

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CISCO SYSTEMS, INC.,
Petitioner,

v.

PORTSMOUTH NETWORK CORP.,
Patent Owner.

IPR2024-01450
Patent 7,596,088 B2

Before ST. JOHN COURTENAY III, JUSTIN T. ARBES, and
CHARLES J. BOUDREAU, *Administrative Patent Judges*.

ARBES, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. Background and Summary

Petitioner Cisco Systems, Inc., filed a Petition (Paper 2, “Pet.”) requesting *inter partes* review of claims 1–4, 6–11, and 13–20 of U.S. Patent No. 7,596,088 B2 (Ex. 1001, “the ’088 patent”) pursuant to 35 U.S.C.

§ 311(a). Patent Owner Portsmouth Network Corp. filed a Preliminary Response (Paper 6, “Prelim. Resp.”) pursuant to 35 U.S.C. § 313.¹

Pursuant to 35 U.S.C. § 314(a), the Director may not authorize an *inter partes* review unless the information in the petition and preliminary response “shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” *See* 37 C.F.R. § 42.4(a) (“The Board institutes the trial on behalf of the Director.”). For the reasons that follow, we institute an *inter partes* review as to claims 1–4, 6–11, and 13–20 of the ’088 patent on all grounds of unpatentability asserted in the Petition.

B. Related Matters

The parties indicate that the ’088 patent was the subject of *Portsmouth Network Corp. v. Cisco Systems, Inc.*, No. 23-cv-00441 (E.D. Tex.), which has been dismissed. *See* Pet. 80; Paper 4, 2. Petitioner filed petitions challenging other patents previously asserted in the district court case in IPR2024-00503 (instituted), IPR2024-00505 (instituted), IPR2024-00506

¹ On April 25, 2025, Patent Owner filed a paper titled “Brief in Support of Patent Owner’s Request for Discretionary Denial” (Paper 7) and Exhibits 2002–2007, citing the “Interim Processes for PTAB Workload Management” Memorandum of March 26, 2025, *available at* <https://www.uspto.gov/sites/default/files/documents/InterimProcesses-PTABWorkloadMgmt-20250326.pdf>. The Memorandum states that “[t]he processes described herein will be implemented in IPR and PGR proceedings where the deadline for the patent owner to file a preliminary response has not yet passed.” Patent Owner filed its Preliminary Response on the deadline of February 13, 2025. Accordingly, the processes described in the Memorandum do not apply, and Patent Owner’s unauthorized paper and exhibits will be expunged. *See* 37 C.F.R. § 42.7(a).

(instituted), and IPR2024-00954 (denied). A different petitioner filed petitions challenging two of those patents in IPR2024-00893 (instituted), IPR2024-00913 (instituted), and IPR2024-00989 (instituted and consolidated with IPR2024-00913).

C. The '088 Patent

The '088 patent discloses “methods and systems for selecting routes for communication connections that share bandwidth allocations in ring configurations.” Ex. 1001, col. 1, ll. 6–9. According to the '088 patent, “[c]ommunication connections traversing a communication network are sometimes allowed to share bandwidth allocation in common network segments,” but routing protocols at the time did not “take into account the ability to share bandwidth allocations between different connections,” so route selection was “often non-optimal for cases in which bandwidth sharing is permitted.” *Id.* at col. 1, l. 65–col. 2, l. 12, col. 5, ll. 20–32.

Figure 1 of the '088 patent is reproduced below.

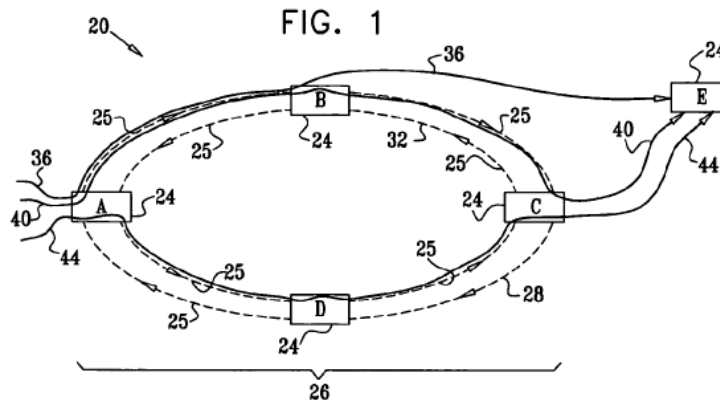


Figure 1 depicts communication network 20 with multiple network nodes 24 “connected by network links, referred to as segments 25,” and arranged in ring configuration 26. Ex. 1001, col. 4, ll. 28–40. “Ring 26 comprises two ringlets, namely a clockwise (CW) ringlet 28 and a counterclockwise (CCW)

ringlet 32.” *Id.* at col. 4, ll. 40–42. The ’088 patent describes an example scenario in which connection 36 from node A to node B to node E has already been defined and “requir[es] a 100 Mbps bandwidth allocation in the segments along its route.” *Id.* at col. 4, ll. 44–51. In the described example, a new 50 Mbps connection is to be established from node A to node C to node E, such that there are two alternative routes for the connection: route 40 (A to B to C to E) and route 44 (A to D to C to E). *Id.* at col. 4, ll. 52–63. The ’088 patent discloses that

the new connection may be allowed to share its bandwidth allocation with existing connection 36. For example, the new connection may be set up to protect the existing connection against failure of a node or segment along its route. In other cases, bandwidth may be allocated to connections with a certain degree of oversubscription. In other words, shared bandwidth may be allocated simultaneously to two or more connections, assuming that not all of these connections will actually use all of the allocated bandwidth simultaneously.

Id. at col. 5, ll. 4–13. Thus, route 40 is selected as the “preferred route that achieves the smallest bandwidth allocation, taking into account bandwidth sharing,” whereas previous algorithms and protocols may have selected route 44 “because more bandwidth is available on the segments of this route, without regard to sharing considerations.” *Id.* at col. 5, ll. 33–46. “As a result of bandwidth sharing, the capacity of ring 26 is significantly improved, enabling it to deliver more bandwidth at a given [quality of service (QoS)] or to deliver higher QoS at a given capacity.” *Id.* at col. 5, ll. 48–51.

The ’088 patent further describes a centralized connection admission control (CCAC) module that performs the route selection. Ex. 1001, col. 5, ll. 46–48, col. 6, ll. 38–44, Fig. 4. The CCAC module “checks whether the

new connection may share its bandwidth allocation with any of the existing connections that traverse ring 26” by receiving a “sharing definition,” distributed “using a signaling or reservation protocol,” that defines the connections that may share bandwidth allocations. *Id.* at col. 7, ll. 1–12. The CCAC module “calculates the cumulative additional bandwidth reservation that would be allocated in the ring segments of ring 26 to the new connection” for each of the two candidate routes (CW and CCW). *Id.* at col. 7, ll. 26–53. The ’088 patent discloses the following equations for calculating such reservation:

$$\Delta BW_{CW} = \sum_{S \in \left[\begin{array}{l} \text{Clockwise ring} \\ \text{segments along} \\ \text{candidate route} \end{array} \right]} (BW_{new}^S - BW_{existing}^S)$$
$$\Delta BW_{CCW} = \sum_{S \in \left[\begin{array}{l} \text{Counter-clockwise ring} \\ \text{segments along} \\ \text{candidate route} \end{array} \right]} (BW_{new}^S - BW_{existing}^S)$$

The above equations show the summation of “the difference between the bandwidth allocated to these connections with and without the new connection” for each segment of the candidate routes (CW and CCW). Ex. 1001, col. 7, l. 35–col. 8, l. 10. In the described example, $\Delta BW_{CW} = 50$ Mbps and $\Delta BW_{CCW} = 100$ Mbps, so route 40 (CW) is chosen. *Id.* at col. 8, ll. 41–63.

D. Illustrative Claim

Challenged claims 1, 8, 15, and 17 of the ’088 patent are independent. Claims 2–4, 6, and 7 depend from claim 1; claims 9–11, 13, and 14 depend from claim 8; claim 16 depends from claim 15; and claims 18–20 depend

from claim 17. Claim 1 recites the following (with letter designations used in the Petition to refer to the various limitations):

1. A method for establishing a connection through a communication network that includes multiple segments, comprising:

[1.1] identifying two or more candidate routes for a new connection having a requested bandwidth to be established through the network;

[1.2] providing a sharing definition specifying one or more other connections, which have respective bandwidths and which are permitted to share a bandwidth allocation with the new connection, [1.3] such that a total bandwidth allocated jointly to the new connection and to the other connections in any given segment is equal to a maximum of the requested bandwidth and of the bandwidths of the other connections in the given segment;

[1.4] for each of the two or more candidate routes, calculating a cumulative additional bandwidth reservation to be allocated to the new connection in the segments along the candidate route, responsively to the sharing definition;

[1.5] selecting a preferred route having a minimum value of the cumulative additional bandwidth reservation out of the two or more candidate routes; and

[1.6] establishing the new connection using the preferred route.

E. Evidence

Petitioner relies on the following prior art:

U.S. Patent Application Publication No. 2003/0198213 A1, published Oct. 23, 2003 (Ex. 1007, “Jensen”);

U.S. Patent Application Publication No. 2004/0190445 A1, published Sept. 30, 2004 (Ex. 1006, “Sathyanath”);² and

U.S. Patent Application Publication No. 2005/0220026 A1, published Oct. 6, 2005 (Ex. 1005, “Dziong”).

F. Prior Art and Asserted Grounds

Petitioner asserts that claims 1–4, 6–11, and 13–20 of the ’088 patent are unpatentable on the following grounds:

Claims Challenged	35 U.S.C. §	References/Basis
1–4, 6, 8–11, 13, 15–20	103(a) ³	Dziong, Sathyanath
7, 14	103(a)	Dziong, Sathyanath, Jensen

II. ANALYSIS

A. Legal Standards

A claim is unpatentable for obviousness if, to one of ordinary skill in the pertinent art, “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007) (quoting 35 U.S.C. § 103(a)). The

² Because Exhibits 1005 and 1006 both list Zbigniew M. Dziong as the first named inventor, we refer to Exhibit 1006 by reference to its second named inventor, Ajay Sathyanath.

³ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. § 103. Because the challenged claims of the ’088 patent have an effective filing date before the effective date of the applicable AIA amendment, we refer to the pre-AIA version of 35 U.S.C. § 103. *See* Pet. 14; Ex. 1001, code (22).

question of obviousness is resolved on the basis of underlying factual determinations, including “the scope and content of the prior art”; “differences between the prior art and the claims at issue”; and “the level of ordinary skill in the pertinent art.” *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). Additionally, secondary considerations, such as “commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy.” *Id.* When conducting an obviousness analysis, we consider a prior art reference “not only for what it expressly teaches, but also for what it fairly suggests.” *Bradium Techs. LLC v. Iancu*, 923 F.3d 1032, 1049 (Fed. Cir. 2019).

A patent claim “is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR*, 550 U.S. at 418. An obviousness determination based on a combination of references requires finding “both ‘that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.’” *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367–68 (Fed. Cir. 2016) (quoting *Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1360 (Fed. Cir. 2012)); *see KSR*, 550 U.S. at 418 (for an obviousness analysis, “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does”).

“Although the *KSR* test is flexible, the Board ‘must still be careful not to allow hindsight reconstruction of references . . . without any explanation as to *how* or *why* the references would be combined to produce the claimed invention.” *TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1066 (Fed. Cir. 2016) (quoting *Kinetic Concepts*, 688 F.3d at 1368). Further, an assertion of obviousness “cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR*, 550 U.S. at 418 (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)); accord *In re NuVasive, Inc.*, 842 F.3d 1376, 1383 (Fed. Cir. 2016) (stating that “conclusory statements” amount to an “insufficient articulation[] of motivation to combine”; “instead, the finding must be supported by a ‘reasoned explanation’” (quoting *In re Lee*, 277 F.3d 1338, 1342 (Fed. Cir. 2002))); *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016) (“To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements. The petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.”).

B. Level of Ordinary Skill in the Art

Petitioner argues that at the time of the ’088 patent (January 2006), a person of ordinary skill in the art would have had “a bachelor’s degree in computer science, computer engineering, electrical engineering, or equivalent training, and approximately four years of experience working in the field of network communications, including experience with [Multiprotocol Label Switching (MPLS)] tunnels and bandwidth allocation,”

where “[a]dditional work experience can substitute for specific educational background, and vice versa.” Pet. 12 (citing Ex. 1003 ¶¶ 20–21). Petitioner further contends that a person of ordinary skill in the art would have been

knowledgeable and familiar with the network communications technologies discussed in [the Specification of the ’088 patent], including bandwidth reservations, quality of service techniques, routing protocols (including Open Shortest Path First (OSPF)), tunneling protocols (including [MPLS]), resource reservations (including Resource ReSerVation Protocol (RSVP)), traffic engineering (including relevant extensions to OSPF, IS-IS, and RSVP), and ring networking standards (e.g., Synchronous Optical Network (SONET) and resilient packet ring (RPR) defined by IEEE 802.17).

Id. Patent Owner states that “Petitioner’s definition . . . is acceptable for” purposes of its Preliminary Response. Prelim. Resp. 8 n.3. Based on the record presented, including our review of the ’088 patent and the types of problems and solutions described in the ’088 patent and cited prior art, we agree with Petitioner’s proposed definition of the level of ordinary skill in the art and apply it for purposes of this Decision.

C. Claim Interpretation

We interpret each challenged claim

using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.

37 C.F.R. § 42.100(b). Petitioner argues that “no claim term requires express construction.” Pet. 12–13. Patent Owner does not propose interpretations of any claim terms in its Preliminary Response. We conclude

that no express interpretation of any claim term is necessary to determine whether to institute an *inter partes* review in this proceeding. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“Because we need only construe terms ‘that are in controversy, and *only to the extent necessary* to resolve the controversy,’ we need not construe [a particular claim limitation] where the construction is not ‘material to the . . . dispute.’” (citation omitted) (emphasis added)).

D. Obviousness Ground Based on Dziong and Sathyanath

Petitioner contends that claims 1–4, 6, 8–11, 13, and 15–20 are unpatentable over Dziong and Sathyanath under 35 U.S.C. § 103(a), citing the testimony of Nader F. Mir, Ph.D., as support. Pet. 20–73 (citing Ex. 1003). Patent Owner responds. Prelim. Resp. 8–28. We are persuaded that Petitioner has established a reasonable likelihood of prevailing on its asserted ground as to claim 1. *See* 37 C.F.R. § 42.108(a).

1. Dziong

Dziong discloses a “protected communication network [that] utilizes a link-based recovery strategy that includes methods for calculating and distributing link-protection parameters and calculating primary and link-detour paths based on these parameters.” Ex. 1005, code (57). A “protected” network is “able to recover automatically from the failure of at least one node or link along paths in the network.” *Id.* ¶ 6. “Link-based recovery” is “the process of recovering from a single link/node failure by rerouting traffic around the failure using a link-detour path, without rerouting the entire path. A link-detour path is that portion of a link-based

recovery path that corresponds to the failure.”⁴ *Id.* ¶ 8. Dziong discloses that previous link-based recovery mechanisms “fail[ed] to take advantage of recovery bandwidth-sharing opportunities,” and describes various methods of sharing recovery bandwidth for the “more efficient use of network resources.” *Id.* ¶¶ 36–38.

For example, Dziong describes “a process for calculating primary paths and link-detour (LD) paths” where each network node “does bookkeeping for each of its incident links of the amount of protection bandwidth that is needed to recover service in the event of each potential link failure in the network” and “advertises to other nodes in the network the amount of protection bandwidth it currently has reserved on each of its incident links.” Ex. 1005 ¶¶ 63–64, Fig. 4 (steps 402 and 404). Then,

an LD path for each link in a set of candidate primary paths for a new demand is calculated in such a way that sharing in the network is maximized (e.g., by summing the cost of each link in each candidate LD path, where the cost is an inverse function of the degree to which the protection bandwidth for that link can be shared with other links in the network, and by choosing the path with the lowest cost).

Id. ¶ 65, Fig. 4 (step 406). Finally, “the primary path for a new demand is selected from the set of candidate primary paths by considering not only the

⁴ “Path-based recovery,” by contrast, is “the process of recovering from a failure of one of the links or nodes in a path from a source node to a destination node by rerouting traffic for the entire path along a recovery path.” Ex. 1005 ¶ 7. Dziong refers to “link-detour paths” and “recovery paths (also known as protection paths),” depending on which method is used, but both refer to paths where traffic is rerouted in case of failure somewhere in a “primary path.” *See id.* ¶¶ 7–9, 70, 83, Fig. 5 (showing the difference between “path-based and link-based recovery paths”); Ex. 1003 ¶ 35. We refer herein to the terminology as it appears in Dziong.

cost of the links in each primary path but also the cost of the LD paths for each link in the primary path.” *Id.* ¶ 66, Fig. 4 (step 408).

Figure 6(a) of Dziong is reproduced below.

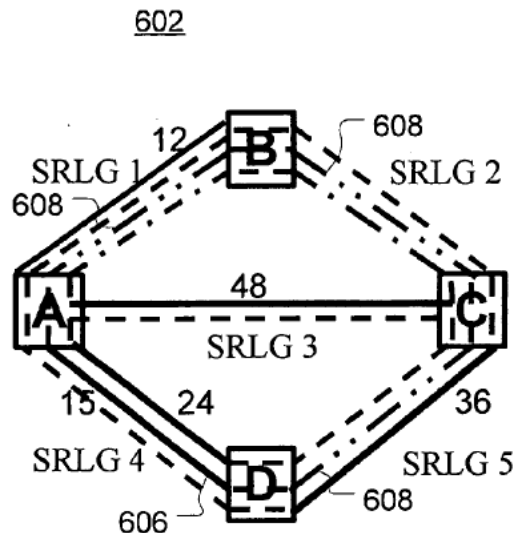


Figure 6(a) depicts exemplary network 602 with four nodes. Ex. 1005 ¶ 88. “[L]inks or the lines/ports that are likely to be affected at the same time are grouped into a shared-risk link group (SRLG).” *Id.* ¶ 70. “[E]ach solid line represents all of the demands that have the same link-detour path, which is represented by a corresponding broken line.” *Id.* ¶ 89. For example, solid line 606 “corresponds to one or more demands totaling 15 units of bandwidth between nodes A and D,” and broken lines 608 “correspond to the common link-detour path for those demands.” *Id.*

Figure 6(b) of Dziong is reproduced below.

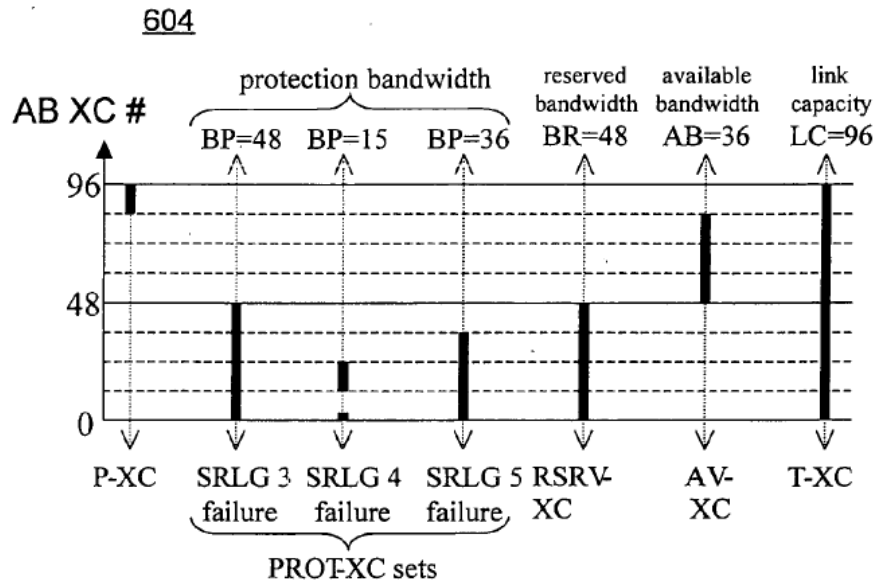


Figure 6(b) shows “[b]andwidth reservation table 604 describ[ing] the current state of the bandwidth of link A-B in terms of cross-connection (XC) units.” Ex. 1005 ¶ 90. The various parameters shown are as follows:

P-XC: “the number of XC units in link A-B that currently support demands” (12 units);

SRLG 3 failure, SRLG 4 failure, and SRLG 5 failure: “the number of XC units in link A-B that are reserved to protect demands on” SRLG 3, SRLG 4, and SRLG 5 (48, 15, and 36 units);

RSRV-XC: “the actual amount of bandwidth that needs to be reserved on link A-B to protect against any one SRLG failure in network 602,” which “corresponds to the maximum of the protection bandwidths required by each of SRLGs 3, 4, and 5 protected by link A-B,” such that “link A-B provides protection bandwidth that is shared between disjoint SRLGs 3, 4, and 5” (48 units);

AV-XC: available bandwidth (36 units); and

T-XC: total link capacity (96 units).

Id. ¶¶ 90–91.

Dziong describes path calculation as either (1) “centralized” where “path calculation is performed in a specialized server that keeps track of all connection states” and “[w]hen a new connection demand arrives at a source node, a request is sent to the server to calculate the primary path and associated protection path(s)” and the “information is [then] sent back to the source node,” or (2) “distributed” where “paths are calculated in their respective source nodes.” Ex. 1005 ¶¶ 95–98. Dziong further discloses various methods of recovery path calculation using a “link-state database” and “link-cost function.” *Id.* ¶¶ 99–117, Fig. 7. In one approach, “a link’s detour path is calculated using link-state and link-cost functions that take into account link-sharing capabilities,” where “the reservation for a new LD path can use both a protection link’s available bandwidth and the protection link’s available shared bandwidth.” *Id.* ¶ 107. “Depending on the path calculation objective, the link-cost function can take into account several metrics,” such as “administrative weight, available bandwidth, and available shared bandwidth.” *Id.* ¶ 113.

Figure 9 of Dziong is reproduced below.

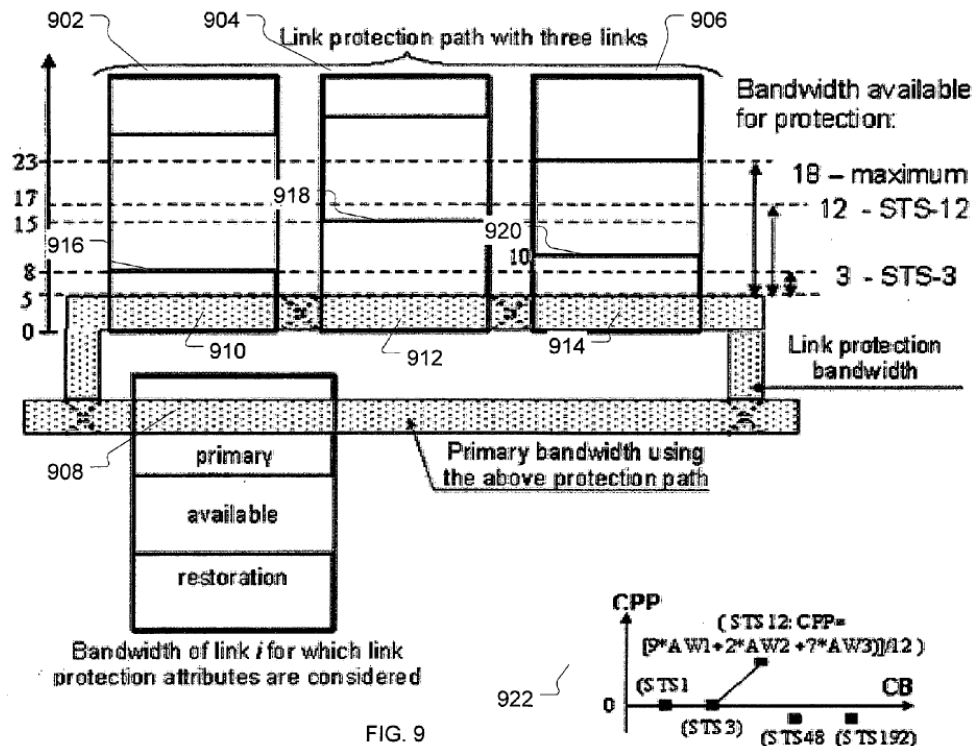


Figure 9 depicts “the link protection path-cost function in a SONET network assuming a static link-cost function (e.g., $LC=f(\text{administrative weight } AW)$),” where “each different bandwidth in the hierarchy, for example, STS-3, typically has a different administrative weight AW .” Ex. 1005 ¶ 131. “[B]oxes 902, 904, and 906 represent the use of bandwidth on three links (A, B, and C) along a link detour path.” *Id.* ¶ 132. Each box has 5 STS-1 units of bandwidth “reserved for protecting the 5 STS-1 bandwidth demand 908 associated with a primary path link i ” and shows “the use of each associated link[’s] bandwidth for primary, available, and recovery bandwidth categories” (from top to bottom). *Id.* The graph in the bottom-right corner of the figure “shows what [the protection path cost (CPP_i)] would [be] for five different sizes of a new demand on link i ” (e.g., zero for STS-1 and STS-3). *Id.* ¶ 134.

2. Sathyanath

Sathyanath discloses “a method for determining a restoration path corresponding to a primary path for a new service in a mesh network having a plurality of nodes interconnected by a plurality of links,” where “[a] path cost is generated for each of a plurality of candidate restoration paths associated with the new service, and the restoration path for the new service is selected based on the path cost for each candidate restoration path.”

Ex. 1006 ¶ 14. Sathyanath recognizes that “[e]fficient use of restoration capacity can be achieved [by] sharing” that capacity. *Id.* ¶¶ 41–45, 63.

Figure 5 of Sathyanath is reproduced below.

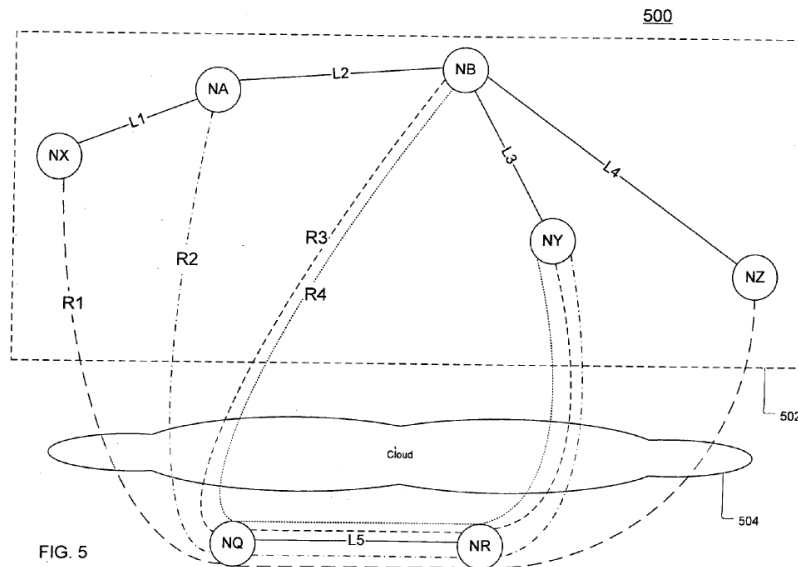


Figure 5 depicts exemplary network 500 supporting four services:

- (1) between nodes NX and NZ with a primary path along L1-L2-L4;
- (2) between nodes NA and NY with a primary path along L2-L3;
- (3) between NB and NY with a primary path along L3; and (4) between NB and NY with a different primary path along L3.

Ex. 1006 ¶¶ 98–99. “The four services are protected by restoration paths R1, R2, R3, and R4,” respectively, each of which includes link L5. *Id.* ¶ 100.

Sathyanath describes sharing information for a link, such as L5, in the form of an “aggregate node-link vector representation,” which “captures minimum sufficient sharing information that is required for a link to correctly compute the amount of restoration capacity required on it to provide guaranteed restoration to an additional primary path while realizing sharing.” Ex. 1006 ¶ 102. “The value in each position of the vector represents the aggregate bandwidth that would be required on link L5 in the event of a single failure in the network of the network element that corresponds to that vector position.” *Id.* ¶ 103.

Figure 6 of Sathyanath is reproduced below.

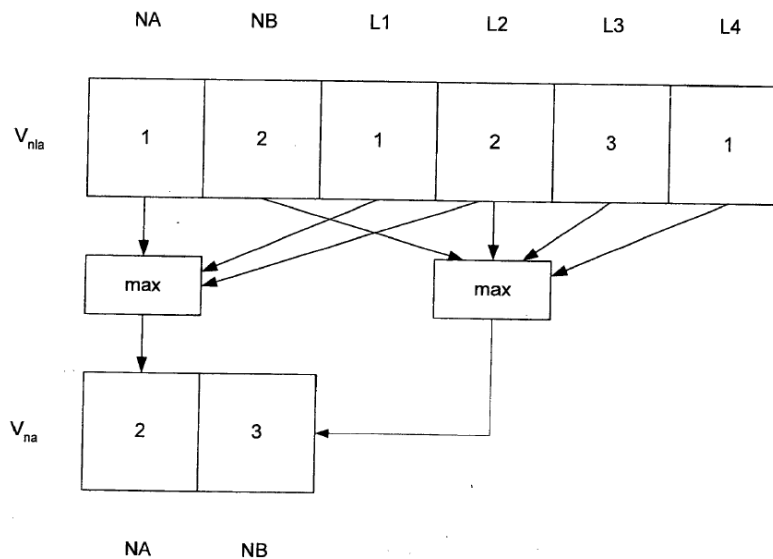


FIG. 6

Figure 6 depicts “node-aggregate vector V_{na} for link L5” as derived from “aggregate node-link vector V_{nla} .” Ex. 1006 ¶ 107. With respect to aggregate node-link vector V_{nla} , Sathyanath discloses the following:

the value of the vector in the position corresponding to node NA is 1. This indicates that, for a failure of node NA, an aggregate bandwidth demand of 1 (associated with protection path R1) will be placed on link L5 corresponding to one (unit bandwidth)

service. Similarly, the 2 in the position of V_{nla} corresponding to node NB indicates that for a failure of node NB, link L5 will be required to support two aggregate (unit bandwidth) services paths (i.e., associated with protection paths R1 and R2). Similarly, potential failures of links L1, L2, L3, and L4 correspond to aggregate bandwidth reservation values in V_{nla} of 1, 2, 3, and 1, corresponding to restoration paths R1, R1+R2, R2+R3+R4, and R1, respectively. Note that the bandwidth that is reserved on link L5 is the maximum of the bandwidth requirements associated with any single network component failure. In the example network of FIG. 5, the reservation bandwidth is thus $\max \{1, 2, 1, 2, 3, 1\}=3$.

Id. ¶ 104. “[T]o provide sharing, each node in the network keeps track of the aggregate node-link vector for all directly connected links” and “disseminates aggregate [node-link] vectors for its connected links.” *Id.* ¶ 105.

Sathyanath describes a number of other exemplary embodiments for sharing information, such as an “extended link-state database,” referred to as the “TE/Share database.” Ex. 1006 ¶ 193. The TE/Share database is maintained at a node and “contains a data structure for each link L that the node owns” with information (e.g., bandwidth) “about all the other links in the network for which link L provides restoration capacity.” *Id.* ¶ 194. Changes to the TE/Share database, such as when “a link is used as a restoration link,” are advertised to other nodes. *Id.* ¶¶ 194–196.

Figure 17 of Sathyanath is reproduced below.

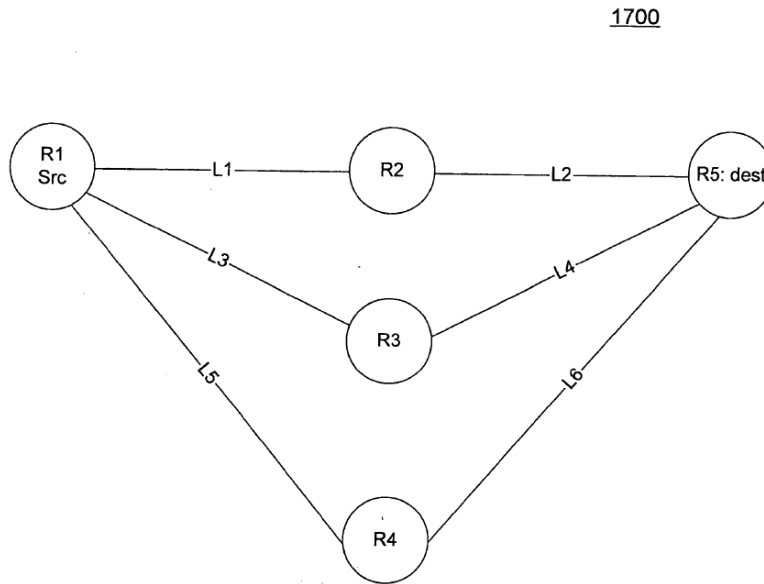


FIG. 17

Figure 17 depicts partial network 1700 having “primary path L1-L2 with four units of bandwidth” and two possible restoration paths, “route A (L3-L4) and route B (L5-L6).” Ex. 1006 ¶ 215. Sathyanath describes exemplary entries in a TE/Share database. *Id.* ¶¶ 215–219. For example, the entry for link L4 may “indicate[] that L4 needs to reserve four units of bandwidth to protect against failures on L8 and L9” (outside of the partial network shown). *Id.* ¶¶ 217, 220. Source node R1 evaluates the potential restoration paths and chooses the one with the least additional bandwidth that would need to be reserved. *Id.* ¶¶ 221–225. As part of that calculation, “no additional bandwidth would need to be reserved on L4” because 4 units already have been reserved and can be shared (given the primary path’s capacity of 4 units). *Id.* ¶ 221.

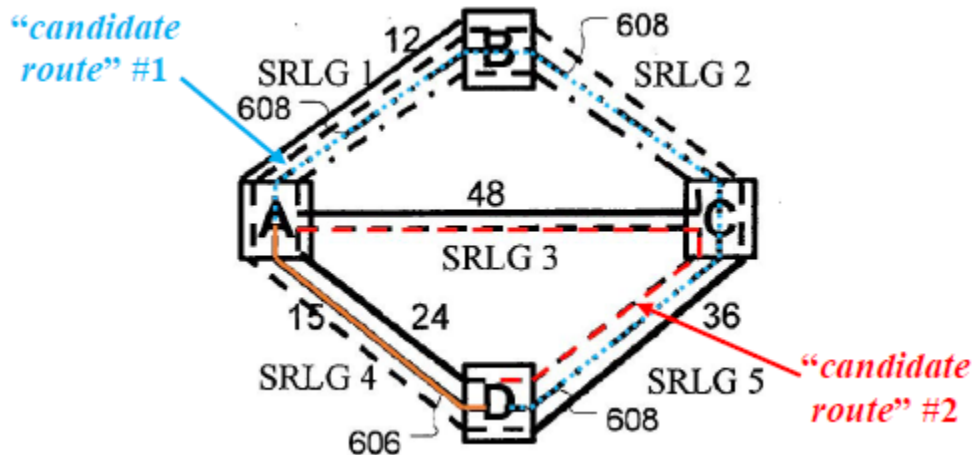
3. *Claim 1*

Petitioner argues that Dziong and Sathyanath collectively teach all of the limitations of claim 1. Pet. 20–51. With respect to the preamble of claim 1 reciting “[a] method for establishing a connection through a communication network that includes multiple segments,” Petitioner argues that Dziong teaches establishing a “recovery path,” such as the A-B-C-D recovery path shown with dotted line 608 in Figure 6(a) above. *Id.* at 23–25. Petitioner further contends that Sathyanath teaches recovery paths “in a variety of network types,” including MPLS, and “[s]ince Dziong does not specify a protocol used to establish link-detour paths, it would have been obvious to use MPLS as described by Sathyanath.” *Id.* at 25–26. Patent Owner does not dispute Petitioner’s arguments regarding the preamble of claim 1. Petitioner has made a sufficient showing for the preamble, regardless of whether it is limiting.

a) Limitation [1.1]

Limitation [1.1] recites “identifying two or more candidate routes for a new connection having a requested bandwidth to be established through the network.” Petitioner argues that Dziong teaches that “‘a link’s detour path is calculated using link-state and link-cost functions’ to determine ‘a minimum-cost link-detour path’ that ‘takes into account link-sharing capabilities,’” and the detour paths considered in those calculations are “candidate routes.” Pet. 27 (quoting Ex. 1005 ¶¶ 104, 107).

Petitioner provides the following annotated version of Dziong's Figure 6(a) (Pet. 29):



Annotated Figure 6(a) depicts a primary path between nodes A and D (SRLG 4, shown in orange) and two potential recovery paths A-B-C-D (shown in blue) and A-C-D (shown in red) for a “new connection” between nodes A and D in the event of failure on the primary path. *Id.* at 28–29.

Petitioner argues that Dziong

describes “providing sufficient recovery bandwidth . . . to accommodate a failure” on a primary path. In other words, a recovery path needs to provide the same amount of bandwidth as the primary path it protects. Since the reserved bandwidth on the A-D primary path is 15 units, it would have been obvious for the candidate recovery paths A-B-C-D and A-C-D to have the same “requested bandwidth” (15 units) to ensure that the primary path’s traffic could be accommodated on the recovery path if needed.

Id. at 29 (citations omitted). Petitioner contends that this is confirmed by the table of Figure 6(b), which shows 15 units of bandwidth reserved on the A-B link to protect the SRLG 4 primary path. *Id.* at 29–30. Petitioner also points to the two recovery paths shown in Figure 17 of Sathyanath as “further examples of ‘identifying’ potential recovery paths.” *Id.* at 31–32 (emphasis omitted).

Patent Owner in response argues that Petitioner “mischaracterizes” Figures 6(a) and 6(b) of Dziong. Prelim. Resp. 12–14. Patent Owner contends that there are not “15 units of reserved bandwidth on link A-D,” but rather “15 units of bandwidth reserved *on link A-B* to protect the 15 units of demand on SRLG 4 (link A-D).” *Id.* at 13. Patent Owner further argues that link A-B (1) has a total “reserved bandwidth” of 48 units (RSRV-XC in Figure 6(b)), not 15 units, and “Petitioner fails to address the amount of allocated bandwidth” or “sharing allocated bandwidth” on its two proposed candidate routes, and (2) has its own 12 units of demand (P-XC in Figure 6(b)), which “Petitioner does not address.” *Id.* at 13–14. Finally, Patent Owner points out that there are 24 other units of demand on link A-D (as shown by the additional solid line between nodes A and D in Figure 6(a)) and argues that “Petitioner fails to address the amount of bandwidth required to ensure that the hypothetical ‘primary path’s traffic’ on link A-D could be accommodated by the hypothetical candidate routes.” *Id.* at 13.

Patent Owner, however, does not explain sufficiently why any of these issues demonstrate a failure to teach limitation [1.1]. We understand Petitioner’s position to be that Dziong identifies “two or more candidate routes” (i.e., A-B-C-D and A-C-D) for a “new connection” (i.e., a new recovery path to protect primary path SRLG 4 in the event of failure) with a “requested bandwidth” (i.e., 15 units) sufficient to protect against failure. *See* Pet. 27–31 (citing Ex. 1005 ¶¶ 36, 70, 89, 90, 104, 105). The 15 units are the “units of demand” on SRLG 4 that must be protected. Ex. 1005 ¶¶ 89 (“[E]ach solid line represents all of the demands that have the same link-detour path, which is represented by a corresponding broken line. For example, solid line 606 in SRLG 4 corresponds to one or more demands

totaling 15 units of bandwidth between nodes A and D.”), 90. A link in a potential recovery path for that demand on SRLG 4, therefore, would need to have “sufficient recovery bandwidth” to protect against failure (i.e., at least 15 units). *Id.* ¶¶ 36, 104. That is reflected in the “SRLG 4 failure” column of Figure 6(b) for link A-B (part of the A-B-C-D recovery path shown in blue in Figure 6(a) above). On this record, we do not see why the fact that link A-B *also* protects against failures of SRLG 3 and 5 and has its own 12 units of demand, or the fact that SRLG 4 *also* has another 24 units of demand (which link A-B does not protect against), contradicts Petitioner’s position regarding Dziong and limitation [1.1]. *See id.* ¶¶ 89–90 (“link A-B is not part of the link-detour path for the other 24 XC units of demand on SRLG 4”).

At this stage, we find that Petitioner has made a sufficient showing that Dziong teaches limitation [1.1]. Therefore, we need not evaluate any additional arguments regarding Sathyanath at this time. *See* Pet. 31–32; Prelim. Resp. 14–16.

b) Limitations [1.2] and [1.3]

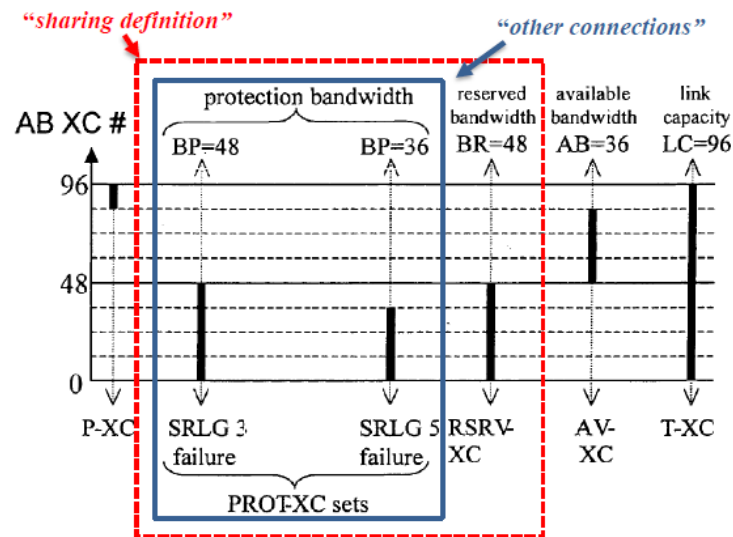
Limitations [1.2] and [1.3] recite the following:

[1.2] providing a sharing definition specifying one or more other connections, which have respective bandwidths and which are permitted to share a bandwidth allocation with the new connection, [1.3] such that a total bandwidth allocated jointly to the new connection and to the other connections in any given segment is equal to a maximum of the requested bandwidth and of the bandwidths of the other connections in the given segment.

With respect to limitation [1.2], Petitioner argues that “Dziong teaches that information including ‘how much bandwidth can be[] shared at each link in the network’ is ‘advertis[ed], across the network,’” such that “‘each

node’ in the network has ‘information about all recovery paths.’” Pet. 33 (quoting Ex. 1005 ¶ 60) (emphasis omitted). Petitioner contends that Figure 6(b) shows the information that would be advertised, where “three protection paths (each a ‘connection’) . . . traverse link A-B” and “protect SRLGs 3, 4, and 5,” with “respective bandwidths” of 48, 15, and 36 units, respectively. *Id.* at 33–34 (emphasis omitted). The three paths “share an overall protection bandwidth reservation of 48 units” (RSRV-XC). *Id.* at 34.

Petitioner provides the following modified and annotated version of Dziong’s Figure 6(b) (Pet. 35):



The figure above shows what the bandwidth allocation would be, in Petitioner’s view, “[p]rior to the establishment of SRLG 4,” with “other connections” (i.e., the SRLG 3 and 5 recovery paths) being permitted to “share a bandwidth allocation” with the “new connection” (i.e., a protection path for SRLG 4). *Id.* at 34–35. Petitioner argues that the information in Figure 6(b) “about the existing bandwidth allocations for link A-B”

constitutes a “sharing definition” that would be “shared with all the network nodes.”⁵ *Id.* at 35.

Next, Petitioner argues that Dziong “provides limited details about the data format used for sharing th[e] information,” so a person of ordinary skill in the art would have considered Sathyanath’s “examples.” Pet. 36. Petitioner discusses two exemplary embodiments in Sathyanath.

First, Petitioner relies on Sathyanath’s “aggregate node-link vector,” which provides “information about which links can share the restoration bandwidth,” as a “sharing definition,” referencing Figures 5 and 6. Pet. 36–37 (quoting Ex. 1006 ¶ 122). Petitioner provides the following annotated version of a portion of Sathyanath’s Figure 6 (*id.* at 38):

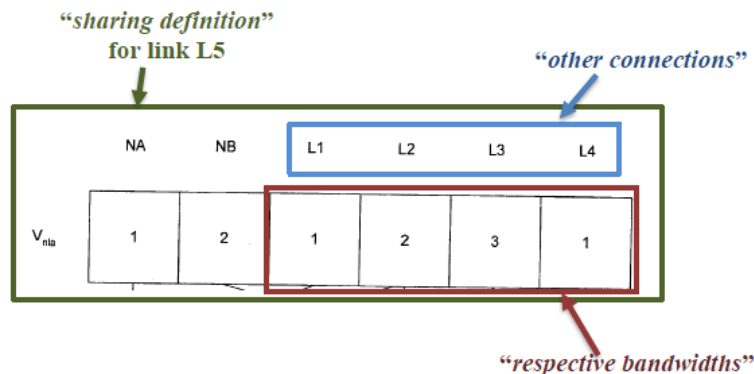
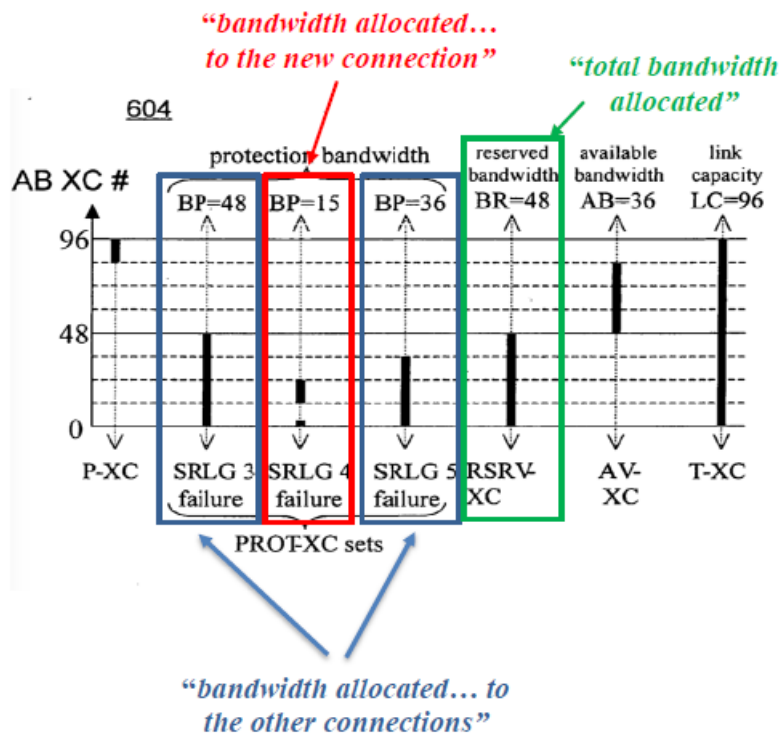


Figure 6 shows a “sharing definition” with four “other connections” (i.e., restoration paths going through link L5, shown in blue) with “respective bandwidths” (i.e., 1, 2, 3, 1, shown in red) that would “share” a bandwidth allocation with a new service, according to Petitioner. *Id.* at 37–39.

⁵ Petitioner also argues that, “[a]lternatively, to the extent Patent Owner argues that the claim language requires the ‘*sharing definition*’ to include bandwidth information *after* allocations are made for the ‘*new connection*,’ . . . it would have been obvious to advertise the bandwidth allocations as shown in Dziong’s unmodified Fig[ure] 6b.” Pet. 35–36; *see* Ex. 1003 ¶ 71. Patent Owner, however, does not propose such an interpretation in its Preliminary Response.

Second, Petitioner relies on Sathyanath’s “TE/Share database,” which also “contains information about bandwidth sharing that was sent to or received from other nodes,” as a “sharing definition,” referencing Figure 17. Pet. 39.

Turning to limitation [1.3], Petitioner argues that Dziong teaches a “total bandwidth allocated jointly to the new connection and to the other connections in any given segment” (i.e., RSRV-XC of 48 units for link A-B). Pet. 40–41. Petitioner provides the following annotated version of Dziong’s Figure 6(b) (*id.* at 41):



Annotated Figure 6(b) shows, in Petitioner’s view, that the 48 units of “total bandwidth allocated” (shown in green) is “equal to a maximum of the requested bandwidth” (i.e., 15 units required to protect against failure on SRLG 4, shown in red) and “the bandwidths of the other connections in the given segment” (i.e., 48 and 36 units to recover from failure on SRLG 3 or 5, respectively, shown in blue). *Id.* at 40–42 (citing Ex. 1005 ¶¶ 63 (“The

amount of bandwidth actually reserved on each incident link is the maximum of the bandwidths required to recover from any of the failures.”), 91 (“RSRV-XC represents the actual amount of bandwidth that needs to be reserved on link A-B to protect against any one SRLG failure” and “corresponds to the maximum of the protection bandwidths required by each of SRLGs 3, 4, and 5 protected by link A-B (i.e., 48 units).”).

Again, Petitioner asserts that “Sathyanath provides further examples” of the bandwidth sharing. Pet. 42. Regarding the example of Figures 5 and 6, Sathyanath states that “the bandwidth that is reserved on link L5 is the maximum of the bandwidth requirements associated with any single network component failure.” *Id.* at 42–43 (quoting Ex. 1006 ¶ 104). Regarding the example of Figure 17, Sathyanath discloses that when assessing recovery paths for the primary path R1-R2 having “four units of bandwidth,” “no additional bandwidth would need to be reserved on L4” because 4 units are already reserved to “protect against failures on L8 and L9” and could be shared, so the “maximum” is 4 units. Ex. 1006 ¶¶ 215, 217, 220–221; *see* Pet. 43.

Patent Owner addresses limitations [1.2] and [1.3] together, arguing that Petitioner “focuses on reserved bandwidth, not allocated bandwidth.” Prelim. Resp. 17–22. Patent Owner contends that Petitioner incorrectly equates Dziong’s “reserved bandwidth” (i.e., RSRV-XC of 48 units in Figure 6(b)) with “total bandwidth allocated” as recited in claim 1. *Id.* at 17–18 (citing Ex. 1003 ¶ 81; Ex. 1005 ¶ 52). Patent Owner asserts that “the reserved bandwidth on link A-B is 48 units. However, if SRLG 4 fails, the allocated bandwidth would be 15 units, not 48 units. Thus, the reserved bandwidth is not the same as the allocated bandwidth.” *Id.* at 19. Similarly,

Patent Owner argues that the bandwidth originally “allocated” on link A-B is “12 used units,” and “[i]n the event of SRLG 4 failure, the allocated bandwidth would be increased by 3 units to be 15 units.” *Id.* (emphasis omitted).

Based on the current record, we are persuaded that the reserved bandwidth in Figure 6(b) of 48 units (RSRV-XC) can be considered “a total bandwidth allocated jointly to the new connection and to the other connections.” The 48 units are “allocated” for protection—they cannot be used to support demands on the link (P-XC, which cannot be shared), and they are not otherwise “available” bandwidth on the link (AV-XC). *See* Ex. 1005 ¶¶ 63 (stating that the bandwidth is “actually reserved”), 90 (explaining that “[b]andwidth reservation table 604 describes the *current* state of the bandwidth of link A-B” (emphasis added)), 91 (“RSRV-XC represents the *actual* amount of bandwidth that needs to be reserved on link A-B” (emphasis added)), Fig. 6(b); Ex. 1003 ¶¶ 81–84, 98 (explaining how bandwidth may be divided into “bandwidth allocated for primary paths,” “bandwidth allocated for recovery (‘restoration’) paths,” and “unallocated (available) bandwidth”). We do not see, on this record, how the fact that Dziong “guarantee[s] the service’s recovery from any *single failure* along its route” means that the 48 units do not represent the “total bandwidth allocated,” as Patent Owner contends. *See* Ex. 1005 ¶ 52 (emphasis added); Prelim. Resp. 18–19. Patent Owner does not, for example, provide a proposed claim interpretation of “total bandwidth allocated” in claim 1 that would exclude the type of protection performed in Dziong.⁶

⁶ We note that the ’088 patent appears to define “bandwidth” broadly as “allocation of network capacity in accordance with any allocation scheme.”

Further, to the extent the dispute is one of timing (i.e., whether bandwidth would not be considered “allocated” in Dziong until after a failure on SRLG 4 occurs), *see* Prelim. Resp. 18–19, we note that Dziong indicates that its recovery paths can be either “computed and reserved in advance of a failure” (“[p]rotection”) or “computed and reserved *after* a failure has occurred” (“[r]estoration”), *see* Ex. 1005 ¶ 34 (emphasis added). *See also id.* ¶¶ 34 (“The present invention can use either or both types of recovery mechanism though protection is preferred.”), 83 (“the paths calculated for link protection herein will generally either be referred to as protection paths or recovery paths, although it should be understood throughout that the alternative of post-failure reservation [is] within the scope and intent of the present invention”); Ex. 1003 ¶ 35 (discussing Ex. 1005 ¶¶ 34, 83).

See Ex. 1001, col. 5, ll. 56–63. The ’088 patent does not appear to define the term “allocate,” but seems, at least in some portions, to consider bandwidth for protection paths to be “allocated” bandwidth. *See, e.g., id.* at col. 1, l. 65–col. 2, l. 3 (“Communication connections traversing a communication network are sometimes allowed to share bandwidth *allocation* in common network segments. For example, bandwidth-sharing connections may comprise connections that are set up to protect one another against failure of a network node or segment.” (emphasis added)), col. 5, ll. 4–8 (“In some cases, the new connection may be allowed to share its bandwidth *allocation* with existing connection 36. For example, the new connection may be set up to protect the existing connection against failure of a node or segment along its route.”), claims 5, 12. To the extent the parties disagree as to the interpretation of “allocation,” “allocated,” “total bandwidth allocated,” or any other claim terms, the parties are encouraged to provide in their papers during trial proposed interpretations for the term(s) and cite support in the Specification and/or prosecution history of the ’088 patent for their respective interpretations.

Patent Owner also again argues that Petitioner mischaracterizes Dziong’s Figure 6(b) because “[t]here are not three protection paths shown,” but rather reserved bandwidth for protecting against failure on three other links. Prelim. Resp. 19. We disagree for reasons similar to those stated above for limitation [1.1]. *See supra* Section II.D.3.a. Figure 6(b) shows that link A-B is part of the protection paths for three SRLGs. Ex. 1005 ¶ 90. The three BP columns each “represent[] the number of XC units in link A-B that are reserved to protect demands on” the respective SRLGs (i.e., 48, 15, and 36 units, for SRLGs 3, 4, and 5, respectively), for a total reserved bandwidth RSRV-XC of 48 units. *Id.* ¶¶ 90–91. On this record, we are not persuaded that Petitioner’s understanding of Figure 6(b) is incorrect.

Regarding Sathyanath, Patent Owner similarly argues that, “[a]t most, Sathyanath discloses a TE/Share database that specifies connections that share reserved bandwidth,” not sharing “allocated bandwidth.” Prelim. Resp. 20. According to Patent Owner, Sathyanath “makes clear that bandwidth is only allocated in response to a failure” and “expressly distinguishes reservation of bandwidth versus allocation of bandwidth.” *Id.* at 20–22 (citing Ex. 1006 ¶¶ 59–60, 82, 177, 216, 220–221).

Patent Owner is correct that Sathyanath distinguishes the terms “allocation” and “reservation” for purposes of its written description and uses “reservation” in its preferred embodiments. *See* Ex. 1006 ¶¶ 59–60. Sathyanath, however, does appear to contemplate allocation both before and after failure. *See, e.g., id.* ¶¶ 46 (“depending on the implementation, [the sharing] process may involve either pre-allocation or real-time allocation of bandwidth on alternative paths”), 60 (“If the bandwidth were allocated in advance of a failure, this would correspond, in the parlance of the field of

protection and restoration for optical transport networks, to a 1:1 protection scheme. . . . However, in preferred embodiments of this invention, the protection bandwidth is not allocated until after the detection of a failure.”), 175 (describing an example in which “the protection bandwidth was allocated on the protection path at the time of establishment of the service on the primary path”). Regardless, Petitioner relies on Sathyanath for its disclosed data formats of a “sharing definition” and relies on Dziong for the particular bandwidths recited in limitations [1.2] and [1.3], as shown in Figure 6(b) above. *See* Pet. 33–44. We are persuaded, on this record, that Petitioner has made a sufficient showing with respect to that combination of teachings.

At this stage, we find that Petitioner has made a sufficient showing that the combination of Dziong and Sathyanath teaches limitations [1.2] and [1.3].

c) Limitation [1.4]

Limitation [1.4] recites “for each of the two or more candidate routes, calculating a cumulative additional bandwidth reservation to be allocated to the new connection in the segments along the candidate route, responsively to the sharing definition.” Petitioner argues that “[t]o calculate the cost of each link, Dziong employs a ‘link-cost function’ which considers metrics such as ‘available bandwidth’ and ‘available shared bandwidth.’” Pet. 44 (quoting Ex. 1005 ¶ 113) (emphasis omitted). Petitioner acknowledges that “Dziong provides limited examples of a link-cost function,” but points to the equation in Figure 9 for “calculating a protection path cost (CPP) that is the sum of bandwidths required on each link of a protection path, multiplied by

corresponding administrative weights (AW), then divided by the new link bandwidth (12 units).” *Id.* at 44–45 (citing Ex. 1005 ¶ 132). Petitioner also notes that Dziong indicates that “the use of administrative weights is optional,” so “[w]ithout the use of administrative weights, Dziong’s Fig[ure] 9 example would include calculating the sum of the additional bandwidths required on the links.” *Id.* at 45 (citing Ex. 1005 ¶ 12). Petitioner contends that “Sathyanath provides further details of a link-cost function,” citing the Figure 17 example where route B is chosen because less cumulative additional bandwidth would need to be reserved than for route A. *Id.* at 45–48. Also, “[b]oth Dziong and Sathyanath describe examples in which the amount of additional bandwidth to be reserved for a recovery path is zero,” which is consistent with the prosecution history of the ’088 patent according to Petitioner. *Id.* at 46 (citing Ex. 1002, 248 (“according to the present invention, it is possible to choose a path with zero cumulative additional bandwidth reservation by virtue of bandwidth sharing”); Ex. 1005 ¶ 134; Ex. 1006 ¶¶ 204, 207, 222).

Patent Owner responds that “Petitioner identifies no reason a [person of ordinary skill in the art] would have been motivated to exclude the use of administrative weights in the CPP function” of Dziong, and an ordinarily skilled artisan would not have been so motivated because “each different bandwidth in the SONET hierarchy has a different administrative weight” in the CPP function. Prelim. Resp. 23 (citing Ex. 1005 ¶¶ 112, 124). Patent Owner further argues that “Dziong distinguishes the use of a static link-cost function based on administrative weight versus a dynamic link-cost function based on available bandwidth” and a person of ordinary skill in the art “interested in calculating link cost based on available bandwidth, as argued

by Petitioner, would not have modified the CPP function of [Figure 9] and instead, would have used a dynamic link-cost function.” *Id.* at 23–24 (citing Ex. 1005 ¶ 112).

On this record, we are persuaded that a person of ordinary skill in the art would have understood the use of administrative weights in Dziong to merely be optional. *See* Pet. 45. Dziong states that “[i]n some cases, the link costs of the LD paths *can be* a function of an administrative weight for the LD path links.” Ex. 1005 ¶ 12 (emphasis added). It also discloses that the link-cost function “can” take into account various factors, “including” available bandwidth, available shared bandwidth, and administrative weight, “[d]epending on the path calculation objective.” *Id.* ¶ 113; *see* Ex. 1003 ¶¶ 95–96. In the CPP function shown in Figure 9, if administrative weights are not used, the numerator would be “the sum of the additional bandwidths required on the links” (i.e., for a new protection path of 12 units (STS-1s), 9 additional units on link A since 3 units are already reserved and can be shared, 2 additional units on link B, and 7 additional units on link C), which would be a “cumulative additional bandwidth reservation to be allocated to the new connection.” *See* Pet. 44–45; Ex. 1003 ¶¶ 102–105; Ex. 1005 ¶¶ 132–134. We also agree with Petitioner on this record that the recited “cumulative additional bandwidth reservation to be allocated to the new connection” in limitation [1.4] can be zero (if there is enough bandwidth available to be shared). *See* Pet. 46. Dziong discloses how that would be the case in Figure 9 for a new demand of either 1 or 3 units: “a demand of either STS-1 or STS-3 can be accommodated without requiring any additional bandwidth for recovery on the detour links A, B, and C.

Therefore the CPP value for those demands is shown as zero.” Ex. 1005 ¶ 134; *see* Ex. 1003 ¶¶ 97–101.

Finally, Patent Owner argues that “Petitioner fails to establish that Dziong considers the amount of allocated/used units in its link-cost calculation,” where “available bandwidth [in Dziong] means unused bandwidth.” Prelim. Resp. 24. Based on the current record, we disagree with Patent Owner’s arguments regarding what “allocation” is required by claim 1, for the reasons explained above. *See supra* Section II.D.3.b.

At this stage, we find that Petitioner has made a sufficient showing that Dziong teaches limitation [1.4]. Therefore, we need not evaluate any additional arguments regarding Sathyanath at this time. *See* Pet. 45–48; Prelim. Resp. 24–25.

d) Limitation [1.5]

Limitation [1.5] recites “selecting a preferred route having a minimum value of the cumulative additional bandwidth reservation out of the two or more candidate routes.” Petitioner argues that Dziong teaches “choosing the path with the lowest cost,” and Sathyanath similarly teaches “calculating the cost of two candidate recovery paths” and choosing the path that “would require the minimum amount of additional bandwidth to be reserved.” Pet. 48–49 (quoting Ex. 1005 ¶ 65 and Ex. 1006 ¶ 200; citing Ex. 1006 ¶¶ 205, 215, 221–222). Patent Owner does not dispute Petitioner’s arguments regarding limitation [1.5]. At this stage, we find that Petitioner has made a sufficient showing for limitation [1.5].

e) Limitation [1.6]

Limitation [1.6] recites “establishing the new connection using the preferred route.” Petitioner argues that “Dziong and Sathyanath describe choosing a protection path that requires the least amount of additional bandwidth allocation.” Pet. 50. As support, Petitioner cites Dziong’s descriptions of sending a “signal to establish the primary path and link-detour paths for the connection” and sending a “reservation setup message” to establish the link-detour path that was chosen. *Id.* (quoting Ex. 1005 ¶¶ 58, 175) (emphasis omitted). Petitioner also cites Sathyanath’s description of “pre-establishment . . . of alternative paths.” *Id.* at 50–51 (quoting Ex. 1006 ¶ 46; citing Ex. 1006 ¶¶ 250, 260) (emphasis omitted).

Patent Owner argues that Dziong “teaches away from establishing a connection for the link-detour path before failure.” Prelim. Resp. 18, 26 (citing Ex. 1005 ¶ 58). We disagree. “A reference teaches away ‘when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken’ in the claim.” *Meiresonne v. Google, Inc.*, 849 F.3d 1379, 1382 (Fed. Cir. 2017). “A reference that ‘merely expresses a general preference for an alternative invention but does not criticize, discredit, or otherwise discourage investigation into’ the claimed invention does not teach away.” *Id.*

Here, paragraph 58 of Dziong, the focus of Patent Owner’s teaching-away argument, merely explains that Dziong’s disclosed methods reduce the likelihood of “crankbacks”:

A crankback is the failure to establish either a primary or protection path based on the unavailability of resources that were anticipated to be available. A crankback can occur, for example,

during the reservation of bandwidth along a calculated protection path for a link. A source node may assume that bandwidth for a new connection is available, and then start to signal to establish the primary path and link-detour paths for the connection. However, during the process of establishing those paths, it might be found that one of the links along the paths cannot support the required bandwidths. In this case, the paths need to be ripped up and the signaling “cranked back” to the originating source node, which needs to try an alternative path. Crankbacks can be very undesirable because of the delay associated with them. Improvement in the number of connections admitted to the network results from a link-detour path-calculation method that increases sharing of the recovery bandwidth and a primary-path calculation method that is a function of the link-detour costs.

Ex. 1005 ¶ 58. The excerpt above discloses “start[ing] to signal to establish the primary path and link-detour paths for [a] connection,” and does not criticize, discredit, or otherwise discourage establishing a connection as recited in claim 1. *See id.*

Patent Owner also points to Dziong’s description of “recovery paths . . . activated when a protected link fails” and argues that Dziong’s “reservation setup message” is “only for reserving bandwidth, . . . not for establishing a connection.” Prelim. Resp. 18, 26 (quoting Ex. 1005 ¶ 60; citing Ex. 1005 ¶ 117) (emphasis omitted). As explained above, though, Dziong discloses establishing a recovery path both before and after failure. *See* Ex. 1005 ¶¶ 34, 83; *supra* Section II.D.3.b.

At this stage, we find that Petitioner has made a sufficient showing that Dziong teaches limitation [1.6]. Therefore, we need not evaluate any additional arguments regarding Sathyanath at this time. *See* Pet. 50–51; Prelim. Resp. 27.

f) Reasons to Combine

Petitioner argues that “Dziong expressly refers to Sathyanath by its application number (10/673,057) and incorporates Sathyanath’s contents by reference,” such that it would have been obvious to a person of ordinary skill in the art “considering Dziong to also refer to and consider Sathyanath because Dziong expressly directs and encourages this.” Pet. 22 (citing Ex. 1005 ¶ 1). Specifically, an ordinarily skilled artisan “would have found Sathyanath’s examples instructive regarding the operation of Dziong’s bandwidth-sharing concepts.” *Id.* According to Petitioner, the two references each describe “multiple examples to illustrate how their bandwidth-sharing concepts would work in various scenarios and network designs,” which a person of ordinary skill in the art would have had reason to combine. *Id.* at 22–23 (citing Ex. 1005 ¶¶ 27, 196 (stating that the described embodiments are not “mutually exclusive” and “modifications” may be made); Ex. 1006 ¶¶ 37, 295 (same)).

Patent Owner makes two arguments in response.

First, Patent Owner argues that Dziong is directed to link-detour paths, whereas Sathyanath is directed to recovery paths, and a person of ordinary skill in the art “working on the problem of protection in link-based shared systems would be aware of the inefficiencies of path-based recovery, and would be unlikely to consider references, like Sathyanath, in resolving those issues.” Prelim. Resp. 10.

We disagree based on the current record. Dziong refers to both “link-based” and “path-based” recovery. Ex. 1005 ¶¶ 6–8. And the two methods are similar in various ways, as Dziong recognizes. *See, e.g., id.* ¶¶ 69 (“While some of the algorithms utilized in a link-based scheme are

related to path-based recovery algorithms, there are significant modifications and special considerations that are made in the case of link-based recovery.”), 103 (“In some areas, the issues associated with recovery path calculation for link-based recovery [are] analogous to recovery path calculations for path-based restoration”). Dziong also purports to incorporate Sathyanath’s application by reference. *Id.* ¶ 1. And, as Petitioner points out, the references have similar disclosures and similar discussions of bandwidth sharing. *See* Pet. 1, 20–22; Ex. 1005 ¶¶ 10–12, 36–39, 60, 65, 88; Ex. 1006 ¶¶ 4, 12–13, 41–45, 200. Thus, on this record, we disagree with Patent Owner that a person of ordinary skill in the art would not consider combining the teachings of Dziong and Sathyanath. *See In re Applied Materials, Inc.*, 692 F.3d 1289, 1298 (Fed. Cir. 2012) (“A reference must be considered for everything that it teaches, not simply the described invention or a preferred embodiment.”); *In re Hyon*, 679 F.3d 1363, 1366 (Fed. Cir. 2012) (affirming an obviousness determination where two “references both teach processes directed to making the same class of products” and minor differences between the disclosures did not “negate the motivation to combine”).

Second, Patent Owner argues that Petitioner “fails to identify specific teachings in Sathyanath that a [person of ordinary skill in the art] would have been motivated to implement in Dziong with a reasonable expectation of success” and “does not explain how the features would have been combined or why there would have been a reasonable expectation of success in doing so.” Prelim. Resp. 11.

Patent Owner, however, only mentions Petitioner’s introductory statement regarding reasons to combine and does not address the substance

of Petitioner’s arguments for claim 1, where Petitioner explains how it is relying on Sathyanath as a secondary reference. *See* Prelim. Resp. 10–11 (citing Pet. 22–23). For example, regarding the “sharing definition” of limitation [1.2], Petitioner argues that because Dziong only gives “limited details about the data format used for sharing” reserved bandwidth information, “it would have been obvious to consider . . . Sathyanath’s examples,” relying on two particular alleged “sharing definition[s]” in Sathyanath (i.e., the “aggregate node-link vector” and “TE/Share database”). Pet. 36–39. Based on the current record, we preliminarily find that Petitioner has made a sufficient showing, supported by the testimony of Dr. Mir, that a person of ordinary skill in the art would have been motivated to use such data formats to share reserved bandwidth information in the system of Dziong, with a reasonable expectation of success. *See id.*; Ex. 1003 ¶¶ 38–39, 72–79.

g) Conclusion

Petitioner’s contentions regarding the combination of Dziong and Sathyanath are supported by the testimony of Dr. Mir and are persuasive based on the current record.⁷ *See* Pet. 20–51; Ex. 1003 ¶¶ 33–128. Petitioner has shown a reasonable likelihood of prevailing on its assertion that claim 1 is unpatentable over Dziong and Sathyanath. Accordingly, we

⁷ We have considered in the analysis above Petitioner’s statement of material facts pertaining to various networking protocols and network nodes, and determine on this record that the statements are supported by the cited evidence of record. Pet. 16–19 (citing Exs. 1003, 1012–1035, 1039); *see* 37 C.F.R. § 42.22(c). Patent Owner does not dispute any of the alleged material facts in its Preliminary Response.

institute review “on all of the challenged claims and on all grounds of unpatentability asserted for each claim.” *See* 37 C.F.R. § 42.108(a).

4. Claims 2–4, 6, 8–11, 13, and 15–20

Patent Owner argues independent claims 1, 8, 15, and 17 together and does not argue dependent claims 2–4, 6, 9–11, 13, 16, and 18–20 separately. Prelim. Resp. 16, 22, 25, 28. On this record, we disagree with Patent Owner’s arguments regarding the independent claims and are persuaded that Petitioner has shown a reasonable likelihood of prevailing on its assertion that claim 1 is unpatentable over Dziong and Sathyanath. *See supra* Section II.D.3. Accordingly, we need not determine at this time whether Petitioner also has shown a reasonable likelihood of prevailing as to any of the other challenged claims. *See* 37 C.F.R. § 42.108(a).

E. Obviousness Ground Based on Dziong, Sathyanath, and Jensen

Petitioner contends that claims 7 and 14 are unpatentable over Dziong, Sathyanath, and Jensen under 35 U.S.C. § 103(a), citing the testimony of Dr. Mir as support. Pet. 73–77 (citing Ex. 1003). Patent Owner does not argue claims 7 and 14 separately. Prelim. Resp. 28. We are persuaded, based on the current record, that Petitioner has shown a reasonable likelihood of prevailing on its assertion that claim 1 is unpatentable over Dziong and Sathyanath, and thus need not determine at this stage whether Petitioner also has shown a reasonable likelihood of prevailing as to any of the other challenged claims. *See* 37 C.F.R. § 42.108(a).

III. CONCLUSION

Based on the arguments presented in the Petition, we conclude that Petitioner has demonstrated a reasonable likelihood of prevailing with respect to at least one claim of the '088 patent challenged in the Petition. Accordingly, we institute a trial on all claims and all grounds asserted in the Petition. The Board has not made a final determination under 35 U.S.C. § 318(a) with respect to the patentability of the challenged claims.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–4, 6–11, and 13–20 of the '088 patent is instituted with respect to all grounds set forth in the Petition;

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of the '088 patent shall commence on the entry date of this Decision, and notice is hereby given of the institution of a trial; and

FURTHER ORDERED that Paper 7 and Exhibits 2002–2007 will be expunged from the record of this proceeding.

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Patent 7,596,088 B2

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