Trials@uspto.gov
571-272-7822

Paper 11
Date: August 13, 2020

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

UNITED PATENTS, LLC,
Petitioner,

v.

ALTERWAN, INC.,
Patent Owner.

IPR2020-00580
Patent 9,667,534 B2

Before ROBERT J. WEINSCHENK, JOHN P. PINKERTON, and STACY B. MARGOLIES, *Administrative Patent Judges*.

PINKERTON, *Administrative Patent Judge*.

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

I. INTRODUCTION

Unified Patents, LLC[1] ("Petitioner") filed a petition for *inter partes* review of claims 1, 6, and 8 of U.S. Patent No. 9,667,534 B2 (Ex. 1001, "the '534 patent"). Paper 2 ("Pet."). AlterWAN, Inc. ("Patent Owner") filed a Preliminary Response. Paper 10 ("Prelim. Resp.").

Institution of an *inter partes* review is authorized by statute when "the information presented in the petition . . . and any 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." 35 U.S.C. § 314(a) (2018); *see* 37 C.F.R. § 42.108. Upon consideration of the Petition, the Preliminary Response, and the associated evidence, we conclude that the information presented shows that there is a reasonable likelihood Petitioner would prevail in establishing the unpatentability of at least one challenged claim of the '534 patent.

A. Related Matters

The parties identify the following judicial proceeding in which the '534 patent is or was asserted and which may affect, or be affected by, a decision in this proceeding: *AlterWAN, Inc. v. Amazon.com, Inc.,* Civil Action No. 1:19-cv-01544 (D. Del). Pet. 89; Paper 4, 2; *see* 37 C.F.R. § 42.8(b)(2).

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[1] Although Unified Patents, LLC is identified as Petitioner on the front page of the Petition, Unified Patents, Inc. is identified as Petitioner in the first line of the Petition. *See* Paper 2, 1. We note that Petitioner's Power of Attorney refers to Petitioner as Unified Patents, LLC. Paper 1, 1. Based on the front page of the Petition and the Power of Attorney, we consider the reference to Unified Patents, Inc. on the first page of the Petition to be a typographical error.

B. The '534 Patent

The '534 patent is titled "VPN Usage to Create Wide Area Network Backbone Over the Internet." Ex. 1001, [54]. The '534 patent explains that one type of prior art Wide Area Network (WAN) service provided by telephone companies uses leased lines provided by an Interchange Carrier (IXC) with a local loop provided by a Local Exchange Carrier (LEC). *Id.* at 1:24–32. The '534 patent also explains that another WAN service is known as a Virtual Private Network (VPN), which is intended for use by large organizations with multiple users. *Id.* at 1:33–35. According to the '534 patent, a VPN appears to the user to be a private leased line trunk network, but it is not. *Id.* at 1:35–36. Instead, VPN services are generally arranged with an IXC for the points from which data will be sent and received, with telephone line circuits established between each network termination and the closest IXC Point of Presence (POP). *Id.* at 1:37–43. The '534 patent states that connections between POPs "are established by routers using routing tables to route the traffic over specified high-capacity transmission facilities on a priority basis to ensure the level of service is adequate and equivalent to a true private network using leased lines." *Id.* at 1:43–48.

The '534 patent also states that prior art attempts to implement a private network using the Internet as a backbone to carry packets were expensive and faced several quality of service problems, including latency or delay on critical packets getting from source to destination, the number of router hops and lack of available bandwidth, and lack of security or privacy. *Id*. at 3:24–67. According to the '534 patent, these problems are solved by the disclosed configuration of a wide area network using the Internet as the backbone, which is referred to in the patent as the AlterWAN network. *Id.*

at 4:3–15. The disclosed network routes encrypted packets along preplanned high bandwidth, low hop-count routing paths between pairs of customer sites that are geographically separated. *Id.* at 4:24–28. The encrypted packets are sent through a high bandwidth, dedicated local loop connection to the first participating ISX/ISP facility, from which they are routed to the routers of only "preselected ISX/ISP facilities . . . which provide high-bandwidth, low hop-count data paths to the other ISX/ISP facilities along the private tunnel." *Id.* at 4:29–41.

Figure 1 of the '534 patent is reproduced below.

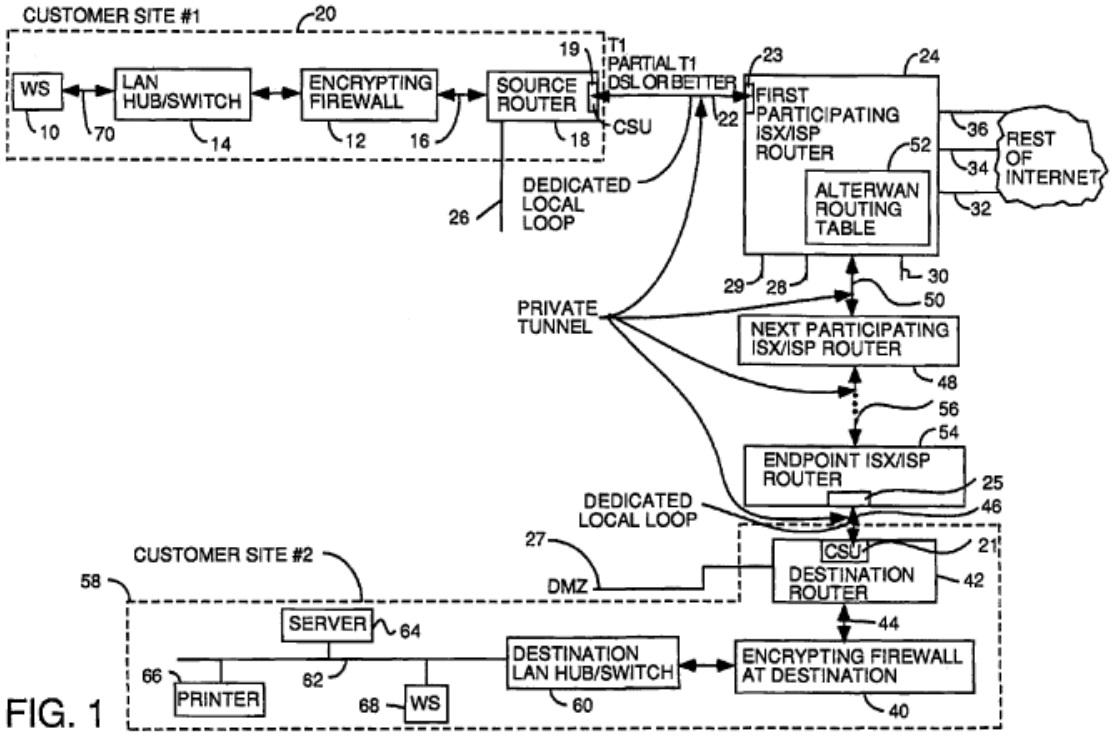

FIG. 1

Figure 1 is a block diagram of a wide area network using the Internet as a backbone. *Id.* at 8:5–9. Figure 1 depicts source customer site 1 (in dashed lines 20) and destination customer site 2 (in dashed lines 58). *Id.* at 8:28–30, 12:3–8. Figure 1 also depicts participating ISX/ISP providers 24, 48, and 54, and a "private tunnel" (identified by reference arrows) for

AlterWAN packets transmitted from customer site 1 to customer site 2. *Id.* at 11:66–67, 12:3–5. As explained in the '534 patent, the "private tunnel" is implemented by dedicated high bandwidth local loop data paths 22 and 46, and high bandwidth data paths 50 and 56 selected for AlterWAN packets by the routing tables in ISX/ISP providers 24, 48, and 54. *Id.* at 12:3–8.

As shown in customer site 1 of Figure 1, work station 10 is coupled to encrypting/decrypting firewall 12 by a local area network (LAN) represented by LAN hub or switch 14. *Id.* at 8:9–12. Similarly, as shown in destination site 2 of Figure 1, work station 68 is coupled to encrypting/decrypting firewall 40 by LAN hub or switch 60. *Id.* at 12:12–19. One function of firewall 12 and firewall 40 is to receive, and distinguish between, AlterWAN packets, which are addressed to nodes at the destination site on the AlterWAN network, and conventional internet protocol packets (IP packets), which are addressed to some other IP address on the internet. *Id.* at 8:22–38. The '534 patent explains that the firewalls make this distinction by examining the packet headers and using the destination address information, and one or more lookup tables, to determine which packets are AlterWAN packets addressed to nodes on the AlterWAN network and which packets are addressed to any other IP address. *Id.* at 8:49–55. AlterWAN packets are encrypted by the firewall and encapsulated in another IP packet having its destination address as the IP address of the untrusted side of the firewall at the other end of the private tunnel. *Id.* at 8:56–62. Conventional IP packets are not encrypted. *Id*. at 8:45. All the packets are then sent to source router 18 (or destination router 42), which routes them. *Id.* at 11:13–14.

Both routers 18 and 42 route any AlterWAN packet, and any IP packet, on a local loop path to the first participating ISX/ISP. *Id.* at 9:49–59.

For example, as shown in Figure 1, router 18 routes any AlterWAN packet into the "private tunnel" of dedicated high bandwidth local loop path 22, which guides these packets to first participating ISX/ISP 24. *Id.* AlterWAN packets are routed from ISX/ISP 24 into high bandwidth data path 50 to the next participating ISX/ISP 48, and then into high bandwidth path 56 to ISX/ISP 54, in the AlterWAN network. *Id.* at 11:24–26; 11:66–12:8. Any conventional IP packets are also routed on dedicated data path 22, other than the AlterWAN private tunnel, to ISX/ISP 24. *Id.* at 11:14–17. At ISX/ISP 24, the conventional IP packets are routed out one of the data paths represented by lines 32, 34, and 36 to the rest of the Internet. *Id.* at 11:17–20.

C. Illustrative Claim

Among the challenged claims (claims 1, 6, and 8), claim 1 is independent. Claim 1 is illustrative of the subject matter of the challenged claims and reads as follows (with notations added to identify the preamble and claim limitations consistent with those used by Petitioner):

> 1. [1.0] A method of routing packets at a machine associated with a first network, the method comprising:
>
> [1.1] receiving packets from one or more third party sources;
>
> [1.2] identifying the received packets as either associated with a virtual private network or not associated with the virtual private network;
>
> [1.3] encapsulating packets identified as associated with the virtual private network and [1.4] routing the encapsulated packets via a dedicated connection to a specific destination associated with the first network; and
>
> [1.5] routing the packets received from the one or more third party sources which are not associated with the virtual

> private network exclusively over at least one second connection, different than the dedicated connection;
>
> [1.6] wherein the method further comprises storing a first routing table and at least one second routing table, [1.7] wherein one or more routes identified by the first routing table are mutually-exclusive to one or more routes identified by the at least one second routing table, [1.8] wherein routing the encapsulated packets includes using only one or more routes of the first routing table to route the encapsulated packets, and [1.9] wherein routing the packets which are not associated with the virtual private network includes using only one or more routes of the at least one second routing table.

Id. at 16:5–29.

D. Asserted Grounds of Unpatentability

Petitioner contends that claims 1, 6, and 8 of the '534 patent are unpatentable based on the following ground (Pet. 2, 19–88):

Claims Challenged	35 U.S.C. §	References
1, 6, 8	103	Dantu,[2] Aziz[3]

In its analysis, Petitioner relies on the declaration testimony of Zygmunt Haas, Ph.D. (Ex. 1003). *See* Pet. 2–88.

II. DISCUSSION

A. Claim Construction

In an *inter partes* review based on a petition filed on or after November 13, 2018, we apply the same claim construction standard that

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[2] U.S. Patent No. 6,532,088 B1, filed Sept. 10, 1999, issued Mar. 11, 2003 (Ex. 1004).
[3] U.S. Patent No. RE39,360 E, filed Aug. 19, 1998, issued Oct. 17, 2006 (Ex. 1005).

would be used in a civil action under 35 U.S.C. § 282(b), following the standard articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b) (2019); 83 Fed. Reg. 51,340, 51,340–41, 51,343 (Oct. 11, 2018). In applying such standard, claim terms are generally given their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art, at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13. "In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence." *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

Neither party proposes specific constructions for any term or phrase of the challenged claims. *See* Pet. 2–9, 19–88; Prelim Resp. 15–34. We determine that no claim terms require express construction to determine whether to institute *inter partes* review.

B. Level of Ordinary Skill

Relying on the testimony of its declarant, Dr. Haas, Petitioner asserts the following:

> A person of ordinary skill in the art . . . for the '534 Patent would have had at least a bachelor's degree in electrical engineering, computer science, or a related subject or the equivalent, and two years of experience working with networking, packet routing systems, and related technologies . . . . More relevant experience could compensate for less education and vice versa.

Pet. 10 (citing Ex. 1001, generally; Ex. 1003 ¶¶ 44–46). Patent Owner does not dispute Petitioner's assertions regarding the level of ordinary skill in the art. *See generally* Prelim. Resp.

Petitioner's use of the phrase "at least" in its description of the level of ordinary skill is too open-ended. We determine, on the current record, that the level of ordinary skill proposed by Petitioner, except for the reference to "at least," is consistent with the challenged claims of the '534 patent and the asserted prior art, and we, therefore, adopt that modified level for purposes of this decision.

C. Asserted Obviousness Over Dantu and Aziz

Petitioner contends that claims 1, 6, and 8 of the '534 patent are unpatentable under 35 U.S.C. § 103 as obvious over Dantu and Aziz. Pet. 2, 19–88. Relying in part on the testimony of Dr. Haas, Petitioner explains how the references allegedly teach or suggest the claim limitations and provides reasoning for combining the teachings of the references. *Id.* at 19–88.

1. Overview of Dantu

Dantu is a U.S. patent titled "System and Method for Packet Level Distributed Routing in Fiber Optic Rings." Ex. 1004, [54]. Dantu relates generally to data transmission in fiber optic ring networks, and more particularly to the routing of IP packets through fiber optic ring networks, including synchronous optical networks (SONET networks) and synchronous digital hierarchy networks (SDH networks). *Id.* at 1:13–19.

Figure 8 of Dantu is reproduced below.

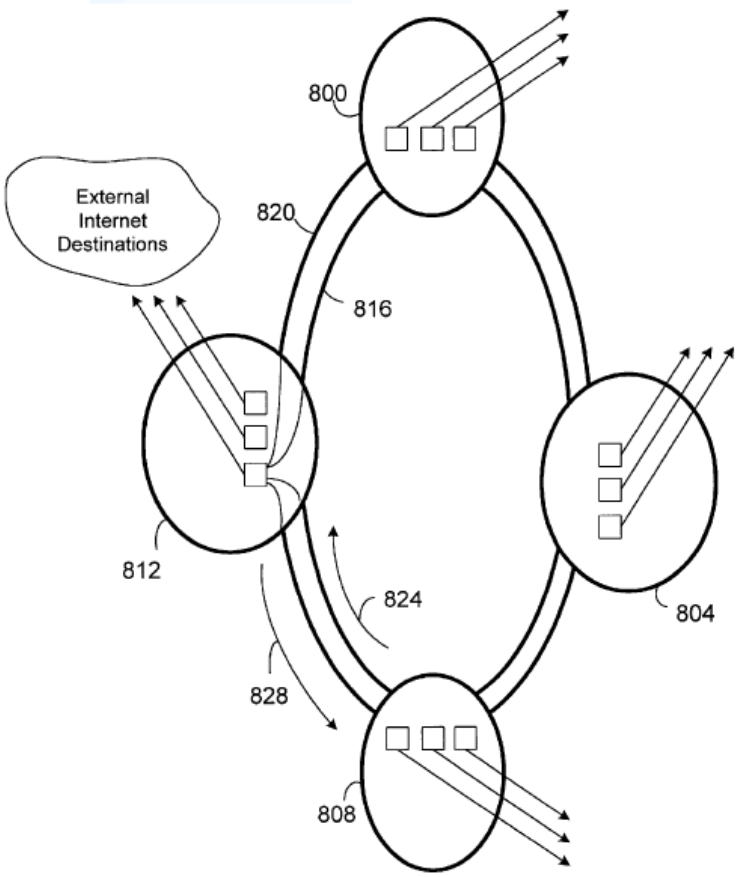

FIG. 8

Figure 8 is a functional block diagram of a fiber optic ring network having a plurality of nodes, each having a plurality of forwarding tables to create virtual private networks according to a preferred embodiment of Dantu. *Id.* at 14:63–66. Figure 8 shows central ingress node 800 communicatively coupled to nodes 804, 808, and 812 by way of fiber optic ring 816 and fiber optic ring 820. *Id.* at 14:67–15:3. Ring 816 conducts user traffic in the direction shown at 824 (i.e., clockwise), while ring 820 conducts user traffic in the direction shown at 828 (i.e., counter-clockwise). *Id.* at 15:3–5. Each node includes a plurality of memories, each of which stores a forwarding table for each of a plurality of virtual private networks.

Id. at 15:11–14. Dantu discloses that in a virtual private network, a subscriber is allocated a path and supporting resources for the subscriber's exclusive use, and "a unique forwarding table is created for the subscriber that defines the data packet forwarding for that particular subscriber." *Id.* at 15:14–19. Dantu further discloses that each forwarding table specifies whether the user traffic data packet is to be forwarded through the fiber optic ring network or output to an external internet destination, such as an external IP node. *Id.* at 15:26–29.

2. Overview of Aziz

Aziz is a U.S. reissue patent (RE39,360) titled "System for Signatureless Transmission and Reception of Data Packets Between Computer Networks." Ex. 1005, [54]. Aziz relates generally to secure transmission of data packets, and in particular to automatically encrypting and decrypting data packets between sites on the Internet and other computer networks. *Id.* at 1:15–19. Aziz discloses a "tunnelling bridge," which is a stand-alone computer with a processor and memory, positioned at the interface between a private network and a public network (i.e., the internet). *Id.* at 2:3–10. In each tunnelling bridge's memory is a hosts table identifying which hosts should have their data packets (sent or received) encrypted. *Id.* at 2:7–10. Aziz explains that "[t]he tunnelling bridge for a given private network (or subnetwork of a private network) intercepts all packets sent outside the network, and automatically determines from the tables whether each such packet should be encrypted." *Id.* at 2:15–18. If a packet is to be encrypted, Aziz states that the tunneling bridge then "encrypts the packet using an encryption method and key appropriate for the destination host, adds an encapsulation header with source and destination

address information (either host address or IP broadcast address for the network) and sends the packet out onto the internetwork." *Id.* at 2:18–24.

3. Discretionary Denial

Patent Owner argues that we should exercise our discretion under 35 U.S.C. § 325(d) and deny institution. Prelim. Resp. 37–43. Patent Owner argues that "Aziz was overcome during prosecution" and that "Aziz combined with Dantu is essentially identical to the combination of two other pieces of art discussed and overcome during examination." *Id.* at 39.

Specifically, Patent Owner argues Aziz is a reissue of U.S. Patent No. 5,548,646 ("the '646 patent"), and that the '646 patent was identified by Patent Owner during examination of the '534 patent in an information disclosure statement ("IDS"), which was initialed by the Examiner, and is cited on the face of the '534 patent. *Id.* at 39; *see* Ex. 1001 [56], 2. Patent Owner states that Petitioner "fails to acknowledge this fact in its Petition." *Id.* Patent Owner also argues that Aziz is "materially similar to and cumulative of art previously considered by the Office" during examination, namely, the combination of Hoke[4] and Newman.[5] *Id.* at 39–42. Patent Owner asserts that Petitioner relies on Aziz's encryption for claim 1's "encapsulation" limitation, but a comparison of Figure 3 of Hoke with Figure 6 of Aziz "demonstrates their equivalency on encryption." *Id.* at 39–40.

Patent Owner further argues that Patent Owner overcame the rejection based on the combination of Hoke and Newman by adding to claim 1 the

[4] U.S. Patent No. 6,701,437 B1 (Exhibit 2002).
[5] U.S. Patent No. 6,948,003 B1 (Exhibit 2003).

limitations in then-pending dependent claim 8, which concern using different routing tables for encapsulated packets than for all other packets. *Id.* at 40–41. Moreover, Patent Owner argues that the combination of Hoke and Newman's routing tables is substantially identical to Petitioner's "Dantu-Aziz combination." *Id.* at 41. In that regard, Patent Owner argues that "Newman describes customer 'lookup' and 'forwarding' tables stored on tunnel switches, which allow the network to forward packets for particular customers," and that "[t]hese forwarding tables are akin to those in Dantu." *Id.* Patent Owner also argues that Newman describes using the customer forwarding tables to separate private virtual server traffic from internet traffic "by customer, not by whether the packet should be routed through a VPN or over the public internet (as the '534 claims require)." *Id.* at 42 (citing Ex. 2003, 12:40–41, 13:33–62). Patent Owner then argues that "[t]he same is true of Dantu, which uses separate tables for each individual VPN." *Id.* (citing Ex. 1004, Fig. 9, 15:35–38). According to Patent Owner, "[o]n this element that resulted in patentability, [Petitioner's] art is substantially the same as the combination of Hoke and Newman." *Id.* Lastly, Patent Owner argues that although neither Aziz nor Dantu were discussed during prosecution, the combination of Hoke and Newman was evaluated extensively, and Petitioner makes no effort to show the Office erred in issuing the '534 patent in view of Hoke and Newman. *Id.* at 42–43.

Section 325(d) provides that, in determining whether to institute an *inter partes* review, "the Director may take into account whether, and reject the petition or request because, the same or substantially the same prior art or arguments previously were presented to the Office." We use a two-part framework in determining whether to exercise our discretion under § 325(d),

specifically:

> (1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and (2) if either condition of [the] first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.

Advanced Bionics, LLC v. Med-El Elektromedizinische Geräte GmbH, IPR2019-01469, Paper 6, 8 (PTAB Feb. 13, 2020) (precedential).

In applying the two-part framework, we consider several non-exclusive factors, including (a) the similarities and material differences between the asserted art and the prior art involved during examination; (b) the cumulative nature of the asserted art and the prior art evaluated during examination; (c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection; (d) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art; (e) whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art; and (f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments. *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8, 17–18 (PTAB Dec. 15, 2017) (precedential as to § III.C.5, first paragraph). If, after review of factors (a), (b), and (d), we determine that the same or substantially the same art or arguments previously were presented to the Office, then we consider factors (c), (e), and (f), which relate to whether the

petitioner demonstrates that the Office erred in a manner material to the patentability of the challenged claims. *Advanced Bionics*, Paper 6 at 10.

We determine that the same or substantially the same art or arguments were not presented previously to the Office. First, as acknowledged by Patent Owner, the same art was not presented previously to the Office. *See* Prelim. Resp. 42–43. Although the original version of Aziz—the '646 patent—was listed in an IDS along with over 300 other references, Dantu, the primary reference relied on by Petitioner, was not presented previously to the Office. *See* Ex. 1002, 323–355 (entire IDS), 326 (citing the '646 patent).

Second, Dantu is not substantially the same as the art previously presented to the Office. With respect to the "routing table" limitations added to obtain allowance of the claims (i.e., limitations 1.6–1.9), the teachings of Dantu and Newman are not substantially the same. Patent Owner argues that Newman describes "customer forwarding tables," which "are akin to those in Dantu," and that, as in Dantu, Newman's customer forwarding tables separate private virtual server traffic from internet traffic "by customer, not by whether the packet should be routed through a VPN or over the public internet (as the '534 claims require)." Prelim. Resp. 41–42 (citing Newman, 12:40–41, 13:33–62; Ex. 1004, Fig. 9, 15:35–38). Dantu, however, does not disclose forwarding tables for a VPN that separate private virtual traffic from internet traffic by "customer." Although Dantu discloses using separate forwarding tables for each VPN (Ex. 1004, Fig. 9, 15:21–22, 15:35–38), the forwarding tables determine whether to forward the received packet onto the fiber optic ring or output it to an external device on the internet by the "IP addresses" in the table, rather than by customer. Ex.

1004, 15:45–48, 15:59–16:11. Thus, on the current record, we are not persuaded by Patent Owner's argument that the forwarding tables of Newman "are akin to those in Dantu" because they separate VPN traffic from internet traffic in a different manner. Accordingly, although we acknowledge that the original version of Aziz was on an IDS, we are not persuaded that the totality of evidence supports that the same or substantially the same art was previously presented to the Office because of the material difference between Dantu and the prior art considered during the examination process.

We also determine that the arguments made in the Petition are not the same or substantially the same as the arguments made previously before the Office. As discussed above, Petitioner argues that the combination of Dantu and Aziz renders claims 1, 6, and 8 obvious. During examination of the '534 patent, the Examiner rejected claims 1–7, 9–17, and 19–23 as obvious over Hoke and Newman, and stated claims 8 and 18 would be allowable if written in independent form. Ex. 1002, 61–65, 91 ("the 2016 Office Action"). Following this rejection, prosecution ended quickly and there were substantially no further arguments by the applicant or the Examiner. In that regard, on January 6, 2017, the applicant filed a response to the 2016 Office Action and amended certain claims, including amending claim 1 to include the limitations of claim 8, which are identical to limitations 1.6–1.9. *Id.* at 44–45. In the remarks section of the response, the applicant did not substantively argue the rejection, but stated "Applicant does not agree with the rejection stated in the Office Action" and "the amendment set forth above should result in the allowability of all claims." *Id.* at 54. On February 15, 2017, the notice of allowance was mailed, allowing "claims 1–7, 9–17

and 19–25 (which have been renumbered as 1–23 respectively)." *Id*. at 24–33. Thus, as Patent Owner states, because the Examiner allowed the claims based on the amendment, "there are no arguments from prosecution to compare to those [Petitioner] is making," with respect to limitations 1.6–1.9 concerning using different routing tables for encapsulated packets than for those not associated with the virtual private network. Prelim. Resp. 42. Given the differences in the prior art relied on by Petitioner and that relied on by the Examiner, and given that the applicant did not substantively address the art that the Examiner relied on, we determine that the arguments in the Petition are not the same or substantially the same as arguments during prosecution.

For the above reasons, we determine that the same or substantially the same art or arguments were not previously presented to the Office, and we need not consider the second part of the *Advanced Bionics* framework.

Even assuming that the same or substantially the same art or arguments were previously presented during prosecution, we determine Petitioner has demonstrated sufficiently that the Office erred in a manner material to the patentability of challenged claims. In particular, on the current record, we determine Petitioner has shown that the Examiner materially erred during prosecution by overlooking the '646 patent's disclosure of encapsulating data packets selected for encrypting within a new packet and adding an encapsulation header. *See* Pet. 34–37 (citing Ex. 1005, Fig. 6, box 260 ("add encapsulation header"), 2:15–24; 5:19–20; 8:34–38); *see Advanced Bionics* at 8 n.9 ("An example of a material error may include misapprehending or overlooking specific teachings of the relevant prior art where those teachings impact patentability of the

challenged claims."). In the only Office Action in which the Examiner rejected claims, the Examiner rejected application claims 1–7, 9–17, and 19–23 as unpatentable under 35 U.S.C. § 103(a) over Hoke in view of Newman. Ex. 1002, 64–91. The Examiner objected to claims 8 and 18 as being dependent upon a rejected base claim, but stated they would be allowable if written in independent form with all of the limitations of the base claim and any intervening claims. *Id.* at 91. In response, the applicant incorporated the limitations of claim 8 into claim 1 and the limitations of claim 18 into claim 11 (*id.* at 44–55), and the pending claims were then allowed (*id.* at 28–33). Thus, the Examiner did not cite or rely on the '646 patent in rejecting any of the claims.

We conclude that the circumstances presented here do not warrant us exercising our discretion to deny institution based on § 325(d).

4. Analysis

a. Independent Claim 1

Petitioner argues Dantu teaches or renders obvious all of the limitations of claim 1, except for the "encapsulating" limitation 1.3, for which Petitioner relies on Aziz. Pet. 19–64. In its Preliminary Response, Patent Owner challenges Petitioner's showing regarding limitations 1.1., 1.3, 1.5, 1.6, and 1.7. Prelim. Resp. 16–34. Patent Owner also argues that Petitioner has not shown a person of ordinary skill would have been motivated to combine Dantu and Aziz, but uses "hindsight bias" to pick and choose disclosures in the references "that in combination would make no sense." *Id.* at 35–37. Patent Owner further argues that Dantu is not analogous art. *Id.* at 44–48.

Having reviewed the record, we determine that the information presented establishes a reasonable likelihood that Petitioner would prevail in showing that claim 1 is unpatentable under 35 U.S.C. § 103(a) as obvious over Dantu and Aziz.

(1) Analogous Art

Before analyzing the evidence and arguments concerning the limitations of claim 1, we first address the issue of whether Dantu is analogous art to the '534 patent.

Prior art is analogous if it is (1) from the same field of endeavor regardless of the problem addressed, or (2) reasonably pertinent to the particular problem with which the inventor is involved. *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004). "The Supreme Court's decision in *KSR* . . . directs us to construe the scope of analogous art broadly." *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1238 (Fed. Cir. 2010). "The field of endeavor of a patent is not limited to the specific point of novelty, the narrowest possible conception of the field, or the particular focus within a given field." *Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1001 (Fed. Cir. 2016).

Patent Owner contends that the '534 patent's field of endeavor is very different from that of Dantu. Prelim. Resp. 45. Patent Owner does not identify a specific field of endeavor of the '534 patent, but argues that the "focus is on routing packets from the originating customer site to the destination using routing tables in conjunction with a private-network-site firewall" and that "[a] feature of the claims is distinguishing between VPN and non-VPN traffic and routing the VPN traffic on its own route." *Id.* at 45. Patent Owner asserts that the '534 patent "never even mentions fiber

optics or fiber optic ring networks." *Id.* at 46. Patent Owner argues that Dantu's teaching is "limited to a particular type of fiber optic ring network" and that the function of the disclosed embodiments is "to receive and forward data to another network as quickly and with as few lost packets as possible, while minimizing cost of full routing capability at different nodes. *Id.* at 46 (citing Ex. 1004, Abstract). Patent Owner further argues that the Office has classified the '534 patent and Dantu under different fields, which "can be evidence of 'non-analogy.'" *Id.* at 46–47 (citing MPEP § 2141.01(a) II).

In addition, Patent Owner contends that Dantu tries to solve entirely different problems than the '534 patent. *Id.* at 47. Patent Owner argues that the '534 patent addresses two main problems with prior art systems: quality of service with respect to the bandwidth and hop-count of paths through the Internet, causing increased latency; and, security and privacy problems. *Id.* (citing Ex. 1001, 3:56–63, 5:8–13, 5:23–25, 5:37–39). Patent Owner argues that, on the other hand, Dantu is "limited to solving a problem of fiber-optic ring networks," particularly "three problems: (i) slow switching, (ii) lost data packets, and (iii) the cost of providing full IP routing capability to nodes in the fiber-optic ring." *Id.* at 48 (citing Ex. 1004, Abstract, 4:39–42).

We are not persuaded by Patent Owner's arguments. Petitioner argues that Dantu is in the same field of endeavor as the '534 patent because they are both systems and methods of routing packets over networks. Pet. 38; *see id.* at 19 (citing Ex. 1004, 4:39–42 ("the present invention contemplates . . . a plurality of fiber optic ring networks that provide routing of IP traffic"; Ex. 1003 ¶ 57). Petitioner also argues that although Dantu discloses the user of a fiber optic network, a person of ordinary skill would

have understood that "much of the packet routing over the Internet is along fiber optic lines and such routing utilizes the same principles as any other type of VPN based public network." *Id.* at 20 (citing Ex. 1003 ¶ 58). Petitioner further argues that, in fact, in discussing the routing of AlterWAN traffic only over high bandwidth lines, the '534 patent "specifically points out that 'there has been a large amountof building of ISX internet providers having fiber optic data paths to other providers to provide large amounts of bandwidth.'" *Id.* at 20–21 (quoting Ex. 1001, 5:24–33); *see also id.* at 21 (quoting Ex. 1001, 6:47–49 ("All the ISX or ISP facilities that are participating in the AlterWAN™ network structure have fiber optic or other high bandwidth data paths . . . ."). For the reasons argued by Petitioner, we determine Petitioner has sufficiently shown that Dantu is in the same field of endeavor as the '534 patent—the field of routing IP packets over networks—and thus is analogous art. *See, e.g.,* Ex. 1001, 4:25–47, 8:22–55; Ex. 1004, 4:39–42. Patent Owner characterizes the field of endeavor of both the '534 patent and Dantu too narrowly. The fact that the Office has used different classification fields for the '534 patent and Dantu is not determinative or convincing here. *See In re Ellis,* 476 F.2d 1370, 1372 (CCPA 1973) (finding that "the similarities and differences in structure and function of the inventions carry far greater weight" than Patent Office classification as evidence of "nonanalogy" or "analogy").

(2) Preamble 1.0

The preamble of claim 1 recites "[a] method of routing packets at a machine associated with a first network, the network comprising." Petitioner argues that Dantu discloses, or at least renders obvious, this limitation because Dantu discloses "a method of routing packets at a

machine (a node containing a processor and memory) associated with a first network (a fiber optic ring network)." Pet. 19–22 (citing Ex. 1004, Fig. 5 (showing node 512 containing processor 502 and memory 504), 4:39–42 ("invention contemplates . . . a plurality of fiber optic ring networks that provide routing of IP traffic"), Fig. 9, 15:57–60 (Figure 9 "illustrates how the forwarding tables in a memory of a node having VPNs relate to the routing and forwarding of packets through a node"); Ex. 1003 ¶¶ 57–60).

Patent Owner does not contest specifically Petitioner's arguments with respect to preamble 1.0. *See* Prelim. Resp. 16–17. Based on Petitioner's arguments and evidence as summarized above, we determine Petitioner has sufficiently shown that Dantu teaches or suggests preamble 1.0.

(3) Limitation 1.1

Petitioner contends that Dantu discloses, or at least renders obvious, limitation 1.1—"receiving packets from one or more third party sources." Pet. 22–26. Petitioner notes that the '534 patent does not use the term "third party source," but does discuss packets being received from a customer site. *Id.* at 22 (citing Ex. 1001, 9:49–53). Petitioner argues Dantu states that "[o]nce a node is set up with forwarding tables, it is ready and begins to receive user traffic in packet form (step 1006)." *Id.* at 23 (citing Ex. 1004, Fig. 10, 16:24–25; Ex. 1003 ¶ 62). Petitioner also argues that Figure 9 shows that "each of the switches 916, 920 and 924 'include an input to receive data packets for specified paths on the fiber optic ring network.'" *Id.* at 24 (citing Fig. 9, 15:45–48; Ex. 1003 ¶ 63). Petitioner further argues that Figure 2 of Dantu illustrates that "central router 204 receives user traffic and routes it through the fiber ring network of IP routers." *Id.* at 24–25 (citing

Ex. 1004, Figure 2, 7:44–47). Thus, Petitioner asserts that Dantu "discloses receiving packets from one or more third party sources (*e.g.*, user traffic from 'an external source (e.g., the internet)')." *Id.* at 26 (citing Ex. 1003 ¶¶ 61–65).

Patent Owner argues Petitioner fails to show that "the receiving nodes receive these third-party packets." Prelim. Resp. 21. Patent Owner asserts that Petitioner begins by pointing to Figure 9, and argues that "the forwarding nodes do not receive packets from third party sources" and that "Figure 9's inputs come solely from within the 'fiber optic ring network.'" *Id.* at 18. Patent Owner also argues that "Figure 2 is a completely different embodiment" than in Figures 5 and 9, and that "central IP router 204" is not a forwarding node as shown in Figures 5 and 9. *Id.* at 19–20 (citing Ex. 1004, 6:42, 7:37–47, 7:65, 11:40–12:14, 15:36–16:11).

On this record, we determine Petitioner has sufficiently shown that Dantu teaches or suggests limitation 1.1. As discussed above, the '534 patent does not use the term "third party source," but does describe receiving packets from a customer site. Ex. 1001, 9:49–53. Similarly, in describing Figure 10, Dantu states that "[o]nce a node is set up with forwarding tables, it is ready and begins to receive user traffic in packet form (step 1006)." *See* Pet. 23 (citing Ex. 1004, 16:24–25). We also agree with Petitioner that Dantu's "user traffic in packet form" is user IP traffic (i.e., IP data packets) "from one or more third party sources (e.g., user traffic from 'an external source (e.g., the internet)")." *See id.* at 26. In regard to Figure 9, although Dantu describes that "each of the switches 916, 920 and 924 'include an input to receive data packets for specified paths on the fiber optic ring network'" (Ex. 1004, Fig. 9, 15:45–48), Patent Owner argues that the

"inputs come solely from within the 'fiber optic ring network." Prelim. Resp. 18–19 (citing Ex. 1004, Fig. 9, 15:46–52). Limitation 1.1 does not, however, recite receiving user traffic or input "directly" from third party sources. In the event that Patent Owner intends to pursue this argument at trial, we encourage Patent Owner to present any proposed claim construction and arguments it believes support Patent Owner's position in Patent Owner's Response.

(4) Limitation 1.2

Petitioner contends that Dantu discloses, or at least renders obvious, limitation 1.2, which recites "identifying the received packets as either associated with a virtual private network or not associated with the virtual private network." Pet. 26–30. In particular, Petitioner argues that Dantu describes "the nodes (shown as 800, 804, 808, and 812) in Figure 8 as 'having three tables' and explains that 'at least two of the forwarding tables shown within each node of [Figure] 8 represent a forwarding table for a [VPN]' and '[t]he third forwarding table is either for all other user traffic or, perhaps, merely for a third subscriber of a virtual private network.'" *Id.* at 28–29 (citing Ex. 1004, Fig. 8, 15:19–26; Ex. 1003 ¶ 68). Petitioner also argues Dantu describes that "after user packets are received by one of the nodes of the fiber optic ring network, 'a processor, similar to the one of [Figure] 5, examines computer instructions within a storage device to determine a corresponding memory portion holding a corresponding forwarding table for a specified VPN according to the identity of the path from which a data packet was received.'" *Id.* at 29 (citing Ex. 1004, 15:60–64; Ex. 1003 ¶ 69; *see also* Fig. 10 (step 1008)) (emphasis omitted). Petitioner further argues that by analyzing the data packet, including its

corresponding path information and the appropriate forwarding table, Dantu is performing the recited identifying step. *Id.* at 30 (citing Ex. 1003 ¶ 70).

Patent Owner does not contest specifically Petitioner's arguments with respect to limitation 1.2. *See generally* Prelim. Resp. Based on Petitioner's arguments and evidence as summarized above, we determine Petitioner has sufficiently shown that Dantu teaches or suggests limitation 1.2.

(5) Limitation 1.3

Petitioner's Arguments

Petitioner contends that Dantu in view of Aziz renders obvious limitation 1.3, which recites "encapsulating packets identified as associated with the virtual private network." Pet. 31–37. Petitioner initially argues that the '534 patent does not specify a particular type of encapsulation, and refers generally to encapsulation by conventional, known methods, such as "conventional or custom firewall/VPN technology." *Id.* at 31 (citing Ex. 1001, 4:47–49, 12:27–29; Ex. 1003 ¶ 72). Petitioner then argues that Dantu discloses a conventional method of encapsulating packets identified as associated with a VPN using a multi-protocol label switching (MPLS) scheme in which data packets are inserted into another data packet along with the packet label (MPLS label). *Id.* at 31–33 (citing Ex. 1004, Fig. 11, 16:3–5, 1[6]:56–60,[6] 16:49–53). Petitioner also argues that a person of ordinary skill would understand that "this disclosure (i.e., inserting a data packet in another packet) was a widely used conventional type of

[6] As Patent Owner notes, this citation should be to Ex. 1004, 16:56–60, rather than Ex. 1004, 11:56–60 as indicated by Petitioner. Prelim. Resp. 23 n.3; Pet. 33.

encapsulation in 2000." *Id.* at 33–34 (citing Ex. 1003 ¶ 75 (citing Ex. 1008, 344)).

Petitioner further argues that to the extent Patent Owner argues that this limitation is not explicitly disclosed in Dantu or was not known as conventional, "Aziz discloses, or at least renders obvious, this limitation because it teaches encapsulating selected packets (*i.e.*, encapsulating the data packets selected for encryption within a new packet by adding an encapsulation header)." *Id.* at 34–35 (citing Ex. 1005, Fig. 6 (items 240, 250, 260), 2:15–24, 5:19–20, 8:34–38; Ex. 1003 ¶¶ 72–77). Petitioner argues that Figures 7 and 8 of Aziz, both of which are reproduced below, are examples of this encapsulation process. *Id.* at 36.

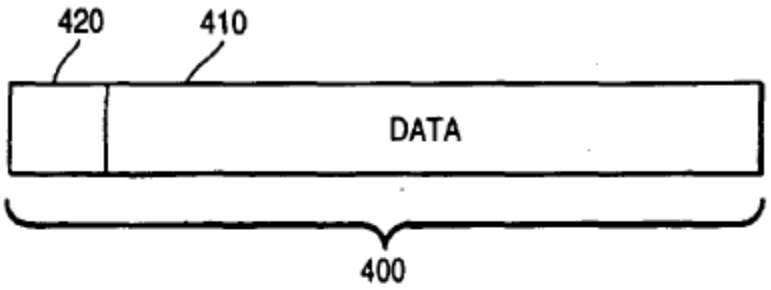

FIG. 7

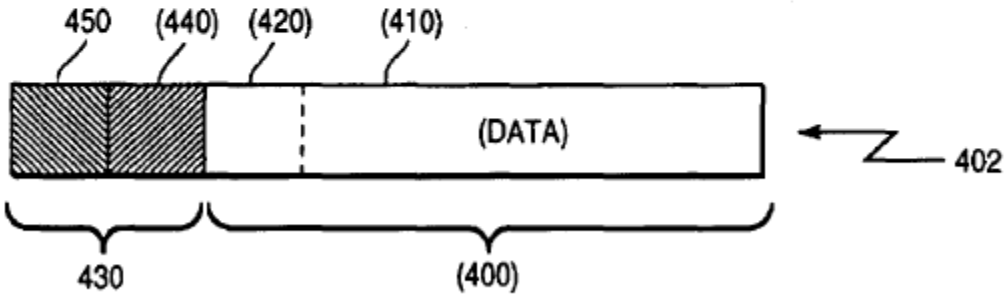

FIG. 8

Figure 7 of Aziz illustrates a conventional data structure for data

packet 400, which includes data 410 and header 420. Ex. 1005, 3:3–4, 4:6–7. Figure 8 illustrates data structure 402 in which "original data 410 and original header 420 are now encrypted, indicated as (410) and (420)," and "new IP header 450" includes "the address of the source and destination hosts." *Id.* at 5:52–59. According to Petitioner, in this example, "the entirety of original data packet 400 (shown in Figure 7) is encapsulated into new data packet 404[7] (shown in Figure 8 as encrypted data packet (400)) by adding new encapsulation header 450."[8] Pet. 36–37 (citing Ex. 1003 ¶ 78). Petitioner also asserts that "[e]ncapsulating headers as disclosed in Aziz is precisely the type of encapsulating packets that was conventional at the time of the alleged invention and disclosed by the '534 patent." *Id.* at 37 (citing Ex. 1008, 1055; Ex. 1003 ¶ 79).

Patent Owner's Arguments

Patent Owner contends that Petitioner fails to show that Dantu or the combination of Dantu and Aziz teaches the "encapsulating" aspect of limitation 1.3. Prelim. Resp. 22–29. In regard to Dantu, Patent Owner argues that Petitioner cannot rely on Dantu's discussions at 16:49–53 and 16:56–60 (in which data packets are inserted into another data packet along with the packet label (MPLS label)) because "that is referring to MPLS

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[7] We note Figure 8 does not use reference number 404 and believe Petitioner mistakenly refers to "new data packet 404," instead of "new data packet 402."

[8] Aziz states that in Figures 7–11, "the fields with reference numerals in parentheses are encrypted, and the other fields are unencrypted." Ex. 1005, 5:66–6:1. Aziz also states, "[t]hus, in Fig[ure] 8, the original data field 410 and address field 420 are encrypted, while the new encapsulation header 430, including the key management information 440 and the IP header 450, is not encrypted." *Id.* at 6:1–4.

addressing at the central node," and not the forwarding node, which Petitioner argues is the "machine" implementing the claim. *Id.* at 22–23. Patent Owner then argues that, although Petitioner points to addressing by the forwarding node (*see* Pet. 33), "MPLS addressing by the forwarding node is not 'encapsulation,'" but is "just switching address labels," which Dantu refers to as "merely address, or label, 'swapping.'" *Id.* at 23 (citing Ex. 1004, 8:47–50, 12:8, 14:49–51). Patent Owner further argues that "swapping address labels" does not satisfy either of Petitioner's two dictionary definitions for "encapsulating"—"defines a data structure" (*see* Ex. 1006, 4) and "method of packaging information," which entails creating the structure (*see* Ex. 1008, 4). *Id.* at 24–25 (arguing that "altering the data in one field of that structure is not 'encapsulating,' but that is all the forwarding node [of Dantu] does").

In regard to Aziz, Patent Owner asserts that Petitioner contends Aziz's "encryption qualifies as encapsulation." *Id.* at 25. Patent Owner states that it disputes the existence of a motivation to combine Aziz with Dantu, but even if combined, the references would not produce the system of claim 1 because the encapsulation would not occur at the "machine," but "outside the Dantu ring network entirely." *Id.* at 25–26. In that regard, Patent Owner argues that as shown in Figure 3 of Dantu, "input from the internet arrives at the central node 300," but the forwarding tables of Figure 3 do not receive external inputs and "the only inputs to the ring network come through the internet." *Id.* at 26–27 (citing Ex. 1004, Fig. 1–3, 665–67, 7:41–43, 8:22–25). According to Patent Owner, Dantu never mentions "customer networks or where data packets originate," and focuses solely on making the transfer of data received at the ring more efficient." *Id.* at 27

(citing Ex. 1004, Abstract). Patent Owner further argues that Aziz, on the other hand, concerns encrypting data at the private customer network tunneling bridge before it reaches the internet so that "no one on the public internetwork can determine the contents of the packets." *Id.* at 27–28 (citing Ex. 1005, Fig. 3, 2:2–20, 2:35–37). Patent Owner maintains that "combining Aziz with Dantu would have put Aziz's encryption at the private network's tunneling bridge, not within Dantu's ring network, let alone at one of Dantu's forwarding nodes." *Id.* at 28. Thus, Patent Owner further maintains that the combination of references fails to satisfy the "encapsulation" part of this limitation because claim 1 requires that "encapsulation occur at a machine that accomplishes the other claimed method steps . . . [and] cannot occur outside the network on an entirely different machine." *Id.* at 28–29.

Moreover, Patent Owner argues Dantu teaches away from attempting to incorporate Aziz at a forwarding node because the point of Dantu's architecture is "to minimize cost and complexity at the forwarding nodes." *Id.* at 29 (citing Ex. 1004, 8:40–46). Patent Owner argues that is why those nodes have no routing tables, routing hardware, or routing functionality and get their instructions from the central node. *Id.* (citing Ex. 1004, 8:20–30). Thus, Patent Owner asserts that adding encryption hardware and code at every forwarding node "would defeat Dantu's entire purpose, all without accomplishing Aziz's purpose—protecting the packets as they traverse the internet." *Id.*

Analysis regarding "encapsulating"

At this stage of the proceeding and based on the record before us, we determine Petitioner has sufficiently shown that Dantu alone, and the

combination of Dantu and Aziz, teaches or suggests "encapsulating packets" as recited in limitation 1.3. Petitioner has shown Dantu teaches an MPLS encapsulation scheme in which a received IP data packet is converted to at least one data packet, such as MPLS data packet 1100 shown in Figure 11, and the data of the IP data packet is inserted within portion 1102, the IP destination address is placed within portion 1108, the IP source address is placed within portion 1112, and the packet label (MPLS label) is placed in portion 1116. *See* Pet. 31–33 (citing Ex. 1004, Fig. 11, 16:3–5, 16:56–60, 16:49–53). Although Patent Owner argues that Petitioner cannot rely on these disclosures of Dantu because they refer to MPLS addressing at the "central node," and not the forwarding node, Dantu specifically states that forwarding tables 904, 980, 912 include "labels (if an MPLS scheme is being used to forward packets)." Ex. 1004, 16:3–5.

In addition, Petitioner has sufficiently shown that Aziz teaches or suggests "encapsulating packets" because, as discussed above, Aziz teaches encapsulating data packets selected for encryption within a new packet by adding an encapsulation header. Pet. 34–37 (citing Ex. 1005, Fig. 6 (items 240, 250, 260), Figs. 7–8, 2:15–24, 5:19–20, 5:52–59, 8:34–38; Ex. 1003 ¶¶ 72–77). We are not persuaded by Patent Owner's argument that, even if combined, the references would not produce the method of claim 1 because Aziz's encryption would not take place within Dantu's ring network, or at one of Dantu's forwarding nodes, but at the private network's tunneling bridge. *See* Prelim. Resp. 28. This argument is not persuasive because Petitioner's proposed combination would modify the routing system of Dantu's forwarding nodes to include Aziz's encryption and encapsulation technique, rather than physically combining Aziz's private customer

network tunneling bridge before packets reach the Internet, as Patent Owner describes. *See* Pet. 34, 39–40 (citing Ex. 1003 ¶¶ 84–85). "The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art." *In re Keller***,** 642 F.2d 413, 425 (CCPA 1981); *see also In re Sneed*, 710 F.2d 1544, 1550 (Fed. Cir. 1983) ("[I]t is not necessary that the inventions of the references be physically combinable to render obvious the invention under review."). Here, Petitioner has sufficiently shown that Aziz discloses a conventional technique in which data packets "are encrypted, then encapsulated into new IP packets for transport, which has the benefit of improving security," and that a person of ordinary skill would have understood that Dantu in view of Aziz teaches or suggests "encapsulating packets" identified as associated with the virtual private network of Dantu at the forwarding tables. Pet. 34–37; Ex. 1003 ¶¶ 79–80.

We also are not persuaded on the current record by Patent Owner's argument that Dantu teaches away from attempting to incorporate Aziz at a forwarding node because it would defeat Dantu's entire purpose, which is "to minimize cost and complexity at the forwarding nodes." Prelim. Resp. 29 (citing Ex. 1004, 8:40–46). 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. *Meiressone v. Google, Inc.*, 849 F.3d 1379, 1382 (Fed. Cir. 2017) (quoting *Galderma Labs., L.P. v. Tolmar, Inc.*, 737 F.3d 731, 738

(Fed. Cir. 2013)). The portion of Dantu cited by Patent Owner states that because "the forwarding nodes are not required to have full IP router functionality[,] [c]ost and complexity . . . are significantly reduced." Ex. 1004, 8:40–43 (emphasis added). Thus, Patent Owner has not shown that Dantu criticizes or discourages using the forwarding tables for encrypting and encapsulating IP packets. Based on the current record, we determine Dantu does not criticize or discourage (or teach away from) using the forwarding tables for encrypting and encapsulating IP packets associated with the virtual private network.

Motivation to Combine Dantu and Aziz

Petitioner contends that a person of ordinary skill would have been motivated to modify the VPN routing system of Dantu to use the private network encapsulation and encryption system of Aziz and would have been able to do so with a reasonable expectation of success. Pet. 39–43 (citing Ex. 1003 ¶¶ 81–90). Petitioner argues that although Aziz discloses private networks and not explicitly virtual private networks, the teachings in Aziz would apply equally to a VPN and would have been considered by a person of ordinary skill in implementing the dedicated path system of Dantu. *Id.* at 40 (citing Ex. 1003 ¶ 85). According to Petitioner, a person of ordinary skill in the art would have been motivated to modify the routing system of Dantu to incorporate the encapsulation and encryption system of Aziz to provide additional security for the data packets being sent according to each VPN. *Id.* at 40–41 (citing Ex. 1003 ¶ 86–87). Petitioner also argues that a person of ordinary skill would have been motivated to combine Dantu and Aziz because both references use tables to determine how the data packets are routed and, in view of the similarities in Dantu and Aziz of receiving a data

packet, determining whether it should be encrypted, and then routing the packet according to a table, a person of ordinary skill would have been motivated to use VPNs implementing the tunnel system of Aziz to "provide for more efficient routing systems." *Id.* at 42 (citing Ex. 1003 ¶ 88; Ex. 1010, 11). Lastly, Petitioner argues that a person of ordinary skill would have known that "modifying the VPN routing system of Dantu to implement the tunneling encapsulation and encryption system of Aziz would have had a reasonable expectation of success" because it was known at the time of the invention of the '534 patent that "VPNs must be implemented using some form of tunneling mechanism." *Id.* at 42 (citing Ex. 1003 ¶ 89; Ex. 1011, 9).

Patent Owner argues that Petitioner relies on hindsight bias to combine the references. Prelim. Resp. 35, 37. Petitioner also argues that one of ordinary skill would not have been motivated to modify the system of Dantu to have each VPN routing table perform the function of encryption and encapsulation as described in Aziz because "while Dantu focuses on routing and forwarding VPN packets, Aziz never mentions VPNs anywhere." *Id.* at 36. Petitioner further argues that combining Dantu and Aziz would undermine Aziz's purpose of data security because "Dantu receives packets that have already traversed public networks," whereas Aziz "teaches encryption prior to the data ever reaching the public network." *Id.* at 36–37.

On the current record, we determine Petitioner's arguments, as discussed above, provide sufficient reasoning with rational underpinning for combining the teachings of Dantu and Aziz with a reasonable expectation of success. *See KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 418–19 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring "articulated

reasoning with some rational underpinning to support the legal conclusion of obviousness")). At this stage of the proceeding, we are not persuaded by Patent Owner's argument that "Aziz never mentions VPNs" because Patent Owner has not provided evidence or persuasive arguments that modifying Dantu with Aziz's encryption and encapsulation technique would have been "uniquely challenging or difficult for one of ordinary skill in the art." *See Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007). Nor are we persuaded by Patent Owner's argument that combining Dantu and Aziz would undermine Aziz's purpose of data security because Petitioner has sufficiently shown that modifying the routing system of Dantu to incorporate the encapsulation and encryption system of Aziz, as proposed by Petitioner, would provide data security for the data packet communications between each VPN subnetwork (or between each VPN host). *See* Pet. 41 (citing Ex. 1003 ¶ 87 (quoting Ex. 1010, 5)). We also are not persuaded by Patent Owner's "hindsight bias" argument because Petitioner relies on the prior art references and "takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from [the] applicant's disclosure." *In re McLaughlin*, 443 F.2d 1392, 113–14 (CCPA 1971).

(6) Limitation 1.4

Petitioner contends that Dantu in view of Aziz discloses, or at least renders obvious, limitation 1.4, which recites "routing the encapsulated packets via a dedicated connection to a specific destination associated with the first network." Pet. 43–49. Specifically, Petitioner argues that Dantu in view of Aziz teaches or suggests nodes containing multiple forwarding

tables, one for a specific VPN, and "[e]ncapsulated data packets identified as associated with a particular VPN (*e.g.*, VPN A) are routed according to its corresponding forwarding table." *Id.* at 45 (citing Ex. 1004, Fig. 8, 15:19–26, 15:30–38; Ex. 1003 ¶ 93). Petitioner also argues that Dantu's routing is done via a dedicated connection between the node and its destination or endpoint along the ring network by which the packets are sent. *Id.* at 46–47 (citing Ex. 1004, 15:26–35; Ex. 1003 ¶ 94). According to Petitioner, in all embodiments of Dantu, "the packets are routed to a specific destination associated with the first network (*i.e.*, the fiber optic ring network) according to the destination address located in the header of the packet." *Id.* at 47–48 (citing Ex. 1003 ¶ 95; Ex. 1004, 8:55–58, 13:62–67, 14:54–57).

Patent Owner does not contest specifically Petitioner's arguments with respect to limitation 1.4. *See generally* Prelim. Resp. Based on Petitioner's arguments and evidence as summarized above, we determine Petitioner has sufficiently shown that Dantu in view of Aziz teaches or suggests limitation 1.4.

(7) Limitation 1.5

Petitioner contends that Dantu discloses, or at least renders obvious, limitation 1.5, which recites "routing the packets from one or more third party sources which are not associated with the virtual private network exclusively over at least one second connection, different than the dedicated connection." Pet. 49–52. Citing its evidence and arguments relating to limitation 1.1, Petitioner argues that "Dantu discloses a node which receives packets from one or more third party sources." *Id.* at 50 (citing Pet. Section IV.C.1). Petitioner also argues that Dantu describes nodes 800, 804, 808, and 812 shown in Figure 8 as "having three tables" and explains that "at

least two of the forwarding tables . . . represent a forwarding table for a [VPN]" and "[t]he third forwarding table is either for all other user traffic or, perhaps, merely for a third subscriber of a virtual private network." *Id.* at 51 (citing Ex. 1004, 15:19–26). Petitioner further argues, "[i]f the node determines that the received packets are not associated with the VPN (*e.g.,* VPN A), then the packets are routed over a *second connection*, different than VPN A's dedicated connection." *Id.* at 52 (citing Ex. 1004, 15:29–35 ("for each VPN, there exists dedicated paths within the fiber optic ring network and dedicated output ports and unique forwarding tables").

Patent Owner argues that Petitioner faces the same problem with this limitation as it did for limitation 1.1—"an inability to establish that the 'machine' received [packets] from one or more third party sources." Prelim. Resp. 29. Patent Owner makes substantially the same arguments with respect to this limitation, and particularly Figures 8 and 9 of Dantu, as it did with respect to limitation 1.1. *See id.* at 29–30. For the reasons discussed above regarding limitation 1.1, Petitioner has sufficiently shown that Dantu's nodes receive data packets from a third party source—user traffic from an external source (e.g., the internet). Moreover, based also on Petitioner's arguments and evidence as summarized above, we determine Petitioner has sufficiently shown that Dantu teaches or suggests limitation 1.5.

(8) Limitation 1.6

Petitioner contends that Dantu discloses, or at least renders obvious, limitation 1.6, which recites "wherein the method further comprises storing a first routing table and at least one second routing table." Pet. 52–54. Petitioner argues Dantu discloses that "each node includes a plurality of

memories within the node" and that "[e]ach of the memories stores a forwarding table for each of a plurality of so called virtual private networks." *Id.* at 52 (citing Ex. 1004, 15:10–14 (emphasis omitted)). Petitioner also argues that Dantu specifies that "a node having three tables illustrates the presence of at least two virtual private networks" and that "at least two of the forwarding tables shown within each node of [Figure] 8 represent a forwarding table for a [VPN]" and "[t]he third forwarding table, is either for all other user traffic or, perhaps, merelyfor a third subscriber of a virtual private network." *Id.* at 52–53 (citing Ex. 1004, 15:19–26; Ex. 1003 ¶ 102) (emphasis omitted). Petitioner further argues Dantu explicitly states that "[Figure] 9 is a functional schematic diagram of a node having a plurality of forwarding tables, each corresponding to a virtual private network according to a preferred embodiment of the invention." *Id.* at 53–54 (Ex. 1004, 15:35–38, Fig. 9).

In response, Patent Owner argues that Petitioner points to Dantu's "forwarding tables" as "routing tables," but Dantu distinguishes "forwarding tables" from "routing tables" and "Petitioner never explains how or why 'forwarding tables' qualify as 'routing tables.'" Prelim. Resp. 31–33. Patent Owner argues that Figure 4 of Dantu "shows a central node, with memory (404) for storing 'routing tables' (404A) separate from 'forwarding tables' (404B)," whereas Figure 5 "shows a forwarding node, which only stores 'forwarding tables' (504A) in memory (504), not 'routing tables.'" *Id.* at 31–32. Patent Owner asserts that, "[a]s Dantu explains, the routing tables are 'for specifying routing through fiber optic ring network (and beyond),' whereas the forwarding tables are 'for specifying packet forwarding through the fiber optic ring network.'" *Id.* at 32 (citing Ex. 1004, 8:1–6).

The issue raised by Patent Owner is addressed to some extent by certain of Petitioner's arguments concerning limitation 1.7, which is discussed below. In that regard, Petitioner argues that, as can be seen in Figure 8, each VPN contains "dedicated paths within the fiber optic ring network and dedicated output ports and unique forwarding tables." Pet. 56 (citing Ex. 1004, 15:33–35) (emphasis omitted). Petitioner also argues "[t]hus, the [forwarding] table [in Figure 8] that corresponds to VPN A routes packets over one or more routes . . . and the other tables route packets not associated with the VPN over at least one or more different routes (*e.g.*, external internet destinations . . . or other dedicated paths)." *Id*. (citing Ex. 1004, Fig. 8). Petitioner also argues that "Dantu's Figure 9 shows 'a functional schematic diagram of a node having a plurality of forwarding tables, each corresponding to a virtual private network,' and each having separate paths." *Id.* at 57 (citing Ex. 1004, 15:35–38). We note Dantu discloses that each of switches 916, 920, and 924 shown in Figure 9 includes "an input to receive data packets for specified paths on the fiber optic ring network" and "a pair of outputs," one coupled to a specified IP node external to the fiber optic ring network, and the other coupled to a specified path on the fiber optic ring network. Ex. 1004, 15:46–52). Dantu states that one purpose of Figure 9 "is to illustrate how the forwarding tables in a memory of a node having VPNs relate to the routing and forwarding of packets through a node." *Id.* at 56–59. Dantu also states that in an embodiment in which the forwarding tables include IP addresses, "the node can determine whether to forward the packet onto the fiber optic ring network or whether to output the packet to an external device on the internet because the node is aware of the IP addresses of the nodes coupled to the fiber optic ring

network." *Id.* at 16:5–11.

Based on the current record, Petitioner has sufficiently shown that Dantu teaches or suggests limitation 1.6 because the nodes shown in Figures 8 and 9 include a "forwarding table" for each of a plurality of VPNs (i.e., "first routing table" and "second routing table") and each "forwarding table" performs the function of the claimed "routing table" by specifying the routes or paths for packets to be forwarded through the fiber optic ring network or output to an external IP node.

(9) Limitation 1.7

Petitioner contends that Dantu discloses, or at least renders obvious, limitation 1.7, which recites "wherein one or more routes identified by the first routing table are mutually-exclusive to one or more routes identified by the at least one second routing table." Pet. 54–58 (citing Ex. 1003 ¶¶ 105–108). As discussed above in regard to limitation 1.6, Petitioner argues Dantu teaches that each node as shown in Figure 8 has a forwarding table for a specified VPN and additional tables for all other traffic. *Id.* at 55 (citing Ex. 1004, 15–19–26, 15:35–38, Fig. 8; Ex. 1003 ¶ 106). Petitioner also argues Dantu discloses that each VPN shown in Figure 8 contains "dedicated paths within the fiber optic ring network and dedicated output ports and unique forwarding tables." *Id.* at 56 (citing Ex. 1004, 15:33–35) (emphasis omitted). Petitioner provides a version of Figure 8 (with color added), which is reproduced below.

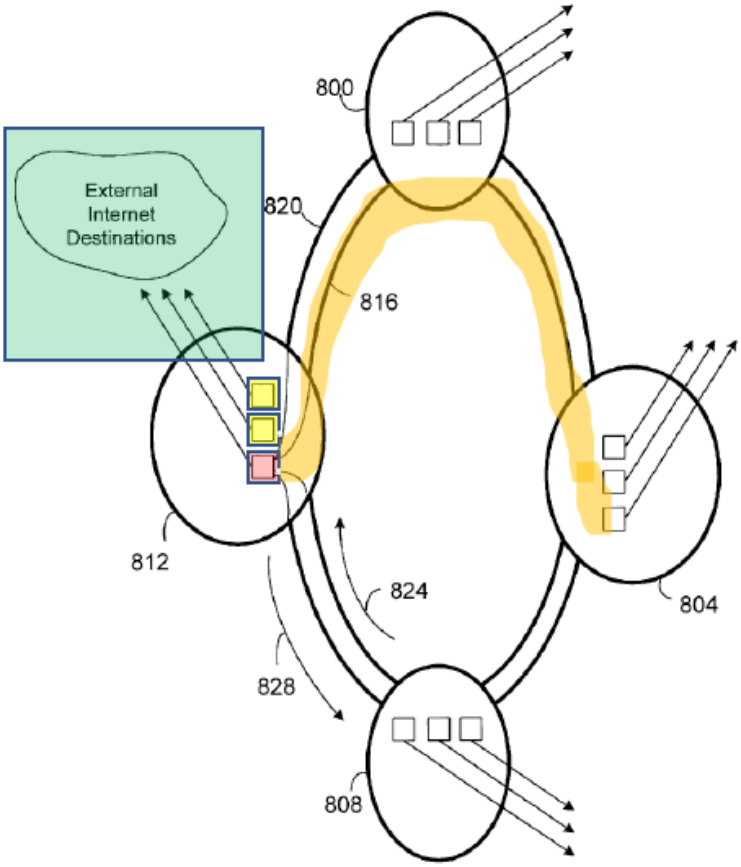

FIG. 8

Id. Petitioner argues this colored version of Figure 8 shows the table that corresponds to VPN A (shown in red) routes packets over one or more routes (e.g., highlighted in orange) and the other tables (shown in yellow) route packets not associated with the VPN over at least one or more different routes (e.g., external internet destinations highlighted in green or other dedicated paths). *Id.* Thus, according to Petitioner, Figure 8 of Dantu "discloses paths separate from the specified VPN path to external internet destinations," and "[t]hese paths are 'dedicated paths,' which are mutually exclusive." *Id.* at 57 (citing Ex. 1004, 15:12–14 ("In a virtual private

network, a subscriber is allocated a path and supporting resources for the subscriber's exclusive use."). Moreover, as also discussed above, Petitioner argues Dantu Figure 9 shows '"a functional schematic diagram of a node having a plurality of forwarding tables, each corresponding to a virtual private network,' and each having separate paths." *Id.* at 57.

Patent Owner argues Petitioner relies on the forwarding nodes' forwarding tables, but never explains how the information they store "qualifies as 'one or more routes.'" Prelim Resp. 33–34. Patent Owner also argues that Dantu describes the types of information the forwarding tables can include, and "does not characterize any as a 'route.'" *Id.* (citing Ex. 1004, 8:44–58). Patent Owner further argues that Dantu "then immediately explains that the forwarding tables do not support 'routing' functionality." *Id.* (citing Ex. 1004, 8:58–64).

Based on this record, Petitioner has sufficiently shown through its arguments and evidence summarized above, as well as the reasons discussed above regarding limitation 1.6, that Dantu teaches or suggests limitation 1.7. In particular, Petitioner has sufficiently shown that Dantu's forwarding tables include "one or more routes" because they specify paths for packets to be forwarded or routed through the fiber optic ring network or output to an external IP node. We do not agree with Patent Owner's assertion that Dantu explains "the forwarding tables do not support 'routing' functionality" because the cited portion of Dantu expressly states that other nodes, such as the forwarding nodes, do not "function as full IP routers." There is a difference between a forwarding table in a forwarding node of Dantu functioning to specify routes and paths for packets and a forwarding node having the complexity to function as a full router. *See, e.g.*, Ex. 1004, 8:40–

43, 14:2–4.

(10) Limitation 1.8

Petitioner contends that Dantu in view of Aziz discloses, or at least renders obvious, limitation 1.8, which recites "wherein routing the encapsulated packets includes using only one or more routes of the first routing table to route the encapsulated packets." Pet. 58–61 (citing Ex. 1003 ¶¶ 109–111). In particular, Petitioner argues that as discussed in regard to limitation 1.3, Dantu in view of Aziz teaches or suggests "the routing of encapsulated packets." *Id.* at 58. Petitioner also argues that as discussed with respect to Figure 9, Dantu discloses each "node having a plurality of forwarding tables, each corresponding to a virtual private network," and "separate paths for separate VPNs, wherein routing the encapsulated packets (i.e., VPN A . . .) includes using only one or more routes of the first routing table (i.e., Table 1 in Figure 9)." *Id.* at 59 (citing Ex. 1004, 15:35–38, Fig. 9, Ex. 1003 ¶ 109). Petitioner further argues that as shown in Figure 9, "the paths for VPN A (e.g., PTH B and IP Node C) are separate from the paths for the other VPNs, or any non-VPN user traffic. *Id.* (Ex. 1004, Fig. 9, 15:12–14, 15:33–35). In addition, Petitioner argues that as shown in Figure 8, Dantu discloses that "[e]ach virtual private network includes its own forwarding table" and "that, for each VPN, there exists dedicated paths within the fiber optic ring network and dedicated output ports and unique forwarding tables." *Id.* at 60–61 (citing Ex. 1004, Fig. 8, 15:21–22, 15:33–35).

Patent Owner does not contest specifically Petitioner's arguments with respect to limitation 1.8. *See generally* Prelim. Resp. Based on Petitioner's arguments and evidence as summarized above, we determine

Petitioner has sufficiently shown that Dantu teaches or suggests limitation 1.8.

(11) Limitation 1.9

Petitioner contends that Dantu discloses, or at least renders obvious, limitation 1.7, which recites "wherein routing the packets which are not associated with the virtual private network includes using only one or more routes of the at least one second routing table." Pet. 61–64 (citing Ex. 1003 ¶¶ 112–114). Petitioner argues Dantu discloses separate paths for separate VPNs, "wherein routing the packets which are not associated with the virtual private network (i.e., those associated with VPN B or other non-VPN user traffic . . . in Figure 9) includes using only one or more routes of the at least one second routing table (i.e., Tables 2 or 3 in Figure 9)." *Id.* at 62 (citing Ex. 1004, Fig. 9). Petitioner also argues that as shown in Figure 9, "the paths for VPN B and non-VPN user traffic (e.g., PTH E and H and IP Nodes F and I) are separate from the paths for VPN A." *Id.* (citing Ex. 1004, Fig. 9, 15:33–35, 15:12–14). Petitioner further argues Dantu specifies with respect to Figure 8, that "a node having three tables illustrates the presence of at least two virtual private networks" and that "at least two of the forwarding tables shown within each node of [Figure] 8 represent a forwarding table for a [VPN]" and "[t]he third forwarding table, is either for all other user traffic or, perhaps, merely for a third subscriber of a virtual private network." *Id.* at 62–63 (citing Ex. 1004, Figure 8, 15:19–26; Ex. 1003 ¶ 113).

Patent Owner does not contest specifically Petitioner's arguments with respect to limitation 1.9. *See generally* Prelim. Resp. Based on Petitioner's arguments and evidence as summarized above, we determine

Petitioner has sufficiently shown that Dantu teaches or suggests limitation 1.9.

(12) Conclusion

For the reasons discussed above, Petitioner has sufficiently shown that the combination of Dantu and Aziz teaches or suggests the subject matter of claim 1 and has provided sufficient reasoning with rational underpinning for combining these references in the manner claimed with a reasonable expectation of success.

b. Dependent Claims 6 and 8

Claim 6 depends from claim 1 and further recites (with paragraph notations added as in the Petition):

> [6.1] wherein the machine is associated with a first endpoint of the first network;
>
> [6.2] the specific destination corresponds to a second endpoint of the first network;
>
> [6.3] the dedicated connection connects said first endpoint with the second endpoint of the first network;
>
> [6.4] identifying includes examining header information for received packets,
>
> [6.5] comparing a network destination address from said header information with a predetermined destination address outside of the first network, and
>
> [6.6] determining that packets are associated with the virtual private network when the network destination address matches the predetermined destination address; and

[6.7] the specific destination is to forward packets associated with the virtual private network from the first network toward the network destination address.

Claim 8 also depends from claim 1 and further recites:

[8.1] wherein encapsulating packets identified as associated with the virtual private network includes encrypting those packets using an encryption key corresponding to a decryption key known a priori to the destination associated with the first network.

Patent Owner does not raise any arguments specific to claims 6 or 8, but asserts Petitioner's attempted proof with respect to these claims "suffers from at least the same flaws" as Patent Owner demonstrated with respect to claim 1. Prelim. Resp. 34.

On the current record, Petitioner sufficiently shows that Dantu, and the combination of Dantu and Aziz, teaches or suggests the subject matter of claims 6 and 8 and provides sufficient reasoning with rational underpinning for combining the teachings as claimed. *See* Pet. 64–88. For example, with respect to claim 6, Petitioner sufficiently shows that Dantu teaches or suggests "a ring network in which packets are routed from one node that serves as an (origin) endpoint (i.e., a first endpoint of the first network) to another node that serves as an (destination) endpoint (i.e., a second endpoint of the first network)." *Id.* at 65–70 (citing Ex. 1004, Fig. 8, 14:67–15:10, 15:25–30, 15:48–52; Ex. 1003 ¶¶ 116–123) (emphasis omitted). Petitioner also sufficiently shows that the dedicated path or connection within the fiber optic ring network connects the first endpoint with the second endpoint. *Id.* at 71–73 (citing Ex. 1004, 15:14–16, 15:30–35; Ex. 1003 ¶¶ 124–126). Petitioner further sufficiently shows Dantu teaches that the "identifying"

step of limitation 1.2 includes "examining header information for received packets." *Id.* at 73–75 (citing Ex. 1004, 7:44–47, 14:54–57, 16:32–35, Figs. 8, 10; Ex. 1003 ¶¶ 127–128). In addition, Petitioner sufficiently shows Dantu teaches "comparing a network destination address (e.g., destination node ID) from said header information with a predetermined destination address outside of the first network (e.g., external destination address contained in the routing table)." *Id.* at 75–77 (citing Ex. 1004, 14:54–57, 16:32–35, 16:39–43, Fig. 10; Ex. 1003 ¶ 129–133). Petitioner also sufficiently shows Dantu teaches determining that packets are associated with the virtual private network (i.e., by selecting the proper forwarding table) when the network destination address (e.g., destination node ID) matches the predetermined destination address (i.e., destination address in the forwarding table). *Id.* at 77–78 (citing Ex. 1004, 14:54–57, 16:24–31, 16:33–35, Fig. 10; Ex. 1003, ¶¶ 134–135). Petitioner further sufficiently shows that Dantu teaches or suggests that "*the specific destination is to forward packets associated with the virtual private network* (as determined by the VPN-specific routing tables) *from the first network* (specifically, the second endpoint of the first network) *toward the network destination address*." *Id.* at 79–83 (citing Ex. 1004, 11:46–56, 15:10–14, 15:26–30; Ex. 137–138). Alternatively, Petitioner sufficiently shows that Dantu in view of Aziz teaches or suggests "that the specific destination is to forward packets associated with the virtual private network from the first network toward the network destination address." *Id.* at 81–83 (citing Ex. 1005, 8:25–27, 8:41–43, Fig. 6 (steps 270, 320, 330, 340), Abstract; Ex. 1003 ¶¶ 139–142). Finally, Petitioner sufficiently shows that a person of ordinary skill would have been motivated to modify the VPN routing system of Dantu to use the

private network encapsulation and encryption system of Aziz, and "its teachings of forwarding data packets towards the network destination address," and would have been able to do so with a reasonable expectation of success. *Id.* at 84 (citing arguments and evidence regarding limitation 1.3; Ex. 1003 ¶¶ 81–90, 143).

With respect to claim 8, Petitioner sufficiently shows that Dantu in view of Aziz teaches or suggests limitation 8.1 because, as discussed regarding limitations 1.2 and 1.3, Dantu discloses identifying packets as associated with a virtual private network, and Aziz discloses encapsulating specifically identified packets "includes encrypting those packets using an encryption key corresponding to a decryption key known a priori (provided in advance) to the destination associated with the first network." *Id.* at 85–88 (citing Ex. 1005, 2:19–22, 2:47–50, 5:15–16, 6:39–44, 8:32–38, Abstract; Ex. 1003 ¶¶ 146–150). Petitioner also sufficiently shows, for the reasons explained in regard to limitation 1.3, that a person of ordinary skill would have been motivated to modify the VPN routing system of Dantu to use the private network encapsulation and encryption system of Aziz and would have been able to do so with a reasonable expectation of success. *Id.* at 88 (citing Ex. 1003 ¶¶ 81–90, 151).

III. CONCLUSION

For the above reasons, we determine that the information presented establishes a reasonable likelihood that Petitioner would prevail in showing that claims 1, 6, and 8 of the '534 patent are unpatentable on the ground asserted in the Petition.

IV. ORDER

Accordingly, it is

ORDERED that pursuant to 35 U.S.C. § 314(a), an *inter partes* review is instituted as to all of the grounds identified in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial, which commences on the entry date of this decision.

For PETITIONER:

Jordan Rossen
Ashraf Fawzy
UNIFIED PATENTS LLC
jordan@unifiedpatents.com
afawzy@unifiedpatents.com

For PATENT OWNER:

Ragnar Olson
Alison Richards
GLOBAL IP LAW GROUP, LLC
rolson@giplg.com
arichards@giplg.com