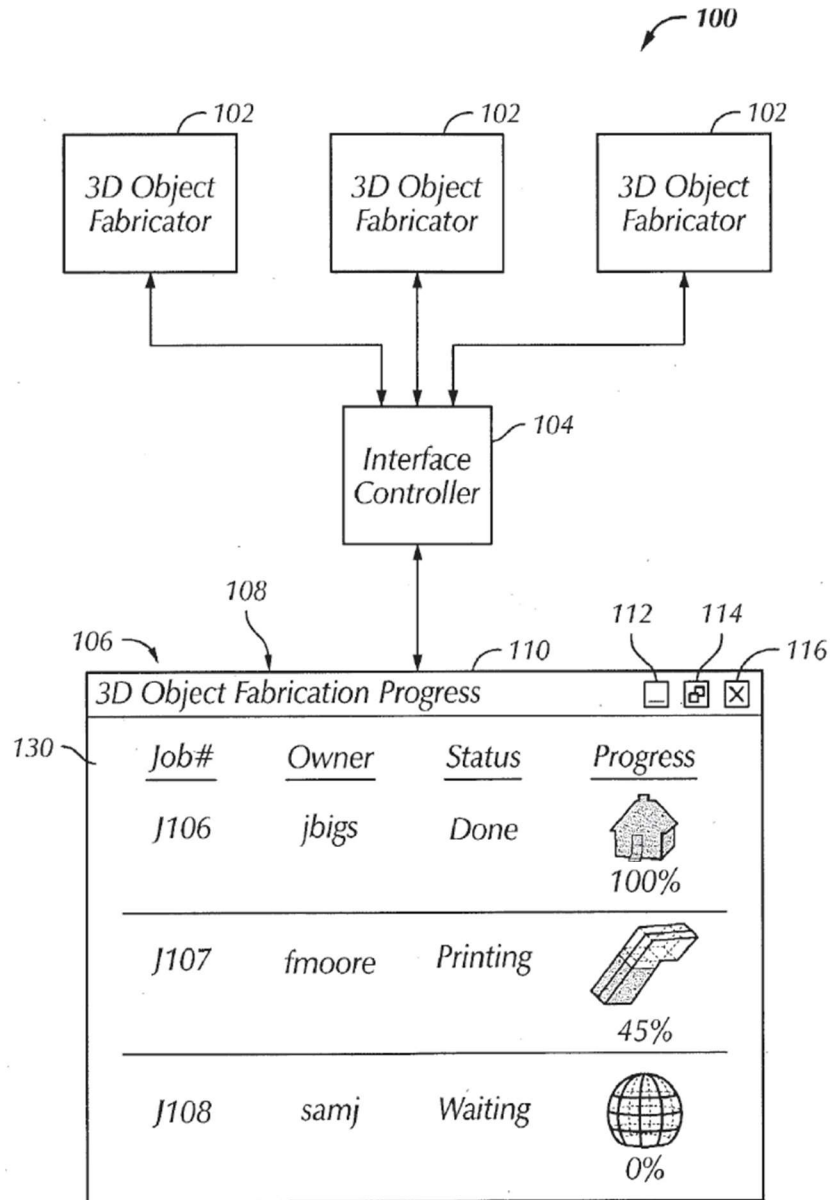


FIG. 1

Id. at Fig. 1. The GUI 108 provides a “visual representation of progress . . . in the form of one or more progressively filled-in wireframe model representations of the three-dimensional object(s).” *Id.* at [0017]. In particular, “[a]fter each pass of the printheads, the printer updates a status register” with a pass number “which is the number of passes completed by the printhead.” *Id.* at [0018]. Based on this

information, the system renders the wireframe model “to show the completed portion as a filled-in.” *Id.* An example of this rendering for a job is show in Figure 2A of *Anderson* below.

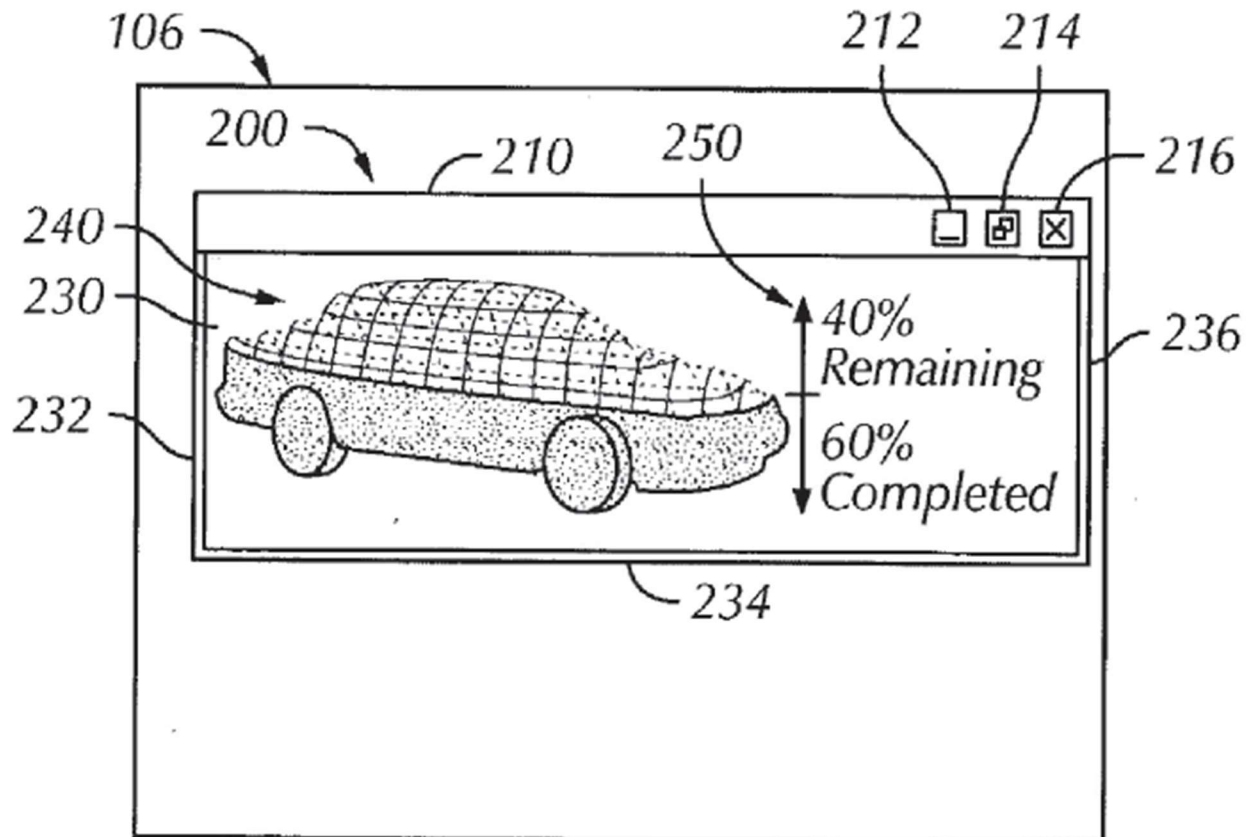


FIG. 2A

Id. at FIG. 2A.

4. Ground 1A Does Not Render Claim 1 Unpatentable

The combination of *Knighton-Luo-Anderson* does not teach or suggest all elements of independent claim 1. Claim 1 recites “a machine vision system configured to capture and analyze image content from the three-dimensional

scanner, thereby providing a status of the print job executing on the three-dimensional printer” and “web server configured to transmit the status of the print job for display at a remote client through the network interface.”

Petitioner relies on the combination of *Knighton*, *Luo*, and *Anderson* (Pet. at 12–29), but these references, whether considered individually or in the combination, fail to teach a machine vision system “providing a status of the print job executing on the three-dimensional printer” by capturing and analyzing image content from a scanner.

According to the Petition, the combination involves applying “Luo’s suggestions to Knighton’s 3D printer system to allow for remote control and monitoring of the fabrication process over the Internet and to present status information in a user interface to the remote user” (Pet. at 12) and implement “Anderson’s suggestions with the predictable Knighton-Luo combination so that the remote user interface (at the remote user’s computer) advantageously included helpful status information, such as indication of whether a model is waiting/printing/completed, the percentage of the object completed, and a visual comparison of the portion fabricated against a model frame in the user interface” (Pet. at 16).

Petitioner relies on *Knighton* for the “three-dimensional scanner” (Pet. at 21–23) and the combination for the machine vision system (Pet. at 23–29).

Petitioner asserts that the combination would have included the teachings of *Luo* related to Internet connectivity (Pet. at 24–25) and an “Image of the Physical Model” (Pet. at 27). Petition also asserts that the combination would have included the teachings of *Anderson* related to a visual representation of progress. *See* Pet. at 27–28. When incorporating the teachings of *Luo*’s “Image of the Physical Model” and *Anderson*’s visual representation of progress, Petition asserts that the visual information would have been based on information from the 3-D scanner. *See* Pet. at 27–28.

Petitioner’s assertions about the combination ignore the teachings of the references themselves and concoct a combination unsupported by record evidence and motivated by hindsight to reach a mistaken conclusion that the status information of the combination is provided by capturing and analyzing image content from a three-dimensional scanner.

As an initial matter, none of the asserted references teach providing status for display on a remote client by capturing and analyzing image content from a three-dimensional scanner. *Knighton* teaches the opposite approach of automatically analyzing scan data, performing evaluations to determine what actions to take, and taking such actions, such as detailing the object. *See* EX1005, 2:37–40, 3:1–18, 3:42–43, 4:58–67. Thus, there is no reason for a user, whether

local or remote to the system, to see information related to the scan data because *Knighton*'s software automatically takes action without user input.

Luo does not disclose the use of a three-dimensional scanner, much less capturing and analyzing image content from a three-dimensional scanner to provide status information. Indeed, the "Image of the Physical Model" in *Luo* "show[s] lives images captured by the CCD" camera and not from a three-dimensional scanner. *See* EX1006 at 4; *see also* 3 ("Show Image of the Physical Model in the Process Control Window"), Fig. 4 ("Get live image of physical model"), Fig. 9, 5–6.

Even if *Knighton* were modified "apply *Luo*'s suggestions to *Knighton*'s 3D printer system to allow for remote control and monitoring of the fabrication process over the Internet and to present status information in a user interface to the remote user" as Petitioner argues (Pet. at 12–13), there is no support for using a three-dimensional scanner to provide a "visual display" of the three-dimensional model. *See* Pet. at 14 (citing EX1005, 2:37-40; EX1003, ¶89⁴). Petitioner cites to a portion of *Knighton* that says a "a scanner 130 may use laser ranging to create the three dimensional model of the work in process 114." EX1005, 2:37-40. But Petitioner ignores what *Knighton* says about the use of such a model. Namely,

⁴ Paragraph 89 of Petitioner's expert declaration simply repeats what the Petition states without further explanation. *Compare* EX1003, ¶89 *with* Pet. at 14.

Knighton says the “model may be analyzed to determine whether corrective measures may be deferred until later in the fabrication process where such deferral would improve the efficiency of the fabrication.” *Id.* at 2:41–44; *see also id.* at 2:48–52 (explaining when “correction action” may need to “be taken”). As explained, *Knighton* teaches a solution that automatically takes corrective action without user interaction, so there is no report of status to the user. *See* EX1005, 3:1–18, 3:42–43.

Rather than address *Knighton*'s contrary teachings, Petitioner resorts to impermissible hindsight and asserts “displaying the three dimensional model of the work in process captured by *Knighton*'s 3D scanner in place of or in addition to a video image of the object as it is being fabricated would have allowed the user to more readily visually identify contours or physical inconsistencies in the object that may be difficult to identify in an image due to the interplay of light and shadow with the object.” Pet. at 52. In support, Petitioner relies on *Luo* and another reference *Crampton* (EX1009). But, Petitioner misinterprets *Luo* in stating that it discloses “capability for displaying such three-dimensional models” and *Crampton* in stating that “displaying such models of scanned three-dimensional data was well-known in prior art systems.”

To be clear, *Luo* does not disclose any capability for displaying three-dimensional models based on three-dimensional data scanned during a print job.

Rather, *Luo* is concerned with other types of models, such as a digital model provided before fabrication and a physical model that is the result of fabrication. *See* EX1006 at 1, 3. As *Luo* explains, there are four basic steps to the process. First, a “[u]ser can upload . . . files of models they have designed.” *Id.* at 1. Second, several pre-processes are performed. Third, “[a]fter completing these pre-processes, [the] user can send a model building command to the server and the server can then control the rapid prototyping machine to build up a physical model locally.” *Id.* Fourth, “[w]hen the RP model [i.e., the physical model] is completed, the remote user can examine the RP model through live image via Internet transmitted from the CCD camera mounted on the RP machine.” *Id.* Nowhere does *Luo* suggest that a three-dimensional model is based on three-dimensional data scanned during a print job.

Similarly, *Crampton* does not teach (or provide a motivation to use) the display of a three-dimensional model based on three-dimensional data scanned during a print job. Rather, *Crampton* describes scanning any object to provide a computer model of it. *See* EX1009, 6:43-60, 8:3-15 (cited by Pet. at 15⁵). There is no teaching of displaying a three-dimensional model based on three-dimensional data scanned during a print job. In particular, *Crampton* discloses a method of

⁵ The Petition also cites Paragraph 90 of its expert's declaration. *See* Pet. at 15. However, the cited portion of the declaration merely repeats what is argued in the Petition without any explanation. *Compare* EX1003, ¶90 with Pet. at 15.

“manually scanning the object,” “detecting the reflected signal,” “generating intermediate data structures,” “combining the intermediate data structures to provide the model, and “displaying the data.” EX1009, 6:43-60; *see also* EX1009, 8:3–15 (describing scanning apparatus to perform scanning). There is no teaching cited by Petitioner that would support displaying a three-dimensional model based on three-dimensional data scanned during a print job, much less to display status of a print job by showing such a model.

In addition to the deficiencies of *Knighton* and *Luo* in the combination, *Anderson* fails to teach providing status by capturing and analyzing image content from a three-dimensional scanner. As explained by the applicant during prosecution, *Anderson* teaches a wireframe model with a completion percentage based on the number of passes completed by the printhead. EX1012, [0018]; *see also* EX1002 at 107. *Anderson* explains that at a “specified interval,” the “3D wireframe model representation is re-rendered to show the completed portion as filled-in” based on a status register specifying “the number of passes completed by the printhead.” EX1012, [0018]. Notably, the wireframe model is based on a digital model on which the fabrication of an object is based; it is not an actual depiction of the object being fabricated. These deficiencies in *Anderson* mirror those identified by the applicant and accepted by the examiner during prosecution. *Supra* §§ III.A, IV.A.2 (Summary of the Prosecution History). In particular, the

applicant argued that *Anderson* alone or in combination with *Adusumilli* did not disclose or suggest a three-dimensional scanner that captures three-dimensional information during a print job in order to provide information about the status of the print job that can be viewed by a remote user. EX1002, 107. In reaching that conclusion, the applicant explained that *Anderson* provided a progressively filled-in wireframe model representation of the three-dimensional object that was determined by a status register that uses the number of passes completed by the printhead, not by any scanner. *Id.*

Further, there is no teaching in *Anderson* that the 3D wireframe model is re-rendered using information from three-dimensional scanner, that the completion percentage is determined using information from three-dimensional scanner, or that the status register in *Anderson* is somehow updated using information from three-dimensional scanner. Thus, *Anderson* does not remedy the deficiencies of *Knighton* and *Luo* that fail to teach providing status information for remote display by capturing and analyzing image content from a three-dimensional scanner.

The *Knighton-Luo-Anderson* combination also suffers from the same deficiencies. Petitioner argues that the combination would include a “visual representation of progress” as *Anderson* suggests. *See* Pet. at 27–28. But Petitioner ignores *Knighton*’s teaching, as explained above, of an automated solution that automatically takes correction action without user interaction, and thus does not

report status to the user. *See* EX1005, 2:41-44, 2:48 –52, 3:1–18, 3:42–43. Thus, there is no motivation to provide *Anderson's* visual representation of progress.

Further, even if the combination does transmit *Anderson's* visual representation of progress (it does not), such a visual representation as *Anderson* teaches would be based on the number of printhead passes and not any three-dimensional scanner. *See* EX1012, [0018], [0025], Figs. 1-2A. Petitioner has not explained why a person of ordinary skill would modify *Anderson's* teachings to generate its visual representation using a three-dimensional scanner as opposed to using printhead passes as *Anderson* teaches or how information captured by the three-dimensional scanner would be used to determine a completion percentage or progressively filled-in wireframe model. *See* Pet. at 12–19, 26–29.

F. The Petition Does Not Show That The Challenged Claims Are Unpatentable Under Grounds 1B through 1H

In addition to Ground 1A, the Petition includes seven additional grounds (Grounds 1B–1H) that rely on Ground 1A's combination of *Knighton*, *Luo*, and *Anderson* in further view of additional asserted art to challenge claims that depend from independent claim 1. *See* Pet. at 1–2. Accordingly, Grounds 1B through 1H fail to teach all elements of dependent claims for at least the reasons discussed above for Ground 1A with respect to independent claim 1. Thus, Petitioner has also

failed to show unpatentability for any of the claims challenged in Grounds 1B through 1H.

G. The Petition Does Not Show That Claims 1-5, 9-19 Are Unpatentable Under Ground 2A

1. Overview of *Mazumder* (EX1004)

Mazumder discloses a system and method for remote direct material deposition fabrication. EX1004 at Abstract, Title. *Mazumder*'s "fabrication process is recorded by video or television camera and [is] shown in real-time on a screen display connected to the remote computer." *Id.* at Abstract. The "video or TV camera 65 records the laser-aided DMD process and transmits the images to the local computer 70" which then sends the images "to the remote computer 95 to be displayed preferably on a TV screen or shown on the remote computer monitor as streaming video." *Id.* at 6:36-43. The remote computer has "two monitors, one with a graphical user interface and the other for image and video observation of the laser-aided direct material deposition process." EX1004, 2:27-33.

Mazumder's system also incorporates "acoustic sensors [that] operate on the principle that during material deposition strains and other physical changes, such as phase transformation changes, or crack/defect initiation produce sound waves which can be picked up." *Id.* at 5:39-43; *see also id.* at 5:58-63 (explaining that acoustic sensors can be used "to distinguish strain from other sources of acoustic emission from the product, such as crack initiation, defect formation, and phase

transformation, during the fabrication of the product fabrication through laser-aided material deposition.”) Accordingly, “[w]hen the designer perceives a defect, an abnormality or some other undesirable characteristic . . . , the designer may pause or abort the fabrication process.” *Id.* at 2:34-39.

2. Overview of *Bonassar* (EX1010)

Bonassar discloses modular fabrication systems and methods. EX1010, Title. The system has multiple deposition tools and a material deposition device with a tool interface for receiving one of the material deposition tools. *Id.*, Abstract. A system controller is connected to the material deposition device to control operation. *Id.* The system controller “is designed to store data about system performance and to improve the system automatically by updating data and models which it uses for manufacturing planning, manufacturing simulation, manufacturing plan execution, and operation control.” *Id.* at [0095].

Additionally, *Bonassar* explains that “for the manufacturing planning and control system to be able to automatically monitor the progress of a fabrication operation, to identify and locate objects placed in the build environment, and to measure the geometry of the finished product, the system may include a non-contact ranging sensor device which can be scanned by the positioning system across the build surface (i.e. substrate).” *Id.* at [0104]. The “resulting data” is used “in feedback control of the deposition tool.” *Id.* In particular, “the manufacturing

planning software [] compensate[s] for variability in the properties of the materials being employed, or other deposition errors.” *Id.* This compensation is achieved “by automatically generating modified manufacturing plans which compensate for the errors, for instance by depositing material into undesired gaps, or by modifying subsequent deposition paths so that they do not collide with excess material that was accidentally deposited.” *Id.*

3. Ground 2A Does Not Render Claim 1 Unpatentable

a) **The *Mazumder–Bonassar* combination does not teach or suggest a three-dimensional printer that includes a build volume**

The preamble of claim 1 of the '097 Patent requires a “three-dimensional printer including a build volume.” Both the “three-dimensional printer” and its “build volume” are referenced in the body of the claim. For instance, the claim recites “a three-dimensional scanner configured to capture three-dimensional information from an object being fabricated within the build volume during a print job executing on the three-dimensional printer.” Thus, the preamble is a limiting part of the claim because it recites elements of the claim and is necessary to give life and meaning to the claim. *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999) (“If the claim preamble, when read in the context of the entire claim, recites limitations of the claim, or, if the claim preamble is

‘necessary to give life, meaning, and vitality’ to the claim, then the claim preamble should be construed as if in the balance of the claim.”).

With respect to the preamble, Petitioner asserts that *Mazumder* discloses a “material deposition system” and that a person of skill “would have recognized that the substrate (and the work space immediately above) is a build volume.” Pet. at 53. Petitioner does not rely on *Bonassar* for this claim element (alone or in the combination with *Mazumder*). See Pet. at 50–53.

However, there is no teaching in *Mazumder* of a three-dimensional printer that includes a build volume. *Mazumder* discloses its subsystems in Figure 1, reproduced below.

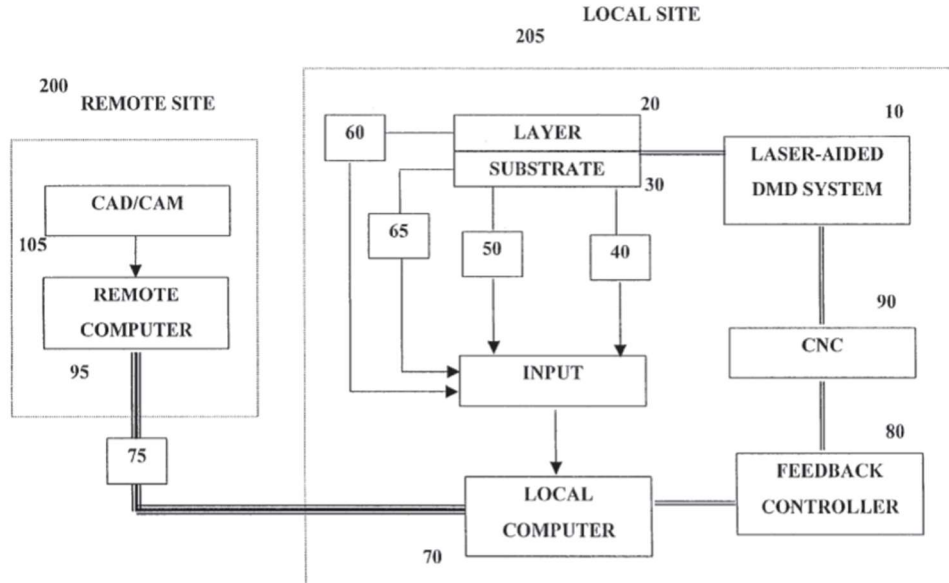


FIG - 1

EX1004, Fig. 1. Although Petitioner points to the substrate in Figure 1 and “the work space immediately above” (Pet. at 53), *Mazumder* expressly states that Figure

1 is a simply “block diagram” of its subsystems. *Id.* at 2:61-62. Nowhere does *Mazumder* suggest that Figure 1 illustrates the physical aspects of the three-dimensional printer, and it clearly does not. In fact, *Mazumder* expressly admits that the “details of the laser-aided, computer controlled direct material deposition system,” which operates as a 3-D printer according to Petitioner (Pet. at 53), “are not all explicitly shown in FIG. 1.” EX1004 at 3:22-25. Although Petitioner relies on *Mazumder*’s disclosure that “[t]he laser source (not shown) of the DMD system is mounted above the substrate 30, and a layer of material 20 is deposited according to the description of the product, which is incorporated in the deposition tool path” (EX1004 at 4:7-10 (cited by Pet. at 53)), this is not a teaching of a build volume. As the ’097 Patent explains, the build volume limits the size of an object that may be printed using the 3D printer. *See, e.g.*, EX1001 at 9:40-46, 19:37-44, 24:1-6. There is no teaching or suggestion in *Mazumder* of limiting the size of an object made with the 3D printer or anything structure or design that limits the bounds of what is printed.

Additionally, there is no reference to the terms “work” or “space” or the combined term “work space,” as Petitioner suggests. *See* Pet. at 53 (“a POSITA would have recognized that the substrate (and the work space immediately above) is a build volume”).

Further, *Mazumder*'s sole reference to the term "volume" refers to data transfer and not a build volume. *See* EX1004 at 1:26 ("the transfer of large volumes of data"). When referring to size, *Mazumder* repeatedly focuses on the size of data and not an object. *See* EX1004 at 4:44-47 ("The tool path files are typically files of the coordinates of many points along the tool path and, for a realistic part or product, have size of the order of 100 MB."), 4:55-58 ("Several commercial compression codes are available and can reduce the size of the files by compressing them before transmittal. In addition, some common sense rules and recent techniques have been developed to shorten the size of the tool path files, especially for blocks of dense data near tightly curved geometric features."), 5:1-10 ("Recent techniques for reducing tool path file size include circular interpolation and NURBS"), 7:33-34 ("remote computer system includes software for minimizing the size of the deposition tool path file"), 8:11-12 ("deposition tool path file is compressed to reduce its size at the remote computer system"), 8:46-47 ("the file of the deposition tool path is compressed to reduce its size"). While Petitioner also relies on its expert to support its conclusion, Petitioner's expert simply repeats the same conclusory statement as the Petition without any explanation or support. *See* Pet. at 53 (citing EX1003, ¶ 166).

To the extent Petitioner attempts to rely on alleged knowledge of a POSITA or common sense to supply this claim element, resorting to common sense or a

POSITA's knowledge alone is improper. *See Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361 (Fed. Cir. 2016) ("common sense is typically invoked to provide a known motivation to combine, not to supply a missing claim limitation"). As the Federal Circuit explained in *Arendi*, the Court's cases "repeatedly warn that references to 'common sense'—whether to supply a motivation to combine or a missing limitation—cannot be used as a wholesale substitute for reasoned analysis and evidentiary support, especially when dealing with a limitation missing from the prior art references specified." *Id.* at 1362. In the rare case where common sense "is used to supply a missing limitation" the search for "a reasoned basis for resort[ing] to common sense must be searching" and "this is particularly true where the missing limitation goes to the heart of an invention." *Id.* Relying on the knowledge of a POSITA or common sense to supply this claim element would be improper where it is admittedly missing from *Mazumder* in the asserted combination and there is no evidence that a build space must necessarily be present.

Thus, the Ground 2A combination does not teach or suggest a three-dimensional printer that includes a build volume.

b) The *Mazumder–Bonassar* combination does not teach or suggest a three-dimensional scanner configured to capture three-dimensional information from an object being fabricated

Claim 1 also requires “a three-dimensional scanner configured to capture three-dimensional information from an object being fabricated within the build volume during a print job executing on the three-dimensional printer.” Petitioner’s conclusion that the combination teaches this element of the claim is grounded in a flawed understanding of *Mazumder’s* disclosure and a failure to explain the combination in light of *Mazumder’s* and *Bonassar’s* teachings. In particular, Petitioner asserts that *Mazumder’s* system includes optical scanners that can detect defects and that *Bonassar* discloses optical sensors that include a 3D scanner that can collect 3D data on the “current state” during fabrication. Pet. at 54-55.

As an initial matter, *Mazumder* does not teach a three-dimensional scanner. See EX1004 at 3:31-33, 5:56-6:1. Petitioner ignores the shortcomings of *Mazumder’s* disclosure and instead attempts to modify *Mazumder’s* optical sensors to include a 3D scanner from *Bonassar*. See Pet. at 54-55. And as discussed in the following section, *Bonassar’s* use of an automated solution to modify a manufacturing process does not support Petitioner’s alleged motivations for the combination.

Additionally, *Mazumder* does not teach that its optical sensors can detect “defect formation” as Petitioner asserts. See Pet at 54 (“The optical sensors 50

include a variety of devices' that can detect 'defect formation...of the product fabrication.'”), 56 (“*Mazumder* describes that its optical sensors detect . . . 'defect formation...of the product fabrication.'”), 50 (“*Mazumder* describes the option of using additional 'optical sensors' for detecting 'crack initiation, defect formation, and phase transformation, during the fabrication of the product fabrication, and Bonassar advantageously provides the details of one such sensor (at 3D scanner) to achieve the goal of detection defect formation.'”).

Instead, *Mazumder* teaches that *another* type of sensor is used to detect defect formation (“and other sources of acoustic emission”). According to *Mazumder*, “acoustic sensors, in particular, require careful calibration to distinguish strain from other sources of acoustic emission from the product, such as crack initiation, defect formation, and phase transformation, during the fabrication of the product fabrication through laser-aided material deposition.” EX1004 at 5:58-63. These acoustic sensors are not calibrated against optical sensors, but “independent (mechanical) strain-gage measurements.” *Id.* at 5:57-58. *Mazumder* explains that “acoustic sensors operate on the principle that during material deposition strains and other physical changes, such as phase transformation changes, or crack/ defect [sic] initiation produce sound waves which can be picked up by the acoustic sensors.” *Id.* at 5:39-43.

Nowhere does *Mazumder* teach or suggest that its optical sensors, as opposed to acoustic sensors, can be used to detect defect formations. Petitioner's misunderstanding of *Mazumder's* teachings is evident from its flawed conclusions regarding the motivation for the combination (*see* Pet. at 50–52) and Petitioner's discussion of various elements of claim 1 (*see* Pet. at 54, 56). In both instances, Petitioner relies on the detection of defect formations in *Mazumder*, which uses acoustic sensors instead of optical sensors as Petitioner mistakenly believes. It is Petitioner's burden to explain why a POSITA would have been motivated to modify *Mazumder's* 3D printing system to replace its acoustic sensors that detect defect formation with a 3D scanner from *Bonassar*. Because Petitioner has failed to carry its burden, the combination does not teach or suggest a three-dimensional scanner configured to capture three-dimensional information from an object being fabricated.

c) The *Mazumder–Bonassar* combination does not teach or suggest a machine vision system configured to capture and analyze image content from the three-dimensional scanner to provide a status of the print job

Claim 1 further requires “a machine vision system configured to capture and analyze image content from the three-dimensional scanner thereby providing a status of the print job executing on the three-dimensional printer” in which “the status of the print job” is transmitted by a web server “for display at a remote client

through the network interface.” Petitioner’s conclusion that the combination teaches these elements of the claim resort to impermissible hindsight driven by a misunderstanding of the references.

Petitioner does not rely on *Mazumder* for disclosure of “a machine vision system configured to capture and analyze image content from the three-dimensional scanner thereby providing a status of the print job executing on the three-dimensional printer.”⁶ *See* Pet. at 56–57. Rather, Petitioner asserts that *Bonassar* uses “machine vision sensing technologies” including “machine vision software” to analyze the image content from the 3D scanner to provide a status of the print job. Pet. at 56. Petitioner points out that *Bonassar*’s scanner acquires the geometry of deposited material and uses data for feedback control and to detect flaws. *See id.*

However, *Bonassar* does not teach using such a machine vision system in conjunction with a three-dimensional scanner. Rather, *Bonassar* teaches using machine vision to process the output from conventional cameras, such as CCD cameras, CCD microscopes, microscopic video capture, and color detection. *See*

⁶ To the extent Petitioner asserts that *Mazumder* does provide such a status, there is no teaching or suggestion in *Mazumder*, alone or in the combination with *Bonassar*, that a status is provided by “a machine vision system configured to capture and analyze image content from a three-dimensional scanner.” Among other reasons provided below, *Mazumder* does not even teach a three-dimensional scanner, and *Bonassar* does not teach a machine vision system for a three-dimensional scanner.

EX1010, [0085] (“Appropriate sensors include, without limitation, CCD cameras with machine vision software, “electronic nose,” mechanical probes with force instrumentation, and fluorescence CCD microscopes with machine vision software.”), [0105] (“Other machine vision sensing technologies are also available, including microscopic video capture at the point of deposition.”), [0110] (“For instance, given a deposit of a chemically reactive material which changes color as it reacts, a machine vision sensor can detect that the color of a region of deposited material is not what is expected for this material given the data present in the materials/tools/substrates database”). Because *Bonassar* does not teach using a machine vision system with a three-dimensional scanner and because *Mazumder* does not disclose any machine vision system, the combination cannot teach a machine vision system configured to capture and analyze image content from the three-dimensional scanner.

d) There is no motivation to combine *Mazumder's* manual solution with *Bonassar's* automated solution

In addition to the deficiencies of the *Mazumder-Bonassar* combination addressed above, there is no motivation to combine *Mazumder* and *Bonassar* in the manner that Petitioner proposes. When discussing the references and the purported motivation to combine, Petitioner acknowledges that *Mazumder* teaches a manual solution with remote control by a “designer” to modify of the manufacturing

process (*see* Pet. at 47–48) and that *Bonassar* teaches an automated solution that automatically modifies the manufacturing process. *See* Pet. at 47–48, 62 (citing EX1004, Abstract, 1:62-2:2, 1:10-13, 1:16-20, 2:13-42, 6:44-67, 4:19-29), at Pet. at 49, (citing EX1010, [0104]). And, in describing the combination, Petitioner repeatedly relies upon the purported benefits of *Bonassar*'s automated solution. *See, e.g.*, Pet. at 50–51 (“*Bonassar* suggested an improvement that beneficially allowed ‘[d]iscrepancies [to] be remedied by generating modifications to the manufacturing plan which replace or circumvent the error.’”), 51 (*Bonassar*'s “manufacturing planning software to design compensating material deposits which can be executed in a timely fashion, without compromising the properties of materials which are sensitive to the time since deposition”), 52 (*Bonassar*'s “manufacturing planning software to compensate for variability in the properties of the materials being employed, or other deposition errors by automatically generating modified manufacturing plans which compensate for the errors”). However, Petitioner fails to satisfy its burden to explain the motivation to combine the teachings of *Mazumder* and *Bonassar* by failing to address the conflicting teachings of *Bonassar* and *Mazumder*.

Specifically, Petitioner's rationale for the combination of *Mazumder* and *Bonassar* ignores the references contrary solutions (i.e., *Mazumder*'s manual solution and *Bonassar*'s automated solution) and resorts to impermissible hindsight

to assert that the combination would both automatically generate modified manufacturing plans, as *Bonassar* teaches, and manually modify the same plans at a remote computer, as *Mazumder* teaches. There is no dispute that *Bonassar* teaches an automated process. As such, *Bonassar*'s solution has no need to report status remotely. In particular, *Bonassar*'s scanning functionality is for an automated, feedback process that controls manufacturing by “automatically generating modified manufacturing plans which compensate for the errors” by modifying deposition paths. EX1010, [0104]. *Bonassar* explains that feedback control “allows the manufacturing planning software to compensate for variability in the properties of the materials being employed, or other deposition errors by automatically generating modified manufacturing plans which compensate for the errors, for instance by depositing material into undesired gaps, or by modifying subsequent deposition paths so that they do not collide with excess material that was accidentally deposited.” *Id.* However, there is no teaching in *Bonassar* that status needs to be reported to a user or other explanation why one would need to report status when the system automatically generates modified manufacturing plans to compensate for errors.

In contrast with *Bonassar*'s automated solution, *Mazumder* teaches a manual solution in which the transfer of information to a remote computer enables a “remote design team” (not an automated system) to modify the manufacturing

process manually by modifying CAD or CAM files. *See* EX1004, 6:48-60; *see also* EX1004, 2:14-23, 2:34-42; Pet. at 62. *Mazumder* explains that while “data-processing is done locally” and “only processed information of actual temperature, strain and stress, as well as physical dimensions, composition and appearance of the product is transmitted to the remote computer,” all “[m]odification of CAD and CAM files, as well as generation and compression of the tool path files is done at the remote site 200 using the remote computer 95.” *Id.* at 6:48-55. *Mazumder* clarifies that “according to the invention, the control of the manufacturing process lies with the remote site 200 that houses the design team.” *Id.* at 6:58-60.

Given the conflicting approaches in *Bonassar* and *Mazumder*, it is Petitioner's burden to explain why its rationale for the combination would include both approaches. But the Petition fails to explain why a POSITA would need to report status when modifying *Mazumder*'s manual solution with *Bonassar*'s automated solution that automatically generates modified manufacturing plans to compensate for errors. *See* Pet. at 56, 60-62. Absent such an explanation, Petitioner's combination resorts to hindsight bias to assert that the combination would report status despite having no need to do so due to the use of an automated solution as taught by *Bonassar*. *Mintz*, 679 F.3d at 1377; *see also AT&T Services*, IPR2024-01143, Paper 15 at 38 (PTAB Feb. 11, 2025) (finding no motivation to combine because of an overly broad conclusion that “suffers from hindsight bias”).

Thus, there is no motivation to combine *Mazumder* and *Bonassar* in the manner Petitioner proposes.

H. The Petition Does Not Show That The Challenged Claims Are Unpatentable Under Grounds 2B through 2F

In addition to Ground 2A, the Petition includes five additional grounds (Grounds 2B–2F) that rely on Ground 2A's combination of *Mazumder* and *Bonassar* in further view of additional asserted art to challenge claims that depend from independent claim 1. *See* Pet. at 1–2. Accordingly, Grounds 2B through 2F fail to teach all elements of dependent claims for at least the reasons discussed above for Ground 2A with respect to independent claim 1. Thus, Petitioner has also failed to show unpatentability for any of the claims challenged in Grounds 2B through 2F.

V. ADDITIONAL COMMENTS

With respect to any arguments in the Petition that are not specifically addressed herein, Patent Owner does not concede the legitimacy of such arguments in the Petition and any underlying contentions in the Petition. If *inter partes* review is instituted, Patent Owner expressly reserves the right to rebut any such arguments and any such contentions at a later point, including in a Patent Owner Response. Patent Owner is not limited to the arguments presented here in this request for

discretionary denial and expressly reserves the right to raise further arguments, including claim construction arguments, not presented herein.

VI. CONCLUSION

For the foregoing reasons, Patent Owner respectfully requests that the Director exercise her discretionary powers and decline to institute *inter partes* review of the '097 Patent.

Respectfully submitted,

Dated: April 14, 2025

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CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(d), I certify that this Request for Discretionary Denial complies with the type-volume limits of 37 C.F.R. § 42.24(b)(1) because it contains 13,850 words, excluding the parts that are exempted by 37 C.F.R. § 42.24(a), according to the word processing system used in preparation of this Request.

Dated: April 14, 2025

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CERTIFICATE OF SERVICE

Pursuant to 37 CFR § 42.6(e)(4), the undersigned certifies that on April 14, 2025, a complete copy of the foregoing Patent Owner's Request for Discretionary Denial was served on Lead and Back-up Counsel for Petitioner at the service address provided in Petitioner's Mandatory Notices:

Email: IPR56224-0012IP1@fr.com

Dated: April 14, 2025

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