

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CISCO SYSTEMS, INC.,
Petitioner,

v.

ORCKIT CORPORATION,
Patent Owner.

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

PATENT OWNER'S RESPONSE PURSUANT TO 37 C.F.R. § 42.120

TABLE OF CONTENTS

	Page
I. INTRODUCTION	1
II. BACKGROUND	3
A. Procedural History	3
B. Patent Owner	4
C. '821 Patent.....	6
D. Prosecution History	10
E. Challenged Claims.....	12
F. Petitioner's Cited References	14
1. Doshi (Ex1005).....	15
2. Guichard (Ex1006).....	20
3. Huang (Ex1007).....	21
4. Xu (Ex1025)	23
G. Level of Ordinary Skill	25
III. NO COMBINATION OF THE CITED PRIOR ART REFERENCES TEACHES OR SUGGESTS EVERY LIMITATION OF THE CLAIMS.....	25
A. The Asserted References Do Not Teach Or Suggest "Selecting An Entity Pair From Said Plurality Of Transport Entities Based At Least In Part Upon Said Overall Cost" (the "selection limitation").....	27
B. The Asserted References Do Not Teach Or Suggest "Digital Logic Configured To Select Said Working Entity And Said	

Protection Entity From Said Plurality of Transport Entity Descriptors.”	33
C. The Asserted References Do Not Teach Or Suggest “if an entity pair reselection event occurs, reselecting said entity pair from the group consisting of said entity pair and a replacement entity pair comprising at least one entity distinct from the entities of said entity pair”	34
1. Petitioner Has Failed to Provide a Reason for Which a POSITA Combine Doshi and Guichard	36
2. Petitioner Has Failed to Provide a Reason for Which a POSITA Would Adapt Such a Combination	40
3. Petitioner Has Failed to Provide a Reason for Which a POSITA Would Have Expected the Modified Doshi-Guichard Combination Would Succeed.	44
D. As The DI Correctly Held, The Asserted References Do Not Teach Or Suggest “Logic Configured To Determine A Probability Of Concurrent Failure Of Said Working Entity And Said Protection Entity”	47
1. Doshi	49
2. Xu	51
E. Claims 2 and 18 are Patentable Over Doshi	55
F. Claim 13 is Patentable Over Doshi	57
IV. CONCLUSION	62

TABLE OF AUTHORITIES

	Page(s)
CASES	
<i>Arendi S.A.R.L. v. Apple Inc.</i> , 832 F.3d 1355 (Fed. Cir. 2016)	57, 62
<i>Eli Lilly & Co. v. Teva Pharms. Int’l GmbH</i> , 8 F.4 th 1331 (Fed. Cir. 2021)	45
<i>Forest Lab’ys, LLC v. Sigmapharm Lab’ys, LLC</i> , 918 F.3d 928 (Fed. Cir. 2019)	37
<i>In re Lee</i> , 277 F.3d 1338 (Fed. Cir. 2002)	40
<i>In re Nuvasive, Inc.</i> , 842 F.3d 1376 (Fed. Cir. 2016)	40
<i>In re Van Os</i> , 844 F.3d 1359 (Fed. Cir. 2017)	38, 59
<i>Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.</i> , 821 F.3d 1359 (Fed. Cir. 2016)	42
<i>Koninklijke Philips N.V. v. Google LLC</i> , 948 F.3d 1330 (Fed. Cir. 2020)	58
<i>KSR Int’l Co. v. Teleflex Inc.</i> , 550 U.S. 398 (2007).....	40
<i>Netflix, Inc. v. DivX, LLC</i> , Case Nos. 22-1203 (Fed. Cir. Oct. 25, 2023)	42
<i>Personal Web Techs., LLC v. Apple, Inc.</i> , 848 F.3d 987 (Fed. Cir. 2017)	37
<i>Samsung Elecs. Co., Ltd. v. Elm 3DS Innovations, LLC</i> , 925 F.3d 1373 (Fed. Cir. 2019)	44

WBIP, LLC v. Kohler Co.,
829 F.3d 1317 (Fed. Cir. 2016) 37

STATUTES

35 U.S.C. § 103 10

AGENCY DECISIONS

Abbott Diabetes Care Inc. v. Dexcom, Inc.,
IPR2022-00913, 2023 WL 7225556 (PTAB Nov. 2, 2023) 58

Asetek Danmark a/s v. Coolit Sys., Inc.,
IPR2020-00825, 2021 WL 4868406 (PTAB Oct. 12, 2021).....60

Xerox Corp. et. al, v. Bytemark, Inc., I
PR2022-00624, Paper 12 (PTAB Feb. 10, 2023).....61

EXHIBIT LIST	
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_distprofile0331.2023.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

Orckit Corporation (“Orckit” or “Patent Owner”) submits this Patent Owner Response (“POR”) to Cisco Systems, Inc.’s (“Petitioner”) Petition challenging Claims 1-20 of U.S. Patent No. 8,830,821 (“’821 Patent”).

The ’821 Patent is directed to methods and systems for selecting primary and protection data paths (or “entities”) in Multi-Protocol Label Switch (“MPLS”) networks. In particular, the ’821 Patent improves the upon prior by claiming an inventive combination of elements that work together in tandem to provide efficient and reliable network recovery. Among other features, the key elements of the ’821 Patent’s independent claims are: (i) the selection of a pair consisting of a “working entity” (or primary) and a “protection entity” (or backup) from a plurality of entities, based on the cost of the working/protection entity pair relative to the cost of the other potential pairs; (ii) the reselection (or reoptimization) of the entity pair upon the occurrence of a triggering event (e.g., a network failure); and (iii) the determination of a probability of concurrent failure of the entities in the pair to help avoid such a failure.

Tellingly, Petitioner has failed to locate any prior art references that disclose all these elements in a single system. Instead, Petitioner asserts that it would have been obvious to a POSITA to arrive at the claimed inventions by combining the prior

art references in Petitioner's grounds. For reasons outlined here and explained in more detail below, Petitioner's assertions fail.

First, none of Petitioner's references disclose (or render obvious) a selection process in which a primary and protection entity are selected from a plurality of available paths and the potential pairs associated with those paths. Rather, the prior art discloses shortcuts aimed at reducing the computational complexity of selecting an optimal pair, but at the expense of sacrificing the added reliability offered by the '821 Patent's selection process.

Second, Petitioner fails to assert any prior art that discloses or renders obvious the reoptimization of a system employing both a working and a protection entity, like the one in the '821 Patent. Its closest reference teaches using reoptimization in systems that implement network recovery "on the fly," rather than with the aid of a precomputed protection path, as taught by the '821 Patent. The same reference (Guichard, discussed *infra*) teaches that protection systems—like the '821 Patent's—are computationally complex, increase "network overhead," and that combining them with other systems (like Guichard's) could "lack optimality." Petitioner's best reference thus teaches Petitioner's proposed combination. Unable to point to any countervailing rationale supporting its combination, Petitioner resorts to hindsight bias by invoking "common sense," and ignoring the tradeoffs discussed

in its own prior art, which would have deterred rather than motivated a POSITA from arriving at the claimed invention.

Third, Petitioner fails to identify any prior art that teaches determining a probability of concurrent failure of the working and protection entities. As explained below, Petitioner's best references either treat this probability as too negligible or too complex to compute and instead opt for the use of shortcuts rather than outright determining the probability of concurrent failure, as required by the claims. Rather than employ heuristics and shortcuts, the '821 Patent discloses and claims specific steps and structures for determining a probability of concurrent failure. Indeed, the Board recognized this difference in the Institution Decision, finding that the Petitioner had not carried its burden with respect to this particular element.

In short, none of the asserted references disclose or render obvious the key elements of the '821 Patent claims (including the three elements discussed *supra*). Acknowledging that the Board decided to institute trial, Patent Owner respectfully submits that the reasons set forth in this response, many of which were not previously presented to the Board, compel a Final Written Decision finding all challenged claims patentable over the asserted prior art.

II. BACKGROUND

A. Procedural History

This proceeding is one of four IPRs filed by Petitioner against Patent Owner.

The other IPRs are IPR2023-00401 (U.S. Pat. No. 7,545,740), IPR2023-00554 (U.S. Pat. No. 10,652,111) and IPR2023-00714 (U.S. Pat. No. 6,680,904). Each of the '740, '821, '111 and '904 Patents is currently asserted by Patent Owner against Petitioner in *Orckit Corporation v. Cisco Systems, Inc.*, Case No. 2:22-cv-00276 (E.D. Tex. July 22, 2022). Patent Owner and Petitioner have agreed to a jointly stipulated dismissal of the district court litigation without prejudice. Ex2031 [Stipulation of Dismissal].

B. Patent Owner

Orckit Corporation owns the '821 patent, which originated from significant research and development by Orckit Communications Ltd. (also known as Corrigent-Systems Ltd., referred to herein as “Orckit-Corrigent”).

Orckit-Corrigent was founded in 1990 in Israel by Izhak Tamir and Eric Paneth. Orckit-Corrigent's products offered networking infrastructure for the delivery of residential, business, and mobile backhauling services in packet-based networks.

By the early 2000s, Orckit-Corrigent was a pioneer in telecommunications, with revenues some years exceeding \$500M from sales to various tier 1 global telecommunications providers. Over the years, Orckit-Corrigent and its subsidiaries developed and sold products in a variety of telecommunications areas, including DSL, Packet Transport Networks (PTN), Carrier Ethernet technologies, PWE

(Pseudo-Wire Emulation) technology, and Resilient Packet Ring (RPR) technology, which was developed and introduced to the market as the IEEE 802.17 Standard, part of the company's packet transport technology. In 2007, Orckit-Corrigent launched its CM4000 PTN line of products, which were purchased and deployed by telecom providers worldwide, including leading Indian carrier Bharat Sanchar Nigam Ltd. (BSNL); T-Systems (Deutsche Telekom) in Germany; Tele2, a leading Pan-European Scandinavian Service Provider; redIT (formerly MetroNet) in Mexico, and others. At one time, Orckit-Corrigent had offices in Israel, US, India, Japan, Korea, Germany, Russia, Brazil, Mexico, Thailand, and the Philippines.

Orckit-Corrigent also engaged in extensive research and development (investing over \$200M) and prosecuted an extensive patent portfolio. Many of the patents in this portfolio were practiced by its products, notably, the CM-4000 product family, which was a series of packet transport network switches (consisting of, among other products, the CM-4140, CM-4206 and CM-4314T/4314 models), and the CM-401x portfolio of switches that included the CM-4011, CM-4012 and CM-4013 products. Ex2014 [Orckit-Corrigent Executive Summary].

In 2012, Orckit-Corrigent entered into debt restructuring/bankruptcy proceedings in Israel. After a series of transactions that followed the Israel proceedings, Orckit Corporation acquired a smaller set of Orckit-Corrigent's patents, including the '821 patent.

C. '821 Patent

The '821 Patent is directed to methods and systems for selecting MPLS network transport entities between a first endpoint and a second endpoint. Ex1001 ['821 Patent], Abstract. “MPLS,” or “Multiprotocol Label Switching,” is a networking technology that routes network traffic using the shortest path between endpoints (e.g., two different network users) based on “labels” rather than network addresses. Ex2011 [What is Multiprotocol Label Switching], 1. The packet “labels” determine the route or path of the packet through the network (over different hops). This path is referred to in the '821 Patent as a “label switch path (LSP).” Ex1001 ['821 Patent], 1:40. This process—of assigning and using labels to determine network paths—is different from the typical IP routing, which relies on complex network address lookups.

In the typical MPLS network, there are multiple different possible (or candidate) paths over which to transmit data between two given endpoints. Depending on the particular MPLS implementation, one or more of those candidate paths (or entities) may be selected as working paths, others may be selected as protection (or backup) paths, and others may not be selected at all. Generally, MPLS does not specify how paths are selected (either as working or protection paths) or whether restoration of a network failure will be accomplished using a precomputed protection path or “on-the-fly” once a failure occurs. Rather, these

details are generally determined by network administrators, and are governed by a host of considerations and tradeoffs, including computational complexity, technical knowhow, quality of service requirements, reliability requirements, and cost.

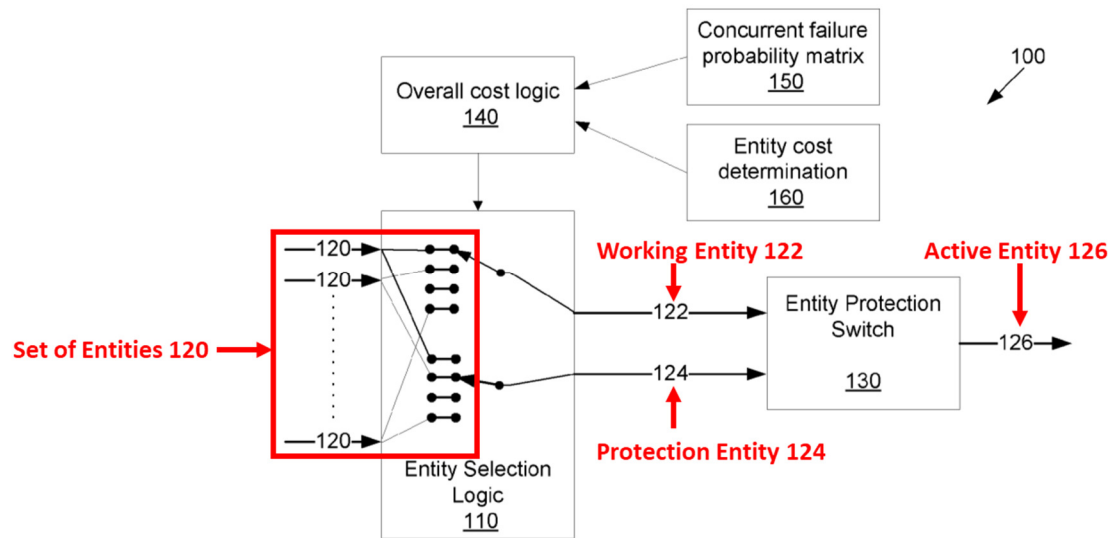
In this context, the '821 Patent describes and claims methods and systems for choosing a preferred path (a “working entity”) and a backup path (a “protection entity”) between the endpoints of an MPLS network. The claimed methods and systems ensure that network failures recover quickly enough to “maintain network connections” and “meet operator requirement[s].” Ex1001 ['821 Patent], 1:23-2:3.

MPLS requires support of “transport entity or trail recovery.” Ex1001 ['821 Patent], 38-40. The transport entity is the path (LSP, pseudowire (PW) or sub network connection (SNC)) that is used to transport a particular packet. *Id.*, 40-43. In the event that a span or node (i.e., a physical connection or device in the LSP such as a wire or switch) fails, MPLS network operators generally require that the path must recover within 50 ms. Ex1001 ['821 Patent], 1:40-45. To ensure that the path recovers within 50 ms, MPLS networks may define a second transport entity known as the “protection entity.” *Id.*, 1:46-51. The original transport entity is known as the “working entity.” *Id.* “When a failure is detected at the working entity, the endpoints switch traffic [from the working entity] to the protection entity.” *Id.*

The '821 Patent teaches that many existing methods for network recovery

from failures (“linear protection mechanisms”) did not “protect against one or several failures affecting both the working entity and the protection entity.” *Id.*, 1:61-66. The ’821 Patent addresses this problem by determining an overall cost for each potential pair of working and protection entities, selecting one pair based at least in part on the entity pair cost (and in some embodiments based on determining and minimizing a probability of concurrent failure of the two entities), and then reselecting the entity pair if certain events occur. Ex1001 [’821 Patent], 2:11-18.

Annotated Fig. 1 (below) demonstrates the relationship between entities. As shown, there are a number of transport entities 120 considered for selection as the working entity 122 and protection entity 124 based in part on the “overall cost logic 140” for each entity 120. Each of these entities 120 is a distinct network route. Ex1001 [’821 Patent], 3:36-40. Entity selection logic 110 first determines a pair of entities based on factors such as overall entity cost for the pair. Ex1001 [’821 Patent], 4:11-29, Fig. 2. “One entity of the entity pair may be selected as a working entity Similarly, a protection entity may be selected from the entity pair.” Ex1001 [’821 Patent], 4:49-57, Fig. 3. Once the working entity 122 and protection entity 124 are determined, entity protection switch 130 determines which entity to use as the active entity 126. *Id.*, 3:54-65, 4:57-59.



An embodiment of the entity selection method is disclosed at Fig. 2. The specification explains as follows:

A plurality of transport entities between a first endpoint and a second endpoint are provided, as shown by block 210. Each possible entity pairing is examined for cost in turn, starting with a first entity pair, as shown by block 215. An overall cost for each pair of the plurality of transport entities is determined, as shown by block 220. The overall cost may be determined based on the probability of simultaneous failure of the working and protection entities (SFP), as described below, the entity cost, or a combination of SFP and entity cost. The entity cost may be defined as the sum of the link metrics, for example IGP or TE metrics, along the entity.

Ex1001 ['821 Patent], 4:11-21. Thus, the working and protection entities in

this embodiment are chosen based on the “overall cost” of the pair, which may take into account both the probability of concurrent failure and the “entity cost.” The “entity cost” may be “the sum of the link metrics, for example IGP or TE metrics, along the entity.” *Id.* “Link metrics” are related to the stability and/or bandwidth and/or responsiveness of systems and/or other characteristics of the path or link as a function of time or condition. The ’821 Patent describes several additional embodiments with different methods of minimizing overall cost. *See, e.g., id.*, 5:33-6:43, Figs. 4A-4C.

D. Prosecution History

The ’821 Patent claims priority to provisional application no. 61/499,943, filed on June 22, 2011. Ex1001 [’821 Patent], 1:8-12. The ’821 Patent was filed on December 5, 2011 as Appl. No. 13/311,128 (the “’128 Application”). *Id.*, (22), (65).

On December 26, 2013, the Examiner issued a non-final rejection rejecting claims 1-4, 8-9, and 17-19 under 35 U.S.C. § 103 over U.S. Pat. No. 7,961,602 (“Tochio”), U.S. Pub. No. 2010/0309778 (“Young”), and U.S. Pub. No. 2010/0157794 (“Nakash”), rejecting claims 5-7, 10-12, and 20 over Tochio, Young, Nakash, and U.S. Pub. No. 2007/0064702 (“Bates”), and objecting to dependent claim 13 as allowable if rewritten in independent form. Ex1002 [File History], 71-92.

On March 25, 2014, Applicant responded, amending independent claims 1 and 17 to add the underlined portion of the following limitation “if an entity pair reselection event occurs, reselecting said entity pair from the group consisting of said entity pair and a replacement entity pair comprising at least one entity distinct from the entities of said entity pair.” Ex1002 [File History], 55, 59. Applicant similarly amended independent claim 14 to add the limitation “logic configured to reselect said working entity and said protection entity from said plurality of transport entity descriptors upon a reselection event.” *Id.*, 58.

Applicant argued in part that, unlike MPLS entities in claim 1, which are immediately available for the claimed selection and/or reselection, “Nakash merely discloses determining costs of links that have not been established, and are therefore clearly not available for either selection or reselection.” *Id.*, 62. Applicant similarly pointed out that “Nakash does not disclose selecting an entity pair from each entity pair [sic-“a plurality of entities”], but only for finding one active path having a shortest path” (*id.*) because “no entity pair is disclosed.” *Id.*, 63. In other words, “Nakash clearly does not disclose selecting an entity pair from said plurality of transport entities based at least in part upon said overall cost, but merely selecting one active path from among several active paths.” *Id.*

On April 9, 2014, the Examiner issued a notice of allowability allowing claims 1-20. Ex1002 [File History], 34. In doing so, the Examiner stated Applicant’s

arguments “have been fully considered and are persuasive.” *Id.*, 37. The ’821 Patent issued on September 9, 2014. Ex1001 [’821 Patent], (45).

E. Challenged Claims

The Petition has challenged claims 1-20 of the ’821 Patent. The ’821 Patent has three independent claims and 17 dependent claims. Independent claims 1 and 14 are excerpted below:

1. An entity selection method performed by a network device, comprising the steps of:

providing a plurality of multi protocol label switching (MPLS) transport entities between a first endpoint and a second endpoint;

determining an overall cost for each entity pair of said plurality of entities;

selecting an entity pair from said plurality of transport entities based at least in part upon said overall cost; and

If an entity pair reselection event occurs, reselecting said entity pair from the group consisting of said entity pair and a replacement entity pair comprising at least one entity distinct from the entities of said entity pair,

wherein said entity pair reselection event is selected from a group consisting of adding an entity to said plurality of transport entities, removing an entity from said plurality of transport entities, an operational status change for one of said plurality of transport entities, and a change in overall cost for one of said plurality of transport entities.

14. A system for selecting entities within an MPLS network, comprising:

a data structure comprising a plurality of transport entity descriptors;

an entity protection switch configured to switch between a working entity and a protection entity; and

digital logic configured to select said working entity and said protection entity from said plurality of transport entity descriptors, comprising: logic configured to determine a probability of concurrent failure of said working entity and said protection entity;

logic configured to determine an entity cost of said plurality of transport entity descriptors: and

logic configured to reselect said working entity and said protection entity from said plurality of transport entity descriptors upon a reselection event,

wherein said reselection event is selected from a group consisting of adding an entity to said plurality of transport entities, removing an entity from said plurality of transport entities, an operational status change for one of said plurality of transport entities, and a change in overall cost for one of said plurality of transport entities.

Consistent with the discussion above, claims 1 and 14 (and the claims that depend from them) generally recite methods and systems for providing a plurality of MPLS transport entities, determining the overall cost for each entity pair of said plurality of entities, selecting an entity pair from said plurality of entities, and then reselecting the entity pair when an entity pair reselection occurs. Claim 14 also requires “logic configured to determine a probability of concurrent failure of said working entity and said protection entity.”

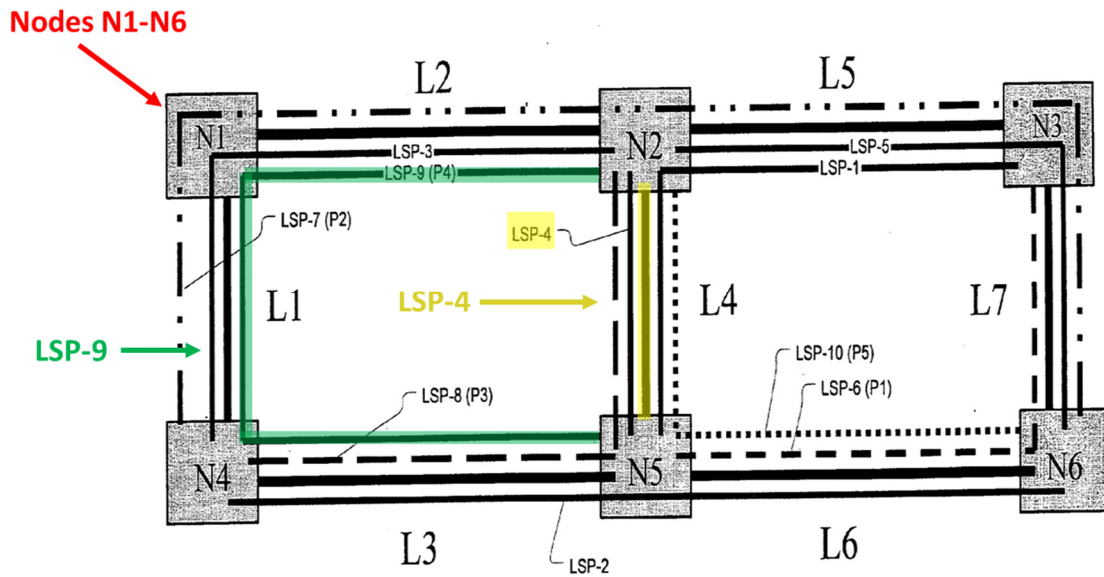
F. Petitioner’s Cited References

While the cited references generally relates to networks using MPLS, the manner in which they chose working and protection paths is completely different than the innovative technique described and claimed in the ’821 Patent.

1. Doshi (Ex1005)

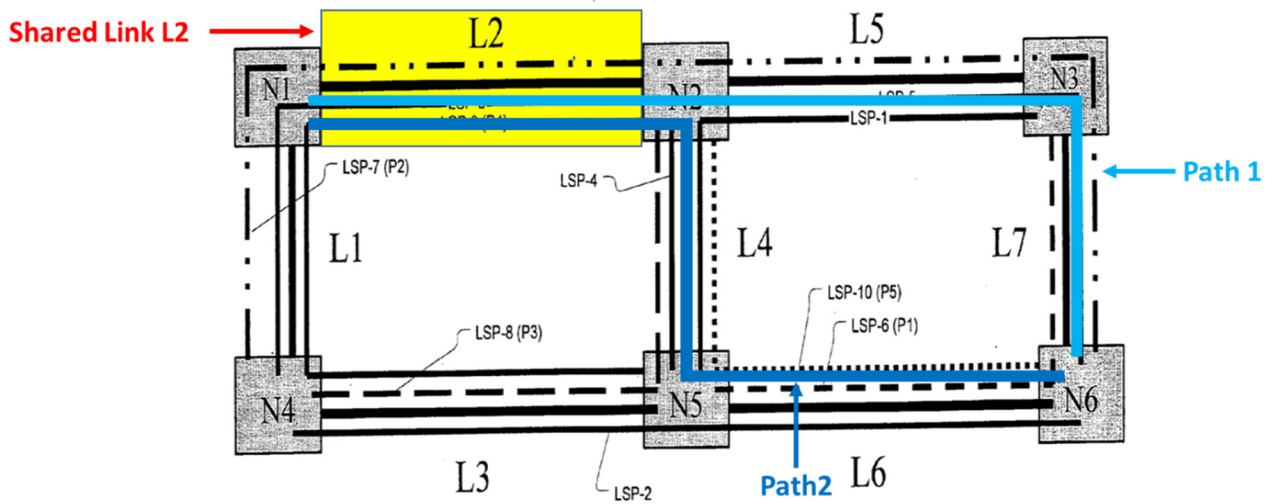
Doshi (Pat. Publ. No. US2004/0205239) is directed to a “method for determining primary and restoration paths for a new service in a mesh network.” Ex1005 [Doshi], Abstract. This method involves “(1) for each of a plurality of candidate primary/restoration path pairs for the new service, generating a path cost for each candidate pair, where the path cost for each restoration path is a function of the sum of the cost of links within the restoration path, and (2) selecting the primary and restoration paths for the new service from the plurality of candidate path pairs based on the path cost.” *Id.*

Doshi Figure 1 (below) gives an example of primary (or working) LSPs and protection (or restoration) LSPs between different nodes N1 through N6, in particular, five primary LSPs LSP-1 through LSP-5 and five “protection paths” LSP-6 through LSP-10. Ex1005 [Doshi], ¶¶[0052]-[0054]. Each primary LSP corresponds to one protection LSP, each of which creates a path between the same nodes. For example, in the figure below, primary LSP-4 is highlighted yellow and runs directly between nodes N2 and N5. LSP-4’s corresponding protection node LSP-9 is highlighted green and also runs between nodes N2 and N5 but uses a different path (i.e., N2-N1-N4-N5).



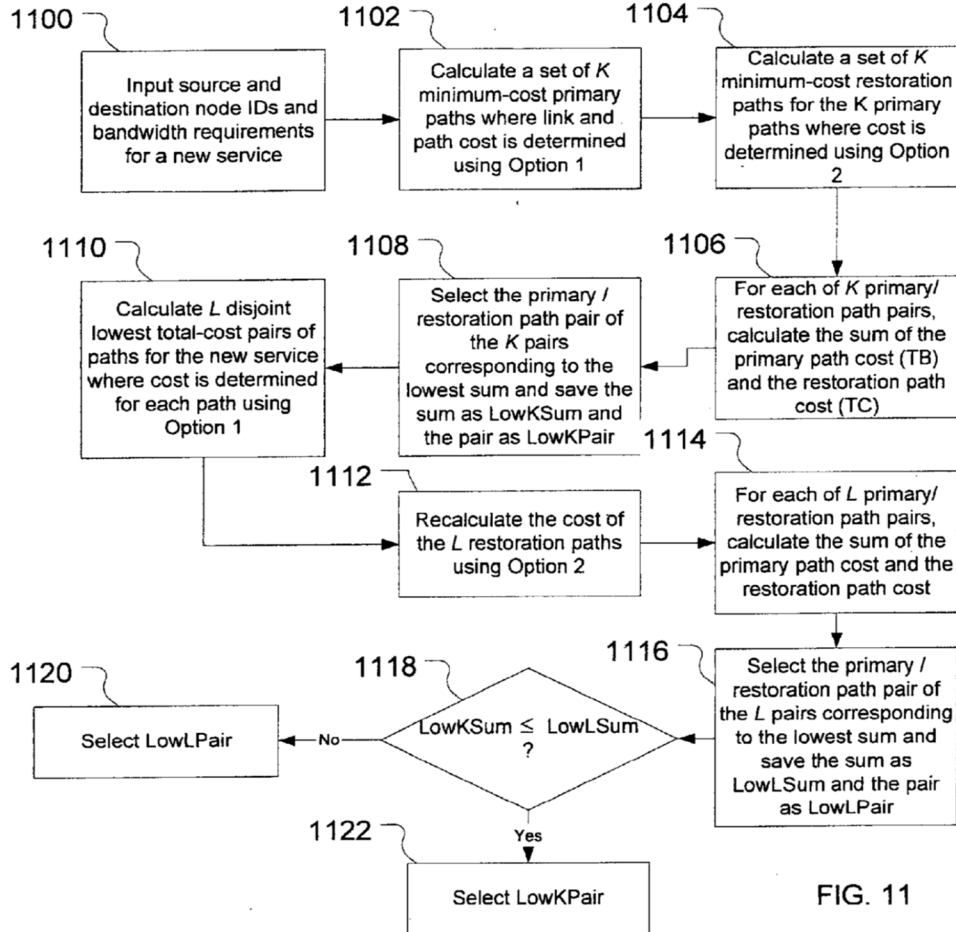
In Doshi, two different paths can either be “routed disjointly” or, in the alternative, can “share common links” (e.g., L1-L7 in Fig. 1) along their respective routes. *Id.*, ¶[0040]. Using the example of Doshi Fig. 1, above, paths LSP-4 and LSP-9 are “routed disjointly” because they do not share any of links L1-L7.

On the other hand, in the annotated example of Doshi Fig. 1 below, Paths 1 and 2 between nodes N1 and N6 both share link L2 (*i.e.*, Path 1 traverses links L2, L5 and L7; and Path 2 traverses links L2, L4 and L6). Doshi refers to path pairs that share links as “shared” paths.



In identifying a primary/protection path pair, Doshi evaluates a number of potential paths. In the example above, Path 1 and Path 2 are only two paths between nodes N1 and N6. Other potential paths between the two nodes include L1-L3-L6 or L1-L3-L4-L5-L7. In more complex networks, there could be numerous different paths to choose from; and networks may select primary and protection paths in any number of ways.

Doshi teaches a selection process based on path cost. Ex1005 [Doshi], Abstract. Doshi Fig. 11 (below) illustrates this process. Fig. 11 calculates “a minimum-cost primary/restoration path pair for a new service in consideration of link utilization, utilization threshold, and sharing degree.” Ex1005 [Doshi], ¶[0142].



First, in step 1100 the bandwidth required and source and destination IDs for the new service are input. *Id.* Step 1102 determines a group of “minimum cost primary paths” using “Option=1 (i.e., no sharing considered).” *Id.*, ¶[0143]. Step 1104 determines a group of “minimum-cost restoration paths ... using Option=2 (e.g., where sharing is considered and the appropriate primary path is passed to the PathCost routine.)” *Id.* Thus, at Step 1104, a group of primary paths have already been selected and Doshi considers “shared” paths as candidate restoration paths

associated with each primary path. In Step 1106, the path costs for each primary and restoration path pair are summed together and the lowest pair is saved. *Id.*

Steps 1110 through 1114 calculate path cost with a second method, which limits the set of candidate protection paths to only disjoint paths that do not share links or nodes with the primary paths. *Id.*, ¶[0142]. In Step 1110, cost is determined for “L disjoint lowest total-cost pairs of paths” with no sharing considered. *Id.*, ¶[0144]. In step 1112, each restoration path identified in step 1110 has its cost recalculated using Option 2 (sharing considered). The sum of the lowest pair of primary path (from the group of L primary paths) and restoration paths (from the group of L restoration paths) is stored. *Id.* In step 1118, whichever cost is lowest between the two methods is selected as the minimum-cost pair. *Id.*, ¶[0145].

In certain embodiments, Doshi describes selecting primary LSPs and protection LSPs that are “strictly disjoint” from each other. Ex1005 [Doshi], ¶[0055]. “[S]trictly disjoint means that the two paths in each primary/protection path pair share no common links or nodes other than their common ingress and egress nodes.” *Id.* However, “this need not be the case in all implementations of” Doshi and in some embodiments, “no strictly disjoint path exists between two nodes” or there may be other factors or constraints that lead to selection of a protection path “that is not strictly disjoint from the primary path (e.g., the protection path may share some

common links with the primary path)”).

2. Guichard (Ex1006)

Guichard (“Definitive MPLS Network Designs”) appears to be a brief excerpt from a book titled “Definitive MPLS Network Designs.” Ex1006 [Guichard], 1. The section in the provided excerpt is titled “Reoptimizing a Traffic Engineering LSP.” *Id.*, 3. It discusses the need to identify more optimal working LSPs in a network as they become available and of establishing the new working LSP before tearing the old working LSP down *Id.*, 3-5. The excerpt of Guichard provided by Petitioner does not address finding optimal protection LSPs, as it is directed to recovery systems based on “on-the-fly” restoration, rather than selection of a protection path.

In a different part (identified in an excerpt provided by the Patent Owner), Guichard makes clear that “on-the-fly” restoration—as discussed in Petitioner’s excerpt of Guichard describing optimization—belongs to a different “famil[y] of network recovery mechanisms” than network protection through precomputed backup paths, to which the ’821 Patent methods and systems are directed. Ex2028 [Guichard], 96.

Guichard also explains that there are several different criteria and network objectives to consider in choosing between different network recovery mechanisms, including the “scope of recovery” (i.e., whether the recovery mechanism includes

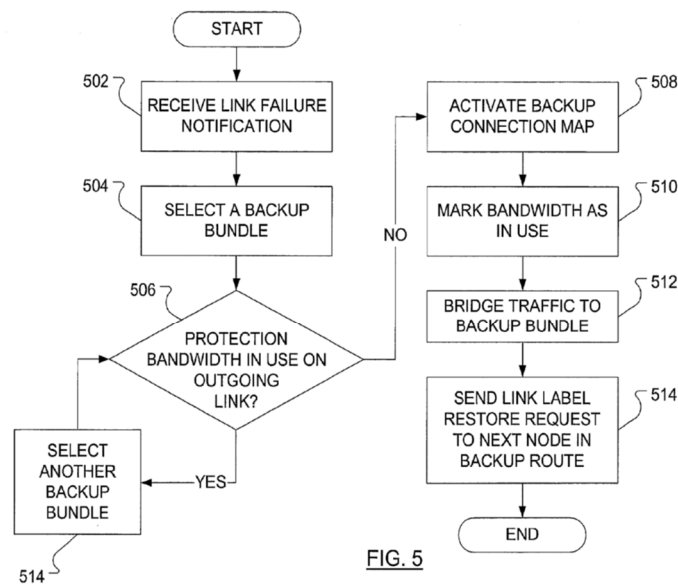
“link failures”), quality of service during failure (i.e., whether the backup path “provide[s] equivalent QoS”), network overhead (i.e., the extra information or “state” required by the recovery mechanism), cost, and network stability. Ex2028 [Guichard], 96.

Guichard explains further that though combining recovery mechanisms may be desirable in some cases, it might also require “extra care to avoid race conditions between recovery mechanisms and double protection, which may lead to a lack of optimality in terms of backup resources.” Ex2028 [Guichard], 96. Thus, Guichard lays out a number of considerations that a POSITA would have to consider before selecting between different network recovery mechanisms as well as combining such mechanisms to create a hybrid recovery mechanism.

Notably, Petitioner’s expert Dr. Houh did not include or address any of these teachings from Guichard in his declaration. *See generally* Houh Declaration.

3. Huang (Ex1007)

Huang (U.S. Pat. Pub. 2003/0117950) is directed to identifying backup paths for network routing in case of “the event of a failure in the fiber.” Ex1007 [Huang], Abstract. Huang Fig. 5 (below) “illustrates steps performed by a head end node in a link redial method” in one embodiment of Huang. *Id.*, ¶[0024].



At step 502, the node receives a link failure notification. *Id.*, ¶[0048]. At step 504, the node selects a “backup bundle” (that is, a group of backup LSPs). *Id.*, ¶[0048]. At step 506, the node determines “whether the protection bandwidth [i.e., the amount of bandwidth needed for a proposed level of protection] is in use on the first outgoing link.” *Id.* If the bandwidth is already in use, then another “backup bundle” is selected. If the bandwidth is not in use, the node “activates the backup connection map (step 508)” and “mark[s] the protection bandwidth on the first outgoing link as being used (step 510).” *Id.* In step 512, “the interrupted traffic [is] bridged to the backup bundle.” *Id.* Finally, at step 514, the node “sends a Link Label Restore Request message to the first node 102C on the backup route.” *Id.* This message ultimately allows the node to “begin[] sending traffic over the backup route.” *Id.*, ¶[0052].

4. Xu (Ex1025)

Xu (U.S. Pat. Pub. 2011/0141877) is directed to a network load balancing method that “uses fixed paths and a fixed path-splitting strategy to enable ingress routers to efficiently reroute traffic after a failure.” Ex1025 [Abstract]. “An off-line management system computes a set of fixed paths and a set of splitting ratios for routing demand from ingress routers to egress routers, with sufficient capacity to meet demands under each failure scenario.” *Id.*, “That data is then used by the ingress router to reroute demand after observing a failure.” *Id.*

Xu teaches load balancing according to the following method:

At an ingress router u_d , traffic is routed by automatically balancing traffic load over a predefined set of paths P_d from the ingress router u_d to the egress router v_d according to a set of splitting ratios α_p . Each splitting ratio defines a fraction of the demands d to be transmitted over a path p of the set of paths P_d in a case of a detectable failure state o corresponding to a subset of a set of modeled failure states s .

Ex1025 [Xu], ¶[0006]. Thus, the routers of Xu transmit traffic over multiple paths p simultaneously according to “splitting ratios” that define the fraction of traffic sent over multiple paths p . If one or more paths p fail, the fraction of traffic sent over other paths p is altered in accordance with the relevant splitting ratio.

Xu explains the advantages of its multipath routing scheme as follows:

Multipath routing between each pair of ingress and egress routers is utilized. Such end-to-end routing has several benefits. First, these routes do not need to change when a failure is detected, which saves time, reduces overhead, and improves path stability. Second, end-to-end load balancing spreads the traffic in the network more effectively than local rerouting. Third, it enables faster recovery and lower protocol overhead than conventional link-state routing protocols, like Open Shortest Path First (OSPF), which not only rely on flooding link-state advertisements and re-computing shortest paths but also suffer from transient forwarding loops. A fourth benefit is the solution's simplicity; most of the functionality is incorporated in the Network-Management Software (NMS) rather than the network elements. The NMS is responsible for selecting the end-to-end paths and calculating the path-splitting parameters for each router. The solution has a minimalist control plane, used only for failure detection, which leads naturally to a simpler network where smart, expensive routers are replaced with cheaper routers and/or switches with a limited feature set.

Id., ¶¶[0030]. Thus, Xu purports that its static multipath routing solution with routes that “do not need to change when a failure is detected” has a number of benefits over techniques that change paths when a path fails.

Xu teaches the detection of “failure states” based on a set of predetermined probabilities of occurrence. *Id.*, ¶¶[0005]-[0007]. “The set of modeled failure states are states that cause at least one path p of the predefined set of paths p_d to fail.” *Id.*,

¶[0006]. “Each modeled failure state has at least a predetermined probability of occurrence.” *Id.* This “predetermined probability of occurrence may be sufficient to meet a predetermined network availability objective when the network is restored against the set of modeled failure states.” *Id.*, ¶[0007]. However, not all possible failure states are included in the set of predetermined modeled failure states, and only the most probable are included. *Id.*, ¶[0049] (“Of course, any subset has a non-zero probability of simultaneous failure, but because of the monstrous size of ‘all’ subsets, for practicality the set is usually restricted to the most probable.”).

G. Level of Ordinary Skill

The Institution Decision adopted Petitioner’s level of ordinary skill. DI, 15. For purposes of this Patent Owner Response, Patent Owner does not dispute Petitioner’s level of ordinary skill for purposes of this Patent Owner Response.

III. NO COMBINATION OF THE CITED PRIOR ART REFERENCES TEACHES OR SUGGESTS EVERY LIMITATION OF THE CLAIMS

As discussed below, Doshi and Guichard do not render independent claims 1 or 17 obvious and Doshi, Guichard and Huang do not render independent claim 14 obvious. First, neither Doshi nor Guichard teaches or suggests the limitation in claims 1 and 17 of “selecting an entity pair from said plurality of transport entities based at least in part upon said overall cost.” The Petition relies on Doshi for “selecting an entity pair.” Pet., 35-36. Doshi selects a primary path from one subset

of transport entities and a restoration path from a second subset of transport entities. It does not select an entity pair from the entire “plurality of transport entities” as required by the claims. The same analysis applies to claim 14’s similar limitation “digital logic configured to select said working entity and said protection entity from said plurality of transport entity descriptors.”

Second, claims 1 and 17 contain the limitation “if an entity pair reselection event occurs, reselecting said entity pair from the group consisting of said entity pair and a replacement entity pair comprising at least one entity distinct from the entities of said entity pair.” Petitioner combines Doshi and Guichard for this limitation (Pet., 40-45, 63-65) but neither Doshi nor Guichard discloses reselecting an entity pair. Guichard’s reselection is limited to reselecting a single active path, and Doshi does not address reselection. Further, Guichard distinguishes between “restoration” mechanisms (such as Guichard’s reselection mechanism) and “protection” mechanisms (such as Doshi’s primary/protection path pair), and Petitioner does not explain why a POSITA would adapt the combination of Doshi and Guichard in this undisclosed manner, or why that adaptation would have a reasonable expectation of success. Accordingly claims 1 and 17, and claims 2-13 and 18-20 that depend therefrom, are patentable over Doshi and Guichard.

Third, independent claim 14 requires “logic configured to determine a probability of concurrent failure of said working entity and said protection entity”.

Ex1001 ['821 Patent], claim 14. The DI correctly found that Petitioner had demonstrated a reasonable likelihood of prevailing on claim 14 because Doshi does not disclose any logic that determines the probability of concurrent failure and Xu's failure states only relates to a predetermined threshold probability of each failure state. DI, 38-39. Accordingly, claim 14 and claims 15 and 16 that depend therefrom are patentable over Doshi, Guichard, and Xu.

Finally, as discussed below, dependent claims 2, 13 and 18 are separately patentable over Doshi and Guichard.

A. The Asserted References Do Not Teach Or Suggest “Selecting An Entity Pair From Said Plurality Of Transport Entities Based At Least In Part Upon Said Overall Cost” (the “selection limitation”)

Independent claims 1 and 17 require “selecting an entity pair from said plurality of transport entities based at least in part upon said overall cost” (the claimed “selection step”). Ex1001 ['821 Patent], claims 1 and 17. Petitioner asserts that Doshi renders this element obvious in view of Guichard. Pet., 35-40, 65. As explained below, Petitioner's assertion fails because Doshi discloses a simplified selection in which the number of available pairs does not correspond to “said plurality of transport entities.”

A POSITA would understand the step of “selecting an *entity pair* from *said* plurality of transport entities” in the context of the preceding requirements of claim 1, which provide antecedent basis for and otherwise set up the claimed selection

step. Ex2025 [Gomez Decl.], ¶65. Those requirements include (i) “providing a plurality of ... transport entities between a first endpoint and a second endpoint” and (ii) “determining an overall cost *for each entity pair of said plurality* of entities.” Ex1001 [’821 Patent], claims 1 and 17. A POSITA would thus understand that the claimed selection is made from each of the “entity pairs of said plurality of entities,” for which the overall cost has been determined. Ex2025 [Gomez Decl.], ¶65.

Unlike the claim language, which requires selecting an entity pair from the pairs associated with *said* plurality of entities, Doshi teaches a simplified selection process in which an entity pair is selected from a narrow subset of the candidate pairs associated with *said* plurality of entities. In particular, Doshi discloses calculating two sets of entities (or paths), one set of K primary paths and one set of K restoration paths, as shown in Figure 11, steps 1102 and 1104:

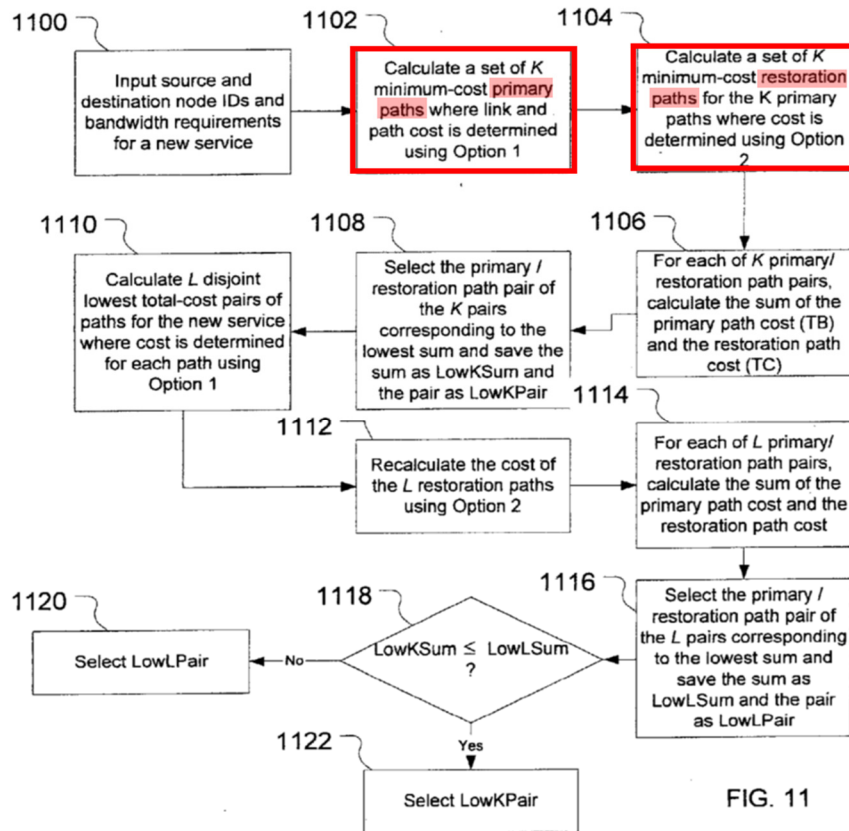


FIG. 11

See also Ex1005 [Doshi], ¶[0143]. At steps 1106-1108, Doshi instructs calculating the cost for K pairs of paths and selecting one pair from those K pairs; thus, for a plurality of K entities, Doshi instructs a POSITA to create a set of candidate pairs with K members. This differs from the total number of pairs that the method of the '821 Patent would yield from the same number of entities (*i.e.*, from the claimed “said plurality” discussed *supra*). Ex2025 [Gomez Decl.], ¶[67].

A numerical example helps illustrate this difference. Assuming a plurality of 10 MPLS entities between two network nodes (*i.e.*, K=10), Doshi teaches a POSITA to calculate at most 10 candidate pairs at steps 1106-1108. Doshi requires that the

total number of available pairs does not exceed the total number of available candidate paths. Ex2025 [Gomez Decl.], ¶68.

In contrast to Doshi, a POSITA would understand claim 1 of the '821 Patent to require a much more computationally intensive process because it requires selecting from the total number of potential paths associated with “said plurality” of entities; and the number of pairs associated with a set of entities (i.e., a plurality) always exceeds the number of entities.

Again, this is better illustrated by applying the same numerical parameters to an exemplary execution of the claimed selection step. Assuming—similar to the example used for Doshi—a plurality of 10 MPLS entities between two network nodes (*i.e.*, $K=10$), a POSITA would understand that there are 90 corresponding candidate path pairs, assuming that the entities in the resulting pairs are not interchangeable (*i.e.*, primary path A and secondary path B are a different pair than primary path B and secondary path A, or $\{A,B\} \neq \{B,A\}$). Ex2025 [Gomez Decl.], ¶¶69-70. This is because, for a plurality of 10 MPLS paths, every potential primary path (A-K) there are nine potential corresponding protection paths (A-K minus whichever is the primary at any given time). If the same POSITA were to treat pairs as interchangeable, irrespective of their designation as primary/protection paths (*e.g.*, $\{A, B\} = \{B,A\}$) then the total number of candidate pairs associated with a

plurality of 10 MPLS paths would be 45 (i.e., half of the previous example).¹
Ex2025 [Gomez Decl.], ¶70.

In any event, a POSITA would readily understand that Doshi's selection process is not a selection of a pair from the pairs associated with "*said* plurality" as required by the claims. Rather, Doshi's selection process curbs the size of the candidate selection set and is effectively a shortcut compared to the selection required by claim 1. Ex2025 [Gomez Decl.], ¶71.

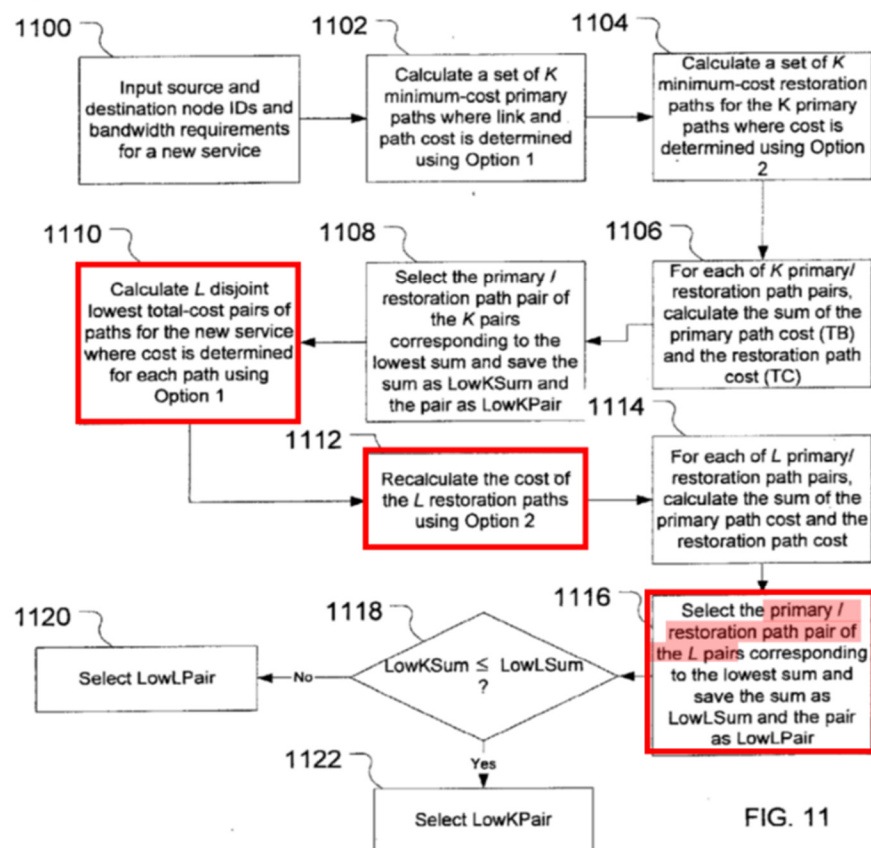
Doshi discloses additional details for its selection process that further demonstrate that it does not select an entity pair from *said* plurality of entities and associated pairs. First, at step 1102 Doshi's method calculates a group of potential "minimum-cost" primary paths, which appear to be a subset of the total provided paths. Thus, Doshi does not disclose selecting primary paths from *said* plurality of transport entities between a first endpoint and a second endpoint.

Second, Doshi discloses calculating a set of secondary "restoration paths" that

¹ If K is the number of entities and N is the number of pairs associated with those entities, then, assuming pair order is not significant, the total number of pairs is $N=K*(K-1)/2$; and if pair order is significant, the total number of pairs is $N=K*(K-1)$.

correspond to the primary paths. Even assuming the primary paths are selected from *said* plurality of transport entities, there is no disclosure in Doshi that the restoration paths are calculated from the same *said* plurality of primary paths. In other words, Doshi's set of K minimum-cost primary paths may be different than Doshi's set of K minimum-cost restoration paths. Thus, Doshi does not disclose selecting a pair of entities from "a plurality of transport entities" because it does not disclose selecting a restoration path from the same plurality of transport entities as the primary paths.

Third, Doshi fails to disclose a selection from *said* plurality of entities with respect to the selection process shown at Doshi Fig. 11, at step 1116 shown below:



At 1116, Doshi discloses selecting an entity pair (*i.e.*, a primary/ and restoration path) from a group of L primary/restoration path pairs. Ex1005 [Doshi], ¶[0144], Fig. 11. Those L path pairs are described as the “L disjoint lowest total-cost pairs of paths” at step 1110. Because the disjoint path pairs are necessarily a subset of the total number of path pairs (since not all pairs are disjoint), this selection likewise is made from a number of candidate paths that is less or equal than the plurality K at step 1102. Accordingly, for the same reasons that Doshi’s first selection (*i.e.*, with respect to K paths and pairs) fails to disclose the claimed selection step, Doshi’s second selection likewise fails to disclose this step.

Lastly, Doshi fails to disclose the claimed selection step from *said* plurality of entities for the separate reason that—both as to its selection of a pair from the K and L groups—it discloses, at step 1116, selecting a pair either from the K group or from the L group, not from *said* plurality of provided paths, as required by the claimed selection step. Ex1005 [Doshi], ¶[0144].

Accordingly, because Doshi discloses a shortcut selection that is materially different from the claimed selection step of claim 1, Doshi does not disclose or render obvious this limitation or claims 1 and 17.

B. The Asserted References Do Not Teach Or Suggest “Digital Logic Configured To Select Said Working Entity And Said Protection Entity From Said Plurality of Transport Entity Descriptors.”

Similar to independent claim 1, independent claim 14 requires “a data

structure comprising a plurality of transport entity descriptors” along with “digital logic configured to *select said working entity and said protection entity from said plurality of transport entity descriptors.*” Ex1001 [’821 Patent], claim 14. Here, the working and protection entity are equivalent to the entity pair of claim 1 and the transport entity descriptors correspond to the transport entities of claim 1. Petitioner asserts that the same combination (Doshi in combination with Guichard) renders this limitation obvious, relying to its analysis of claim 1 in support. Pet., 78-79.

Given that there are no substantial differences between this limitation and the selection step of claim 1 and Petitioner asserts the same arguments, Petitioner’s challenge as to claim 14 fails for the same reasons as for claims 1 and 17.

C. The Asserted References Do Not Teach Or Suggest “if an entity pair reselection event occurs, reselecting said entity pair from the group consisting of said entity pair and a replacement entity pair comprising at least one entity distinct from the entities of said entity pair”

Independent claims 1 and 17 require that “if an entity pair reselection event occurs, reselecting said entity pair from the group consisting of said entity pair and a replacement entity pair comprising at least one entity distinct from the entities of said entity pair” (the claimed “reselection”). Ex1001 [’821 Patent], claims 1 and 17.

Petitioner *does not* contend that either Guichard or Doshi (the references on which its obviousness grounds are based) disclose the claimed reselection of an entity pair. Rather, Petitioner asserts that: (i) Guichard “teaches event-driven

reoptimization ... upon the occurrence of a particular event” (e.g., “each time a new link is advertised as newly operational”) and (ii) “it would have been obvious to a POSITA, in view of Guichard, to perform event-driven reoptimization, when implementing Doshi’s MPLS architecture.” Pet., 40-41.

Indisputably, Guichard does *not* disclose the use of entity pairs or of a protection entity; and Doshi does not disclose reoptimization of either an entity pair or of a protection entity. Petitioner’s challenge based on Guichard and Doshi thus rests on two steps: *first*, combining Guichard’s primary path reoptimization with Doshi’s entity pair to produce a system in which the primary path is reoptimized, and, *second*, adapting this combination to practice reoptimization of both a primary path (as disclosed in Guichard) and a protection path (which is not disclosed in either Doshi or Guichard).

As explained below in detail, Petitioner has failed to show that a POSITA would have found either of these two steps obvious. Ex2025 [Gomez Decl.], ¶¶84. First, Petitioner fails to provide a reason for which a POSITA would have combined Doshi and Guichard. Second, even assuming a POSITA would have combined Doshi with Guichard to practice primary path reoptimization, Petitioner fails to contend—or to provide a reason for which—a POSITA would adapt the Doshi/Guichard combination to practice the claimed reselection of an entity pair (i.e., “reselecting said entity pair”), as opposed to the reselection of a primary path

only. Third, Petitioner has failed to provide a reason for which a POSITA would have had a reasonable expectation that such an adapted combination would succeed in the manner in which it is set forth in the claims of the '821 patent. Ex2025 [Gomez Decl.], ¶84.

1. Petitioner Has Failed to Provide a Reason for Which a POSITA Combine Doshi and Guichard

Petitioner asserts that a POSITA would have combined Guichard and Doshi because (i) Guichard teaches that reoptimization is “highly desirable” (Petition at 20) and (ii) a “POSITA considering Doshi would have naturally considered the teachings of Guichard” because both references “generally pertain to MPLS networks and address the problem of selecting LSPs” with a low cost. Petition at 20-21. In particular, Petitioner asserts that the “combination represents what would have been common sense to a POSITA—that it is desirable to evaluate whether selected LSPs remain optimal and to reoptimize the selection if a better option is available.” Petitioner’s assertions are incorrect and, in any event, fail as a matter of law.

That both Guichard and Doshi are purportedly directed to an efficient and reliable MPLS network does not (and cannot) as a matter of law provide a reason to combine these two specific references. The needs for efficiency and reliability are common to virtually every innovation in the field of MPLS networks (Ex2025

[Gomez Decl.], ¶¶86-88.); thus, they are precisely the types of **generic** needs that the Federal Circuit has held insufficient to provide reason to combine specific prior art references to practice a specific claimed invention. *See Forest Lab’ys, LLC v. Sigmapharm Lab’ys, LLC*, 918 F.3d 928, 935 (Fed. Cir. 2019) (“a generic need for more antipsychotic treatment options did not provide a motivation to combine these particular prior art elements”).

Federal Circuit precedent is clear and well-established on this very point: in determining whether a POSITA would have combined two references with discrete teachings—like Guichard and Doshi—the correct inquiry is not whether a POSITA, “with two (and only two) references sitting on the table in front of him, would have been motivated to combine ... the references in a way that renders the claimed invention obvious[; rather, the] real question is whether that skilled artisan would have plucked” those references out of the sea of prior art in order to combine them. *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1337 (Fed. Cir. 2016); *see also Personal Web Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 993-94 (Fed. Cir. 2017) (“that reasoning seems to say no more than that a skilled artisan, once presented with the two references, would have understood that they *could be* combined. And that is not enough: it does not imply a motivation to pick out those two references and combine them to arrive at the claimed invention.”) (emphasis in the original). Moreover, it is well-settled that the “common sense” (Pet., 22) that Petitioner and its expert invoke

cannot alone provide a reason to combine references and adapt their combination to practice an invention in the manner set forth specifically in the claims. *In re Van Os*, 844 F.3d 1359 (Fed. Cir. 2017) (“Absent some articulated rationale, a finding that a combination of prior art would have been ‘common sense’ or ‘intuitive’ is no different than merely stating the combination ‘would have been obvious.’ Such a conclusory assertion with no explanation is inadequate to support a finding that there would have been a motivation to combine.”)

Here, Guichard teaches reoptimization in a system that *omits* the protection path featured in Doshi; and Doshi *omits* the reoptimization technique taught in Guichard. Moreover, Guichard contains disclosures that Petitioner chose not to include in its Petition and its expert’s declaration, which discuss systems featuring precomputed protection entities:

There are actually two families of network recovery mechanisms—protection and restoration. A protection mechanism relies on the precomputation (and signaling) of a backup (alternate) path before any failure. In contrast, a restoration mechanism requires the computation of the backup path only after the failure has occurred; in other words, the backup path is computed on the fly.

Ex2028 [Guichard], 96. Notwithstanding its discussion of protection systems (like the Doshi system), Guichard does not teach a protection system with reoptimization, nor does it suggest it is desirable to apply reoptimization in the context of such

systems; rather, it discloses that restoration systems (like Guichard) and protection systems (like Doshi) belong to different “families of network recovery systems.” *Id.* Ex2025 [Gomez Decl.], ¶90.

Guichard also teaches, that protection systems like Doshi may be faster in some respects but also “require more network overhead because extra state is required.” Ex2028 [Guichard], 96-97. And, with respect to combining restoration systems (like Guichard’s) with protection systems (like Doshi’s), as discussed *supra*, Guichard explains further that combining such recovery mechanisms requires “extra care to avoid ... *a lack of optimality* in terms of backup resources.” Ex2028 [Guichard], 96.

In this context, a POSITA would *not* understand Guichard’s disclosure of reoptimizing a primary path as a reason to combine Guichard’s restoration system with Guichard’s protection system. Thus, the statement upon which Petitioner relies is insufficient to provide a reason to combine. Ex2025 [Gomez Decl.], ¶90.

Indeed, a POSITA reading Guichard would understand that protection systems like Doshi’s and reoptimization techniques like Guichard’s entail significant costs and tradeoffs (such as increased network overhead) that might make such a combination disadvantageous; and Guichard teaches expressly that such combinations are very likely to be suboptimal. These tradeoffs and teachings would deter a POSITA from combining the two systems. Ex2025 [Gomez Decl.], ¶¶91-92.

Critically, Petitioner fails to address, let alone analyze these tradeoffs as would be required to demonstrate that a POSITA would have chosen to take the “extra care” required to combine the two references. Instead, Petitioner contends—without basis and only with generic assertions in support—that a POSITA would have combined Doshi’s protection systems with Guichard’s reoptimization. Pet., 67-69. But the law is clear that “[t]he factual inquiry whether to combine references must be thorough and searching, and the need for specificity pervades our authority on the PTAB’s findings on motivation to combine.” *In re Nuvasive, Inc.*, 842 F.3d 1376, 1381-82 (Fed. Cir. 2016) (citing *In re Lee*, 277 F.3d 1338, 1343 (Fed. Cir. 2002)) (emphasis added). Petitioner’s assertions fail as a matter of law to supply an “apparent reason” to combine the prior art teachings “in the fashion claimed by the patent at issue,” let alone with the specificity required by the Federal Circuit to prove obviousness. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). Accordingly, the Board should reject Petitioner’s grounds as to all claims that recite the reselection limitation.

2. Petitioner Has Failed to Provide a Reason for Which a POSITA Would Adapt Such a Combination

Even if Petitioner had provided an apparent reason for which a POSITA would specifically combine Guichard and Doshi (it has not), Petitioner’s assertion that the Doshi/Guichard combination renders the reselection limitation obvious still fails

because Petitioner has failed to provide any reason for *adapting* that combination to practice reselection with respect to entity pairs.

Claim 1 is clear that “if an *entity pair reselection event occurs*, reselecting *said entity* pair from the group consisting of *said entity pair and a replacement entity pair* comprising at least one entity distinct from the entities of *said entity pair*.” Ex1001 [’821 Patent], claim 1. As discussed *supra*, Doshi discloses the use of entity pairs (i.e., a primary entity and a protection entity) but does not disclose the reoptimization (or reselection) of either its primary or protection entities. Moreover, Doshi discloses a selection process in which the primary entity is selected from one set (with K or L members) and the corresponding protection entity is selected from a second set (also with K or L members). *Supra*, §III.A. Thus, to the extent that a POSITA were to adapt Doshi to practice reoptimization (or reselection) that reoptimization would occur with respect to individual entities in a pair, rather than all pairs associated with a given plurality of entities. Ex2025 [Gomez Decl.], ¶95.

This is important because Guichard teaches reoptimization of a single entity in a restoration system, not reoptimization of an entity pair, i.e., reoptimization in a protection system like the one in Doshi. Thus, to the extent that a POSITA would have had a reason to combine Doshi and Guichard (it would not), such a POSITA would create a combination in which reoptimization would be used only with respect to the primary path, which is what Guichard teaches. Because Guichard does not

teach reoptimization of a protection path, a POSITA would have to adapt the Guichard/Doshi combination to reoptimize the both the primary path and the protection path. Ex2025 [Gomez Decl.], ¶¶96.

Critically, Petitioner has failed to adduce any evidence or even contend in the Petition that a POSITA would adapt the purported Doshi/Guichard combination to practice reoptimization of both a primary and a protection path as required by the claims and thus has waived this argument. *Netflix, Inc. v. DivX, LLC*, Case Nos. 22-1203; -1204 (Fed. Cir. Oct. 25, 2023) (upholding patentability determination where challenger failed to raise and therefore forfeited arguments in Petition); *Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367 (Fed. Cir. 2016) (“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.’”).

But even assuming Petitioner had not forfeited the argument (it has), Petitioner has simply failed to provide any reasons for which a POSITA would (i) use reoptimization in the context of a protection entity and, critically, (ii) why a POSITA would create such a system in light of the significant tradeoffs (e.g., in “network overhead”) taught by Guichard.

Indeed, Guichard’s disclosures that protection mechanisms require substantially more “network overhead” due to the “extra state” that is required, and

that combining mechanisms from different families creates a “a lack of optimality,” teach against implementing the reoptimization of a restoration system (like Guichard) in a protection system (like Doshi), as this would increase the computational complexity of the recovery scheme and likely decrease its optimality, *i.e.*, undercut the goal of reoptimization. Ex2025 [Gomez Decl.], ¶¶99.

Petitioner’s own exhibits are replete with disclosures about the use of heuristics to reduce computational complexity (e.g., Ex1025 [Xu] Abstract, ¶¶[0049]), how such heuristics are actually preferable to “optimal” computational solutions that may be impractical (*e.g.*, Ex1025 [Xu] ¶¶[0030], [0056]-[0057]), how precomputation increases network overhead (e.g., Ex2028 [Guichard] 96-97), and how a POSITA must choose carefully among different levels of protection to balance optimality with other design constraints (e.g., Ex1007 [Huang], ¶¶[0010]-[0014] (discussing different levels of protection and associated costs and tradeoffs). Ex2025 [Gomez Decl.], ¶¶99-102. (discussing these references).

Rather than analyze or even address these issues—and articulate why a POSITA would choose to combine Guichard and Doshi and adapt the resulting combination—Petitioner and its expert have simply assumed that a POSITA would do so based on generic needs for efficiency (which Petitioner’s own art teaches are not met through a combination of fundamentally different systems like the proposed Doshi/Guichard combination). Petitioner’s conclusory contentions about such a

combination fail as a matter of law, and, for this additional reason, the Board should reject Petitioner's obviousness challenge.

3. Petitioner Has Failed to Provide a Reason for Which a POSITA Would Have Expected the Modified Doshi-Guichard Combination Would Succeed

Cisco contends that a POSITA would have a reasonable expectation of success in combining Doshi and Guichard on the basis of four assertions: (i) "Doshi and Guichard both address the same technology;" (ii) "Guichard provides significant implementation details;" (iii) "skilled artisans [] had reoptimized similar systems;" and (iv) "Doshi already sets forth the calculation and selection techniques that would be utilized during the reoptimization evaluation." Pet., 22-23.

As a threshold matter, as also explained *supra*, Petitioner has not provided a reason for adapting the Guichard/Doshi combination to reoptimize both a primary and a protection path as required by the claims. But even if the Board were to set this dispositive failure aside (the Board should not), Petitioner's assertions in support of its reasonable expectation contention fail for the reasons set forth below.

First, that Doshi and Guichard address the same technology lacks the required specificity to supply a POSITA with a reasonable expectation of success, as a matter of law. *See, e.g., Samsung Elecs. Co., Ltd. v. Elm 3DS Innovations, LLC*, 925 F.3d 1373, 1383 (Fed. Cir. 2019) (holding that in a complex field, "...specific evidence that a person of ordinary skill in the art would have reasonably expected success in

combining...” prior art elements is required). Further, as explained above, Guichard is directed to a restoration system that differs substantially from Doshi’s protection system and even classifies the two systems in different “families of network recovery mechanisms.” Neither reference discloses any rationale that might have led a POSITA to conclude that combining disparate elements from these two families would work successfully; and Petitioner’s rationales are conclusory boilerplate, lacking any detail. Pet., 22-23. Without a rationale as to why Doshi’s system would work with Guichard’s, a POSITA would not have had a reasonable expectation of success in combining the two. *See, e.g., Eli Lilly & Co. v. Teva Pharms. Int’l GmbH*, 8 F.4th 1331, 1347 (Fed. Cir. 2021) (finding no reasonable expectation of success when the Board considered “whether the references included any other ‘information’, ‘direction’, or ‘specific’ suggestion that would have led to a reasonable expectation of success” and found no such data were disclosed).

Second, contrary to Petitioner’s assertion, Guichard does not provide “significant implementation details.” Pet., 22-23. Though Guichard gives some high level guidance on the types of tools that can be used for reoptimization of a primary path, the three-page excerpt of Guichard that Petitioner attaches to the petition is entirely silent on how to reoptimize both a protection and a primary path, the scenarios in which such a reoptimization would even be appropriate, the relevant design trade-offs, or any other detail that would lead a POSITA to form a reasonable

expectation of success. Ex1006 [Guichard], 3-5. If anything, Guichard teaches against a system combining reoptimization with precomputed protection paths by disclosing the increased “network overhead” and “lack of optimality” of such a system, which a POSITA would expect only to be further increased if reselection/reoptimization were applied to both a primary and a protection path (i.e., a path pair), as required by the claims of the ’821 patent.

Third, Petitioner is likewise wrong that “skilled artisans had reoptimized similar systems.” Petitioner’s expert admitted that all but one of the references cited by Petitioner fail to disclose reoptimization of a protection path. Ex2027 [Houh Dep. Tr.], 90:20-24, 92:17-23, 95:25-96:7, 96:12-25, 130:21-131:5. Thus, these systems are not “similar” in that they do not disclose reoptimization of a protection path or an “entity pair” as required by the claims. The only reference that mentions reoptimization in the context of a protection system is the Zamfir reference. Ex1034 [Zamfir]; Pet., 23; Ex1003 [Houh Decl.], ¶65. Zamfir is a very different protection system than that of the ’821 patent. Zamfir does not describe a protection system based on entity pairs between two end points. Instead, Zamfir describes a dynamic and virtual protection system by creating paths on-the-fly. Ex1034 [Zamfir]. Thus, Petitioner’s assertion concerning “similar systems” likewise fails.

Fourth, Petitioner is wrong that “Doshi already sets forth the calculation and selection techniques that would be utilized during the reoptimization evaluation.”

Pet., 23. As an initial matter, Doshi says nothing about reoptimization. That Doshi contains some techniques that might work *without* reoptimization cannot possibly provide a POSITA with a reasonable expectation that the same techniques would work in the context of the Doshi/Guichard combination. Ex2025 [Gomez Decl.], ¶¶108-109. Indeed, Doshi’s techniques are designed to work in a system that employs shortcuts and heuristics to reduce computational complexity, including by using disjoint paths to avoid determining a probability of failure (*See* §III.D, *infra*), and by limiting the number of path pairs available for selection (*see* §III.A, *supra*). Performing the same computations repeatedly in response to state changes—as taught by Guichard—would increase the computational complexity of the Doshi system. Ex2025 [Gomez Decl.], ¶99. Given the teachings in Doshi and in other art (e.g., Xu, Guichard) concerning the desirability of reducing network overhead and simplifying network calculations, a POSITA would not understand Doshi’s disclosed techniques as a reason for which an adapted Doshi/Guichard combination would enjoy a reasonable expectation of success.

Accordingly, the Board should reject Petitioner’s obviousness combination as to the reselection limitation for this additional reason.

D. As The DI Correctly Held, The Asserted References Do Not Teach Or Suggest “Logic Configured To Determine A Probability Of Concurrent Failure Of Said Working Entity And Said Protection Entity”

Independent claim 14 requires “logic configured to determine a probability of concurrent failure of said working entity and said protection entity” (the “probability logic”). Ex1001 [’821 Patent], claim 14. Petitioner asserts that Doshi and Xu render this limitation obvious. Petitioner’s assertion fails. Neither Doshi nor Xu discloses determining such a probability, let alone the probability of concurrent failure of a working and protection entity. Likewise, neither Doshi nor Xu provides a reason for adapting either of the two references in light of the other to practice the claimed probability logic.

The claimed logic is expressly “configured to determine a probability of concurrent failure” of two entities (the working entity and protection entity). Ex1001 [’821 Patent], claim 14. The ’821 Patent teaches that it is desirable, in high availability MPLS networks, to provision primary and protection paths that are not likely to fail at the same time, to minimize service disruptions. *Id.*, 1:61-66 (“in network environments where span or node failure likelihood is relatively high, existing MPSSL-TP linear protection mechanisms may not meet operator availability requirements since they may not protect against one or several failures affecting both the working entity and the protection entity.”). To accomplish this, the ’821 Patent teaches configuring a logic to determine that probability and to factor that probability into the cost of the selected entity pairs. For instance, the ’821 describes the use of a probability matrix, which is used to accomplish this determination. Ex1001 [’821

Patent], 3:40-47 (“The concurrent failure probability matrix 150 examines the set of entities 120 and calculates the probability of concurrent failure for each entity pair.”). As Patent Owner’s expert Dr. Gomez attests, the probability matrix is further evidence—beyond what is already evident from the claim language—that the determination of a probability of concurrent failure requires a logical process. Ex1001 [Gomez Decl.], ¶¶115-116.

In contrast, neither Doshi nor Xu discloses determining such a probability; rather, as described below, both Doshi and Xu describe different heuristics (or shortcuts) for selecting entity pairs that are less susceptible to concurrent failure. These heuristics are used—in Xu and Doshi—in lieu of determining a probability of concurrent failure; thus, they cannot satisfy the requirement for a logic dedicated to determining such a probability, as required by the ’821 patent.

1. Doshi

Petitioner asserts that “[s]ince Doshi explains that the ‘probability of occurrence’ of two such failures is ‘very insignificant,’ a POSITA would have understood that determining that two paths are disjoint with no nodes or links in common is also a determination that the paths have a ‘very insignificant’ probability of failing concurrently.” Pet., 81 (*citing* Doshi ¶[0040]). In particular, Petitioner identifies Paragraph 40 of Doshi as a disclosure of this limitation:

Normally the extra capacity is sized for recovering from only a single

failure at a given time in the network. This is due to the fact that the probability of occurrence of more than one failure during the time interval required to repair a failure is very insignificant, and therefore most of the time it is sufficient to cover just a single network failure.

Ex1005 [Doshi], ¶[0040]. Contrary to Petitioner's assertion, this disclosure from Doshi teaches against determining a probability of failure.

Consistent with other heuristics that Doshi adopts to reduce the complexity associated with MPLS path protection, Doshi teaches a POSITA to ignore the probability of failure and instead opt for protection because the protection path is disjoint from the primary path. Ex1005 [Doshi], ¶[0040]; Ex1001 [Gomez Decl.], ¶119. According to Doshi the probability of concurrent failure when two paths are disjoint is "very insignificant;" therefore, when the pair selected is disjoint, the probability of concurrent failure need not be determined. But Doshi is silent on determining a probability, as required by the claim.

That Doshi is silent as to determining the probability of concurrent failure is further evident from the lack of any structure in Doshi for determining such a probability. In contrast, claim 14 recites "digital logic ... comprising: logic configured to determine a probability of concurrent failure". Ex1001 ['821 Patent], claim 14. The specification provides, as one example of such a logic, a probability matrix, the role of which is to determine the probability of concurrent failure of the

entity pairs associated with the claimed plurality of entities. Ex1001 [’821 Patent], 3:40-47; Ex1001 [Gomez Decl.], ¶120. Further, the ’821 Patent discloses that the probability of failure is a factor in the claimed cost determination for the entity pairs. Ex1001 [’821 Patent], 3:40-47 (“[a]n overall cost logic block 140 uses results from a concurrent failure probability matrix... to select the working entity 122 and the protection entity 124...” claim 14. In contrast, Doshi discloses selecting—in some instances—a disjoint pair, thus avoiding any probability determination.

Accordingly, far from disclosing the determination of a probability of concurrent failure, Doshi teaches against such a determination by adopting a shortcut in its protection system. Thus, independent claim 14 and claims 15 and 16 that depend therefrom are patentable over Doshi.

2. Xu

Petitioner also asserts that Xu discloses determining a probability of failure or renders this limitation obvious. Pet., 81-82. Essentially, Petitioner asserts that: (i) Xu discloses a scenario in which a primary and a protection entity fail concurrently; and (ii) “Xu explains that each failure state has a ‘predetermined probability of occurrence’” from which a POSITA would understand that said “probability has been ‘determine[d]’.” Pet., 81-82 (quoting Ex1025 [Xu], ¶[0006]. For reasons explained below, both of Petitioner’s assertions are wrong.

Petitioner’s first assertion is wrong because the claim do not require

determining a probability of concurrent failure in the abstract; rather, they require determining the probability of concurrent failure of “said working entity and said protection entity.” Ex1001 [’821 Patent], claim 14. Unlike the claims, Xu’s “failure states” do not relate to a working entity and protection entity as required by claim 14. Xu does not even teach the concept of a “protection entity;” rather, Xu describes a conceptually and fundamentally different architecture for “balancing traffic load over a predefined set of paths P_d ” (e.g., multipath routing). Ex1025 [Xu], ¶¶[0006], [0030].

Xu discloses that each available path p in the set of paths P_d may simultaneously carry a fraction of the traffic between two routers according to a “splitting ratio.” *Id.*, ¶[0006]. If one or more paths fail, Xu uses a different splitting ratio to determine how much traffic to transmit over each remaining path p . *Id.*, ¶[0008]. Because each path p is constantly transmitting if it is available, each path is by default a “working entity,” *i.e.*, it is constantly transmitting and receiving traffic, and there is therefore no designated “protection entity” as required by the claims here. *See id.*, ¶¶[0030], [0035]. Indeed, because all entities are actively transmitting and receiving, Xu does not describe the concept of a “working entity” at all, let alone of a “protection entity.”

This difference between claim 14 and Xu is captured by an analogy comparing water drain systems. A typical bathroom sink has a main drain at the bottom and an

overflow drain near the top in case the bottom drain is stopped. This is similar to claim 14, where there is a working entity (the main drain) and a protection entity (the overflow drain) for use only if the working entity fails. Xu does not work like this. Instead, Xu is similar to storm drains, *i.e.*, multiple drains, each designed to carry a portion of the runoff water during a rainstorm (similar to the drainage system of a street). To account for the possibility of a single drain getting blocked (or failing), the system can redistribute the extra water to the other drains, which are designed with excess capacity. In this architecture, there is no concept of at least a “protection entity” or of “a probability of concurrent failure” for a “protection entity.” Thus, Xu is not determining “a probability of concurrent failure **of said working entity and said protection entity**” as required by claim 14. Ex1001 [Gomez Decl.], ¶125.

But even setting aside the problems with Petitioner’s first assertion, Petitioner’s second assertion (concerning the determination of a probability) is also wrong. Like Doshi, Xu discloses a heuristic (or shortcut) that is used to ***avoid*** determining a probability of failure. Xu teaches a “predetermined probability of occurrence” that is a predetermined threshold probability of failure (used to inform the appropriate splitting ratios in a static system (Ex1025 [Xu], ¶[0049]; Ex1001 [Gomez Decl.], ¶126)), not the actual probability of individual failure states. In particular, Xu discloses a “set of failure scenarios S” comprised of the links and

nodes that are most likely to fail (*id.*, ¶[0049]). It does not disclose a mechanism or logic for determining the probability of concurrent failure of an entity pair, as required by claim 14.

Petitioner’s argument—that the predetermined probabilities fed into the Xu system must be determined—is simply illogical. The claims require “logic configured to determine a probability”—not using a predetermined probability. Using a predetermined probability is akin to using a prefabricated component (or a prebaked food); and it is simply not the same thing as building a component (or cooking). Xu’s prebaked probabilities are likewise different from calculating probabilities in a dynamically changing system like an MPLS network. Indeed, Xu emphasizes the use of heuristics (shortcuts) in connection with implementing network protection “because of the monstrous size of ‘all’ subsets” that would need to be calculated if a POSITA were to opt for determining a probability on the fly. Ex1025 [Xu], ¶[0049]; Ex1001 [Gomez Decl.], ¶127. Moreover, Xu does not explain how or whether its system determines probabilities for individual failure states, let alone provide any reason to a POSITA that those probabilities were actually determined (as opposed to, for example, extracted from historic data or other assumptions).

Thus, independent claim 14, and claims 15-16 that depend therefrom, are patentable over Doshi and Xu.

E. Claims 2 and 18 are Patentable Over Doshi

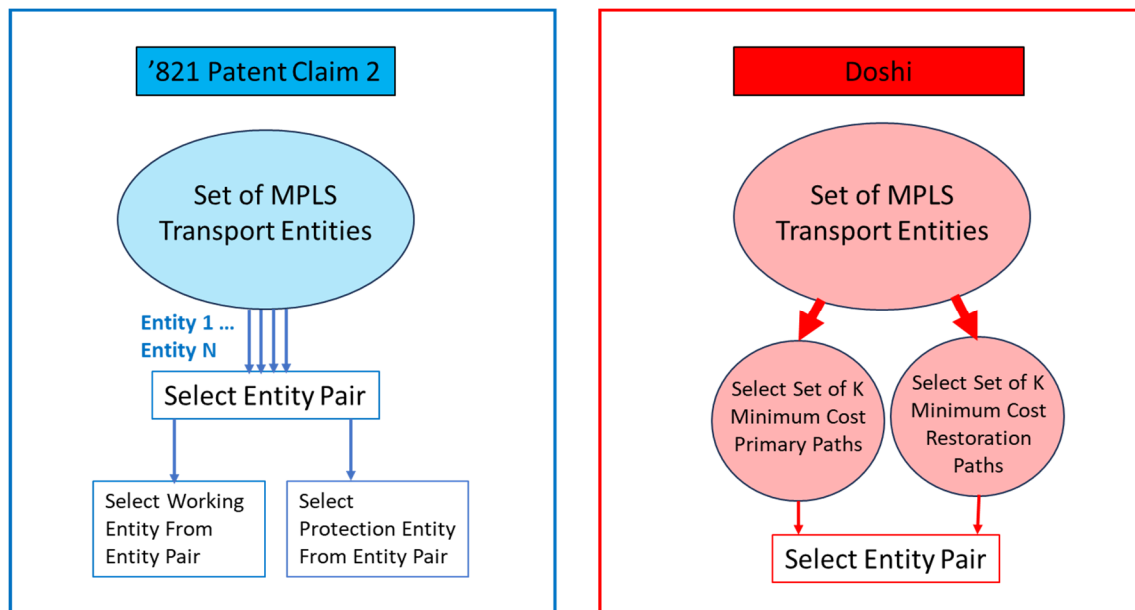
Claim 2 requires “[t]he method of claim 1, wherein said step of selecting an entity pair further comprises: selecting a working entity from said entity pair; and selecting a protection entity from said entity pair.” Ex1001 [’821 Patent], claim 2. Claim 18 similarly requires “selecting a working entity from said plurality of transport entities” and “selecting a protection entity from said plurality of transport entities”, among other limitations. Ex1001 [’821 Patent], claim 18. The Petition relies on Doshi alone for these limitations. Pet., 46-47, 65. Doshi does not disclose these limitations.

The language of claim 2 requires both working and protection entity are chosen “from said entity pair.” *Id.* “Said entity pair” refers to the entity pair chosen in claim 1: “selecting an entity pair from said plurality of transport entities.” *Id.*, claim 1. Thus, claim 2 requires selecting an “entity pair” (i.e., 2) of transport entities. *Id.*, claim 2. From this already-selected “entity pair” (i.e., a set of 2 entities), claim 2 requires that one transport entity is selected as a working entity and one is selected as a protection entity. *Id.*

Doshi does something different. First, Doshi selects “a set of K minimum cost primary paths” out of all available paths. Ex1005 [Doshi], ¶[0143], Fig. 11. Then, Doshi selects “a set of K minimum-cost restoration paths” out of all available paths. *Id.* Next, Doshi selects a primary path (e.g., a working entity) from the “set of

K minimum cost primary paths” and a restoration path (e.g., a protection entity) from the “set of K minimum-cost restoration paths.” *Id.* Thus, Doshi does not select a working entity from an entity pair or a protection entity from an entity pair as required by claim 2. Instead, Doshi selects a working entity from a group of potential working entities and a protection entity from a group of potential protection entities, and it only then creates a pair made up of those two entities. This is a fundamentally different process than claim 2 of the ’821 Patent.

The difference between the techniques taught by ’821 Patent claim 2 and Doshi is shown in the illustration below:



In claim 2, the entity pair is selected before the working and protection entity are selected; In Doshi, the entity pair is selected after the potential working entities and protection entities are selected. Thus, claims 2 and 18 are patentable over Doshi.

F. Claim 13 is Patentable Over Doshi

Claim 13 requires “[t]he method of claim 1, further comprising the step of: if said entity pair reselection results in both working and protection entities being replaced, sequentially replacing said working entity and said protection entity.” Ex1001 [’821 Patent], claim 13. The Petition relies on Doshi in view of Guichard for this limitation. Pet., 59-63. The Petition provides no explanation or evidence that either Doshi or Guichard discloses “sequentially replacing said working entity and said protection entity.” *Id.* Thus, the Petition effectively concedes that neither Doshi nor Guichard disclose this limitation.

Instead, Petitioner argues, without evidentiary support, that “[i]t would have been obvious for the LSPs of the originally selected pair (e.g., a primary LSP and a protection LSP) to be sequentially replaced as the ongoing reoptimization efforts identify lower cost LSPs.” Pet., 60. Thus, Petitioner argues that a POSITA would import the completely missing limitation (“sequentially replacing said working entity and said protection entity”) from their background knowledge.

The Federal Circuit has cautioned that “[i]n cases in which ‘common sense’ is used to supply a missing limitation, as distinct from a motivation to combine, ... our search for a reasoned basis for resort to common sense must be searching.” *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1363 (Fed. Cir. 2016). Further, such reliance “should generally only be done when ‘the [missing] limitation in question

[is] unusually simple and the technology particularly straightforward” and that “references to common sense ‘cannot be used as a wholesale substitute for reasoned analysis and evidentiary support.’ ” *Koninklijke Philips N.V. v. Google LLC*, 948 F.3d 1330, 1338 (Fed. Cir. 2020) (*quoting Arendi*, 832 F.3d at 1361-1362). *See, e.g., Abbott Diabetes Care Inc. v. Dexcom, Inc.*, IPR2022-00913, 2023 WL 7225556, at *16 (PTAB. Nov. 2, 2023).

Petitioner has not shown that this limitation is unusually simple or the technology particularly straightforward. To the contrary, entity pair reselection for path selection in MPLS technology is a very complex subject. Ex2025 [Gomez Decl.], ¶¶137-140. Multiple references in this IPR alone (including Doshi, Guichard, Huang and Xu) demonstrate that there are numerous ways to perform MPLS path selection, none of which are obviously preferred by a POSITA to the others. Ex2025 [Gomez Decl.], ¶137. And, as the Petition effectively concedes, none of these references teach or suggest sequentially replacing a working entity and a protection entity as required by claim 13. Ex2025 [Gomez Decl.], ¶¶141.

Nor does the Petition provide reasoned analysis or evidentiary support supporting its allegation that “sequentially replacing said working entity and said protection entity” in the context of claims 1 and 13 of the ’821 Patent is part of the general knowledge a POSITA would inherently conjure from thin air to combine with the Doshi reference and arrive at the claimed invention. Petitioner does not cite

a single piece of evidence (extrinsic or otherwise) tending to show that “sequentially replacing said working entity and said protection entity” in the MPLS network transport technology of claim 1 would be within the common knowledge of a POSITA. Pet., 59-63, Ex1003 [Houh Decl.], ¶¶174-181. Nor does Petitioner provide a rationale for why a POSITA would want to combine this nonexistent background knowledge of a POSITA with its hypothetical system of Doshi and Guichard, other than through hindsight reasoning. *See In re Van Os*, 844 F.3d 1359, 1361 (Fed. Cir. 2017) (“Absent some articulated rationale, a finding that a combination of prior art would have been ‘common sense’ or ‘intuitive’ is no different than merely stating the combination ‘would have been obvious.’”).

Instead, the Petition starts with the hindsight assumptions that the missing limitation is part of the background knowledge of a POSITA and assumes that a POSITA would naturally want to combine that knowledge with its hypothetical combination of Doshi and Guichard. Pet., 61-63. Based on these assumptions, the Petition speculates that a POSITA would start with “Doshi’s modified and annotated [by Petitioner] Figure 1” and then, in view of Guichard, choose to implement the undisclosed limitation. Pet., 61-62.

Petitioner’s attorney speculation is untethered to any objective facts. First, Petitioner’s analysis starts with Petitioner’s hypothetical annotations to Doshi Fig. 1 rather than Doshi itself. Pet., 61 (showing Doshi Fig. 1 as “modified and annotated”

by Petitioner. As discussed above, Petitioner's combination of Doshi and Guichard is flawed, and the combination does not teach claim 1. *Supra*, §III.C. Further, Petitioner's *annotations* are not reasoned analysis or evidentiary support. Thus, Petitioner's argument starts with unsupported assumptions about how a POSITA would interpret Doshi Fig. 1 before it even addresses the completely missing limitation.

Next, Petitioner speculates that “[w]hen both LSPs are determined to be suboptimal, a POSITA would have found it obvious to replace the LSPs sequentially to minimize interruption in service.” Pet., 62. But Petitioner points to no evidence that “both LSPs” in Doshi in view of Guichard would ever be “determined to be suboptimal.” As discussed above, Doshi does not discuss reoptimization and Guichard only discusses reoptimizing a single link (*supra*, §III.C), thus Petitioner's hypothetical combination lacks reoptimization of two LSPs, let alone any disclosure that both LSPs are “determined to be suboptimal.” Again, this highlights the hindsight nature of Petitioner's analysis. *See Asetek Danmark a/s v. Coolit Sys., Inc.*, IPR2020-00825, 2021 WL 4868406, at *15 (PTAB Oct. 12, 2021) (holding claim patentable where “the technology at issue is not simple, and it is apparent that multiple modifications to [the prior art] would likely be necessary for success.”).

Petitioner's only justification for implementing its hypothetical modifications is the boilerplate statement that “a POSITA would have appreciated the desirability

of maintaining a working and protection path throughout the replacement process.” Pet., 62. Petitioner cites no evidence in support. Further, even if true, there are any number of other techniques by which a POSITA could choose to maintain a working and protection path that do not involve “sequentially replacing said working entity and said protection entity.” Ex2025 [Gomez Decl.], ¶146. Petitioner provides no explanation or evidence explaining why a Petitioner would choose to implement the specific technique taught by claim 13.

Petitioner cites its expert declaration in support of its speculative argument. Pet., 59-63. But the expert declaration parrots back nearly verbatim the attorney argument presented in the Petition. Ex1003 [Houh Decl.], ¶¶174-180. Indeed, Dr. Houh does not cite a single piece of evidence in support of his opinions. *Id.* In such circumstances, Dr. Houh’s testimony is entitled to little, if any, weight. *Xerox Corp. et. al, v. Bytemark, Inc.*, IPR2022-00624, Paper 12 (Feb. 10, 2023) (“the Board was correct in giving little weight to Petitioner’s expert because the expert declaration merely offered conclusory assertions without underlying factual support and repeated, *verbatim*, Petitioner’s conclusory arguments.”).

Petitioner has not shown that this limitation is unusually simple or the technology particularly straightforward, or provide reasoned analysis or evidentiary support that the missing limitation is within the background knowledge of a POSITA. Instead, Petitioner provides a hindsight explanation that rests on several

layers of speculative assumptions about how a POSITA would implement Doshi in view of Guichard in view of a POSITA's background knowledge. Petitioner provides absolutely no evidence in support of its speculation. Under controlling Federal Circuit caselaw, Petitioner has failed to meet its burden to show that claim 13 is unpatentable. *Arendi*, 832 F.3d at 1361-1362.

IV. CONCLUSION

For the reasons set forth above, Petitioner has not met its burden of proving claims 1-20 of the '821 Patent are unpatentable by a preponderance of the evidence. The Board should therefore issue a final written decision finding claims 1-20 patentable.

Respectfully submitted,

/ Stephen P. McBride /

Stephen P. McBride, Reg. No. 78,396
CARMICHAEL IP, PLLC

Date: December 15, 2023

CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITS

This Patent Owner's Response (the "POR") consists of 13,107, excluding table of contents, table of authorities, certificate of service, this certificate, or table of exhibits. The POR complies with the type-volume limitation of 14,000 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: December 15, 2023

CERTIFICATE OF SERVICE

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

PATENT OWNER'S RESPONSE

EXHIBITS 2025-2036

The names and email addresses of the parties being served are as follows:

Theodore M. Foster	ipr.theo.foster@haynesboone.com
David L. McCombs	David.mccombs.ipr@haynesboone.com
Gregory P. Huh	Gregory.huh.ipr@haynesboone.com
Calmann J. Clements	Calmann.clements.ipr@haynesboone.com

Respectfully submitted,

/ Stephen P. McBride /

Date: December 15, 2023