

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SHENZHEN TUOZHU TECHNOLOGY CO., LTD.,
Petitioner

v.

STRATASYS, INC.
Patent Owner.

IPR2025-00438
U.S. PATENT NO. 10,569,466

PATENT OWNER'S SUR-REPLY

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Other Authorities

37 C.F.R. § 42.104(b)(3).....	10
37 C.F.R. §§ 42.104(b)(5).....	13, 16

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	Order Denying Defendants' Motion to Dismiss for Failure to Join Indispensable Party, <i>Stratasys, Inc. v. Shenzhen Tuozhu Technology Co. Ltd.</i> , No. 2:24-cv-00644-JRG, Dkt. No. 53 (E.D. Tex. May 29, 2025)
2010	Plaintiff's Unopposed Motion to Consolidate Case No. 2:25-cv-00465-JRG with Case Nos. 2:24-cv-00644-JRG and 2:24-cv-00645-JRG, <i>Stratasys, Inc. v. Shenzhen Tuozhu Technology Co. Ltd.</i> , No. 2:24-cv-00644-JRG, Dkt. No. 54 (E.D. Tex. May 30, 2025)
2011	Lex Machina, Patent Litigation Report 2024 (Feb. 2024)
2012	U.S. District Court, Eastern District of Texas [Live] Calendar Events Set for 6/1/2026-8/1/2026
2013	Declaration of Dr. Denis R. Cormier related to IPR2025-00438

2014	Upcraft, S. and Fletcher, R., 2003. The rapid prototyping technologies. <i>Assembly Automation</i> , 23(4), pp.318-330
2015	Transcript of January 9, 2026 Deposition of Dr. Hickner related to IPR2025-00438

I. PETITIONER'S REPLY DOES NOT CURE GROUND 1A'S DEFECTS**A. No Disclosure of Element 1[f] Or A Reason To Modify Loughran**

Calling Petitioner's proposed modification a mere "complement" to Loughran does not solve the problems identified in the Response. (Reply, 1-3). Loughran assigns different roles to the client and the printer. The client uses material information to generate jobs—for example, for build-time estimation, orientation, and scaling. (EX1004, ¶¶[0002], [0027], [0043], [0055]). The printer, by contrast, retrieves machine-readable material information, extracts parameters, and "automatically and dynamically" adjusts itself for fabrication. (*Id.*, ¶¶[0024]-[0026], [0035]-[0037], [0045], [0048]). Petitioner's cited passages show client-side CAD generation plus printer-side dynamic adjustment—not the claimed receipt at the printer of client-selected operational parameters. (*Id.*, ¶¶[0002], [0024]-[0028], [0037], [0043], [0049], [0055]). As Dr. Cormier confirmed during deposition, CAD software generally defines the size and shape of the part and may use material information for geometric adjustments, whereas the "operational parameters" for operating the printer are generated later by slicer software. (EX1045, 57:6-9, 67:2–68:10, 69:18-71:18).

The Reply's assertion that both systems can access the same material-information server does not close the gap. (Reply, 4-5). Loughran's server provides material information; it does not provide the printer-characteristics and deposition-

condition inputs Dubois uses to determine “optimum values of printing parameters.” (EX1004, ¶¶[0022]-[0028], [0035], [0042], [0054]; EX1005, ¶¶[0016]-[0017], [0068]-[0073], [0148]-[0150]). Nor does Loughran ¶[0041] disclose client-side selection of printer-control parameters; it says only that the first SFF system may receive information about the second SFF system, including a list of known material identifiers and perhaps a base URL. (EX1004, ¶[0041]). That does not disclose client selection of the printer-control operational parameters recited in claim 1[f].

Petitioner's reliance on Dubois's statement that computation units can be implemented by “software on a personal computer” fares no better. (Reply, 2-4 (citing EX1005, ¶[0170])). In Dubois, computation unit 198 remains part of data processing unit 105, which works with database 199 and coordinates printer displacement, ejection, tank, ejection-head, chamber, and error-correction controls. (EX1005, ¶¶[0029], [0147]-[0169], [0170], Figs. 5-6). So even if software modules may reside on a PC, Dubois still discloses a printer-centric control architecture—not a remote CAD client receiving tag data and sending back selected operational parameters over the network.

Petitioner also overstates Patent Owner's point in arguing that Patent Owner demands a “specific data flow or architecture” or reduction to practice. (Reply, 5-6). The point is narrower: claim 1[f] requires a particular client-to-printer transmission of selected operational parameters, and generalized assertions that a POSITA could

have done so cannot substitute for evidence that the prior art teaches or suggests that exchange. *See In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380–81 (Fed. Cir. 2016) (a petitioner may not rely on conclusory assertions and instead must articulate specific reasoning grounded in record evidence); *DSS Tech. Mgmt., Inc. v. Apple Inc.*, 885 F.3d 1367, 1374–76 (Fed. Cir. 2018) (Board's reliance on "ordinary creativity" and conclusory expert assertions was insufficient). That Dr. Hickner could not explain how his proposed modification would function undercuts his and Petitioner's assertion that such modification was "routine." (EX2015, 68:10-79:15). Nor does the record explain why a POSITA would alter Loughran's trusted, server-driven, printer-side adjustment workflow as Petitioner proposes, regardless of a specific deficiency in Loughran or not. (EX1004, ¶¶[0024]-[0026], [0037], [0045], [0048]-[0049], [0055]). The Reply's labels—"straightforward," "ordinary option," and "predictable"—do not supply that missing disclosure or explanation.

B. No Disclosure of Claim 5's Client-To-Printer Selection Of Tagged Build Materials

The Reply still identifies no disclosure of claim 5's two-supply/two-tag/client-selection exchange. (Reply, 6-8).

The Loughran passage Petitioner cites—communication mechanism 604 receiving "a list of unique material identifiers of materials known to the second SFF system 104"—does not disclose the printer providing tag data from two currently

coupled supplies, much less receiving back from the client a selection of one of those tagged supplies. (EX1004, ¶[0052]; Reply, 6-7). Nor do Loughran's client-side steps of comparing identifiers, retrieving material information, and using it in job generation disclose the claimed client instruction selecting one of the first and second tagged build materials. (EX1004, ¶¶[0041]-[0043], [0052]-[0055]).

Dubois does not cure that defect. It discloses slicing a 3D representation into print layers and establishing printing parameters for each layer and trajectory. (EX1005, ¶¶[0059], [0075], [0107]-[0110], [0148]-[0155]). But it does not disclose the proposed tag-driven client/printer workflow, and Petitioner's proposition that a slice "specifies a selection of build material" comes from Dr. Hickner's gloss and Napadensky, not Dubois itself. (Reply, 7-8; EX1003, ¶¶78-79; EX1006, ¶¶[0039]-[0040], [0193]-[0194]; EX2015, 105:6-12). Petitioner cannot relabel that outside reference as mere "corroboration" to supply a missing limitation.

Even if a POSITA would understand that a multi-material print file may assign different materials to different layers or regions, that is not the claimed step of the printer receiving from the client a selection of one of the first and second tagged build materials in the claim 5 workflow. Indeed, Dr. Hickner admitted that a slicer can contain build-material information that can be transmitted over a network without any tag, confirming that Petitioner's "slice" theory is not tied to the claimed tag-to-client-to-printer workflow. (EX2015, 25:17-26:11). Petitioner, not Patent

Owner, departs from the claim language by treating slice-level material assignment—which Petitioner asserts applies to “every 3D model”—as the specific client-based, tag-driven selection required by claim 5. That reading would render claim 5 superfluous. *See Aristocrat Techs. Australia Pty Ltd. v. Int’l Game Tech.*, 709 F.3d 1348, 1356–57 (Fed. Cir. 2013) (declining to adopt construction because it would render limitation “superfluous”).

II. PETITIONER’S REPLY DOES NOT CURE GROUND 2’S FAILURE TO TEACH ELEMENT 19[E]

A. Petitioner’s “Devos Is Express” Argument Misreads Devos

Petitioner contends Devos expressly discloses a support-structure requirement because it says the system may determine operating parameters including “powder settling coefficients (e.g., to determine whether powder supports need to be included, and if so, how much support).” (Reply, 9; EX1008, ¶¶0032]). But the listed operating parameter is “powder settling coefficients,” not a “support structure requirement.” EX2013, ¶139; *see also* EX2015, 117:8-121:1 (Dr. Hickner unable to answer whether “a powder settling coefficient” is an “operational parameter”). The parenthetical describes a possible use of that coefficient; it does not identify a separate operating parameter that is a “support structure requirement,” as claim 19 requires. (EX2013, ¶¶134-135).

Petitioner’s reliance on Dr. Cormier’s statement that a POSITA would understand a “support structure requirement” to specify whether/where supports

should be generated and printed and with what settings underscores the defect. (Reply, 9; EX2013, ¶133). Devos discloses none of that—no generated support geometry, no identification of where supports are to be printed, and no settings for printing such supports. (EX1008, ¶¶[0013]-[0015], [0032], [0035]; EX2013, ¶¶133-135).

B. Devos Does Not Determine Or Print Claimed Support Structures During Fabrication

Petitioner argues that because Devos is directed to 3D printing and does not discuss thermal post-processing, it necessarily teaches determining and creating support structures during printing. (Reply, 9-10). But Devos discloses only a powder-bed binder-jet process in which powder is spread, binder forms a cross section, the process repeats until “the entire object is formed within the powder bed,” and the unbonded powder is brushed away. (EX1008, ¶¶[0013]-[0015], [0035]). Devos nowhere states that the controller generates or prints separate support structures during that process. (*Id.*, ¶¶[0013]-[0015], [0032], [0035]).

As Dr. Cormier explained, a POSITA would understand that in Devos's binder-jet process the surrounding unbound powder bed supports the part during printing, so rigid printed support structures are unnecessary. (EX2013, ¶138; EX2014, 325-327; EX1045, 13:3-17). Petitioner's response—that even if support were needed later it “would still need to be created during the printing process”—is

attorney argument, not a teaching of Devos. (Reply, 10; EX1008, ¶¶[0013]-[0015], [0032], [0035]). As Dr. Cormier testified, to the extent support might later be needed during furnace sintering of a metal binder-jetted part, the customary circa-2012 approach was manual placement of ceramic supports after printing—not printing support structures during the build itself. (EX1045, 78:5-79:3).

C. Petitioner's Outside-Publication Reliance Confirms The Limitation Is Missing From Devos

Petitioner's citations to outside publications about “some powder bed processes” confirm the limitation is missing from Devos itself. (Reply, 10 (citing EX1043, 4; EX1044, 1-2)). Ground 2 is based on Devos alone. Petitioner therefore cannot fill the gap with implication, probability, or possibility. *Cf. Southwire Co. v. Cerro Wire LLC*, 870 F.3d 1306, 1311–12 (Fed. Cir. 2017) (use of inherency for obviousness must be carefully circumscribed, and the missing limitation must necessarily be present). If Devos taught a “support structure requirement,” Petitioner would not need other publications about different powder-based manufacturing systems to supply that point.

Petitioner's new citations cannot supply what its own expert admitted is missing from Devos. (EX2015, 121:2–122:3 (Dr. Hickner admitting that Devos provides “no technical detail” on how any support-structure requirement would be derived from a settling coefficient); EX2013, ¶139).

D. Petitioner's Enablement Response Misses The Point

Petitioner's enablement response misses the point. (Reply at 10-11). Patent Owner did not argue that Devos as a whole is non-enabled; rather, Patent Owner showed that Petitioner's asserted feature—a support-structure requirement supposedly derived from settling coefficients and used to control printing—is not actually taught in Devos and, in any event, is not enabled by the sparse disclosure Petitioner relies on. (EX1008, ¶¶0032; EX2013, ¶¶139-141). Any presumption of enablement attaches to what Devos actually discloses, not to Petitioner's reconstruction of an undisclosed support-structure operational parameter. *See Raytheon Techs. Corp. v. Gen. Elec. Co.*, 993 F.3d 1374, 1381 (Fed. Cir. 2021) (“[A] standalone § 103 reference must enable the portions of its disclosure being relied upon.”).

Even setting aside the lack of disclosure of the element and assuming this is an implementation issue as Petitioner proposes, Devos provides no algorithm, working example, or explanation of how a settling coefficient becomes a determination whether supports are needed, where they should go, or how much should be printed. (EX1008, ¶¶0032; EX2013, ¶¶139-141). Under *Wands*, the absence of guidance and examples, coupled with the admitted technical complexity of the analysis, confirms that Petitioner has not shown otherwise. *See In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988); EX2015, 119:16-122:3 (Dr. Hickner: “I mean,

we're talking about, you know, complicated details of additive manufacturing and powders"; "There's no technical detail in Devos as to how that's done."); EX2013, ¶¶139-141. As Dr. Cormier confirmed during deposition, a powder settling coefficient would be only one input into a complex post-print sintering analysis requiring expertise beyond a POSITA to predict whether a part might sag during later furnace processing. (EX1045, 80:4-81:12).

III. PETITIONER'S REPLY DOES NOT CURE THE DEFECTS OF GROUNDS 3A-3D

A. The Reply Does Not Show The Claimed "Client" Or "Request" In Element 1[b]

Petitioner argues that Menchik teaches a "client" because controller 105 may be external, PC-based, include a CAD system, and be connectable to a communications network. (Reply, 11-12; EX1009, ¶¶[0021], [0024], [0026], [0053]). But those passages describe possible implementations of Menchik's controller, not a distinct client device. Menchik also expressly states that controller 105, even when partially external, provides "some or all of the printing system control capability." (EX1009, ¶[0024]). That is a printer-control component, not the claimed "client." (EX2013, ¶¶149-152). Different claim terms ("client" in claim 1; "controller" in claim 19) are presumed to have different meanings. *See Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1254–55 (Fed. Cir. 2010). And Dr. Hickner admitted he did not analyze whether the '466 Patent's "controller" and "client" can be equated. (EX2015, 16:22-18:11).

Petitioner's "request" theory fares no better. Menchik says only that a "printing file or other collection of print data may be prepared and/or provided . . . by a computing platform connected to 3D printer system 100," and that the file may be used to determine "the order and configuration of deposition of building material." (EX1009, ¶[0025]). That is print data, not a "request." Dr. Hickner himself testified that a "request" is "something more specific than any transmission of data." (EX2015, 19:19-20:4). Menchik does not identify the "computing platform" as the claimed client or disclose the printer receiving from such a client over a network the claimed fabrication request. (EX2013, ¶151).

Notably, Dr. Hickner confirmed that his declaration's mapping of Menchik's printing file to the claimed "request" was tied to the scope "advanced by Patent Owner" in the parallel district court case. (EX2015, 143:19-144:15; *see also id.*, 128:2-131:9). Petitioner, however, offers no claim-construction position for "request" in this proceeding. That failure is fatal. *Revvo Techs., Inc. v. Cerebrum Sensor Techs., Inc.*, IPR2025-00632, Paper 20, at 4–5 (Director Nov. 3, 2025) (precedential) (holding that when a petitioner advances a different PTAB claim-construction position, it must explain why; simply adopting Patent Owner's district-court constructions is not enough under Rule 42.104(b)(3)); *see also Cambridge Mobile Telematics, Inc. v. Sfara, Inc.*, IPR2024-00952, Paper 12, at 6–8 (PTAB Dec. 13, 2024) (denying institution where petitioner said it was applying Patent Owner's

litigation position and that the Board need not construe any term, but provided no express construction).

B. No Disclosure of Element 1[e]

For element 1[e], the Reply again relies on the same controller/client conflation. (Reply, 13). As discussed for element 1[b], a POSITA would understand that Menchik's controller 105 is not the claimed "client," so element 1[e] also is not shown. (EX2013, ¶154).

C. No Disclosure of Element 1[f]

Element 1[f] requires "receiving one or more operational parameters from the client selected for use in controlling operation of the three-dimensional printer." (EX1001, claim 1). Petitioner now argues that Menchik teaches client-side selection of operational parameters because controller 105 computes parameters and the printing file is used to determine "the order and configuration of deposition of building material." (Reply, 13-14). But Menchik's cited passages disclose controller-side computations and actions, not receipt at the printer of client-selected operational parameters.

Menchik says controller 105 may receive data from material supply sources and "control the supply of building material to printing apparatus 140," including by computing "material parameters," "material required," and "supply parameters." (EX1009, ¶[0027]). It likewise says the controller may compute "printing

parameters,” including guidelines for which cartridges to use, how many to use, and when replacements are necessary. (*Id.*, ¶[0037]). Figure 6 then describes controller-side computations of material quantities, uptake and deposition order and quantity, supply sufficiency, and cartridge usage, followed by controller-directed valve switching and material transfer. (*Id.*, ¶¶[0047]-[0051]). That is controller-side management, not receipt at the printer of client-selected operational parameters. (EX2013, ¶¶155-163).

The Reply's new assertion that a POSITA would have found it obvious that controller 105 would provide these parameters and instructions “as part of the printing file” is unsupported. (Reply, 13-14). Paragraph [0025] says only that the printing file may be used to determine “the order and configuration of deposition of building material”; it does not say the file includes chip-stored “optimal operation parameters” or controller-computed “material parameters” or “supply parameters.” (EX1009, ¶¶[0025], [0027], [0035], [0037], [0047]-[0049]).

Moreover, even if Menchik discloses various “parameters” in the abstract, element 1[f] is not satisfied unless the printer receives operational parameters from the client selected for use in controlling printer operation. (EX1001, claim 1). Menchik's cited disclosures instead describe parameters stored on the cartridge chip or computed by the controller for its own supply control. (EX1009, ¶¶[0027], [0035], [0037], [0047]-[0051]). That does not satisfy element 1[f].

D. No Disclosure of Element 19[e]

The Reply's element-19[e] argument remains deficient for the same reason identified in the Response: Petitioner still does not identify a Menchik disclosure of “determining an operational parameter for configuring the three-dimensional printer . . . based upon at least one property of the build material in the data,” where the parameter includes one of claim 19's enumerated items, such as a “support structure requirement.” (EX1001, claim 19; Reply, 14-18).

First, Petitioner impermissibly expands its element-19[e] theory in reply—turning a single cross-reference into four pages of new analysis. (Reply, 14-17). The Board should decline to consider those untimely arguments. *Wasica Fin. GmbH v. Cont'l Auto. Sys., Inc.*, 853 F.3d 1272, 1286–87 (Fed. Cir. 2017) (“It is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify with particularity the evidence that supports the grounds for the challenge to each claim”) (quotation omitted); *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324, 1330–31 (Fed. Cir. 2019); 37 C.F.R. §§ 42.104(b)(5).

Second, Petitioner argues that because “building material” includes support material, and because Menchik determines “whether/when/how much support material to extract,” Menchik teaches a “support structure requirement.” (Reply, 15-16; EX1009, ¶¶[0017], [0027], [0048]-[0051]). But a support-material quantity or extraction computation is not a “support structure requirement,” which Patent

Owner's expert explained would specify whether/where supports should be generated and printed and with what settings. (EX2013, ¶133). Menchik discloses none of that. Quantity computations are not printer-configuration support-structure requirements. (*Id.*, ¶¶169-172).

Third, Petitioner alternatively relies on Menchik's statement that the memory chip may store "optimum building parameters (e.g., for building or support)" and treats those as both a "property of the build material" and the basis for the claimed support-structure requirement. (Reply, 17; EX1009, ¶[0035]). That still fails. If the "optimum building parameters" are already stored on the chip, Menchik is not "determining" them based on a property in the data; it is reading them. The Reply thus collapses the "property" and resulting "operational parameter" into the same thing, contrary to the claim language. (EX1001, claim 19; EX2013, ¶168). Indeed, the Reply still does not identify the particular material property in the data, the determination step, and the resulting enumerated operational parameter with the required causal link.

Fourth, Petitioner's response to Patent Owner's FFF-related point misses the mark. The point is that Menchik's inkjet/material-supply disclosures do not teach claim 19[e]'s enumerated printer-configuration parameters, including a "support structure requirement" as a POSITA would understand it. (EX1009, ¶¶[0004], [0025], [0035], [0048]-[0049]; EX2013, ¶169). The Reply's citations to other

additive-manufacturing techniques and the '466 Patent's general reference to other printing methods do not change what Menchik teaches. (Reply, 16-17). And Petitioner still does not address the deficiency the Board identified in IPR2025-00585—namely, the absence of any teaching that Menchik's "amount of modeling material, support liquid, or combination of modeling and support materials required" is determined based on tag data that includes at least one property of the build material. (IPR2025-00585, Paper 11 at 29-30; EX1001, claim 19; EX1009, ¶¶[0048]). That deficiency is fatal here as well.

E. The Reply Still Does Not Cure the Petition's Defects With Respect to Claims 3-5.

Claims 3-5 depend from claim 1, so Menchik's failure to teach elements 1[b], 1[e], and 1[f] remains dispositive. (EX1001, 23:53-67). The Reply tries to cure the Petition's claim-3 deficiency by pointing to multiple cartridge types/colors/compositions and associated memory chips. (Reply, 18; EX1009, ¶¶[0017]-[0018], [0028], [0035], [0042]-[0043]). In doing so, Petitioner relies not only on new disclosure from paragraphs generally cited in its cross-referenced element 1[a] analysis, but also on paragraphs not cited there at all. *Compare* Pet., 53-57 (not citing ¶¶[0017]-[0018], [0035]) *with* Reply, 18. Petitioner cannot cure its failure to show claim 3 in the Petition by citing previously unidentified portions of Menchik for the first time in Reply. *See Ariosa Diagnostics, Inc. v. Verinata Health,*

Inc., 805 F.3d 1359, 1367–68 (Fed. Cir. 2015); *Wasica*, 853 F.3d at 1286; 37 C.F.R. §§ 42.104(b)(5).

F. The Reply Does Not Cure the Petition's Defects With Respect to Claim 10

Petitioner's Reply on claim 10 merely repeats the same faulty equivocations from the Petition. (Reply, 18-19). Menchik's "recommended jetting temperature" is not claim 10's "extruder temperature." The Reply's assertion that the two are "analogous terms in different printing techniques" concedes this point. (Reply, 19). Petitioner cannot rewrite the claim language to cover "analogous terms."

The Reply's support-structure theory for claim 10 fails for the same reasons as claim 19. Menchik's "optimum building parameters (e.g., for building or support)" are chip-stored information, and its computed "amount of support liquid" or support materials required is a quantity computation; neither is shown to be claim 10's "support structure requirement." (EX1009, ¶¶[0035], [0048]); *supra* §III.D. Furthermore, claim 10 depends from claim 1, so Petitioner still must show receipt at the printer of a client-provided operational parameter. Petitioner has not done so. (EX1001, claims 1, 10; EX2013, ¶¶179-180).

Petitioner's reliance on deposition snippets that other fabrication techniques may use similar operational parameters does not cure what Menchik lacks. (Reply, 19-20). The question is not whether some other process might use a similar kind of

temperature or support-related parameter; it is whether Menchik teaches claim 10's recited parameters in the claimed client-to-printer workflow. It does not. (EX2013, ¶¶178-180).

Accordingly, Petitioner's Reply does not cure the deficiencies in Grounds 3A-3D.

IV. PETITIONER'S REPLY DOES NOT CURE THE DEFECTS IN THE JAZAYERI-BASED GROUNDS (1B/1D/1F/3B/3D/3F/3H)

Petitioner's Jazayeri-based grounds still fail. Jazayeri is not analogous art to the claimed tagged-build-material, three-dimensional fabrication framework, Petitioner lacks a reasoned basis to graft Jazayeri's cloud-print workflow onto the asserted 3D-printing references, and Jazayeri discloses a print request received at a server, not by a three-dimensional printer. (EX1010, ¶¶[0008]-[0010], [0018]-[0028], [0036], [0066]; EX2013, ¶¶107-122, 184-185).

A. Petitioner's Analogous-Art Arguments Fail

Petitioner's "same field of endeavor" theory abstracts both the '466 Patent and Jazayeri to generic "printing capabilities over a network." (Reply, 21-22). That is too broad. The '466 Patent concerns a networked 3D-printing environment in which a printer reads tag data from build-material supplies and uses build-material information/properties to determine fabrication parameters. (EX1001, 1:23-33, 20:61-22:33). Jazayeri addresses "conventional printers and printing paradigms" and

a cloud print service for requests, print dialogs, printer registration, job routing, and print characteristics such as paper size, orientation, and number of copies. (EX1010, ¶¶[0002]-[0007], [0018]-[0028], [0036], [0070]-[0072]). Defining the field as generic “networked printing” would sweep in virtually any network-printing reference, whether or not it addresses tagged build materials, three-dimensional fabrication, or material-dependent process control. (EX2013, ¶110).

Nor is Jazayeri reasonably pertinent to that problem. The '466 Patent's problem is not merely “printing over a network”; it is using tag-derived build-material data in a networked 3D-printing environment to determine operational parameters for fabrication. (EX1001, 1:23-33, 20:61-22:33; EX2013, ¶111). Jazayeri instead addresses driver-based document-printing problems through a cloud print service, printer registration, print dialogs, and printer-independent print jobs later converted into printer-specific formats. (EX1010, ¶¶[0004]-[0007], [0018]-[0028], [0036], [0040]-[0046]). Petitioner's own use of Jazayeri confirms the disconnect: it relies on Jazayeri only to add a pre-job “request” layer and printer-selection UI—not for any teaching about tagged build materials, tag sensors, or material-dependent fabrication control. (Reply, 23-24; EX2013, ¶111).

The Reply's reliance on the '466 Patent's disclosure of an optional print server also does not rescue analogousness. (Reply, 22). The specification distinguishes print server 208 from the three-dimensional printers and describes the server as

allocating print jobs and queues. (EX1001, 6:3-37, 8:27-28, 8:53-58). That architecture does not convert Jazayeri's document-print server into analogous art for the '466 Patent's tagged-build-material problem.

B. The Reply Does Not Establish A Motivation To Combine Jazayeri With The Asserted 3D-Printing References

Petitioner next argues that Patent Owner never explained how adding Jazayeri's print server would affect Loughran's material-parameter control and that the Petition did not propose modifying the underlying 3D-printing workflows. (Reply, 23-24). But Jazayeri is not merely "a print server." It discloses a cloud-print workflow: a print request is received at a server, a print dialog is presented to allow user selection of an available registered printer, a print job designating the selected printer is then received at the server, the job is converted into a printer-specific format, and the job is routed to a print client associated with the selected printer. (EX1010, ¶¶[0008]-[0010], [0036], [0066]-[0073], [0092]-[0100]). Importing that workflow into Loughran or Menchik inserts user-account, registered-printer, server-routing, and UI-selection layers foreign to the disclosed 3D-printing workflows. (EX2013, ¶¶114-119, 184-185).

That matters because Petitioner already asserts that the 3D-printing references disclose direct networked job submission without Jazayeri's cloud-print overlay. *See, e.g.*, (Reply, 1-2 (Loughran-Dubois), 11-12 (Menchik)). Thus, Petitioner's

asserted need to import Jazayeri's request layer is not tied to any gap in the disclosed job-submission architecture. (EX2013, ¶¶115, 184-185).

Petitioner's generic "benefits" remain untethered to the problems addressed by those 3D-printing references. The Reply repeats Jazayeri's cloud-printing advantages—multiple clients/printers, platform independence, and reduced need for local drivers. (Reply, 24; EX1010, ¶¶[0018], [0025], [0028]). But those are document-printing benefits. They do not explain why a POSITA addressing tagged build materials and material-dependent fabrication control in 3D printing would graft Jazayeri's server/UI workflow onto Loughran, Dubois, Menchik, or the other asserted references. (EX2013, ¶¶118-119, 184-185). And for Loughran-Dubois, those printer-agnostic benefits remain in tension with the printer-side teachings on which Petitioner otherwise relies. (EX1004, ¶¶[0024]-[0026], [0037]; EX1005, ¶¶[0016]-[0017], [0148]-[0150]).

Petitioner is correct that obviousness does not always require identifying a formal "deficiency" in the primary reference. (Reply, 24). But that does not relieve Petitioner of the burden to provide a reasoned explanation for why a POSITA would have made the particular modification proposed. Petitioner fails to do so.

C. The Reply Does Not Cure the Failure to Teach Element 1[b]

Contrary to Petitioner's suggestion, Patent Owner did dispute that the Jazayeri-based combinations teach element 1[b]: Jazayeri's "print request" is

received at a print server, not by the three-dimensional printer. (EX1010, Abstract, ¶¶[0008]-[0010], [0036], [0066]; EX2013, ¶¶184-185).

The Reply answers that “element 1[b] does not preclude a server receiving a print request from a client.” (Reply, 23). But claim 1 recites that the actor receiving the request is the printer that performs the remaining steps—not an intermediate server. (EX2013, ¶¶151-153, 184-185; EX1001, claim 1). Jazayeri therefore does not teach element 1[b] because it expressly teaches that the print request is “received, at a server.” (EX1010, ¶¶[0008]-[0010], [0036], [0066]).

The '466 Patent's optional print-server disclosure does not change that. The specification states that a print server may maintain print queues and allocate print requests to printers, confirming that server and printers are distinct components. (EX1001, 8:27-28, 8:53-58, 17:2-12). Thus, server receipt of a request is not equivalent to the printer's receiving a request from the client under claim 1[b].

V. PETITIONER'S REPLY DOES NOT CURE THE DEFECTS OF GROUNDS 1E/1F/3E/3F RELATING TO CLAIM 17

A. Petitioner Misidentifies Both The Claim-17 “Operational Parameters” And The Claimed “Diagnostic Test”

Petitioner argues that Menchik “determines quantities/availability and whether/when/how much support material to extract” using tag data, and that the “amount of support material required” is an “operational parameter” because Menchik chooses whether and when to use a cartridge based on that amount. (Reply,

25). That repeats the mismatch identified in the Response and again collapses the operational parameter and diagnostic test into the same sufficiency calculation. *Mformation Techs., Inc. v. Research in Motion Ltd.*, 764 F.3d 1392, 1398–1400 (Fed. Cir. 2014) (rejecting attempt to collapse distinct claim requirements into a single generic act where the claim language and logic treat them separately).

First, Claim 17 ties the diagnostic test to “the one or more operational parameters” from claim 1 that are “receiv[ed] . . . from the client” and “selected for use in controlling operation of the three-dimensional printer when fabricating the object.” (EX1001, claims 1, 17). Menchik’s material-required calculations are supply-management calculations, not the client-selected operational parameters recited in claim 1. (EX2013, ¶¶193-194).

Second, Petitioner’s Reply treats the same material-sufficiency calculation as both the claimed “operational parameter” and the later “diagnostic test.” (Reply, 25-26). But claim 17 separately requires “performing a diagnostic test to determine whether the one or more operational parameters is suitable for the three-dimensional printer.” (EX1001, claim 17). A consumables-quantity estimate used to determine whether enough material is on hand is not the same thing as the claim-1 operational parameters whose suitability the diagnostic test of claim 17 assesses. (EX2013, ¶195).

B. Petitioner's Reliance On Loughran And Dubois Does Not Cure That Mismatch

Loughran's cited discussion concerns reading a material identifier and retrieving material information/parameters associated with the material; it does not teach that a job-level "amount of material required" is itself the claim-1 operational parameter, or that a diagnostic test assesses the suitability of such parameters. (EX1004, ¶¶[0021]-[0024]; EX2013, ¶194).

Dubois does not help either. Its cited discussion concerns admissible printing parameters, deposited thicknesses, and ejection conditions in the dynamic production process. (EX1005, ¶¶[0069]-[0073], [0081]-[0090]). That does not teach that a material-quantity estimate is itself the claim-1 "operational parameter," much less that a later adequacy check of remaining material is the claim-17 "diagnostic test." Even if material usage may be influenced by material characteristics, that does not transform a supply estimate into the claimed operational parameter or diagnostic test. (EX2013, ¶¶193-195).

C. Menchik's And Dahlin's Adequacy Check Is Not Claim 17's Diagnostic Test

Petitioner next argues that Menchik's and Dahlin's determination whether enough support material exists to complete the object is a "diagnostic test," citing the '466 Patent's statement that a diagnostic test may determine "whether a desired fabrication can be performed with the supply." (Reply, 25-26; EX1001, 15:53-64).

But claim 17 requires a diagnostic test of whether “the one or more *operational parameters*” are suitable for the printer. Petitioner still does not identify those claim-1 operational parameters; it again points only to Menchik’s and Dahlin’s inventory-style determination whether enough material remains to complete the job. (EX1009, ¶¶[0048]-[0049]; EX1011, 1:64-2:2, 5:26-37, 5:55-64).

That is not enough. Menchik discloses computing required material, determining whether available cartridges are sufficient, and then controlling cartridge/valve usage or displaying information. (EX1009, ¶¶[0048]-[0051]). Dahlin discloses calculating whether a spool contains enough filament to complete the job and then notifying the operator whether it is adequate or will require replacement. (EX1011, 5:26-37, 5:55-64). Those are supply-sufficiency checks and operator notifications—not diagnostic tests of claim-1 operational-parameter suitability. (EX2013, ¶¶196-197).

D. Petitioner’s Attempt To Dismiss The Board’s Reasoning In IPR2025-00585 Misses The Point

Petitioner says the Board’s decision in IPR2025-00585 is irrelevant because it addressed a different patent and did not analyze Menchik and Dahlin here. (Reply, 25). But the Board’s observation remains instructive: materially similar language recites “two distinctive steps: determining an operational parameter . . . followed by performing a diagnostic test.” IPR2025-00585, Paper 11 at 15-18. The same

structural problem remains because Petitioner still tries to satisfy both steps with the same supply-sufficiency computation. (EX2013, ¶195).

VI. PETITIONER'S REPLY DOES NOT CURE THE DEFECTS OF GROUNDS 1C/1D/3G/3H RELATING TO CLAIM 5

A. Claim 5 Operates Within Claims 3-4's Two-Tag, Networked Client/Printer Workflow

Petitioner now argues that claim 5 “does not require that the selection is performed by the printer” and “does not even mention tag data.” (Reply, 27-28). But claim 5 requires “receiving a selection of one of the first build material and the second build material from the client,” and depends from claims 3 and 4, which require first and second tagged supplies and “providing data from the first tag and the second tag to the client over the network.” (EX1001, 23:53-67). Thus, the claim-5 selection occurs in that two-tag, networked client/printer workflow. (EX2013, ¶¶202-205). Claim 5 therefore requires selection of one of the tagged build materials coupled to the printer—not selection of a material in the abstract.

B. KISSlicer's Local Slicer Assignments Are Not The Claimed “Receiving A Selection . . . From The Client”

Petitioner next argues that because KISSlicer is software executed on a client computing device and used to create a print file, “the selection of one of two tagged build materials would be received from the client.” (Reply, 26-27). But KISSlicer describes local slicer settings used when generating a print file. It lets a user select

materials for specific extruders and assign extruders to object, raft, support-object interface, and support-main functions, using extrusion-specific settings such as temperature, filament diameter, extruder mm/rev, destring, and flow parameters. (EX1018, 3-5, 9-10). Those are slicer-side settings for generating printer-ready instructions; they do not disclose receiving from the client a selection of one of two tagged build-material supplies in the workflow of claims 3-5. (EX2013, ¶¶203-205; EX2015, 108:11-110:18 (Dr. Hickner admitting that KISSlicer provides default materials and allows manual parameter updates, but does not ingest tag data from a material supply)).

The same is true whether KISSlicer is notionally run on Loughran's alleged client or Menchik's alleged client/controller. Running slicer software on a client computer does not itself disclose or render obvious the claimed step of the printer receiving from the client a selection of tagged build materials after tag data for both supplies is provided to the client. (EX1004, ¶¶[0027], [0051]-[0055]; EX1009, ¶¶[0024]-[0025]; EX2013, ¶¶202-205, 207).

C. Petitioner's "Not A Physical Combination" And "All 3D Models Are Sliced" Points Do Not Address The Missing Limitation

Petitioner argues that obviousness does not require physical combinability and that all 3D models are sliced horizontally. (Reply, 27-28). But Patent Owner's point was not bodily combination. It was that KISSlicer's extrusion-centric slicer settings

do not supply the specific claim-5 limitation Petitioner needs. General statements that 3D models may be sliced, or that slicer software may generate path instructions from STL files, do not teach the missing step of the printer receiving from the client a selection between two tagged build-material supplies. (EX2013, ¶¶203-205, 207).

D. Considering The Combinations “As A Whole” Does Not Cure The Missing Claim-5 Step

Petitioner argues Patent Owner improperly attacks KISSlicer/Jazayeri in isolation whereas the Petition relies on the combinations “as a whole.” (Reply, 28). But even considering the combinations as a whole, Petitioner still fails to show claim 5 is obvious. Loughran and Menchik still do not disclose the printer receiving from the client a selection of one of two tagged build-material supplies, KISSlicer adds only local slicer-side extruder/material assignments when preparing a print file, and Jazayeri only adds a print-server framework. (EX1004, ¶¶[0027], [0049]-[0055]; EX1009, ¶¶[0024]-[0027], [0043], [0049]-[0051]; EX1018, 3-5, 9-10; EX1010, ¶[0036]; EX2013, ¶206).

Respectfully submitted,

Dated: May 22, 2026

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CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(d), I certify that this Sur-Reply complies with the type-volume limits of 37 C.F.R. § 42.24(c)(4) because it contains 5,596 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 Sur-Reply.

Dated: May 22, 2026

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CERTIFICATE OF SERVICE

Pursuant to 37 CFR § 42.6(e)(4), the undersigned certifies that on May 22, 2026, a complete copy of the foregoing Patent Owner's Sur-Reply was served on Lead and Back-up Counsel for Petitioner at the service address provided in Petitioner's Mandatory Notices:

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