

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CISCO SYSTEMS, INC. AND JUNIPER NETWORKS, INC.,¹
Petitioners,

v.

ORCKIT CORPORATION,
Patent Owner.

Case IPR2023-00402
U.S. Patent No. 8,830,821

PATENT OWNER'S SUR-REPLY

¹ Juniper Networks, Inc. filed a motion for joinder and a petition in IPR20240-00034, which were granted. Accordingly, Juniper Networks, Inc has been joined as a petitioner in this proceeding.

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2001	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, Dkt. No. 46 (E.D. Tex., Jan. 15, 2023), First Amended Docket Control Order (“First Amended Docket Control Order”)
2002	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, Dkt. No. 28 (E.D. Tex., Nov. 4, 2022), Notice of Compliance (“11-4-2022 Notice of Compliance”)
2003	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, Dkt. No. 47 (E.D. Tex., Jan. 19, 2023), Notice of Compliance (“1-19-2023 Notice of Compliance”)
2004	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, Dkt. No. 55 (E.D. Tex., Mar. 23, 2023), Defendant’s Motion To Stay
2005	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, Dkt. No. 56 (E.D. Tex., Mar. 29, 2023), Order Denying Motion to Stay
2006	United States District Courts National Judicial Caseload Profile For the 12 Months Ending March 31, 2023 (available at https://www.uscourts.gov/sites/default/files/data_tables/fcms_na_distprof_ile0331.2023.pdf) (“Judicial Caseload Statistics”)
2007	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, Dkt. No. 50 (E.D. Tex., Feb. 3, 2023), Notice of Compliance (“2-3-2023 Notice of Compliance”)
2008	U.S. Pat. No. 6,963,578 (“Akahane”)
2009	December 11, 2008 Final Rejection (U.S. Appl. No. 11/123,801) (“’801 Application Final Rejection”)
2010	July 28, 2008 Claim Amendments (U.S. Appl. No. 11/123,801) (“’801 Application Pending Claims”)
2011	“MPLS: What Is Multiprotocol Label Switching”, <i>downloaded from</i> https://www.paloaltonetworks.com/cyberpedia/mpls-what-is-multiprotocol-label-switching , <i>last accessed</i> May 22, 2023.
2012	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, Dkt. No. 59 (E.D. Tex., Mar. 30, 2023), Order Granting Motion To Amend Invalidity Contentions
2013	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, Dkt. No. 61 (E.D. Tex., April 13, 2023), Order Granting Motion To Amend Invalidity Contentions

2014	“About Orckit-Corrigent: Executive Summary,” 2011.
2015	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, (E.D. Tex., April 13, 2023), Defendant’s First Amended Invalidity Contentions (Cover Pleading)
2016	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, (E.D. Tex., April 13, 2023), Defendant’s First Amended Invalidity Contentions (Exhibit A - ’904 Patent Charts)
2017	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, (E.D. Tex., April 13, 2023), Defendant’s First Amended Invalidity Contentions (Exhibit B - ’821 Patent Charts)
2018	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, (E.D. Tex., April 13, 2023), Defendant’s First Amended Invalidity Contentions (Exhibit C - ’740 Patent Charts)
2019	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, (E.D. Tex., April 13, 2023), Defendant’s First Amended Invalidity Contentions (Exhibit D - ’111 Patent Charts)
2020	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, (E.D. Tex., April 13, 2023), Defendant’s First Amended Invalidity Contentions (Exhibit E - Combination Charts)
2021	<i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276, (E.D. Tex., April 13, 2023), Defendant’s First Amended Invalidity Contentions (SME Contentions)
2022	United States District Courts National Judicial Caseload Profile For the 12 Months Ending December 31, 2022 (available at https://www.uscourts.gov/sites/default/files/data_tables/fcms_na_distprofile1231.2022.pdf) (“December 22 Judicial Caseload Statistics”)
2023	Declaration of George Stamatopolous in Support of Patent Owner’s Motion for Pro Hac Vice Admission
2024	Declaration of Michael Ng in Support of Patent Owner’s Motion for Pro Hac Vice Admission
2025	Declaration of Miguel Gomez
2026	CV of Miguel Gomez
2027	Deposition Transcript of Dr. Henry Houh, dated November 15, 2023
2028	“Definitive MPLS Network Designs,” by Guichard et al., Cisco Press, 2005 (“Guichard”) (complete reference)

2029	“Heuristics Unleashed: A Comprehensive Guide to Heuristics in Computer Science and Programing,” <i>available at</i> https://softjournal.com/insights/heuristic-programming#:~:text=In computer science%2C a heuristic, a reasonable amount of time; last accessed Dec. 12, 2023. (“Softjournal”)
2030	“MPLS Basic MPLS Configuration Guide,” Cisco Inc., 2013 (“MPLS Configuration Guide”)
2031	Stipulation of Dismissal in <i>Orckit Corporation v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00276 (E.D. Tex. July 22, 2022).
2032	Network Working Group RFC 3469, “Framework for Multi-Protocol Label Switching (MPLS)-based Recovery,” February 2003
2033	Internet Engineering Task Force (IETF) RFC 6372, “MPLS Transport Profile (MPLS-TP) Survivability Framework,” September 2011
2034	“MPLS Convergence Factors,” published by IPCisco.com, <i>available at</i> https://ipcisco.com/lesson/mpls-convergence-factors/ , <i>last accessed</i> 12/14/2023
2035	Network Working Group RFC 4090, “Fast Reroute Extensions to RSVP-TE for LSP Tunnels,” May 2005
2036	Internet Engineering Task Force (IETF) RFC 6445, “Multiprotocol Label Switching (MPLS) Traffic Engineering Management Information Base for Fast Reroute,” November 2011

I. INTRODUCTION

The challenged claims are directed to an innovative protection system for MPLS networks that includes, among other elements, (i) selecting a pair of working and protection entities from a plurality of pairs corresponding to a plurality of MPLS entities, (ii) reselecting the entity pair upon occurrence of an event, (iii) and determining a probability of concurrent failure for the working and protection entities.

Petitioner has failed to identify prior art teaching these elements, alone or in combination, as well as the required motivations to combine the asserted references. To plug the gaps in the grounds, the Reply asserts untimely and unsupported constructions of key terms, incorrectly characterizes the record to improperly expand the claims' scope, tries to supply missing limitations with improper incantations of "common sense," and launches an attack on PO's expert based on his testimony about his work on MPLS concepts that is consistent with Petitioner's POSITA definition.

Because Petitioner's assertions are meritless, and for the reasons detailed below, the Board should find the challenged claims patentable.

II. CLAIM CONSTRUCTION

A. Petitioner's New Constructions Are Untimely

The Board should reject Petitioner's untimely constructions of "selecting," "working entity," and "protection entity." Neither the Petition nor the POR construe "selecting an entity pair." Pet., 12-13; 37 C.F.R. § 42.104(b)(3); *SAS Institute Inc. v. Iancu*, 138 S.Ct. 1348, 1351 (2018). The POR applies the ordinary and customary meaning of the terms Petitioner proposes construing. Reply, 7, 9 (citing POR, 28, 30, 51-52). PO's arguments are rooted in the claim language, consistent with the Petition's interpretations. POR, 28, 30, 51-52; *see* Pet., 35-40; 80-82.

The Petition's discussion of "selecting an entity pair" does not mention "subset." Pet., 35-40. And the Petition repeatedly refers to "working entity" and "protection entity" as the "working" or "primary" LSP and "protection LSP," respectively. Pet., 18, 47, 77-80, 83. Petitioner cannot propose new, materially different constructions now.

PO had no notice Petitioner's Reply would advance new and different constructions than the Petition and no opportunity to submit rebuttal evidence. *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1080 (Fed. Cir. 2015). Accordingly, the Board should disregard Petitioner's new constructions.

B. “Selecting An Entity Pair From Said Plurality Of Transport Entities Based At Least In Part Upon Said Overall Cost”

The claims require (i) “providing *a plurality of [MPLS] transport entities* between a first endpoint and a second endpoint” (EX1001, claims 1, 17); (ii) “determining an overall cost for *each entity pair of said plurality of entities*” (*id.*); and (iii) “selecting an entity pair from said plurality of transport entities *based at least in part upon said overall cost.*” Thus, the claims require selecting an entity pair based on the overall cost *for each entity pair* of the plurality of entities.

Fig. 2 illustrates the claimed process:

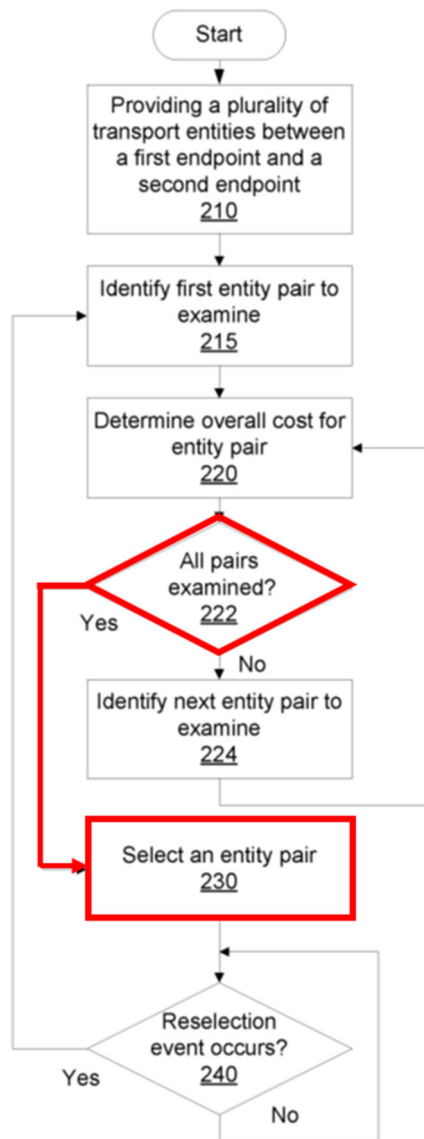


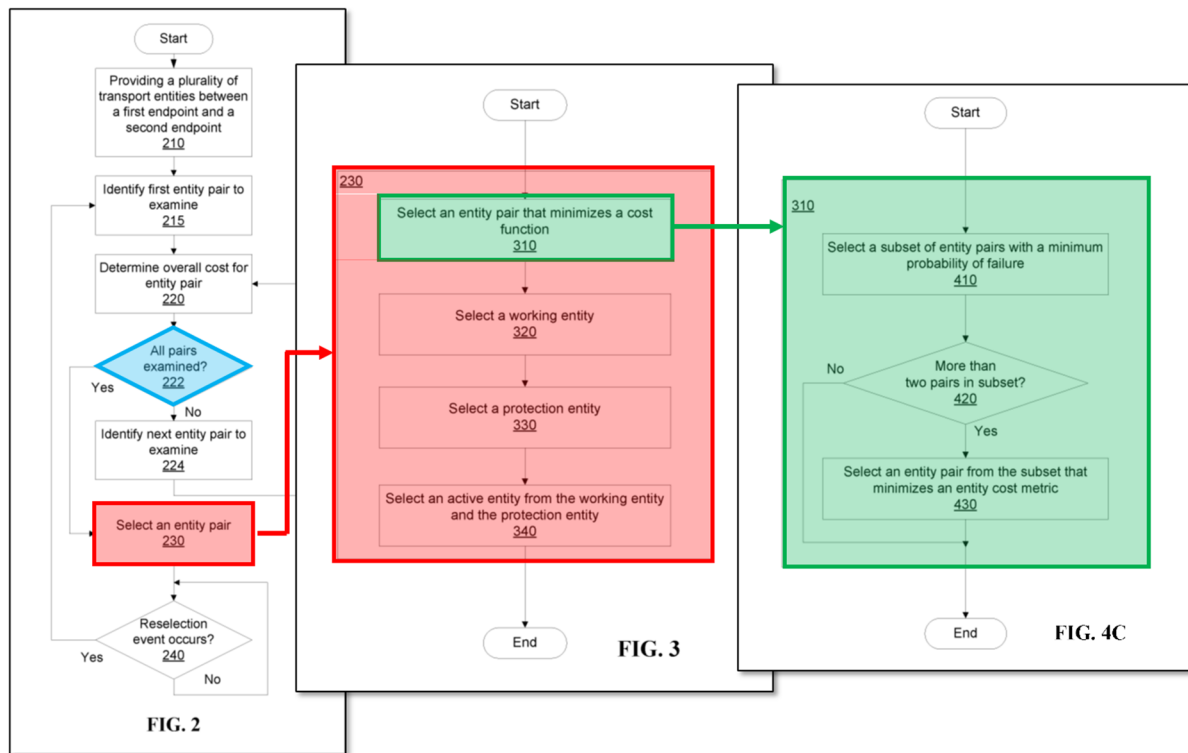
FIG. 2

The entity pair is selected (230) after examining *all* entity pairs (222). Thus, for 10 entities, 90 corresponding pairs are examined; and for 3 entities, 6 pairs are examined. POR, 30-31.

Petitioner incorrectly asserts “claim 1 includes ‘selecting an entity pair from a subset of entity pairs.’” Reply, 7-8. Claim 9 includes “selecting ... from a subset” as a further limitation (through dependent claims 4 and 2) on claim 1’s “selecting an entity pair” limitation. EX1001, claim 9. Further, Claim 1’s “determining an overall cost for each entity pair” is an input to—and thus a separate limitation from—“selecting an entity pair.” EX1001, claim 1.

Petitioner incorrectly asserts that PO excludes Fig. 4C (Reply, 8), which is one exemplary method for performing Fig. 3 step 310 (which in turn is “a logic flowchart expanding on entity selection for the first exemplary embodiment for an entity selection method”). EX1001, 2:63-65. Fig. 3 is an example of Fig. 2’s entity selection method 230, which is only performed once *all* entity pairs have been examined at 222. EX1001, 4:24-29, Fig. 2.

As shown below, Fig. 4C step 430 (on which Petitioner relies within green box 310) is one step in entity selection 230 (in red); step 222 (which examining all entity pairs in blue) is an input to entity selection 230; and the input (222) to selection step 230 (and thus steps 310 and 410) considers the overall cost of all possible pairs of transport entities:



Accordingly, the Board should reject Petitioner’s construction.

C. “Working Entity” and “Protection Entity”

These terms carry their ordinary and customary meaning. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005). Claim 14 requires a plurality of MPLS transport entity descriptors comprising a working and a protection entity. EX1001, claim 14. The “working entity” is the “original [transport] entity” (*Id.*, 1:49) designated to support traffic over the MPLS network. *Id.*, 1:38-40 (“The [MPLS] framework requires support of the transport entity or trail recovery.”).

The ’821 Patent also “defin[es] a second transport entity, the protection entity, between the same endpoints as the original entity, where the working and

protection entities do not share the span or nodes against whose failure protection is required.” *Id.*, 1:46-51. “When a failure is detected at the working entity, the endpoints switch traffic to the protection entity.” EX1001, 1:51-53. Thus, the patent defines a pair of entities—one working entity for transporting traffic and one protection entity if the working entity fails.

Petitioner incorrectly proposes construing “working entity” as “an entity that actively carries network traffic” and “protection entity” as “an entity intended to carry network traffic of a working entity if that working entity fails.” Reply, 10. The working entity is not just any entity that happens to actively carry traffic, it is the single entity selected to carry traffic between two specified endpoints. EX1001, 4:54-55 (“***One entity of the entity pair may be selected as a working entity***, as shown by block 320”); *see also* 1:41-44, 1:49-50, Fig. 3, claims 2, 14, 18.

Similarly, the protection entity is a single entity “defin[ed]” as part of a pair with the working entity. *Id.*, 1:47-49, Fig. 3, 4:55-57, claims 2, 14, 18. The ’821 Patent requires that the working entity and protection entity are part of an entity pair. Petitioner’s construction incorrectly allows any entities that happen to “actively carr[y] network traffic” to serve as working entities and any entities that happen “to carry network traffic of a working entity if that working entity fails” to serve as protection entities.

Further, the working and protection entities are designated between two specific endpoints. *See* EX1001, 1:50-52 (“a plurality of [] transport entities between a first endpoint and a second endpoint.”); claim 1. Petitioner’s construction incorrectly allows the working and protection entities to carry any network traffic regardless of endpoints.

Petitioner’s constructions are based entirely on *extrinsic* evidence. Reply, 9-10 (relying on second Houh declaration ¶ 11 and new exhibits 1043 and 1044 introducing new arguments about “1:n architecture.”). EX1044 is not mentioned in the intrinsic record. While a version of EX1043 appears to be mentioned in the specification, Petitioner does not argue that EX1043 is incorporated by reference, such that it could be considered intrinsic evidence, nor can it. To incorporate by reference, “the host document must identify with detailed particularity what specific material it incorporates and clearly indicate where that material is found in the various documents.” *Paice LLC v. Ford Motor Co.*, 881 F.3d 894, 906–07 (Fed. Cir. 2018). The patentee expressly incorporated other documents by reference (EX1001, 1:8-12, 2:54-58), but not EX1043. EX1001, 1:58-61.

Further, the intrinsic record discloses “1:1 and 1+1 protection architectures” but not “1:n architectures.” EX1001, 1:54-57, claims 15, 16. Claim 14 claims “an entity protection switch configured to switch between *a* [single] working entity and *a* [single] protection entity” (e.g., a 1:1 or 1+1 architecture, which require two

entities.) *See also id.*, claims 1 and 17. Neither claim 14 nor any other intrinsic evidence contemplate multiple working entities, let alone protection entities shared among multiple working entities.

The '821 Patent could not have intended to refer to EX1043 for examples of 1:n MPLS mechanisms because *EX1043 provides no 1:n examples*. The '821 Patent refers to “IETF draft-zulr-mpls-tp-linear-protection-switching” as providing examples of MPLS mechanisms that “support both 1:1 and 1+1 architectures” (EX1001, 1:54-61), and EX1043 provides specific examples using 1:1 and 1+1 architectures. *Id.*, 4 -5. However, EX1043 only mentions “1:n architecture” once, stating that “[d]etails for the 1:n protection switching architecture will be provided in a future version of this draft.” *Id.*, 5. Because Petitioner’s new constructions lack intrinsic support and rely only on new extrinsic evidence, they must be rejected.

III. THE CHALLENGED CLAIMS ARE PATENTABLE

A. The “Selection Limitation”

Contrary to Petitioner’s assertions that PO “does not dispute Doshi’s teachings under the plain and ordinary meaning” (Reply, 11), the plain claim language requires selecting the entity pair from “each entity pair of said plurality of entities,” not from a subset of entity pairs. *Supra*, §I.B.

Without identifying any teaching in Doshi that three entities would yield three entity pairs, Petitioner asserts that Doshi teaches this limitation. Reply, 12. The example that the Petition relies on (Doshi Figure 1, annotated below) discloses 10 LSPs (in yellow). EX1005, Fig. 1, Pet., 18, 24, 26, 27, 28, 31, 39, 43, 61.

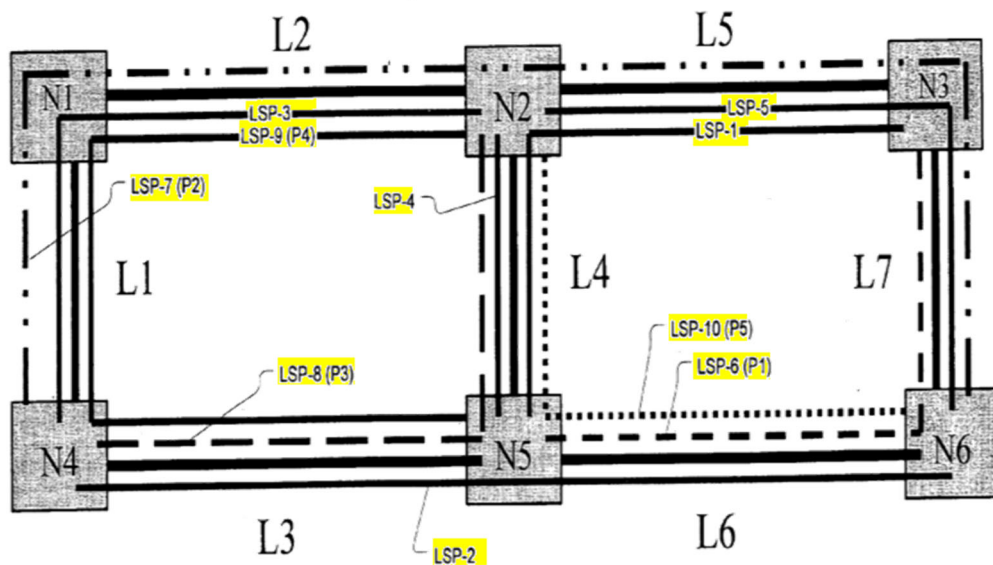


FIG.1

Second, the entity pair order is not interchangeable, as the “overall cost” for each entity pair changes depending on order. EX1001, claims 1, 14, 17. Petitioner does not dispute that Doshi’s 10 LSPs yield 90 pairs. Further, claims 2, 14 and 18 expressly require designating one entity a working entity and one entity a protection entity, thus the pair order is not interchangeable. EX1001, claims 2, 14, 18.

Third, even for $K=3$, Petitioner's argument fails. Claims 1 and 17 recite methods for selecting entities. The example in the POR ($K=10$) illustrated how claims 1 and 17 differ from Doshi's method. Even if Doshi and the '821 Patent resulted in the same outcome for case $K=3$ (and entity pairs were interchangeable), the results in every other case demonstrate that Doshi's method is different. *See, e.g., Univ. of Strathclyde v. Clear-Vu Lighting LLC*, 17 F.4th 155, 160 (Fed. Cir. 2021) ("An obviousness determination generally requires a finding that all claimed limitations are disclosed in the prior art"). Further, Mr. Gomez did not agree that a "POSITA [may] treat pairs as interchangeable" (Reply, 12) but pointed out that, even if a POSITA improperly ignored the order of entities in a pair, Doshi's selection mechanism is still different than claims 1 and 17. EX2025, ¶69.

Petitioner incorrectly asserts that Doshi's selection is not performed from a subset of the total provided paths but that "[i]n step 1104, a 'minimum-cost restoration path is selected for every one of the K primary paths.'" Reply, 12-13, (quoting EX1005, [0143]). But step 1102 only considers K minimum-cost primary paths (i.e., excluding paths that are too expensive, also excluding all shared paths ("i.e., no sharing considered")). EX1005, [0143]. Thus, the K primary paths considered are a subset of the "plurality of entities." POR, 31-32. At step 1104, "a set of K minimum-cost restoration paths are calculated" using option 2 ("i.e., where sharing is considered and the appropriate primary path is passed to the

PathCost routine”). EX1005, [0143]. Doshi’s choice of primary paths ignores all shared paths and any other paths above the minimum-cost threshold. The choice of restoration path is then limited to “K minimum-cost restoration paths” with respect to one specific primary path (i.e., “the appropriate primary path”), limiting the restoration paths to be paired to K paths. In both cases, Doshi is taking a shortcut, excluding numerous paths from pairing and never considering the cost of “each entity pair of said plurality of entities.”

Petitioner speculates that Doshi *could* reach the same result as the ’821 Patent if all paths were disjoint. Reply, 13-14. But Doshi is directed to networks with both disjoint and shared paths. *See, e.g.*, EX1005, Fig. 1; [0009] (“Problems in the prior art are addressed in accordance with the principles of the present invention by a *shared* mesh network (SMN)...”) Pet., 24 (“Doshi discloses a *shared* mesh data network ‘SMDN 100’”). Doshi Fig. 11 expressly considers shared paths (step 1104), determining restoration paths using “Option=2 (i.e., where sharing is considered...)”. EX1005, Fig. 11, [0143]. Thus, Doshi teaches using shared paths in addition to disjoint paths.

Petitioner mischaracterizes Mr. Gomez’s testimony, asserting that he “contradicted the alleged necessity” of considering shared paths (Reply, 14). Mr. Gomez stated that Petitioner’s hypothetical was untethered to the ’821 Patent or

Doshi, testifying “[i]t would be a very unique network...” (EX1037, 212:9-12) because Doshi discloses considering both shared and disjoint paths.

B. “Entity Pair Reselection”

The POR argued that Petitioner’s obviousness combination fails because neither Guichard nor Doshi, alone or combined, discloses reselection of an entity pair. POR, 34. Petitioner does not address this deficiency. Accordingly, Petitioner’s arguments fail.

1. Petitioner’s Reasons To Combine Fail

Petitioner incorrectly asserts that PO ignores its reasons to combine. Reply, 15. Petitioner cites Guichard’s teachings for reoptimizing a single path. *Id.* (“reoptimization would allow for selecting *a* shorter path if *one* becomes available.”). Guichard does not teach the claimed “reselecting [an] entity pair.” POR, 36-40.

Petitioner asserts that it “did not rely on generic efficiency and reliability.” POR, 16. But Petitioner does not identify why these generic rationales would motivate combining Doshi and Guichard given that the two references identify significant disadvantages and tradeoffs to combining their teachings with no teaching that such a combination would result in efficiency or reliability. POR, 36-40; *See Forest Lab ’ys, LLC v. Sigmapharm Lab ’ys, LLC*, 918 F.3d 928, 935 (Fed. Cir. 2019).

Petitioner incorrectly attempts to distinguish *Forest Laboratories* by arguing that “Petitioner ... identified specific aspects for improvement.” POR, 16.

“[S]electing a shorter path if one becomes available” is a generic need that does not relate to reselecting an entity pair. *ActiveVideo Networks, Inc. v. Verizon Commc'ns, Inc.*, 694 F.3d 1312, 1328 (Fed. Cir. 2012). Guichard teaches that reoptimizing a protection system like Doshi’s entails significant costs and tradeoffs that make such a combination disadvantageous. EX2025, ¶¶90-92; EX2028, 96-97 (e.g., “protection mechanisms ... require more network overhead...”).

Petitioner incorrectly asserts that PO “improperly argues the references individually.” Reply, 17. To the contrary, PO argues that neither Doshi nor Guichard teach reselecting an entity pair, as claimed. POR, 34-35. Further, Guichard distinguishes between *different* network recovery systems: protection mechanisms (like Doshi) and restoration mechanisms (like Guichard). POR, 38; EX2028, 96.

Petitioner argues Guichard teaches that it may “be desirable to elect to use a combination of recovery mechanisms.” Reply, 18 (quoting EX2038, 96). But Guichard (i) does not teach reoptimizing protection systems, and (ii) also teaches that such combinations create “race conditions between recovery mechanisms and double protection, which may lead to a lack of optimality...” *Id.* Adding Guichard’s reoptimization to Doshi’s protection scheme creates exactly the race

conditions Guichard warns against. EX2025, ¶93. Mr. Gomez testified a POSITA would not use “a combination of recovery mechanisms” unless it had “been validated to work and to not have additional issues” precisely because of “unintended issues,” e.g., Guichard’s “race conditions.” EX1037, 167:8-22; *see also* EX2025, ¶¶90-93.

Petitioner argues that any costs and tradeoffs in a Guichard/Doshi combination can be avoided. Reply, 18. But nothing in the record (including Guichard) teaches *how* to avoid these costs and tradeoffs or even whether the Doshi/Guichard tradeoffs can be avoided. To the contrary, Guichard teaches avoiding such *combinations* unless users can figure out how to mitigate costs and tradeoffs. *Trivascular, Inc. v. Samuels*, 812 F.3d 1056, 1068 (Fed. Cir. 2016) (no motivation to modify prior art where doing so “would destroy the [prior art’s] basic objective”).

Petitioner argues that Guichard’s single path reoptimization satisfies the claim because “reselecting the entity pair would be from the original entity pair and a replacement entity pair comprising a new primary LSP path.” Reply, 19. The claim requires reselecting between *two* sets of pairs—the original pair and a “replacement entity pair.” EX1001, claim 1. Guichard’s reoptimization involves reoptimizing a single path, not a pair of paths. EX1006, 80. Nothing in

Guichard’s reoptimization process involves either an “entity pair” or a “replacement entity pair.” *Id.*

Petitioner complains that PO “ignores the Petition” because ““a POSITA would have ... repeat[ed] Doshi’s candidate pair cost determination and selection techniques.”” Reply, 19 (quoting EX1003, ¶119). But Doshi does not discuss reselection (EX1055, [0014]), and Guichard only teaches reoptimizing a single path. Even if a POSITA implemented Guichard’s single path reoptimization in Doshi (as discussed above, they would not), the combination could only reoptimize Doshi’s single failed link rather than repeat Doshi’s resource-intensive protection system. *See, e.g.*, EX1005, Fig. 11; EX2025, ¶¶89.

Further, the claims require “reselecting ... from the group consisting of said entity pair and a replacement entity pair.” EX1001, claim 1. Nothing in Doshi’s “candidate pair cost determination and selection techniques” teaches reselection, let alone reselecting from a group consisting of a current entity pair and a replacement entity pair. *AFG Indus., Inc. v. Cardinal IG Co.*, 239 F.3d 1239, 1245 (Fed. Cir. 2001) (““consisting of” [is] understood to exclude any elements, steps, or ingredients not specified in the claim.”). Further, Dr. Houh admits that Doshi’s LSP pair would be reselected from “all possible LSP pair combinations.” Reply, 20 (citing EX1038, ¶24).

Petitioner argues that “a combination need not result in the best option to render the claims obvious.” Reply, 20. But Guichard specifically counsels against combining recovery mechanisms. EX2028, 96. And Xu teaches heuristic shortcuts (which are not limited to NP-hard problems (*Infra*, §II.D)), consistent with the general preference in the art for simple, fast solutions, that reduced complexity. POR, 43. Accordingly, a POSITA would not combine Doshi and Guichard or modify such a combination to reselect an entity pair, as claimed.

2. There Is No Reasonable Expectation of Success

Petitioner incorrectly asserts that Guichard’s teaching that combining recovery mechanisms leads to undesirable “race conditions” supports a reasonable expectation of success. Reply, 20-21. Guichard does not teach how a POSITA could avoid race conditions, or whether it would be possible to do so in the Doshi/Guichard combination. POR, 45-46.

Petitioner concedes that only one prior art system its expert identified discloses reoptimization in a protection system. Reply, 21. As explained in the POR (and unrebutted by Petitioner), that system (Zamfir) is different from the claimed reselection because it “does not describe a protection system based on entity pairs between two end points.” POR, 46. “Instead, Zamfir describes a dynamic and virtual protection system by creating paths on-the-fly.” *Id.* Because

Zamfir differs materially from Petitioner’s proposed combination it cannot create a reasonable expectation of success. EX2025, ¶107.

Petitioner argues that Doshi’s “calculation and selection techniques” would be hypothetically repurposed for a “reoptimization evaluation.” Reply, 21. But Doshi does not disclose this, nor does Petitioner map Doshi’s “calculation and selection techniques” to the claimed reselection process. *Id.* Thus, there is no reasonable expectation of success in combining Doshi’s path calculation with Guichard’s reoptimization to practice the claimed reselection.

C. “Probability Of Concurrent Failure”

The Institution Decision correctly found that the asserted references do not teach this limitation. POR, 47-54; DI, 37-39. Petitioner relies on Doshi’s description of the likelihood of the simultaneous failure of two disjoint paths as “very insignificant” for this limitation (Pet., 80-81) but does not dispute that this statement is an assumption rather than a determination of probability. Reply, 23, POR, 49-51.

Petitioner argues that Doshi “utilizes one calculation (LowKSum) that is based on shared paths (which have a higher probability of joint failure) and another calculation (LowLSum) for disjoint paths (with ‘very insignificant’ probability of joint failure).” Reply, 23. Doshi thus assumes that the probability of simultaneous

failure of disjoint paths is “insignificant” but never “determines” the probability of concurrent failure.

Petitioner argues that steps 410 and 430 from '821 Patent Figure 4C are similar to steps 1110 and 1116 from Doshi Fig. 11. Reply, 23-24. Nothing in steps 1110 or 1116 discusses “determin[ing] a probability of concurrent failure” as required by the claim. Instead, steps 1110 and 1116 discuss determining lowest total-cost pairs. EX1005, Fig. 11, [0144]. But cost is different from probability of failure; in Doshi, “a path’s cost [i]s a function of link utilization and sharing” EX1005, [0141].

Petitioner argues that Xu discloses a “working entity” and “protection entity” based on its belated and incorrect new constructions. Reply, 25-26; *supra*, §I.C. The POR shows that Xu’s network is fundamentally different than the '821 Patent. POR, 51-52; EX2025, ¶122-125. Claim 14 of the '821 Patent selects a single working entity to transmit traffic and a single protection entity from a group of entities. EX1001, claim 14. Xu may transmit traffic over any number of entities at any given time and does not disclose protection entities. POR, 51-52.

Xu applies load balancing over a “predefined set of paths P_d ” “according to a set of splitting ratios.” EX1025, [0005]-[0006]. The splitting ratio “defines a fraction of the demand to be transmitted over a path p of the set of paths P_d .” *Id.* In Xu, there are numerous paths between routers s and t . *Id.*, [0033], Fig. 1.

Initially in Fig. 1, Xu's system splits traffic between paths 110 and 112. *Id.* This is different than the '821 Patent, where only one path (the working entity) is ever active at a time. Further, once Xu's link 114 is cut (meaning path 112 has failed), "traffic is immediately redistributed to the remaining paths" using the splitting ratios corresponding to that particular failure state. *Id.*; *see also id.*, [0005], [0006].

Thus, Xu lacks the concept of a single "working entity" to pair with a single "protection entity." All paths in the set of paths P_d carry traffic according to the splitting ratio. In some states, the splitting ratio for a path may be 0, meaning a particular path is not assigned traffic. *See, e.g., id.*, Fig. 1 (showing "0" for path 112). That does not mean the path is the claimed "protection entity," it just means that the NMS determined other paths were better to use. *Id.*, [0002] ("The exact path that a network communication session takes, ... is flexible and may be ... chosen depending on a variety of conditions, including proximity, availability and speed.").

Petitioner argues that it relies on Xu only for the limitation of "determine a probability of concurrent failure" and not for "working entity" and "protection entity." Reply, 27. Xu discusses predetermined probabilities of particular failure scenarios, not determining the probability of concurrent failure of two specific links, let alone the probability of concurrent failure of a working entity and

protection entity as required by the claims. Pet., 81, POR, 53-54, EX1025, [0049]. Indeed, Xu lacks the concept of a working and protection entity.

Petitioner argues that “Xu’s heuristic discussion is limited to the context of an ‘NP-hard’ embodiment.” Reply, 27. Heuristics are used elsewhere in Xu. For example, Xu explains that each failure state has a “predetermined probability of occurrence.” Pet., 82 (citing EX1025, [0006]); *see also* Pet., 81 (citing EX1025, [0006], [0049], [0080]). Indeed, the Petition relies on Xu at [0049], which discloses that the set of Xu’s failure states is “usually restricted to the most probable.” Pet., 81. Thus, the Petition relies on Xu’s disclosure of a shortcut (or heuristic) to limit the set of failure states to the “most probable” based on predetermined probabilities.

Petitioner cites nothing in Xu that indicates Xu’s failure states use anything other than predetermined heuristics for probabilities. Reply, 27. Further, Xu Fig. 1 does not discuss determining probabilities of concurrent failure. Instead, Xu discusses using predetermined probabilities, without any disclosure as to how these predetermined probabilities were arrived at. Pet., 81; EX1025, [0049].

Petitioner incorrectly implies that Mr. Gomez testified claim 14’s “digital logic” need not “determine a probability of concurrent failure.” Reply, 27-28 (citing EX1073, 173:20-174:22). Mr. Gomez testified that the limitation “determining a probability of concurrent failure includes ... computational

hardware for computing the matrix of probabilities.” EX1037, 174:10-16.

Similarly, Mr. Gomez testified that the claims did not “dictate[] an order” of whether the limitations of (1) selecting working and protection entities or (2) determining a probability of concurrent failure occurred first.

Petitioner argues that “a POSITA would have understood that in the ’821 patent, the network operator assigning failure probabilities of spans and/or nodes (which have been predetermined) configures the probability matrix to determine a probability of simultaneous failure for a pair that has the spans or nodes in common.” Reply, 28 (quoting EX1038, ¶36). Petitioner’s argument is incorrect. The claim requires “**digital logic** ... to determine a probability of concurrent failure.” EX1001, claim 14. Petitioner’s argument relies on the **network operator**—who is not “digital logic.”

Further, the claim requires logic to “determine a probability of concurrent failure.” *Id.* Petitioner asserts that the ’821 Patent allows for **span and node** failure probability to be predetermined (e.g., by network operators). Reply, 28 (citing EX1001, 6:20-33). But the passage states, consistent with the claim, that “span failure probabilities may be **automatically calculated by the network**, for example, by a management entity” EX1001, 6:23-29. The probability matrix of the ’821 Patent is an example of a “management entity” that “automatically

calculate[s]” the probability of concurrent failure, not the “network operator” relied on by Petitioner. POR, 48-49; EX2025, ¶¶115-116.

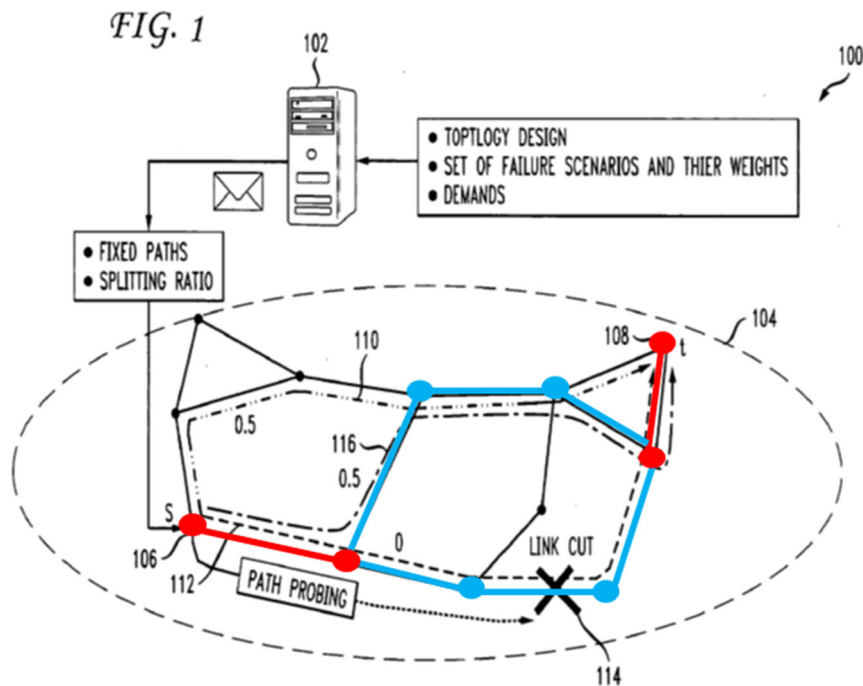
Further, the passage Petitioner relies upon failure probabilities for a single link or node (EX1001, 6:20-33), not determining “probability of concurrent failure” for multiple entities—*i.e.*, a working entity and a protection entity—at any point, as required by claim 14. Even where two different entities share a common link or node, those different entities also have nodes and links that are not common. Calculating the failure probability for a common link or node does not account for the concurrent failure probability of independent links or nodes for each entity. EX1001, 5:66-6:4 (“the term ‘simultaneous failure’ encompasses concurrent failures of the working and protection entities ... but the failures do not necessarily begin at the exact same time.”).

Petitioner incorrectly argues that Xu’s failure model is similar to the ’821 Patent. Reply, 28-29. The claimed probability of concurrent failure is performed by digital logic, not provided by a “network operator.” EX1001, claim 14. In contrast, Xu receives predetermined probabilities of occurrence from an external source. EX1025, [0006]; Reply, 28.

Further, the claim requires a probability of concurrent failure of a working entity and a protection entity, not the probability of occurrence of failure states. “Failure states are states that cause at least one path *p* of the predefined set of paths

Pd to fail.” EX1025, [0006]. In contrast, the ’821 Patent determines the probability that two specific entities—the working and protection entity—fail concurrently. Finally, Xu’s failure scenarios are limited to paths with “shared vulnerability.” *Id.*, [0040], Reply, 28. There is no such limitation in the ’821 Patent, where the working and protection entities may be disjoint. EX1001, 3:47-50 (“a pair having multiple spans and/or nodes in common may be more likely to simultaneously fail than a pair having no spans or nodes in common.”).

Petitioner annotates Xu Fig. 1, arguing “the probability of router 106 failing corresponds to a probability of simultaneous failure of paths 112 and 116.” Reply, 29-30. This is incorrect. Paths 112 and 116 contain additional path links and nodes, some of which are shared and some of which are disjoint. The probability of concurrent failure is the total probability that any shared segment(s) fail in addition to the probability that any disjoint segments fail. The annotation below illustrates the shared (in **red**) and disjoint (in **blue**) links and nodes that must be considered to calculate a probability of concurrent failure for paths 112 and 116:



Petitioner's example—a predetermined probability that a single node fails—does not account for potential failures at any of these additional elements. Reply, 30. Accordingly, claim 14 and its dependent claims are patentable.

D. Claims 2 and 18

Petitioner's Reply does not address the POR's arguments. Reply, 31, POR, 55-56. These claims require selecting a working entity and a protection entity from an entity pair. EX1001, claim 2. That is, one entity of the claimed pair is selected as a working entity and the other is selected as a protection entity. *Id.* Further, as discussed above, the order of the working and protection entities in a pair is not interchangeable. *Supra*, §II.A. Doshi selects a working entity from a

set of minimum cost primary paths and a protection entity from a different set of minimum cost restoration paths. POR, 55-56.

Petitioner argues that “Doshi describes ‘switching between working and protection LSPs’ of the entity pair.” Reply 31. But claim 2 is directed to the initial selection of a working and protection entity as part of “selecting an entity pair.” EX1001, claim 1. The functionality Petitioner relies on in Doshi (Reply, 31) describes “switch[ing] traffic from a primary (i.e., working) LSP to its corresponding protection LSP” “after detecting a failure.” EX1005, [0267]. *See id.*, [0156] (“Whenever one of the primary path elements fails, the connection is switched automatically to the restoration path.”). There is no “selection” because the primary entity has already failed. POR, 55. Further, once the protection LSP in Doshi is switched to the primary LSP, there is no corresponding new protection entity to select as the “pair” no longer exists—that is, the former working LSP does not transition to the protection LSP because the former working LSP is no longer operational.

Accordingly, claims 2 and 18 (and their dependent claims) are patentable.

E. Claim 13

Neither Doshi nor Guichard disclose this limitation. Reply, 31-32; POR, 58-62. Dr. Houh’s second declaration attempts to remedy the deficiencies in his first declaration. Reply, 32, EX1038, ¶¶42-45. Petitioner again fails to argue

sequentially replacing MPLS entity pairs “pertains to an unusually simple or particularly straightforward technology” *Abbott Diabetes Care Inc. v. Dexcom, Inc.*, IPR2022-00913, 2023 WL 7225556, at *16 (PTAB Nov. 2, 2023). This is because MPLS entity pair reselection is complex. EX2025, ¶¶137-142.

Dr. Houh’s second declaration introduces new arguments and evidence about an alleged “make-before-break” mechanism. EX1038, ¶¶44-45. These arguments raise new evidence that PO cannot counter at this late stage with rebuttal evidence. 37 C.F.R. § 42.104(b)(4); 5 U.S.C. §§ 554(b)(3), 554(c), 556(d).

Moreover, Dr. Houh’s new arguments do not establish that “sequentially replacing said working entity and said protection entity” was part of a POSITA’s common knowledge. The “make-before-break” references Dr. Houh cites only have a single entity for carrying traffic and lack the concept of a working and protection entity that are part of a pair. EX1038, ¶¶44-45. The claim requires two steps: sequentially replacing (1) the working entity and (2) the protection entity. EX1001, claim 13. The references cited by Dr. Houh at best disclose sequentially replacing a single entity. None of the prior art discloses sequential reoptimization of both a working and protection entity. EX2025, ¶142. *See id.*, ¶145.

Stated differently, Doshi discloses a protection entity and lacks the concept of reoptimization. If the working entity fails, Doshi switches to the protection entity without any disruption time. Petitioner improperly asserts that this missing

limitation can be supplied by common sense, but Dr. Houh provides no rationale for why it would be common sense to a POSITA to sequentially replace both working and protection entities rather than, for example, simply switch to the (already designated) protection entity. Petitioner’s new evidence does not overcome Mr. Gomez’s reasoned analysis to the contrary. EX2025, ¶¶134-148. Accordingly, claim 13 is patentable.

F. Mr. Gomez Qualifies as a POSITA

Petitioner asserts that Mr. Gomez does not qualify as a POSITA because he “has some relevant academic training but does not have the required practical working experience” in MPLS. Reply, 32-33. Not so. Mr. Gomez’s “relevant academic training” on MPLS qualifies him as a POSITA (Reply, 33), and Mr. Gomez testified that “he became ‘familiar’ with ‘concepts of MPLS’ early on in the mid ’90s” including through his work. Reply, 34.²

² Petitioner’s POSITA definition does not require “practical working experience” with MPLS, only that a POSITA be “knowledgeable regarding MPLS techniques.” Pet., 12. *See id.* (“[l]ack of professional experience can be remedied by additional education.”).

Petitioner mischaracterizes Mr. Gomez’s testimony, arguing that he “testified that he had no working experience on projects involving MPLS” (Reply, 33); but Mr. Gomez testified he was familiar with MPLS and worked on projects using MPLS concepts:

5	Q.	Have you worked on projects
6		involving MPLS?
7	A.	Not specifically. I've worked on
8		a number of projects that use the concepts
9		of MPLS.
10	Q.	Are you familiar with MPLS?
11	A.	Yes.
12	Q.	And how did you become familiar
13		with MPLS?
14	A.	Well, it's been around for a
15		while and -- my earliest -- I've had a
16		number of projects that ran into the
17		problems that are solved by MPLS and the
18		concepts therein.
19		The earliest one I had was a
20		videoconferencing system that wasn't
21		working over the internet in the way it
22		needed to and that was because we didn't
23		have the reservation resources -- or the
24		resources reserved for the
25		videoconferencing system.

EX1037, 216:5-25.

Petitioner also argues that “[c]ontrary to Mr. Gomez’s assertion, MPLS did not exist in the ‘mid ’90s.’” Reply, 34. But consistent with Mr. Gomez’s testimony that his work on concepts involving MPLS started in the late 90s—including in “startups” and “major corporations” that utilized these concepts in their technologies”—and that many “MPLS concepts have been around since the

mid '90s,” Petitioner admits that work on MPLS began in **1997**. *Id.* In any event, Mr. Gomez did not testify MPLS existed in the “mid '90s” but that he encountered concepts that were later embodied in MPLS:

9	Q.	Were you an MPLS expert as of
10		April 7, 2006?
11	MR. STAMATOPOULOS:	Objection.
12	A.	I had worked with many of the
13		concepts early since the late '90s, and as
14		MPLS formed I was aware of the many
15		requirements for it and we employed many of
16		the -- some of the techniques at least in
17		some of the products we built.
18	Q.	Prior to April 7, 2006?
19	MR. STAMATOPOULOS:	Objection.
20	A.	You know, many of these concepts
21		that are embodied in MPLS have been around
22		since the mid '90s, and I was involved in
23		many technology startups as well as major
24		corporations that utilized these
25		technologies.

EX1037, 51:9-25; *see id.*, 78:16-79:1; 81:15-82:5, 83:3-18, 104:3-14, 107:7-109:7; 215:10-16.

Petitioner asserts that Mr. Gomez’s opinions are “unhelpful” and “lack evidentiary support.” Reply, 34-35. Again, not so. Mr. Gomez’s declaration has over two hundred citations to evidentiary support. EX2025.

Similarly, Petitioner argues that Mr. Gomez’s legal understanding is “baseless parroting of attorney argument” (Reply, 35), but Mr. Gomez testified he

was “advised [of] elements of the law and how to apply them.” EX1037, 191:16-19; *see o id.*, 192:22-193:4, 197:4-7. Incorporating legal standards provided by attorneys is not “baseless parroting of attorney argument.” Accordingly, Mr. Gomez qualifies as a POSITA.

IV. CONCLUSION

The Board should find claims 1-20 patentable.

Respectfully submitted,

/ Stephen P. McBride /

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Date: May 10, 2023

CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITS

This Patent Owner's Sur-Reply (the "Sur-Reply") consists of 5576 words, excluding table of contents, table of authorities, certificate of service, this certificate, or table of exhibits. The Sur-Reply complies with the type-volume limitation of 5,600 words as mandated in 37 C.F.R. § 42.24. In preparing this certificate, counsel has relied on the word count of the word-processing system used to prepare the paper (Microsoft Word).

Respectfully submitted,

/ Stephen P. McBride /

Date: May 10, 2023

CERTIFICATE OF SERVICE

The undersigned hereby certifies that the following document was served by electronic service, by agreement between the parties, on the date below:

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