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571-272-7822

Paper No. 62
Date: January 11, 2021

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

POLYCOM, INC.,
Petitioner,

v.

DIRECTPACKET RESEARCH, INC.,
Patent Owner.

IPR2019-01234
Patent 7,710,978 B2

Before BRYAN F. MOORE, SHEILA F. McSHANE, and RUSSELL E. CASS, *Administrative Patent Judges.*

McSHANE, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining Some Challenged Claims Unpatentable
Granting Patent Owner's Motion to Seal
35 U.S.C. § 318(a)

I. INTRODUCTION

We have jurisdiction to hear this *inter partes* review under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a). For the reasons discussed herein, we determine that Petitioner has shown, by a preponderance of the evidence that some, but not all, of the challenged claims of U.S. Patent No. 7,710,978 B2 (Ex. 1001, "the '978 patent") are unpatentable.

A. Procedural Background

Polycom, Inc. ("Petitioner")[1] filed a Petition requesting *inter partes* review of claims 1–30 ("the challenged claims") of the '978 patent pursuant to 35 U.S.C. §§ 311–319, along with the supporting Declaration of Dr. Tal Lavian. Paper 1 ("Pet."); Ex. 1002. directPacket Research, Inc. ("Patent Owner") filed a Preliminary Response to the Petition, along with the supporting Declaration of Dr. Kevin Jeffay. Paper 8; Ex. 2001. With authorization (Paper 12), Petitioner filed a Reply to Patent Owner's Preliminary Response (Paper 13), with Patent Owner filing a pre-institution Sur-reply (Paper 15). Pursuant to 35 U.S.C. § 314(a), on January 13, 2020, we instituted *inter partes* review on the grounds of:

[1] Petitioner identifies Plantronics, Inc. as another real party-in-interest. Pet. 3.

Claims Challenged	35 U.S.C. §	Reference(s)/Basis
1–3, 5–15, 17–23, 25–30	103(a)[2]	Krtolica,[3] Kirchhoff[4]
2–4, 15, 16, 23–30	103(a)	Krtolica, Kirchhoff, Hosner[5]

Pet. 6; Paper 19 ("Inst. Dec." or "Dec.").

Patent Owner filed a Patent Owner Response ("PO Resp."), along with the Declaration of Dr. Kevin Jeffay in Support of the Response. Paper 29; Ex. 2009. As discussed in the Patent Owner Response, Patent Owner disclaimed claims 1, 6, 7, 10–14, 18, 21, and 22 of the '978 patent, leaving claims 2–5, 8, 9, 15–17, 19, 20, and 23–30 under challenge in this proceeding. PO Resp. 4; Ex. 2049. Petitioner filed a Reply ("Pet. Reply") to the Patent Owner Response, with the supporting Reply Declaration of Dr. Tal Lavian. Paper 45; Ex. 1028. Patent Owner filed a Sur-Reply ("PO Sur-Reply"). Paper 53.

An oral hearing was held on October 20, 2020. A transcript of the hearing is included in the record. Paper 61 ("Tr.").

B. Related Proceedings

The parties reference the same litigation ("the district court litigation"), which was originally filed in the Eastern District of Virginia,

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[2] The Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. § 103, and was effective March 16, 2013. Because the '978 patent's effective filing date predates the AIA's amendments to § 103, this decision refers to the pre-AIA version of § 103.

[3] US 7,360,243 B2, issued April 15, 2008, filed on October 2, 2003. Ex. 1004.

[4] US 7,206,932 B1, issued April 17, 2007, filed on February 14, 2003. Ex. 1005.

[5] George Hosner, *OpenVPN and the SSL VPN Revolution*, SANS Institute, Information Security Reading Room, 2004. Ex. 1006.

and then transferred to the Northern District of California in July 2019. At the time of the Petition filing, Petitioner identified *directPacket Research, Inc. v. Polycom, Inc*., 2:18-cv-00331-AWA-RJK (E.D. Va.) as a related matter. Pet. 3. At the time of Mandatory Notices filing, Patent Owner indicated that *directPacket Research, Inc. v. Polycom, Inc*., C.A. No. 5:19-cv-03918-VKD (N.D. Cal.) involved the '978 patent. Paper 4, 1 (Notices).

C. The '978 Patent

The '978 patent is entitled "System and Method for Traversing a Firewall With Multimedia Communication" and issued on May 4, 2010 from an application filed on April 13, 2006. Ex. 1001, codes (22), (45), (54).

The '978 patent is directed to transporting multi-port protocol traffic using a single-port protocol. Ex. 1001, code (57). The '978 patent explains that multimedia communications traffic will most likely have to traverse a firewall at some point during transmission, where firewalls are used in modem networks to screen out unwanted or malicious traffic. *Id*. at 1:59–63. The invention is a method for transporting multimedia communications traffic through firewalls using a single-port protocol that is known to be transmitted on a port typically open on standard firewalls. *Id*. at 3:3–6. Multiport protocol traffic from a first endpoint is first converted in a single-port protocol for transport across a network. *Id*. at 3:6–8. After traversing the firewall using the single port, the traffic is "reconverted to the multiport protocol and directed to the appropriate ports at a targeted second endpoint." *Id*. at 3:7–10.

Figure 2, reproduced below, is a diagram illustrating an Internet protocol (IP) communication system configured according to an embodiment of the invention. Ex. 1001, 3:51–53.

FIG. 2

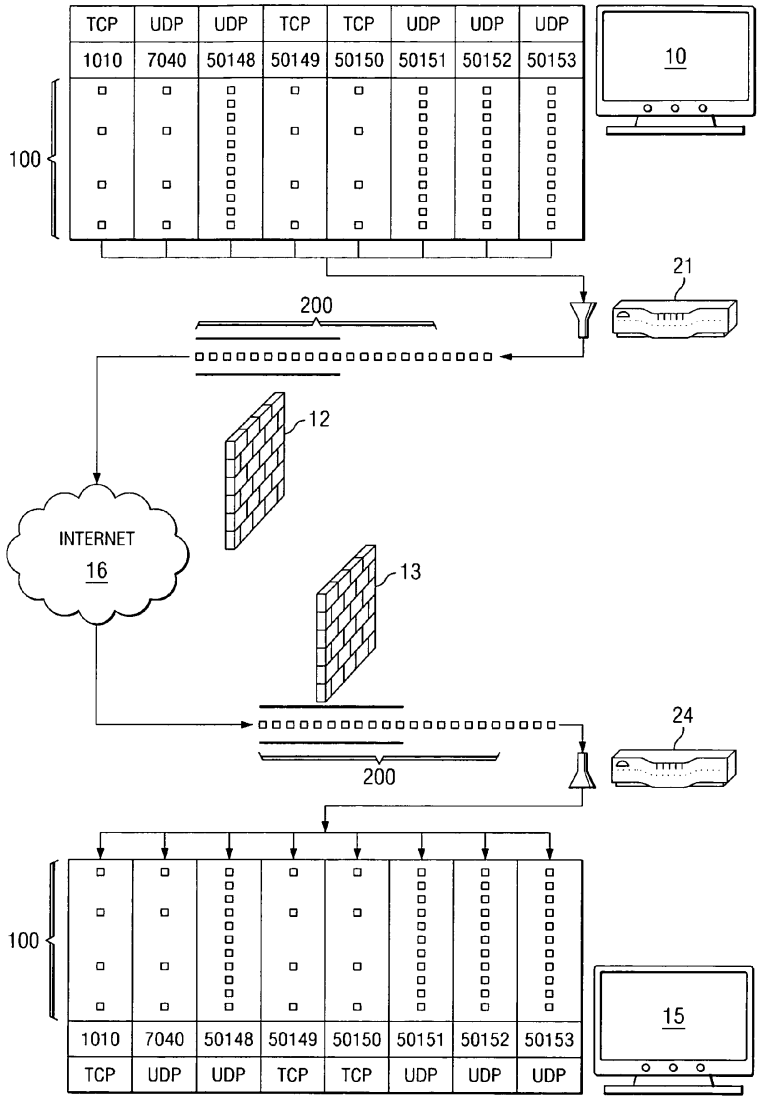

Figure 2, above, shows video conference endpoint 10 sending multimedia data (packets 100) to video conference endpoint 15, with network devices 21 and 24 in the system. Ex. 1001, 4:45–48. Packets from different ports conforming to various protocols and sub-protocols are received by network device 21. *Id*. at 4:55–57. Network device 21 receives packets 100 from endpoint 10 and encapsulates the multiport packets 100 into single-port packets 200. *Id*. at 4:67–5:2. The encapsulated packets are sent to device 24 using well-known or registered ports, "which are the ports that are typically

open in standard firewalls." *Id*. at 5:8–10. Device 24 receives encapsulated single-port packets 200 sent from device 21 and then reconstructs the multiport packets using packets 200. *Id*. at 5:23–25. The invention enables both one-way as well as two-way communications between endpoints 10 and 15. *Id*. at 5:45–50.

Claims 1, 14, and 23 of the '978 patent are independent. Claim 1, which has been disclaimed, is reproduced below, with sub-paragraphing added to the limitations for reference purposes.

> 1. A method for communication between two or more endpoints, said method comprising:
>
> > [a] receiving, at a first intermediate communication device that is communicatively coupled with a first endpoint communication device, a plurality of multiport packets of data in a multiport communication protocol for communication from the first endpoint communication device;
> >
> > [b] converting, by said first intermediate communication device, said plurality of multiport packets into a plurality of single-port packets in a single-port communication protocol;
> >
> > [c] transmitting from said first intermediate communication device said plurality of single-port packets over a commonly-open port to at least a second intermediate communication device that is communicatively coupled with one or more other endpoint communication devices, said plurality of single-port packets traversing one or more firewalls using said commonly-open port;
> >
> > [d] receiving said plurality of single-port packets at said at least a second intermediate communication device;
> >
> > [e] reconverting, by said at least a second intermediate communication device, said received plurality of single-port packets into said multiport communication protocol resulting in reconverted plurality of multiport packets; and

> [f] delivering, from said at least a second intermediate communication device to said one or more other endpoint communication devices, said reconverted plurality of multiport packets using two or more ports associated with said multiport communication protocol.

Ex. 1001, 8:47–9:10.

II. ANALYSIS

A. The Parties' Arguments

In our Decision on Institution, we concluded that the arguments and evidence advanced by Petitioner demonstrated a reasonable likelihood that at least one claim of the '978 patent would have been obvious. Inst. Dec. 22–45. Here, we determine whether Petitioner has established by a preponderance of the evidence that the challenged claims are obvious. 35 U.S.C. § 316(e). We previously instructed Patent Owner that "any arguments for patentability not raised in the response may be deemed waived." Paper 20, 8; *see also* 37 C.F.R. § 42.23(a) ("Any material fact not specifically denied may be considered admitted."); *In re Nuvasive, Inc*., 842 F.3d 1376, 1379–82 (Fed. Cir. 2016) (holding Patent Owner waived an argument addressed in the Preliminary Response by not raising the same argument in the Patent Owner Response). Additionally, the Board's Trial Practice Guide states that the Patent Owner Response "should identify all the involved claims that are believed to be patentable and state the basis for that belief." Consolidated Trial Practice Guide ("TPG"), 66 (November, 2019).[6]

On the record before us, we note that we have reviewed arguments and evidence advanced by Petitioner to support its unpatentability contentions, where Patent Owner chose not to address certain limitations in

[6] Available at https://go.usa.gov/xpvPF.

its Patent Owner Response. In this regard, the record contains persuasive arguments and evidence presented by Petitioner regarding the manner in which the prior art discloses the corresponding limitations of claims 2–5, 15–17, 23–26, 29, and 30 of the'978 patent.

B. Level of Ordinary Skill in the Art

Petitioner asserts that a person of ordinary skill in the art would have a "a Bachelor's degree or equivalent in electrical engineering, computer engineering, or similar field, and at least two years' experience in a relevant field such as telecommunications or multimedia communications." Pet. 20–21. In support, Dr. Lavian testifies that the relevant experience could include "experience in designing, implementing, monitoring and maintaining voice over Internet protocol [VoIP] and multimedia networks," and the person of ordinary skill would therefore have "at least some familiarity with the fundamentals of computer networks and related concepts, including VoIP, multimedia transmissions, protocol conversion, and well-known communication protocols such as Session Initiation Protocol [SIP], H.323, and Transport Control Protocol/Internet Protocol [TCP/IP]." Ex. 1002 ¶ 17.

In the Decision on Institution, we adopted Petitioner's proposed skill level, that is, that one of ordinary skill in the art would have a Bachelor's degree or equivalent in electrical engineering, computer engineering, or similar field, and at least two years of experience in a relevant field such as telecommunications or multimedia communications. Inst. Dec. 20. We also agreed with Petitioner that one of ordinary skill would have some familiarity with the design and implementation of VoIP and multimedia networks. *Id*. We did not agree, however, that the level of qualifications included monitoring and maintaining VoIP and multimedia networks, as Petitioner asserted, and therefore declined to adopt those requirements. *Id*.

In Response, Patent Owner accepted the qualifications for one of ordinary skill in the art adopted in the Decision on Institution to include "familiarity with the design and implementation of VoIP and multimedia networks," but further described this requirement to include other requirements:

> an understanding of the techniques employed by network firewalls and the issues they present with respect to establishing and conducting multimedia communication sessions;
>
> an understanding of the performance demands placed on the network by multimedia communications, and the constraints that such demands place on processing and security measures that could be adopted; and
>
> a recognition of the distinctions between prior art firewall traversal solutions and the inventions of the '978 Patent.

PO Resp. 21–22. Patent Owner refers to *GPAC*, which identifies the factor of the "type of problems encountered in the art" as a consideration in determining the level of ordinary skill in the art. *Id*. at 22 (citing *In re GPAC*, 57 F.3d 1573, 1579 (Fed. Cir. 1995)).

We have reviewed the relevant technology and claims of the '978 patent, as well as the technology of the asserted prior art, and we adopt the same qualifications as those adopted in the Decision on Institution because they are commensurate with the relevant technology.

These qualifications are similar to presented by Petitioner, with the exception that the additional proposed qualifications for monitoring and maintaining VoIP and multimedia networks are not adopted because a person of ordinary skill in the art need not have had hands-on experience with the operations of monitoring and maintaining networks. As noted, the previously-adopted qualifications are acceptable to Patent Owner, except that Patent Owner proposes to include some more specific details for the

level of qualifications that we decline to add because that specific knowledge, at least at some level, would fall within the knowledge of one with experience in the telecommunications or multimedia communications fields and having familiarity with the design and implementation of VoIP and multimedia networks.

Additionally, we note that in the Decision on Institution, we requested that Patent Owner address what impact, if any, the different levels of proposed qualifications have on the obviousness analysis. Inst. Dec. 20, n.5. Neither Patent Owner nor Petitioner identified any differences in their obviousness analysis due to differences in the qualifications of a person of ordinary skill in the art. *See generally*, PO Resp.; Pet. Reply; PO Sur-Reply.

C. Claim Construction

For cases like this one, where the petition for *inter partes* review was filed after November 13, 2018, the Board interprets claim terms in accordance with the standard used in federal district court in a civil action involving the validity or infringement of a patent. *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340, 51,340, 51,358 (Oct. 11, 2018) (amending 37 C.F.R. § 42.100(b) effective November 13, 2018) (now codified at 37 C.F.R. § 42.100(b) (2019)). Under the principles set forth by our reviewing court, the "words of a claim 'are generally given their ordinary and customary meaning,'" as would be understood by a person of ordinary skill in the art in question at the time of the invention. *Phillips v. AWH Corp*., 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (quoting *Vitronics Corp. v. Conceptronic*, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996)). "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.,* 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

Petitioner relies on the ordinary and customary meaning of the claim terms as understood by one of ordinary skill in the art. Pet. 20. Patent Owner indicates that its arguments are also based upon the ordinary and customary meaning of the terms as they would be understood by one of ordinary skill in the art. PO Resp. 22.

We determine that it is not necessary to provide an express interpretation of any of the terms of the claims. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co*., 868 F.3d 1013, 1017 (Fed. Cir. 2017); *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc*., 200 F.3d 795, 803 (Fed. Cir. 1999) ("[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.").

D. Alleged Obviousness of Claims 2, 3, 5, 8, 9, 15, 17, 19, 20, 23, and 25–30 Over Krtolica and Kirchhoff

In the Petition, Petitioner contended that claims 1–3, 5–15, 17–23, 25–30 would have been rendered obvious by the combination of Krtolica and Kirchhoff. Pet. 23–71. As discussed *supra* Section I.A, Patent Owner disclaimed several claims, so the remaining challenges are to claims 2, 3, 5, 8, 9, 15, 17, 19, 20, 23, and 25–30 of the '978 patent under this ground. Claims 2, 3, 5 and 9 depend, directly or indirectly, from claim 1 and therefore include all of its limitations, with claim 3 also depending from claim 2 and therefore including its limitations. Claims 15, 17, 19, and 20 depend directly from claim 14 and therefore include all of its limitations. Claims 25–30 depend from claim 23 and therefore include its limitations.

To support its contentions, Petitioner provides explanations as to how the combination of Krtolica and Kirchhoff teaches each claim limitation. Pet. 23–71. Petitioner also relies upon the Lavian Declarations (Ex. 1002; Ex. 1035) to support its positions. Patent Owner argues that the prior art asserted fails to teach some of the claim limitations and the rationale to combine the references is insufficient, with Dr. Jeffay providing supporting testimony. *See generally* PO. Resp.; Ex. 2001; Ex. 2009.

We begin our discussion with brief summaries of Krtolica and Kirchhoff and then address the evidence and arguments presented.

1. Krtolica (Ex. 1004)

Krtolica is directed to a system that distributes information data packets from multiple send endpoints to multiple receive endpoint ports 11R in receive endpoint unit 12R by passing packets through at least one firewall via a selected port. Ex. 1004, 3:55–62. Figure 1, reproduced below, depicts communication system 10 between send station 14S and receive station 14R through open port 15P in firewall 15W. *Id*. at 2:55–57.

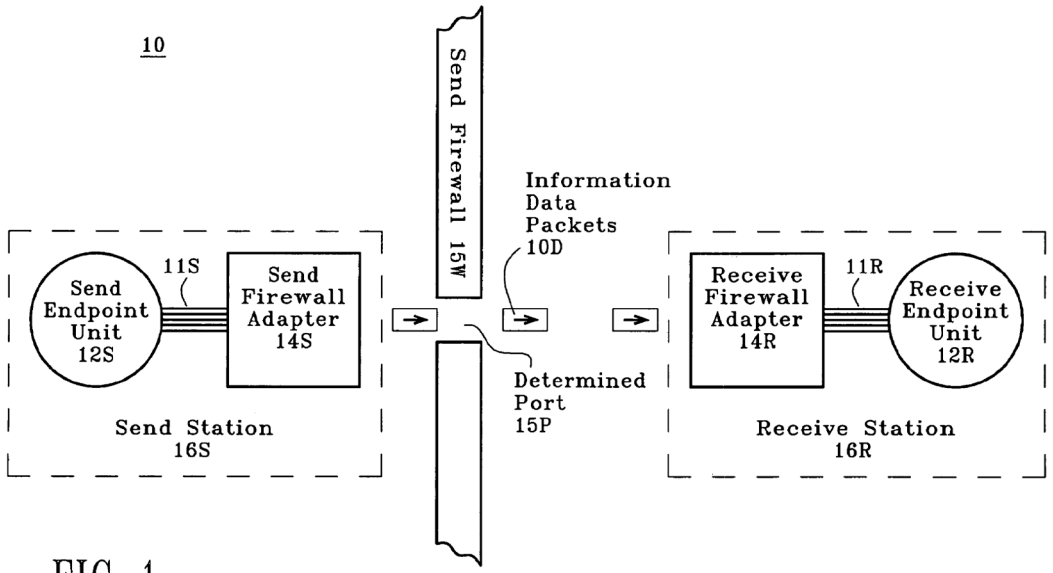

FIG 1

Figure 1, above, depicts standard based communication system 10 supporting firewall friendly communication between send station 16S and receive station 16R. Ex. 1004, 3:64–67. Endpoint ports 11S are shown in send endpoint unit 12S with packets passing through standard based send firewall adapter 14S, traversing firewall 15W through selected port 15P, and passing through standard based receive firewall adapter 14R. *Id*. at 3:55–62. Figure 3, reproduced below, is a block diagram of firewall adapters. *Id*. at 2:62–63.

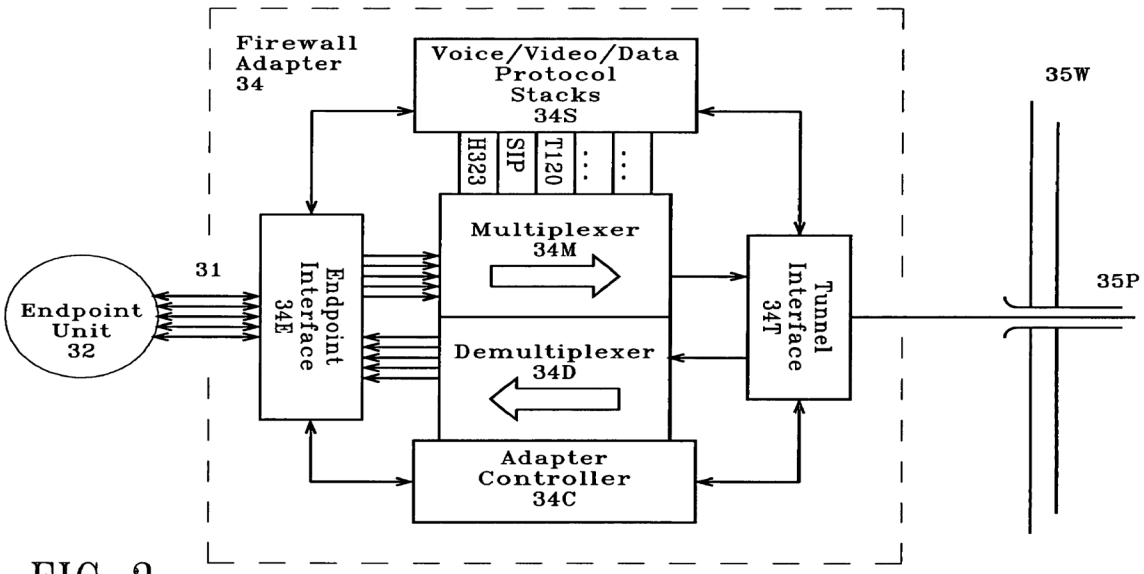

FIG 3

As shown in Figure 3, above, firewall adapter 34 includes endpoint interface 34E and tunnel interface 34T that manages the transport of incoming and outgoing data packets. Ex. 1004, 4:41–45. Multiplexer 34M reads the header configuration of outgoing packets in multiple streams of packets from multiple send endpoint ports 31 of send endpoint unit 32 and provides a single stream of multiplexed packets which traverse firewall 35W through port 35P. *Id*. at 4:57–61. Demultiplexer 34D reads the header configuration of incoming packets in the single stream of received packets which has

traversed the firewall and provides multiple streams of demultiplexed packets for multiple endpoint ports 31. *Id*. at 4:62–66.

Figure 4, reproduced below, is a block diagram of communication system 40 showing multiplexed channels in network port 45P between firewall adapter 44S and firewall adapter 48R. Ex. 1004, 2:64–67.

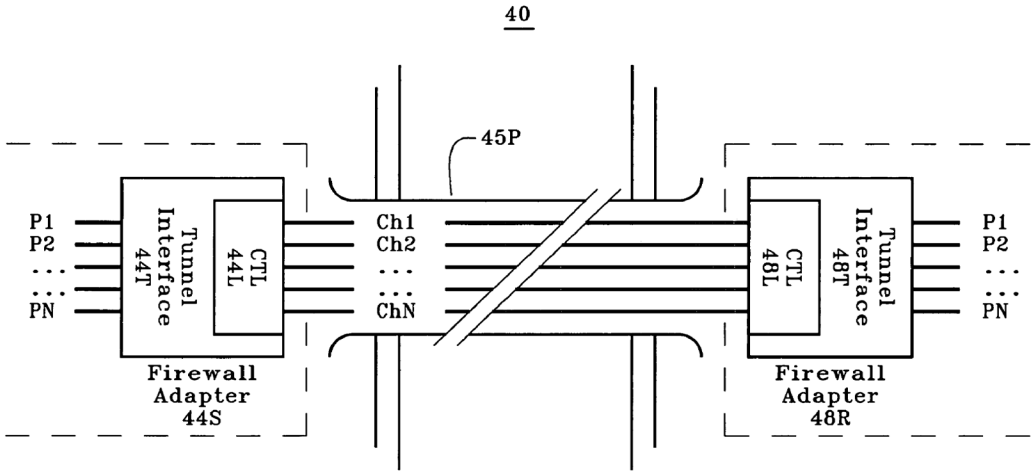

FIG 4

Figure 4, above, depicts system 40 that distributes information data packets from multiple send endpoint ports P1, P2, . . . Pn within send firewall adapter 44S, to multiple receive endpoint ports P1, P2, . . . Pn within receive firewall adapter 48R. Ex. 1004, Fig. 4, 5:9–12. The data packets enter tunnel interface 44T on the multiple send ports, and leave on multiple corresponding logical channels C1, C2, . . . Cn. *Id*. at 5:12–15. The port to channel conversion is effected by component and template library (CTL) 44Lwithin the tunnel interface that assigns a unique channel number to the headers of the outgoing data packets arriving from each send port. *Id*. at 5:15–19. All of the assigned channels are tunneled to receive firewall adapter 48R in common network port 45P, which is typically port 80. *Id*. at 5:19–21.

2. Kirchhoff (Ex. 1005)

Kirchhoff relates to voice over Internet-Protocol (VoIP) software, and more particularly to VoIP through firewalls. Ex. 1005, 1:9–11. Kirchhoff discloses a method for passing packets and audio data through a firewall. *Id*. at 2:38–44. Firewalls may not allow connections to be initiated from outside, and instead in Kirchhoff, an external manager "acts as a proxy passing voice data between PCs." *Id*. at 3:4–46. Figure 3, reproduced below, shows an external manager for setting up a communication channel through firewalls. *Id*. at 2:52–53.

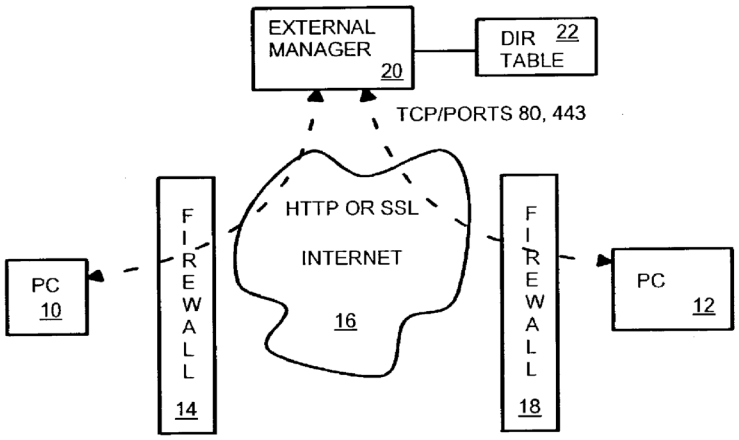

FIG. 3

In Kirchhoff, end unit personal computers (PCs), such as PC 10 and PC 12, as shown in Figure 3 above, are registered with exernal manager 10. Ex. 1005, 3:47–50, 4:9–12. Kirchhoff discloses a technique for traversing firewalls with VoIP communications by preferably using commonly-open ports such as HTTP port 80 or SSL port 443, where the firewalls "are configured by default to allow incoming transport control protocol (TCP) packets from ports 80 and 443." *Id*. at 1:62–67, 3:32–35. Packets passing through a firewall can be filtered by examining their IP addresses, TCP

ports, protocols, states, or other header criteria at network layer 3 or transport layer 4. *Id*. at 1:37–40.

3. Analysis

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc*., 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness. *Graham v. John Deere Co*., 383 U.S. 1, 17–18 (1966).

a. Independent claim 1

Claims 2, 3, 5, 8, and 9 depend, directly or indirectly, from independent claim 1 and thus contain all the limitations of claim 1. We therefore evaluate whether the Petition presents sufficient evidence and supporting argument to demonstrate that the asserted prior art teaches or suggests the subject matter of claim 1.

i. Preamble and Limitation [a]

Petitioner asserts that the combination of Krtolica and Kirchhoff teaches a method for communication between two of more endpoints, as recited in the preamble of claim 1. Pet. 23–24. Petitioner relies upon Krtolica's disclosure of communications between Send Endpoint Unit 12S and Receive Endpoint Unit 12R, as shown in Figure 1. *Id*. (citing Ex. 1004, 3:55–58, Fig. 1).

Petitioner contends that Krtolica teaches limitation [a] of receiving multiport packets of data at a first intermediate communication device by its disclosure in Figure 1 of distribution of information data packets 10D "containing standard configuration headers from multiple send endpoint ports 11S in send endpoint unit 12S to multiple receive endpoint ports 11R in receive endpoint unit 12R," with the packets passing though send firewall adapter 14S. Pet. 24 (citing Ex. 1004, 3:58–60, 3:55–58, Fig. 1). Petitioner maps send endpoint unit 12S to the claimed "first endpoint communication device" and send firewall adapter 14S to the claimed "first intermediate communication device." *Id*. Petitioner also refers to Figure 4 of Krtolica, which discloses that the data received at the firewall adapter in a multiport communications protocol is received in user datagram protocol (UDP) and transport control protocol (TCP), and other protocols could be used, such as H.323 and SIP. *Id*. at 26 (citing Ex. 1004, 1:45–48, 6:53–55, Fig. 4).

We have reviewed Petitioner's uncontested arguments and evidence for these claim limitations and are persuaded that Petitioner has shown that the combination of Krtolica and Kirchhoff teaches the preamble and limitation [a] of claim 1.[7]

ii. Limitation [b]

Petitioner contends that limitation [b] of claim 1, the step of conversion of multiport packets to single-port packets by the first intermediate communication device, is taught by Krtolica's disclosure of send firewall adapter 14S converting multiport packets sent through multiple send endpoint ports 11S into single-port packets for traversing firewall 15W

[7] We make no specific determination as to whether the preamble of claim 1 is limiting.

through selected port 15P, as depicted in Figure 1. Pet. 27 (citing Ex. 1004, 3:58–62, Fig. 1). Petitioner refers to multiplexer 34M shown in Figure 3 that "reads the header configuration of outgoing packets in multiple streams of packets from multiple send endpoint ports 31 of send endpoint unit 32" and then "provides a single stream of multiplexed packets which traverse firewall 35W through port 35P." *Id*. at 28 (citing Ex. 1004, 4:57–61, 5:45–61, Figs. 3, 5). In further support, Petitioner refers to Krtolica's disclosure of firewall traversal by tunneling and transmittal of packets using single-port communication protocols. *Id*. (citing Ex. 1004, 5:15–19, 6:47–7:20).

We have reviewed Petitioner's arguments and evidence for this claim limitation and are persuaded that Petitioner has shown that the combination of Krtolica and Kirchhoff teaches limitation [b] of claim 1.

iii. Limitation [c]

Petitioner asserts that Krtolica, or Krtolica in view of Kirchhoff, teaches limitation 1[c] of transmitting single-port packets over a commonly-open port to a second intermediate communications device. Pet. 29–33. Petitioner relies upon Krtolica's disclosure of packets travelling through send firewall 15W passing through single port 15P, as shown in Figure 1. *Id*. at 29–30 (citing Ex. 1004, 3:58–61). Petitioner further contends that Krtolica discloses that the single port used for firewall traversal can be a commonly-open port, relying upon Krtolica's disclosure that "open port may be port 80 which is normally open for public interface." *Id*. at 30 (citing Ex. 1004, 5:47–48). Petitioner also asserts that in the alternative, that, to the extent that Krtolica does not disclose a commonly-open port, Kirchhoff discloses transmitting over a commonly-open port, for instance, web browsers "us[ing] the Transport Control-Protocol (TCP) on port 80, or the SSL protocol on port 443." *Id*. at 31 (citing Ex. 1005, 3:32–35). Petitioner

asserts that the '978 patent discloses that port 443 is a "well-known port" that is "commonly open by default on most firewalls." *Id*. (citing Ex. 1001, 5:10–13).

Petitioner also asserts that it would have been obvious to a person of ordinary skill in the art to combine Krtolica's teachings regarding firewall traversal with Kirchhoff's teachings on the use of commonly-open port 443 to traverse firewalls because Kirchhoff specifically suggests using port 443 as a more secure alternative to port 80: "[r]ather than us[ing] port 80, port 443 may be used for secure web connections using SSL." Pet. 31–32 (citing Ex. 1005, 3:38–39). With this, Petitioner asserts that a person of ordinary skill in the art would have been led to modify the system of Krtolica from using port 80 to port 443 with a reasonable expectation of success. *Id*. Petitioner also contends that port 443 is a "well-known port" that is "commonly open by default on most firewalls" (*id*., citing Ex. 1001, 5:10–13), and the use of port 443 in the system of Krtolica would have been a simple substitution of known elements (*id*.). Dr. Lavian provides supporting testimony for the teachings and rationale to combine in view of one of ordinary skill in the art. *See* Ex. 1002 ¶¶ 96–99.

We have reviewed Petitioner's arguments and evidence for this claim limitation and are persuaded that Petitioner has shown that the combination of Krtolica and Kirchhoff teaches limitation [c] of claim 1 and that sufficient rationale to combine Krtolica and Kirchhoff has been provided.

iv. Limitation [d]

Petitioner contends that limitation [d], that is, receiving single-port packets at a second intermediate communication device, is taught by Krtolica's disclosure of receive firewall adapter 14 R, which mapped to the claimed "second intermediate communication device," receiving packets

through a single common network port. Pet. 32–33 (citing Ex. 1004, 3:55–67, 5:18–21, Fig. 2).

We have reviewed Petitioner's arguments and evidence for this claim limitation and are persuaded that Petitioner has shown that the combination of Krtolica and Kirchhoff teaches limitation [d] of claim 1.

v. Limitation [e]

Petitioner asserts that Krtolica teaches limitation [e] by its disclosure of receiving single-port packets at the second intermediate communication device by the demultiplexer 34D of firewall adapter 34. Pet. 33 (citing Ex. 1004, 4:62–5:3, Figs. 1, 3, 4). Petitioner more specifically refers to Figure 4, which depicts that firewall adapter 48R "reconverts the data received over multiple channels on a single port into data transmitted over multiple ports P1, P2, . . . PN." *Id*. at 34 (citing Ex. 1004, 5:9–26; 6:42–46, Fig. 4).

We have reviewed Petitioner's arguments and evidence for this claim limitation and are persuaded that Petitioner has shown that the combination of Krtolica and Kirchhoff teaches limitation [e] of claim 1.

vi. Limitation [f]

Petitioner contends that limitation [f] of delivering reconverted multiport packets from a second intermediate communication device to other endpoint communication devices using one or more ports is taught by Krtolica's disclosures. Pet. 34–37. Petitioner asserts that firewall adapter 48R distributes multiport packets "to multiple receive endpoint ports 11R in receive endpoint unit 12R." *Id*. at 35 (citing Ex. 1004, 3:55–58, Figs. 1, 4). Petitioner further asserts that the multiport packets are delivered over two or more ports associated with the multiport communication protocol. *Id*. at 36 (citing Ex. 1004, 5:7–26, Figs. 1, 4).

We have reviewed Petitioner's arguments and evidence for this claim limitation and are persuaded that Petitioner has shown that the combination of Krtolica and Kirchhoff teaches limitation [e] of claim 1.

vii. Conclusion

On the full record, Petitioner has demonstrated by a preponderance of the evidence that the limitations of disclaimed claim 1 are taught by the combination of Krtolica and Kirchhoff.

b. Dependent Claim 2

Claim 2 recites the method of claim 1 that further comprises "encrypting said plurality of single-port packets in said single-port communication protocol prior to said transmitting." Ex. 1001, 9:11–14.

Petitioner asserts that although Krtolica does not expressly discuss encryption, one of Krtolica's goals is to maintain a high level of network security, thus, it would have been obvious to person of ordinary skill in the art that encryption of a single-port packets was one way to maintain or increase network security. Pet. 37 (citing Ex. 1004, 1:7–10, 2:33–36; Ex. 1002 ¶¶ 42, 52, 69–73, 106). Petitioner contends that Krtolica's primary embodiments use HTTP port 80. *Id*. (citing Ex. 1004, 6:22–24). Referencing Rosenberg,[8] Petitioner also contends all HTTP messages are already encrypted, so it would have been obvious to a person of ordinary skill to use encryption in Krtolica because of the preferred HTTP protocol. *Id*. (citing Ex. 1025, 4); *see also* Ex. 1002 ¶ 106.

Petitioner also argues that, to the extent that Krtolica alone does not render the limitation obvious, Kirchhoff discloses the use of secure sockets

[8] J. Rosenberg, *SIP Traversal through Residential and Enterprise NATs and Firewalls*, Internet Engineering Task Force, November 17, 2000. Ex. 1025.

layer (SSL), which is a protocol that relies on data encryption. Pet. 38 (citing Ex. 1005, 8:47–49). Petitioner refers to Kirchhoff's solution of replacing standard SSL data with audio data that is already compressed and coded by proprietary means, and "full key encryption is not needed but could be added," so audio encryption is one option for implementing the system of Kirchhoff. *Id*. (citing Ex. 1005, 9:4–8).

Petitioner asserts that it would have been obvious to one of ordinary skill in the art to combine Kirchhoff's encryption teachings with Krtolica's firewall traversal system in order to meet Krtolica's goal of "maintain[ing] high security." Pet. 38 (citing Ex. 1004, 2:33–37). Petitioner asserts that a person of ordinary skill in the art would have been aware that encryption was one way to add additional security to network transmissions and would have been aware that SSL protocol, with "SSL/TLS being the most widely deployed security protocol in the world," provides for secure web connections through the use of encryption. *Id*. at 38–39 (citing Ex. 1005, 3:38–41; Ex. 1002 ¶¶ 42, 52, 69–73, 108; Ex. 1006, 5). Petitioner contends that the prior art contains the teaching, i.e. the widespread use of SSL protocol for increased network security, that would have led a person of skill to modify Krtolica to use encryption with a reasonable expectation of success. *Id*. at 39 (citing Ex. 1002, ¶¶ 42, 52, 69–73, 109). Petitioner also refers to Kirchhoff's teaching that "SSL can be more efficient than HTTP for transferring audio data streams" as a basis for a rationale to combine. *Id*. (citing Ex. 1005, 8:53–54).

Patent Owner contends that Krtolica or the combination of Krtolica and Kirchhoff fails to teach claim 2, and that there are flaws in Petitioner's showing of the rationale to combine the references, the details of how to

combine them, and the reasonable expectation of success. *See* PO Resp. 23–33; PO Sur-Reply 3–15. We address these arguments in turn.

i. Krtolica Does Not Teach Use of HTTP, Need for Encryption, or Encryption

Patent Owner argues that Krtolica does not teach or suggest encrypting because it uses a system that establishes a site-to-site tunnel on a determined port and Krtolica does not mention encrypting this data traffic. PO Resp. 23. Patent Owner asserts that Petitioner's argument that one of ordinary skill in the art would have sought to encrypt Krtolica's packets to maintain a high level of security "fails to appreciate the critical distinction between network security and data privacy communications carried on the network." *Id*. (citing Ex. 2009 ¶¶ 110–113). Dr. Jeffay testifies that a person of ordinary skill in the art "encountering Krtolica would understand that the conception of security in Krtolica relates to network security—the ability to control what traffic enters or exits a network—and not to data privacy such as the ability to encrypt user data." Ex. 2009 ¶ 110. Patent Owner contends that Krtolica "aims to maintain high network security, i.e., by limiting the number of ports be opened on a firewall, whereas encryption seeks to secure the contents of the communications carried on the network (and once past the firewall on the public Internet)." PO Resp. 23–24 (citing Ex. 2009 ¶¶ 110–113). Patent Owner asserts that encryption would undermine network security because it would prevent firewalls from inspecting the content of communications to detect malicious traffic. *Id*. at 24 (citing Ex. 2009 ¶¶ 110–113; Ex. 1005, 4; Ex. 2027, 76).

Patent Owner also asserts that Petitioner's contention that one of ordinary skill in the art would have used encryption with Krtolica's system is flawed because: (1) "it conflates the disclosure of a specific port (*e.g.*, port

80) with the disclosure of a protocol commonly associated with the port (*e.g.*, HTTP);" and (2) HTTP does not require encryption. PO Resp. 24. Patent Owner further asserts that, even if Krtolica were viewed to teach the use of HTTP protocol on port 80, this does not equate to a requirement for encryption, and Petitioner's argument that HTTP messages are already encrypted is not true. *Id*. at 24–25 (citing Ex. 2009 ¶¶ 115–116). Patent Owner argues that a person of ordinary skill in the art would not have understood that Krtolica's disclosure of port 80 teaches the use of HTTP. PO Sur-Reply 3 (citing Ex. 2009 ¶ 116; Ex. 1036, 143:23–144:2, 144:16–145:10[9], 146:2–148:4, 148:15–149:12; Ex. 1035 ¶ 7).

Additionally, in its Sur-Reply, Patent Owner argues that Krtolica's goal of maintaining high security does not implicitly teach encrypting by reiterating that the privacy that encryption provides undermines Krtolica's aim to maintain high network security because "*network* security" prevents detection of malicious traffic. PO Sur-Reply 4. Patent Owner asserts that portions of the '978 patent and a NIST publication are also consistent with its purported distinction between protecting the "security of the network" and "'protect[ing] the data itself' using encryption." *Id*. at 4, n.4 (citing Ex. 1001, 2:31–34, 2:17–30; Ex. 2036, 5; Ex. 1036, 153:17–157:7; Ex. 2027, 23, 68).

On this complete record, we determine that Petitioner has provided sufficient evidence that Krtolica discloses the use of HTTP protocols on port 80 because Krtolica explicitly discloses that a selected firewall port "may be a default port such as port 80 in a HTTP (hypertext transfer protocol)

[9] Patent Owner refers to "143:23:2" and "144:16–10" which appear to be typographical errors. The citation string above includes revised citations based on the context of Patent Owner's argument.

application." Ex. 1004, 6:23–24; *see also* Ex. 1004, claim 16 ("the method of claim 15, wherein the default firewall port is the HTTP network port."). Krtolica additionally discloses that "[p]ort 80 is a standard start/browsing port." *Id*. at 6:24–25. In light of these disclosures, we are not persuaded by Patent Owner's argument that Petitioner conflates the disclosure of a specific port 80 with the use of the HTTP protocol—Krtolica's disclosures themselves indicate the common association of port 80 with the HTTP protocol. *See* PO Resp. 24. Even if other protocols could be used on port 80, we agree with Petitioner that this would not negate Krtolica's express teaching of running HTTP over port 80. *See* Ex. 1035 ¶ 7.

On this complete record, we also determine that Petitioner has provided sufficient evidence that, at least, Krtolica's express goal of maintaining a high level of network security would provide motivation for the use of encryption in its system. *See* Pet. 27. Krtolica discloses that its invention is directed to "routing voice/video/data communications through network firewalls, and more particularly to such routing through determined network ports with minimal security risk," and it is an "object of this invention to provide such a standard based firewall adapter which maintains high security." Ex. 1004, 1:7–10, 2:33–36. We credit Dr. Lavian's testimony that one of skill in the art would have viewed encryption as a way of maintaining or increasing network security. *See* Ex. 1002 ¶ 106.

We do not find, as Patent Owner argues, that the fact that encryption is used for the protection of "data privacy communications" means that encryption cannot enhance network security—the evidence of record instead supports that encryption is used as a network security feature. *See* PO Resp. 22–23; PO Sur-Reply 3–4; Pet. Reply 2–4. More specifically, we agree with Petitioner that the '978 patent discloses that video conferencing systems that

do not support encryption are "not secure and may be intercepted while being transmitted across the Internet," and that "having an added layer of encryption" results in media traffic being "more secured." Pet. Reply 3 (citing Ex. 1001, 2:31–34; 6:10–14). Petitioner refers to Figure 3 of the '978 patent, which depicts encryption and decryption in the operation of its firewall. *Id*. Petitioner also points to the NIST document, relied upon by Patent Owner for some arguments, which states that "[t]he key to securing VOIP is to use the security mechanisms like those deployed in data networks (firewalls, encryption, etc.) to emulate the security level currently enjoyed by PSTN network users." *Id*. at 3–4 (citing Ex. 2027, 23). We find that this record supports Dr. Lavian's testimony that a goal of network security is to keep information secure so that unauthorized users cannot access or modify information, and having unencrypted messages would defeat this purpose because the information could be intercepted and accessed by unauthorized users. Ex. 1035 ¶ 6.

Although Patent Owner attempts to distinguish some of the teachings of these references where, for instance, encryption in SSL is used to ensure that "[t]he connection is private," we are not persuaded by these arguments. Encryption would nevertheless result in providing greater security for the communications. *See* PO Sur-Reply 4, n.3 (comparing Ex. 1001, 2:31–34 with *id*. at 2:17–30; citing Ex. 2036, 5; comparing Ex. 1036, 153:17–157:7 with Ex. 2027, 23). And, the resulting enhanced communications security provides "security mechanisms like those deployed in data networks," that is, greater data network security. *See* Ex. 2027, 23. Although Patent Owner argues that encryption used with firewalls prevents detection of malicious traffic, the NIST document recognizes the use of encryption with firewalls, where "encryption [is] a necessity for VOIP," and the '978 patent uses

encryption with firewalls without noting anything inventive about the use of encryption in this combination or identifying any disadvantages with the use of encryption in conjunction with a firewall using a single-port protocol. *See* Pet. Reply 4 (citing Ex. 2027, 70[10]; *id*. at 3 (citing Ex. 1001, Fig. 3 (at 311, 341), Fig. 5 (503, 508)).

Patent Owner also presents arguments that Krtolica does not teach encryption. PO Resp. 23–25. We need not address these arguments because we consider Petitioner's argument in the alternative that the combination of Krtolica and Kirchhoff teaches claim 2, which we address below. *See* Pet. 38–40.

ii. Kirchhoff Does Not Teach Encryption

Patent Owner asserts that Petitioner presents contradictory statements as to whether Kirchhoff teaches encryption. PO Resp. 25 (comparing Pet. 38 with Pet. 72); *see also* Ex. 2009 ¶¶ 117–119. Patent Owner contends that Kirchhoff does not teach or suggest encrypting because it is directed to the use of an SSL protocol to establish an SSL session across a firewall, which may then be used to stream unencrypted "audio data . . . in SSL messages instead of encrypted data." *Id*. at 25–26 (citing Ex. 1005, code (57)). Patent Owner argues that Kirchhoff's use of SSL is due to the fact that SSL sessions can be established across a firewall, but not on account of the encryption functionality that the protocol optionally provides. *Id*. at 26. Patent Owner refers to Kirchhoff's explicit statement that "[t]he data exchanged does not actually have to be encrypted, as long as the messages are in the same format as ordinary SSL messages" in support of its

[10] Petitioner refers to this page 69 of the NIST document, but the cited quote is on page 70 of the document.

arguments. *Id*. (citing Ex. 1005, 8:67–9:2, 9:25–29). Patent Owner also asserts that, "while use of SSL generally connotes performing encryption," the use of encryption is optional and is not performed by default. *Id*. at 26, n.2 (citing Ex. 2031, 16). Patent Owner refers to Kirchhoff's statement that "[a]udio data is streamed in SSL messages instead of encrypted data," and its explanation that the use of encryption is not needed because voice data is being carried in the SSL messages, which is proprietarily encoded, in support of its arguments. PO Sur-Reply 5 (citing Ex. 1005, code (57), 8:36–41). Patent Owner also points out that Kirchhoff discloses exemplary formats for an SSL handshake message to establish an SSL session, but also discloses that there is no intent to have a secure session for the transfer of audio data. *Id*. at 6 (citing Ex. 1005, 9:25–30, 9:54–56). Patent Owner refers to the SSL handshake protocol and asserts that, per the SSL standard, a valid CipherSpec need not perform encryption, that is, it may validly specify a cipher of NULL, which results in an identity operation and not encryption. *Id*. at 6, n.4 (citing Ex. 2036, 16–17, 47–48, 53); *see also* PO Resp. 26, n.2.

We find that Petitioner has provided sufficient evidence of Kirchhoff's teaching of encryption by its disclosure of traversal of firewalls with VoIP communications using SSL, and we do not find Patent Owner's arguments persuasive. Patent Owner acknowledges Kirchhoff's disclosure of the use of SSL protocol to establish an SSL session across a firewall, but then points to its disclosure of streaming "audio data . . . in SSL messages instead of encrypted data." PO Resp. 26 (citing Ex. 1005, code (57)). Although Kirchhoff teaches, in part, the use of a proprietary method where audio data is already in a format that is not easily readable, it also states that while full encryption is not needed for that audio stream, it could be added.

Ex. 1005, 9:4–7. Further, it is not disputed that Kirchhoff discloses traversal of firewalls with VoIP communications using, for instance, SSL port 443. Ex. 1005, code (54), 1:62–67, 8:42–54 ("Since SSL is commonly used by web sites, most firewalls allow SSL traffic to port 443. Some firewalls may check some or all of the packets . . . , but since the data transferred by SSL is encrypted . . ."). Patent Owner itself notes the teachings of Kirchhoff, identifying that although the use of SSL is optional, the "use of SSL generally connotes performing encryption on the data that SSL records carry," and Dr. Jeffay testifies that encryption techniques were known at the time of Krtolica. *See* PO Resp. 26, n.2; Ex. 2009 ¶ 114. Further, in instances such as Kirchhoff's audio data in alternative format or with the CipherSpec, Patent Owner does not dispute that encryption could also be used and, as Petitioner asserts, the weight of the evidence supports that there would have been enhanced security with encryption. *See* PO Resp. 26; PO Sur-Reply 5; Pet. Reply 6–7.

iii. Petitioner Does Not Establish Motivation to Combine Krtolica with Kirchhoff

Patent Owner asserts that a person of ordinary skill in the art would not have been motivated to combine Krtolica with Kirchhoff to perform encryption because this would result in a marked degradation in the quality of the multimedia communications. PO Resp. 27. Patent Owner contends that encrypting would harm the efficiency of the system because of the increase in data due to the additional encryption header and the increase in latency, which would "render[] the system of Krtolica unsatisfactory for its intended purpose." *Id*. at 28–29 (citing Ex. 2009 ¶¶ 117–118; Ex. 2027, 3–4, 19, 65–69). Patent Owner further argues that Petitioner's argument that SSL is more efficient than HTTP for transferring data does not establish a

rationale to combine, because purported efficiency alone is not sufficient. *Id*. at 28 (citing *ActiveVideo Networks Inc. v. Verizon Communs., Inc.*, 694 F.3d. 1312, 1328 (Fed. Cir. 2012)).

Patent Owner also contends that the motivation to modify Krtolica to use SSL is unsupported because the use of encryption is optional in SSL and adding encryption would undermine network security. PO Resp. 29 (citing Ex. 2036, 16; Ex. 1019, 19). Patent Owner asserts that a person of ordinary skill's awareness that SSL is implemented in a commercial web-browser cannot be seen as a motivation to modify Krtolica's firewall traversal system to encrypt. PO Sur-Reply 11 (citing Ex. 2009 ¶¶ 81–85).

As discussed above, we agree with Petitioner that Kirchhoff discloses the use of SSL, a protocol that uses data encryption (Ex. 1005, 8:47–49). We also agree with Petitioner that Krtolica discloses the use of HTTP protocols on port 80 (Ex. 1004, 6:23–24), and does so with a goal of maintaining high network security (*id*. at 1:7–10, 2:33–36). As Kirchhoff discloses, and Dr. Lavian's testimony supports, one of ordinary skill in the art would have been aware that port 443, rather than port 80, would be used for secure web connections using SSL, which includes the use of encryption, and this would have resulted in enhanced network security. *See* Ex. 1005, 3:38–41; Ex. 1002 ¶¶ 52, 69, 108. As Dr. Lavian testifies, SSL/TLS was the most widely deployed security protocol in the world and the well-known use of SSL in HTTPS protocol enables secure web-based e-commerce. Ex. 1002 ¶¶ 69, 108; Ex. 1035 ¶ 8; Ex. 1006, 5. And, Krtolica has a stated goal to maintain network security. Ex. 1004, 1:7–10, 2:33–37. We find this evidence provides a sufficient rational underpinning in support of obviousness for combining the teachings of Krtolica and Kirchhoff. *See KSR*, 550 U.S. at 418.

For the reasons discussed above, we also do not find persuasive Patent Owner's arguments that use of encryption in SSL was optional and adding encryption would allegedly undermine network security. Nor do we find persuasive the argument that the Petitioner's motivation to combine based on efficiency is insufficient, because Petitioner relies on another rationale for the combination of Krtolica and Kirchhoff, that is, enhanced network security, also discussed above.

We additionally do not find persuasive Patent Owner's arguments that combining Krtolica and Kirchhoff would render the system of Krtolica unsatisfactory for its intended purpose because, as Petitioner argues, this assertion is contradicted by the state of the art at the time. *See* Pet. Reply 9. As discussed above, Dr. Lavian explains that there were known systems having firewalls with SSL traversal at the time of the invention. Ex. 1002 ¶¶ 53, 59–65; Ex. 1035 ¶ 20; Ex. 1014. Moreover, the '978 patent uses encryption with firewalls using a single-port protocol, and Patent Owner does not direct us to any disclosure in that patent that indicates that the use of encryption with a single-port protocol was inventive in that the system, or that encryption had to be done in a special manner. *See* Pet. Reply 3 (citing Ex. 1001, Fig. 3 (at 311, 341), Fig. 5 (503, 508)); *see also* Ex. 1001, 6:4–8. In a similar vein, Patent Owner argues that due to incompatibilities the combination of SSL with Krtolica would be unsuccessful, and we address this issue below.

iv. Petitioner Does Not Establish a Reasonable Expectation of Success of the Combination of Krtolica and Kirchhoff or Sufficiently Explain How to Combine

Petitioner contends that the prior art contains the teaching, i.e., the widespread use of SSL protocol for increased network security, that would

have led a person of skill to modify Krtolica to use encryption with a reasonable likelihood of success. Pet. 39 (citing Ex. 1005, 8:53–54). As discussed above, the evidence of record supports that SSL protocol was widely used for increased network security. Dr. Lavian testifies that in view of the widespread deployment of SSL, it would have been obvious to a person of ordinary skill to implement Krtolica with SSL with a reasonable expectation of success. Ex. 1002 ¶ 109. On this complete record, we also determine that Petitioner has provided sufficient evidence that there would have been a reasonable expectation of success in making the combination of Krtolica and Kirchhoff. *See* Pet. 27.

Patent Owner contends that the Petition fails to establish that a person of ordinary skill in the art would have had a reasonable expectation of success because, although the Petition asserts that modifying the system of Krtolica to encrypt would have been predictable, a person of skill would have understood that encryption "is very complex and easy to do wrong." PO Resp. 31 (citing Ex. 1006, 6, 8). Patent Owner argues that there are several real-world problems that would have needed to be overcome to successfully modify Krtolica. *Id*. (citing Ex. 2025, 49:20–50:21, 68:23–69:15, 87:18–88:4). Patent Owner asserts that a person of ordinary skill in the art would have understood that multimedia communications require a minimum Quality of Service (QoS), characterized as the amount of latency, jitter, and packet loss a communication stream may experience, and this would have been a consideration that Petitioner fails to address. *Id*. at 31–32 (citing Ex. 2009 ¶ 130; Ex. 2027, 3, 4, 19–24, 57, 59, 65–67, 75, 76; Ex. 2025, 49:20–50:21, 68:23–69:15, 87:18–88:4). Patent Owner argues that modifying the system of Krtolica to perform encrypting would have introduced latency such that communications could be adversely affected by

the additional overhead. *Id*. at 32 (citing Ex. 2027 ¶ 130). Patent Owner further argues that the use of SSL is incompatible with Krtolica's system, "resulting in a 'meltdown.'" *Id*. (citing Ex. 1006, 14). Patent Owner asserts that there is considerable evidence that establishes that modifying the system of Krtolica to include encrypting "would have been entirely unpredictable, if not impossible, at the time of the '978 Patent." *Id*. Patent Owner also argues that a person of ordinary skill in the art would have to address daunting challenges in implementing encryption and, referring to the testimony of Dr. Lavian, this would have been "a very complicated task." PO Sur-Reply 2 (citing Ex. 2009 ¶¶ 81–85, 122, 197–99; Ex. 2027, 8–9, 24–30, 42–43, 68–73; Ex. 2048, 28:25–29:15).

We are not persuaded by Patent Owner's arguments on potential quality issues. In support, Dr. Jeffay's testimony refers to the NIST document and states that those requirements "can adversely be affected by the additional overhead incurred when encrypting data." Ex. 2009 ¶ 130 (citing Ex. 2027, 19–22). The NIST document identifies latency and jitter as potential issues with transmissions in VoIP. *See* Ex. 2027, 19–21; *see also* PO Resp. 31–32 (citing Ex. 2027, 3, 4, 19–24, 57, 59, 65–67, 75, 76). More specifically, however, the NIST document states that, with regard to the effect of encryption, there can be degraded voice quality, with a tradeoff between security and voice quality, and need for speed, but "[f]ortunately, the difficulties are not insurmountable." Ex. 2027, 68. And, the deposition testimony of Dr. Lavian, which Patent Owner bases some of its arguments on, reflects Dr. Lavian's opinion that, although encryption would increase overhead, the effect of encryption on quality would be minimal and would not create a problem. Ex. 2025, 49:20–50:21, 68:23–69:15 ("I do not see [adding encryption] is a challenge."), 87:18–88:4; *see also* PO Resp. 32.

Thus, weighing the evidence of record, we find that it supports Dr. Lavian's testimony that quality issues would have been manageable in the combination of the prior art.

We also do not find persuasive Patent Owner's argument on the alleged incompatibility of SSL encryption with Krtolica's system. *See* PO Resp. 32 (citing Ex. 1006, 14). For its arguments, Patent Owner refers to Hosner and an issue with the use of its OpenVPN system with TCP. *See id*. We are not persuaded by this argument because the referenced issue is specific to its application.[11] *See id.* Moreover, to demonstrate the predictability of the use of encryption, Petitioner notes, and we agree, that the '978 patent itself does not identify any issues with encrypting a single-port protocol or anything inventive in the application of encryption, and instead states that "[a]ny method or algorithm of encryption may be used" with its invention. *See* Tr. 44:6–20; *see also* Ex. 1001, 6:5–6; *cf. In re Epstein*, 32 F.3d 1559, 1568 (Fed. Cir. 1994) (holding "the Board's observation that appellant did not provide the type of detail in his specification that he now argues is necessary in prior art references supports the Board's finding that one skilled in the art would have known how to implement the features of the references").

Additionally, we are not persuaded by Patent Owner's arguments on the alleged "complications" in the implementation of encryption. *See* PO Sur-Reply 2 (citing Ex. 2048, 28:25–29:15). Although Dr. Lavian's deposition testimony states that encryption is a complicated process, in context, he notes that one does not personally encrypt but refers to

[11] Additionally, this assertion is attorney argument only and is not supported by expert testimony. *See* PO Reply 32; PO Sur-Reply 14.

commonly-known applications that use encryption. *See* Ex. 2048, 29:23–30:5. As discussed above, the evidence supports that SSL protocol with encryption was widely used. Additionally, the evidence of record supports that there were known systems with firewalls and SSL traversal at the time of the invention, and, more particularly, the '978 patent used encryption with firewalls using a single-port protocol, with no indication that there were any issues with encryption or that specific types of encryption were required, thus providing support that the combination would have worked for its intended purpose. *See DePuy Spine, Inc.*, 567 F.3d at 1326 (quoting *KSR*, 550 U.S. at 401 ("The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.")).

Patent Owner additionally argues that the Petition fails to explain how a person of ordinary skill in the art would have modified Krtolica to include the teachings of Kirchhoff. PO Resp. 30. Patent Owner asserts that the Petition and Dr. Lavian make conclusory statements about the modification, such as that the modification would be simple, and offer no identification of which elements of Krtolica would need to be modified to implement the claimed encryption. *Id*. More specifically, Patent Owner argues that it is unclear where the Petitioner proposes to implement encryption. PO Sur-Reply 13, n.9.

We do not find these arguments persuasive because Petitioner sufficiently identifies how the combination would be made; Dr. Lavian explains that the SSL protocol would be applied to Krtolica's firewall traversal system. Pet. 38; Ex. 1002 ¶ 107. Petitioner identifies Krtolica's use of HTTP on port 80 of the firewall, and refers to Kirchhoff's use of SSL on port 443. Pet. 37–38 (citing Ex. 1004, 6:22–24; Ex. 1005, 3:38–41). We

note that "the [obviousness] analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *KSR*, 550 U.S. at 418 (2007). The '978 patent itself does not indicate, for instance, that the specific location or method of encryption is inventive or critical such that one of ordinary skill would not be able to implement encryption in a single-port protocol application. *See* Ex. 1001, cols. 6–7. Here, as we discussed above, the record supports the known application of encryption, and in this light, we find that Dr. Lavian's explanation that "combining prior art elements (firewall traversal and encryption) according to known methods (e.g., using SSL port 443) to yield predictable results" presents credible and adequate testimony on the combination. *See* Ex. 1002 ¶ 109.

v. Conclusion

We have considered Patent Owner's arguments concerning objective indicia of nonobviousness in Section II.D.3.k below. *See* PO Resp. 47–57. For the reasons discussed, we find that Patent Owner's evidence purportedly showing long-felt need, unexpected results, and industry praise, does not outweigh Petitioner's evidence concerning the obviousness of claim 2. On the full record, Petitioner has established by a preponderance of the evidence that claim 2 would have been obvious over the combination of Krtolica and Kirchhoff.

c. Dependent Claim 3

Claim 3 recites the method of claim 2 that further comprises "decrypting said encrypted plurality of single-port packets prior to said reconverting." Ex. 1001, 9:15–17.

Petitioner asserts that the combination of Krtolica and Kirchhoff teach this claim because a person of ordinary skill in the art would have understood that encrypted data requires decryption. Pet. 40 (citing Ex. 1002 ¶¶ 42, 110). Petitioner further contends that "since it is the single port data that is initially encrypted, the single port data must be decrypted prior to reconverting to multiport data." *Id*.

Patent Owner argues that dependent claim 3 is not rendered obvious based on the arguments presented for claim 2. PO Resp. 33. We do not find these arguments persuasive for the reasons discussed above.

We have considered Patent Owner's arguments concerning objective indicia of nonobviousness in Section II.D.3.k below. *See* PO Resp. 47–57. For the reasons discussed, we find that Patent Owner's evidence purportedly showing long-felt need, unexpected results, and industry praise, does not outweigh Petitioner's evidence concerning the obviousness of claim 3. On the full record, Petitioner has established by a preponderance of the evidence that claim 3 would have been obvious over the combination of Krtolica and Kirchhoff.

d. Dependent Claim 5

Claim 5 recites the method of claim 1 wherein "said single-port communication protocol comprises: Secure Sockets Layer (SSL) protocol." Ex. 1001, 9:24–27.

Petitioner asserts that Krtolica in combination with Kirchhoff teaches the claim limitations. Pet. 41. Petitioner contends that Kirchhoff discloses the use of SSL in preferred embodiments. *Id*. Petitioner asserts that it would have been obvious for a person of skill in the art to combine the two references for reasons similar to those presented for claim 2. *Id*. at 41–43.

Patent Owner argues that dependent claim 5 is not rendered obvious for reasons similar to those presented for claim 2, specifically that the rationale to combine the references is inadequate. PO Resp. 34. We do not find these arguments persuasive for the reasons discussed above.

We have considered Patent Owner's arguments concerning objective indicia of nonobviousness. PO Resp. 47–57. For the reasons discussed below in Section II.D.3.k, we find that Patent Owner's evidence purportedly showing long-felt need, unexpected results, and industry praise, does not outweigh Petitioner's evidence concerning the obviousness of claim 5. On the full record, Petitioner has established by a preponderance of the evidence that claim 5 would have been obvious over the combination of Krtolica and Kirchhoff.

e. Dependent Claim 8

Claim 8 depends from disclaimed claim 6, and further comprises "sending alternate data instead of requested data in response to a resend request." Ex. 1001, 9:43–45. Given this dependency, claim 8 contains all the limitations of disclaimed claim 6, as well as the limitations of disclaimed claim 1, which claim 6 depends from. We have reviewed Petitioner's explanations and supporting evidence as to how the combination of Kirchhoff and Krtolica teaches the limitations of disclaimed claim 6, and we agree with and adopt Petitioner's analysis. *See* Pet. 43–44. On the full record, Petitioner has demonstrated by a preponderance of the evidence that claim 6 would have been obvious over the combination of Krtolica and Kirchhoff.

Turning to claim 8, the Petition asserts that Krtolica discloses that "UDP does not send back a return acknowledgment message of the arrival of each packet received." Pet. 44–45 (citing Ex. 1004, 6:58–59). Petitioner

argues that if a resend request were sent, it would have been ignored by the UDP in favor of another data packet, so these embodiments send alternative data instead of requested data in response to a resend request. *Id*. at 45 (citing Ex. 1002 ¶¶ 38, 119). In support, Dr. Lavian testifies that in Krtolica, "UDP lacks the return acknowledgement message present in TCP, making it suitable for transmitting voice and video at low loss levels." Ex. 1002 ¶ 119.

Patent Owner asserts that Krtolica does not disclose an embodiment where UDP is used. PO Resp. 34. Patent Owner further argues that, even if Krtolica taught the use of UDP, Petitioner's reliance on such a teaching is inconsistent with the position it takes for claim 6, where TCP is the "first transmission protocol" used for the teaching of "transmitting said plurality of single-port packets." *Id*. at 34–35 (citing Pet. 43–44). Patent Owner also contends that the Petition fails to explain where a resend request is identified or why one would be sent using UDP. *Id*. at 35 (citing Ex. 2009 ¶¶ 137–138). Patent Owner refers to Krtolica's disclosures that in UDP, the protocol "does not guarantee the arrival of each information packet," where "[i]f a packet is misrouted due a flawed or misread header, that packet is never received; and neither the receiver or the sender are ever aware of the missing packet." *Id*. (citing Ex. 1004, 6:56–57, 6:59–61). Patent Owner further asserts that, even as to the TCP embodiment, Krtolica does not disclose the use of a resend request as claimed. *Id*. Patent Owner refers to Krtolica's disclosure of ensuring packet delivery by "send[ing] a return message acknowledging each packet that has arrived," and that "a sender becomes aware of which packets did not arrive by the absence of return messages; and sends a replacement packet." *Id*. (citing Ex. 1004, 7:4–7). Patent Owner argues that the retransmission mechanism is based on the absence of a return message, and there is no claimed "resend request." *Id*.

In Reply, Petitioner asserts that Krtolica discloses the use of both UDP and TCP. Pet. Reply 12 (citing Ex. 1004, 6:53–55). Petitioner argues that for claim 6, the Petition explained that either TCP or UDP could be considered the first or second protocol. *Id*. at 13 (citing Pet. 43–44; Ex. 1035 ¶ 22). Petitioner contends that UDP sends alternative data instead of requested data, and the scenario described in the Petition would occur when one endpoint is using TCP and sends a resend requests to an endpoint using UDP. *Id*. (citing Ex. 1035 ¶¶ 22–24).

Patent Owner argues that Petitioner impermissibly presents a new argument in its Reply, and we agree. PO Sur-Reply 8. The Petition, and Dr. Lavian's supporting testimony, only assert that UDP does not send a return acknowledgement message of packet arrival and "if a resend request were sent, it would be ignored by UDP in favor of another data packet." *See* Pet. 44–45; Ex. 1002 ¶ 119. In Reply, Petitioner presents a new line of argument directed to an endpoint using TCP that sends a resend request to an endpoint using UDP—but this is a different argument from that presented in the Petition.

Even if we were to consider Petitioner's new argument, we would still find it deficient. With Petitioner's revised argument under the scenario where "one endpoint is using TCP and sends a resend request to an endpoint using UDP," Petitioner does not provide sufficient evidence that the combination of Krtolica and Kirchhoff teaches the claim limitation. *See* Pet. Reply 13. We agree with Patent Owner that, in view of Dr. Lavian's testimony concerning the differences in protocols, Petitioner fails to explain how incompatible TCP and UDP protocols could communicate with each other in order to teach the claimed sending of alternate data in response to a resend request. *See* PO Sur-Reply 16 (citing Ex. 2048, 15:18–21, 16:13–

21). And, even if such conversions were possible, Dr. Lavian does not explain why one of ordinary skill in the art would have been motivated to implement Krtolica in this manner. *See* Ex. 1002 ¶¶ 38, 119; Ex. 1035 ¶¶ 22–24.

Accordingly, on the full record, Petitioner has not established by a preponderance of the evidence that claim 8 would have been obvious over the combination of Krtolica and Kirchhoff.

f. Dependent Claim 9

Claim 9 depends from claim 1, and further comprises "qualifying said plurality of multiport packets, wherein said qualifying comprises:"

> registering a network device;
>
> using network ports by said registered network device;
>
> determining whether said plurality of multiport packets originated from a network port used by said registered network device; and
>
> allowing further transmission of said plurality of multi-port packets based on said determining.

Ex. 1001, 9:45–55. Petitioner asserts that the combination of Krtolica and Kirchhoff teaches the limitations of claim 9 by Kirchhoff's disclosure of an external manager that registers PCs that are connected to it. Pet. 45 (citing Ex. 1005, 3:47–50, 4:6–9). Petitioner argues that a person of ordinary skill in the art would have been motivated to combine the firewall traversal method of Krtolica with Kirchhoff's registration of network devices because they are both directed towards firewall traversal techniques; qualification and registration were well-known to a person of ordinary skill in the art and; the incorporation of known device registration would improve Krtolica "in the same way." *Id*. at 46 (citing Ex. 1002 ¶ 122). Petitioner alternatively argues that combining the known prior art elements of registration of

network devices and firewall traversal according to known methods would yield predictable results. *Id*.

Patent Owner argues that: (1) Kirchhoff uses a destination addresses and not an origin; (2) Kirchhoff's firewalls do not know the registration status of PCs so filtering cannot be used for determining the packet origin from a port used by a registered device; and (3) the rationale to combine is insufficient and there is no explanation of how Krtolica is modified by Kirchhoff. PO Resp. 36–41.

For the last argument on the rationale to combine, Patent Owner refers to Kirchhoff's teaching of a registration process for a PC and an external manager, that is external to the firewall, in order to transverse the firewall. PO Resp. 40 (citing Ex. 1005, Fig. 3). Patent Owner argues that Petitioner has provided no explanation of why a person of ordinary skill "would take Kirchhoff's teaching of registration with a device external to the firewall and modify Krtolica to register the multiport packets of Krtolica's endpoint units with a device internal to the firewall (i.e., the firewall adapter of Krtolica)." *Id*. More specifically, Patent Owner asserts that while Kirchhoff performs registrations in order to transverse the firewall, there would be no need to do so in Krtolica. *Id*. Dr. Jeffay testifies that no improvement has been shown by using the registration of Kirchhoff in Krtolica. Ex. 2009 ¶ 140. Dr. Jeffay explains that device registration is necessary in Kirchhoff because the external manager is needed so that clients outside the firewall can initiate calls to clients inside the firewall. *Id*. ¶ 141. Dr. Jeffay contrasts this with Krtolica's disclosures where clients can establish direct communications with each other. *Id*. ¶ 142. Dr. Jeffay further testifies that "Dr. Lavian identifies no problem that is solved or ameliorated by the combination" and a person of ordinary skill in the art "would understand that putting a device

registration process into Krtolica . . . serves no purpose and adds no value to Krtolica." *Id*. ¶ 143.

As *KSR* states, "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." *KSR*, 550 U.S. at 418. Further, "it is insufficient to simply conclude the [prior art] combination would have been obvious without identifying any reason why a person of skill in the art would have made the combination." *Metalcraft of Mayville, Inc. v. The Toro Co*., 848 F.3d 1358, 1366 (Fed. Cir. 2017); *see also Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) ("obviousness concerns whether a skilled artisan not only could have made but would have been motivated to make the combinations or modifications of prior art to arrive at the claimed invention").

Here, we agree with Patent Owner that Petitioner has presented insufficient rationale to combine the registration process of Kirchhoff in Krtolica. As Kirchhoff describes, the external manager, which is outside of the firewalls, uses registration as part of the process to allow the external manager to act as a proxy to make direct connections between PCs so that they may communicate as shown in Figure 3, reproduced below, because the firewalls may not allow a connection outside the firewall. Ex. 1005, 3:42–49.

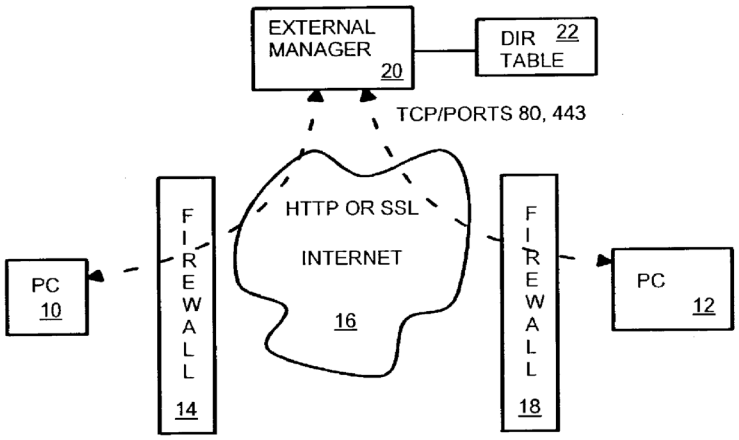

FIG. 3

As part of the diagram of the process depicted in Figure 3, external manager 20 registers each PC by storing addresses and ports for the PCs in directory table 22, and the PCs send the call requests to external manager 20 which then searches for the address and port information for the PC in directory table 22, which is used to route voice-data messages through the external manager to the respective PC. Ex. 1005, 3:51–56. We agree with Patent Owner that, in Krtolica, communications are established using the adapter controller of the firewall adapter, which is within the firewall, without the need for an external manager that registers network devices as decribed in Kirchhoff. *See* PO Resp. 39; Ex. 1004, Fig. 1, Fig. 2, 4:47–52[12]. As such, while Krtolica and Kirchhoff are directed toward firewall traversal techniques, Petitioner fails to provide sufficient support of any need to improve Krtolica, or that there is there any support that the method used in Kirchhoff for registration would be applied to Krtolica "in the same way" to

[12] Patent Owner refers to "47–52" with regard to the adapter controller, which appears to be a typographical error. PO Resp. 39.

improve its firewall tranversal technique, or that the application of Kirchhoff's registration process was a known process. *See* Ex. 1002 ¶ 122.

In Reply, Petitioner argues that the improvement of Kirchhoff is "adding packet filtering functionality to Krtolica." Pet. Reply 15. That argument for a motivation may apply to other limitations of the claim, but there is no explanation as to why this rationale should be applied to the registration limitation. Petitioner additionally argues that the Petition does not seek the wholesale combination of Krtolica and Kirchhoff, but is only relying on Kirchoff's disclosure of well-known concepts like network device registration, and a person of ordinary skill in the art would understand how to add this concept to Krtolica. *Id*. at 17. But Petitioner fails to provide support that Kirchhoff's registration method would be needed in or helpful to Krtolica. Additionally, short of a conclusory statement from Dr. Lavian, Petitioner fails to provide support that the registration method of Kirchhoff, which stores addresses and ports for devices, is well-known.

Accordingly, on the full record, Petitioner has not established by a preponderance of the evidence that claim 9 would have been obvious over the combination of Krtolica and Kirchhoff.

g. Independent Claim 14

Patent Owner has disclaimed claim 14. Claims 15–17, 19, and 20 directly depend from disclaimed independent claim 14 and thus contains all the limitations of claim 14. We therefore must make a determination as to whether the Petition presents sufficient evidence and supporting argument to demonstrate that the asserted prior art teaches or suggests the subject matter of claim 14.

The Petition relies upon similar support for its obviousness challenge to claim 14 as that presented for claim 1, and additionally asserts that

Krtolica teaches the claimed "conversion table" for packet conversion. *See* Pet. 55–62. More specifically, claim 14 also includes the limitation of a "conversion table for said first network device to convert . . . multiport packets into . . . single-port packets . . ., wherein said single-port communication protocol is acceptable by . . . different commonly-open transmission control protocol (TCP) ports," where the "interface communicates" "over a selected one of the plurality of different commonly-open TCP ports." Ex. 1001, 10:9–18. Petitioner asserts that Krtolica's Tunnel Interface 44T contains the CTL, that is, the component and template library 44L within the tunnel interface, which is equivalent to "a conversion table that converts received multiport packets to single port packets for tunneling to CTL 48L within tunnel interface 48T." Pet. 57 (citing Ex. 1004, 5:15–17, 5:19–21). Dr. Lavian provides testimony that "[t]he 'components' and 'templates' in the CTL library contain the values necessary for conversion from multiport to single port protocol, and back again." Ex. 1002 ¶ 142, *see also id.* ¶ 77 (citing Ex. 1004, 5:9–21). Petitioner refers to Figure 4 of Krtolica and the disclosure that tunnel interface 44T communicates the single port packets over common network port 45P, "which is typically port 80." Pet. 57 (citing Ex. 1004, 5:19–21). Petitioner asserts that Krtolica explains that "[t]he determined firewall port may be selected from a range of firewall ports" and "may be a default port such as port 80 in a HTTP [ ] application." *Id*. at 52 (citing Ex. 1004, 6:19–24). Petitioner also refers to the assertions made for limitation 1[c], which include Kirchhoff's disclosure that "web browsers use the Transport Control-Protocol (TCP) on port 80" (*see* Pet. 31 (citing Ex. 1005, 3:32–35)) to contend that Krtolica teaches the use of port 80, which is a commonly-open TCP port. *Id*. at 57–58.

We have reviewed Petitioner's uncontested explanations and supporting evidence as to how the combination of Kirchhoff and Krtolica teach the limitations of claim 14, and we agree with and adopt Petitioner's analysis. *See* Pet. 55–62.

On the full record, Petitioner has demonstrated by a preponderance of the evidence that the limitations of disclaimed claim 14 are taught by Krtolica and Kirchhoff.

h. Independent Claim 23

Independent claim 23 recites, in part, a method that includes the step of "encrypting the plurality of multiport packets, thereby resulting in encrypted packets." Ex. 1001, 11:14–12:7. The Petition relies upon similar evidence and argument for the obviousness challenge to claim 23 as that presented for claims 1, 2, and 3 for most of the claim 23 limitations. *See* Pet. 64–69.

Claim 23 additionally recites "encapsulating the encrypted packets into a plurality of single-port packets." Petitioner relies upon Krtolica's conversion process that uses tunneling for the teaching of this claim limitation, with Dr. Lavian testifying that tunneling uses encapsulation to create the tunnel. Pet. 66 (citing Ex. 1002 ¶¶ 61, 167). Petitioner contends that Krtolica's encapsulation process "stamps the header of outgoing packets as part of the creation process," and then multiplexer 34M "reads the header configuration of outgoing packets in multiple streams of packets" and "provides a single stream of multiplexed packets which traverse firewall 35W through port 35P," thus teaching encapsulation. *Id*. at 66–67 (citing Ex. 1004, 4:53–56, 4:57–61).

We have reviewed Petitioner's explanations and supporting evidence as to how the combination of Kirchhoff and Krtolica teach the limitations of claim 23, and we agree with and adopt Petitioner's analysis. *See* Pet. 64–69.

Patent Owner argues that dependent claim 23 is not rendered obvious based on the arguments presented for claim 2. PO Resp. 42. We do not find the arguments persuasive for the reasons discussed above.

We have considered Patent Owner's arguments concerning objective indicia of nonobviousness in Section II.D.3.k below. PO Resp. 47–57. For the reasons discussed, we find that Patent Owner's evidence purportedly showing long-felt need, unexpected results, and industry praise, does not outweigh Petitioner's evidence concerning the obviousness of claim 23. On the full record, Petitioner has established by a preponderance of the evidence that claim 23 would have been obvious over the combination of Krtolica and Kirchhoff.

i. Dependent Claims 15, 17, 25, 26, 29, and 30

We have reviewed Petitioner's explanations and supporting evidence as to how the combination of Kirchhoff and Krtolica teach the limitations of claims 15, 17, 25, 26, 29, and 30, and we agree with and adopt Petitioner's analysis. *See* Pet. 62, 69–70, and 71.

Patent Owner argues that dependent claims 15, 17, 25, 29, and 30 are not rendered obvious based on the arguments for claims 2, 5, and 23.[13] PO

[13] Patent Owner does not present argument for claim 26 under the obviousness challenge based on the combination of Krtolica and Kirchhoff. *See* PO Resp. 42–44. Petitioner's argument for claim 26, which depends from claim 23, relies on the evidence and argument presented for claim 6, which Patent Owner has disclaimed and which we have found to be sufficiently taught by the prior art under this ground. *See* Pet. 69–70.

Resp. 42–44. We do not find the arguments persuasive for the reasons discussed above.

We have considered Patent Owner's arguments concerning objective indicia of nonobviousness in Section II.D.3.k below. *See* PO Resp. 47–57. For the reasons discussed, we find that Patent Owner's evidence purportedly showing long-felt need, unexpected results, and industry praise, does not outweigh Petitioner's evidence concerning the obviousness of claims 15, 17, 25, 26, 29, and 30. On the full record, Petitioner has established by a preponderance of the evidence that claims 15, 17, 25, 26, 29, and 30 would have been obvious over the combination of Krtolica and Kirchhoff.

j. Dependent Claims 19, 20, 27, and 28

For its challenges to claims 19 and 27, Petitioner relies upon the same evidence and argument presented for claim 8. Pet. 63, 70. For claims 20 and 28, Petitioner relies upon the same evidence and argument presented for claim 9. Pet. 63–64, 70–71. For the reasons discussed above, we have determined that Petitioner has not met its burden in its challenges to claims 8 and 9, and the challenges to claims 19, 20, 27, and 28 fail for similar reasons.

k. Objective Indicia of Nonobviousness

Patent Owner also presents arguments and evidence of objective indicia or secondary considerations of nonobviousness. PO Resp. 47–57; PO Sur-Reply 22–27. Objective indicia of nonobviousness may include long-felt but unsolved need, failure of others, unexpected results, commercial success, copying, licensing, industry praise, and expert skepticism. *Mintz v. Dietz & Watson, Inc*., 679 F.3d 1372, 1379 (Fed. Cir. 2012). "[O]bjective indicia may often be the most probative and cogent evidence of nonobviousness in the record," and "help turn back the clock

and place the claims in the context that led to their invention." *Id*. at 1378. Evidence of objective indicia of nonobviousness "must always when present be considered en route to a determination of obviousness." *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA*, *Inc.*, 699 F.3d 1340, 1349 (Fed. Cir. 2012); *see also Apple Inc. v. Samsung Elecs. Co*., 839 F.3d 1034, 1048 (Fed. Cir. 2016) (en banc).

Objective indicia of nonobviousness are "only relevant to the obviousness inquiry 'if there is a nexus between the claimed invention and the [objective indicia of nonobviousness].'" *In re Affinity Labs of Tex., LLC*, 856 F.3d 883, 901 (Fed. Cir. 2017) (quoting *Ormco Corp. v. Align Tech., Inc*., 463 F.3d 1299, 1312 (Fed. Cir. 2006)). For objective indicia of nonobviousness to be accorded substantial weight, their proponent must establish a nexus between the evidence and the merits of the claimed invention. *ClassCo, Inc. v. Apple, Inc*., 838 F.3d 1214, 1220 (Fed. Cir. 2016).

As the Federal Circuit has explained, "a patentee is entitled to a rebuttable presumption of nexus between the asserted evidence of secondary considerations and a patent claim if the patentee shows that the asserted evidence is tied to a specific product and that the product 'is the invention disclosed and claimed.'" *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (quoting *Demaco Corp. v. F. Von Langsdorff Licensing Ltd*., 851 F.2d 1387, 1392 (Fed. Cir. 1988)). That is, presuming nexus is appropriate "when the patentee shows that the asserted objective evidence is tied to a specific product and that product 'embodies the claimed features, and is coextensive with them.'" *Id*. (quoting *Polaris Indus., Inc. v. Arctic Cat, Inc*., 882 F.3d 1056, 1072 (Fed. Cir. 2018)). On the other hand, the patentee is not entitled to a presumption of nexus if the patented

invention is only a component of a commercially successful machine or process. *Id*. Once "the patentee has presented a prima facie case of nexus, the burden of coming forward with evidence in rebuttal shifts to the challenger . . . to adduce evidence to show that the commercial success was due to extraneous factors other than the patented invention." *Demaco*, 851 F.2d at 1392–93.

However, "[a] finding that a presumption of nexus is inappropriate does not end the inquiry into secondary considerations." *Fox Factory*, 944 F.3d at 1373. "To the contrary, the patent owner is still afforded an opportunity to prove nexus by showing that the evidence of secondary considerations is the 'direct result of the unique characteristics of the claimed invention.'" *Id*. at 1373–74 (quoting *In re Huang*, 100 F.3d 135, 140 (Fed. Cir. 1996)). "Ultimately, the fact finder must weigh the secondary considerations evidence presented in the context of whether the claimed invention as a whole would have been obvious to a skilled artisan." *Lectrosonics, Inc. v. Zaxcom, Inc*., IPR2018-01129, Paper 33 at 33 (PTAB Jan. 24, 2020) (precedential) (citing *WBIP, LLC v. Kohler Co*., 829 F.3d 1317, 1331 (Fed. Cir. 2016)).

i. Presumption of Nexus

Patent Owner argues that the challenged claims are embodied in its Secure Traversal Navigation Solution system (the "STNS system"). PO Resp. 49 (citing Ex. 2008; Ex. 2009 ¶¶ 200–204; Ex. 2028). Patent Owner refers to the Declaration of Rahul Vijh for support, with Mr. Vijh testifying that he considered "Source Code for directPacket's STNS system" and, based on his review, the STNS system embodies the inventions of claims 1–30 of the '978 patent. Ex. 2008 ¶¶ 9, 17. Mr. Vijh refers to a claim chart, which purports to identify source code for each element of the claims. *Id*.

¶ 17, App. B. Patent Owner contends that when a marketed product embodies the claimed invention, objective evidence may be presumptively attributed to the patented invention. PO Resp. 50 (citing *PPC Broadband, Inc. v. Corning Optical Commc'ns RF, LLC*, 815 F.3d 734, 747 (Fed. Cir. 2016)).

Patent Owner also refers to the testimony of Dr. Jeffay, who references the Declaration of Mr. Vijh and relies upon it for his opinion that the challenged claims are embodied in the STNS system. Ex. 2009 ¶ 200. Patent Owner also relies on Dr. Jeffay's review of a report by market research firm Wainhouse Research (the "Wainhouse report") (Ex. 2029), which provides the results of testing of the Patent Owner's STNS system. Ex. 2009 ¶ 201.

Patent Owner argues that Petitioner fails to directly respond to and rebut the testimony provided by Dr. Jeffay and Mr. Vijh. PO Sur-Reply 23–24. More specifically, Patent Owner asserts that Dr. Jeffay provides unrebutted testimony regarding how the objective evidence offered is reasonably commensurate with the scope of the challenged claims. *Id*. at 24 (citing Ex. 1037, 201:18–205:16; *Rambus Inc. v. Rea*, 731 F.3d 1248, 1257 (Fed. Cir. 2013)).

As Petitioner argues, however, Patent Owner does not provide sufficient analysis demonstrating that the STNS system was coextensive (or nearly coextensive) with the challenged claims. *See* Pet. Reply 20–24. The main evidence of a nexus presented by Patent Owner is the Vijh Declaration, but Mr. Vijh's testimony on the issue merely consists of the statement that he examined source code for the STNS system, and "it is my opinion that directPacket's STNS system practices and embodies the inventions recited in Claims 1–30 of the '978 Patent." Ex. 2008 ¶¶ 9, 17. Mr. Vijh also states

that in support of this opinion, he "compiled a claim chart identifying, on a claim element-by-claim element basis, where in the STNS Source code each element of Claims 1–30 of the ''978 Patent is found," which is attached as Appendix B of the Declaration. Appendix B, however, only presents as support for each claim element a listing of subroutine names without additional detail, such as the source code for the subroutine or an explanation of its contents or operation. *See id*. ¶ 17, App. B.[14] Moreover, none of the source code for the STNS system was produced by Patent Owner. *See id*. Thus, Patent Owner has not provided Petitioner or the Board with sufficient information to understand the basis for Mr. Vijh's opinion or to evaluate its accuracy. Accordingly, because the testimony is conclusory and not supported by evidence of record, we give little weight to Mr. Vijh's testimony concerning the alleged practice of the claims by the STNS system. 37 C.F.R. § 42.65(a) ("Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.").

Patent Owner also relies on the testimony of Dr. Jeffay, who refers to the Vijh Declaration, and states that "I find the [Mr. Vijh's] analysis credible" and "the conclusions developed are supported by the analysis presented." Ex. 2009 ¶ 200. Dr. Jeffay continues: "*[f]or these reasons*, it is my opinion" that the claims are embodied by the STNS system. *Id*. (emphasis added). We cannot afford weight to this portion of Dr. Jeffay's

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[14] Patent Owner filed a Motion to Seal, which seeks to seal portions of Appendix B of the Vijh Declaration, and, more particularly, seeks to seal the names of portions of the source code. Paper 30; Ex. 2008. We address the Motion to Seal below, but note that the discussion herein does not disclose the identification of portions of the source code that are alleged to be confidential.

testimony because Dr. Jeffay does not base his opinion on his own independent evaluation of the source code and rather relies upon that the testimony of Mr. Vijh, which we find to be insufficiently supported and conclusory, as discussed above.

We also are not persuaded by Dr. Jeffay's reliance on the Wainhouse report. *See* Ex. 2009 ¶ 201. Dr. Jeffay testifies that "the [Wainhouse] [r]eport provides the results of extensive testing of the Patent Owner's STNS system which has been shown to embody the inventions of the '978 Patent." *Id*. Dr. Jeffay's testimony is based upon the Wainhouse report's statement that the STNS system has the ability to "resolv[e] the firewall/NAT issues in the [test] environment seamlessly and without adversely impacting the overall call quality and user experience," and the report's identification of the STNS system's "primary strengths" as requiring only a single port, allowing installation without needed to open any additional firewall ports, and encapsulating the call traffic into an encrypted SSL v3 stream. *Id*. ¶ 202 (citing Ex. 2028, 17). Patent Owner additionally refers to Dr. Jeffay's deposition testimony as support for the allegation that Mr. Vijh's opinions are corroborated by the Wainhouse report. PO Sur-Reply 23 (citing Ex. 1037, 201:18–205:16; *see also*, Ex. 2028; Ex. 2009 ¶ 200).

The Wainhouse report documents an evaluation of the STNS system, including testing, with assessment of different criteria, such as install/configure difficulty, user interface, connectivity, interoperability, feature sets, security, and costs. Ex. 2028, 1–4. Although the Wainhouse report includes testing protocols and results, it does not provide any details on the STNS system itself or its operation. *See generally id*. Similarly, as discussed above, Dr. Jeffay's testimony references the Wainhouse report, but provides no discussion or explanation of how the claim elements are

embodied in the STNS system. *See* Ex. 2009 ¶¶ 201–203; Ex. 2028, 2, 4, 17; Ex. 1037, 201:18–205:16. Instead, Dr. Jeffay testifies, in a conclusory manner, that "the [Wainhouse] Report confirms my opinion that the Challenged Claims are embodied by Patent Owner." Ex. 2009 ¶ 201. In view of the lack of information on the STNS system and its operation in the Wainhouse report, and Dr. Jeffay's failure to provide supporting explanations, we cannot credit Dr. Jeffay's testimony on the alleged nexus, and the Wainhouse report does not serve to corroborate Mr. Vijh's opinion that the challenged claims are embodied in the STNS system.

Thus, based on the evidence of record, Patent Owner does not provide sufficient analysis demonstrating that the infringing products were coextensive (or nearly coextensive) with the challenged claims. *See* PO Resp. 49–55. We, therefore, find that a presumption of nexus is inappropriate. *See Lectrosonics*, Paper 33 at 33; *Fox Factory*, 944 F.3d at 1374.

ii. Long-Felt Need

Turning to long-felt need, Patent Owner asserts that its STNS system satisfied a long-felt but unmet need for a method of transporting encrypted multimedia communication data through a single, commonly-open port on a network firewall, as evidenced by "an exceedingly increasing demand for the ability to conduct secure, multimedia communications over the Internet." PO Resp. 50–51 (citing Ex. 2009 ¶¶ 196–199). Patent Owner further asserts that when communication protocols were first developed in the mid to late 90s, the contemplated use was one with the endpoint devices on the same network, but with the development of the Internet, there was a demand for "multimedia communication sessions across disparate, geographically distant networks." *Id.* Patent Owner argues that obstacles to these

communications included firewalls and encryption. *Id*. at 51 (citing Ex. 2009 ¶¶ 58–60). Patent Owner further argues that "despite nearly a decade's worth of significant attention devoted to the issue . . . no solution had emerged," and the purported solutions were not capable of handling real-world cases. *Id*. at 51–52 (citing Ex. 2009 ¶¶ 196–199; Ex. 2027, §§ 9.4, 9.5).

Patent Owner contends that its STNS system satisfied this long-felt need because it "satisfied the need for a method of multimedia communication that provided high network security (i.e., firewall traversal through a single, commonly-open port) and high communication security (i.e., encryption), without sacrificing any quality of service." PO Resp. 52 (citing Ex 2009 ¶¶ 200–204, Ex. 2028). Patent Owner therefore argues that because the STNS solution solved known issues without adversely impacting overall call quality and user experience, the claims satisfied a long-felt but unmet need. *Id*. (citing Ex. 2028, 12, 17). Patent Owner further asserts that the objective results of the study discussed in the Wainhouse report, performed by an industry-leading "independent market research firm," found that the STNS system solved known issues, "seamlessly and without adversely impacting the overall call quality and user experience." PO Sur-Reply 25–26 (citing Ex. 2028, 12, 17, 20).

Establishing long-felt need "requires objective evidence that an art-recognized problem existed in the art for a long period of time without solution." *Ex parte Jellá*, Appeal No. 2008-1619, 2008 WL 5693899, at *13 (BPAI Nov. 3, 2008) (precedential). Furthermore, one must demonstrate that "widespread efforts of skilled workers having knowledge of the prior art had failed to find a solution to the problem." *In re Allen*, 324 F.2d 993, 997 (CCPA 1963).

Petitioner argues that the STNS system did not satisfy a long-felt but unmet need. Pet. Reply 24–25. In support, Dr. Lavian testifies that there were numerous products on the market in 2004 that allowed firewall traversal with multimedia communications. Ex. 1035 ¶ 35 (citing Ex. 1002 ¶¶ 53, 59–65; Ex. 1014). Further, the Wainhouse report states that "[f]ortunately, there are solutions on the market today that allow organizations to conduct IP-based videoconferencing sessions with those outside their private network without sacrificing network security." Ex. 2028, 2.

We are not persuaded that Patent Owner has provided sufficient evidence to establish a long-felt need that the claimed invention satisfied. Patent Owner relies on the Wainhouse report for support that the STNS system allegedly solved long-felt needs, however, the report also refers to other "solutions on the market" that allowed IP-based videoconferencing while providing network security. Ex. 2028, 2. Further, the Wainhouse report provides relative ratings for the STNS system, with the ratings including factors such as cost and feature sets, that would be used in "decision-making," which further indicates that there would have been other systems available for comparison that would meet customer needs. *See id.* at 3. For instance, the Wainhouse report's assessment includes a summary of relative "strengths" and "weaknesses," which provides support that there were other alternative systems available, as Dr. Lavian also testifies. *Id*. at 17–18; Ex. 1035 ¶ 35 (citing Ex. 1002 ¶¶ 53, 59–65; Ex. 1014).

Additionally, the lack of any evidence of actual sales or customer use of the STNS system cuts against Patent Owner's assertion that this system satisfied long-felt but unmet needs of customers. And, Patent Owner does not show a nexus between the alleged long-felt needs and the merits of the

claimed invention; Patent Owner provides no additional evidence to demonstrate that the STNS system attributes met long-felt needs.

iii. Unexpected Results

Patent Owner asserts that there were real-world constraints at the time of the '978 patent that imposed significant obstacles for multimedia communications. PO Resp. 53. Patent Owner argues that converting multimedia communication traffic from a multiport communication protocol into a single port communication protocol requires processing vast amounts of data, and a person of ordinary skill in the art would also have to anticipate and resolve the impacts of sending this information through a commonly-open port. *Id*. Further, Patent Owner asserts that a person of ordinary skill would not have expected that the underlying communication could be encrypted because this would overburden the system. *Id*. (citing Ex. 2009 ¶¶ 82–85). Patent Owner argues that the inventor's ability to clear these hurdles was "seamless," and accomplished what no person of ordinary skill in the art expected was possible. *Id*. at 54 (citing Ex. 2028, 17; Ex. 2009 ¶¶ 200–204; Ex. 2008).

We agree with Petitioner's argument that Patent Owner does not identify how the STNS system was any different than products that were on the market at the time. *See* Pet. Reply 26. To establish unexpected results, the claimed subject matter must be compared with the closest prior art. *In re Baxter Travenol Labs*., 952 F.2d 388, 392 (Fed. Cir. 1991). As discussed above, the evidence of record indicates that there were other products in the market that allowed IP-based videoconferencing while providing network security. *See* Ex. 2028, 2; Ex. 1002 ¶¶ 53, 59–65; Ex. 1035 ¶ 35; Ex. 1014. Patent Owner provides no evidence explaining the differences between the STNS system and other systems. *See* PO Resp. 53–54. Furthermore, the

lack of any evidence of actual sales or customer use of the STNS system cuts against Patent Owner's assertion that this system's operation had unexpected results. And, Patent Owner fails to show a nexus between the alleged unexpected results and the merits of the claimed invention; Patent Owner provides no additional evidence to demonstrate that the STNS system attributes produced unexpected results.

iv. Significant Industry Praise

Patent Owner asserts that the STNS system received significant industry praise from industry thought leaders. PO Resp. 54. More specifically, Patent Owner asserts that Wainhouse, a respected analyst and thought leader in the videoconferencing industry, lauded the STNS system's ability to "seamlessly" communicate encrypted multimedia communication through a single, commonly-open port of a firewall. *Id*. at 54–55 (citing Ex. 2028, 17; Ex. 2029). Patent Owner contends that this alleged industry recognition of the features of the claims that "unexpectedly overcame the significant limitations of the prior art solutions further confirms they are nonobvious." *Id*. at 55 (citing *Institut Pasteur & Universite Pierre Et Marie Curie v. Focarino*, 738 F.3d 1337, 1347 (Fed. Cir. 2013)).

Here, the only evidence presented in support of alleged significant industry praise is the Wainhouse report. *See* PO Resp. 54–55. We find this evidence to be insufficient to demonstrate significant industry praise. As discussed above, the Wainhouse report documents an evaluation of the STNS system, including testing. Ex. 2028, 1–4. The Wainhouse report documents that the STNS system had some strengths, but also had some weaknesses, and the report included some possible improvements. *Id*. at 3, 18–19. The limited nature of the evidence—one report from an evaluation company which flagged some system weaknesses—does not rise to a level

of demonstrating significant industry praise. Patent Owner fails to show a nexus between the alleged industry praise and the merits of the claimed invention; Patent Owner provides no additional evidence to demonstrate that the STNS system attributes had been found to be praiseworthy by the industry.

v. Conclusions on Objective Indicia of Nonobviousness

For the reasons explained above, we conclude that Patent Owner's evidence purportedly showing, long-felt need, unexpected results, and significant industry praise is not sufficient to outweigh Petitioner's evidence of obviousness of the challenged claims.

l. Summary

To summarize, we determine that Petitioner has demonstrated by a preponderance of the evidence that the combination of Krtolica and Kirchhoff teaches all the limitations of claims 2, 3, 5, 15, 17, 23, 25, 26, 29, and 30, there is adequate rationale to combine the references, and claims 2, 3, 5, 15, 17, 23, 25, 26, 29, and 30 are unpatentable as obvious over Krtolica and Kirchhoff. We also determine that Petitioner has not demonstrated by a preponderance of the evidence that the combination of Krtolica and Kirchhoff teaches all the limitations of claims 8, 9, 19, 20, 27, and 28.

E. Alleged Obviousness of Claims 2–4, 15, 16, and 23–30 Over Krtolica, Kirchhoff, and Hosner

Petitioner contends that claims 2–4, 15, 16, and 23–30 would have been rendered obvious by the combination of Krtolica, Kirchhoff, and Hosner. Pet. 71–84.

We begin our discussion with a brief summary of Hosner and then address the evidence and arguments presented.

1. Hosner (Ex. 1006)[15]

Hosner is directed to an open source virtual private network (VPN) known as OpenVPN. Ex. 1006, 4. "A VPN device is used to create an encrypted, non-application oriented tunnel between two machines that allows these machines or the networks they service to exchange a wide range of traffic regardless of application or protocol." *Id*. at 5. OpenVPN uses encryption and an encapsulation tunnel, where a tunnel "is built by encrypting the packets or frames and then encapsulating these in regular IP traffic between the two hosts or networks." *Id.* at 8. Hosner discloses a number of different ciphers that can be used for encryption. *Id*. at 6.

2. Analysis

In its obviousness contentions, Petitioner relies upon Hosner in combination with Krtolica and Kirchhoff to the extent that Krtolica and Kirchhoff are considered not to disclose the encryption of single-port packets in the single-port communication protocol of claim 2. Pet 72. Petitioner asserts that Hosner discloses an open source SSL VPN called Open VPN that "is used to create an encrypted, non-application oriented tunnel between two machines that allows these machines or the networks they service to exchange a wide range of traffic regardless of application or protocol." *Id*. (citing Ex. 1002 ¶ 184; Ex. 1006, 4–5). Petitioner contends that Hosner explains that a key element of VPNs is encryption. *Id*. (citing Ex. 1006, 8).

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[15] In the Preliminary Response, Patent Owner disputed the printed publication status of Hosner. Prelim. Resp. 26–40. No arguments on this issue were presented in the Patent Owner Response. *See generally* PO Resp. We ordered that "any arguments for patentability not raised in the [Patent Owner] response may be deemed waived," and we deem any arguments not raised in the Response to be waived by Patent Owner. Paper 20, 8.

Petitioner makes similar arguments for claim 3's teaching of decrypting the encrypted single-port packets prior to reconverting. Pet. 74. For claim 4, Petitioner asserts that Hosner teaches "common symmetric ciphers" that include Advanced Encryption Standard (AES) and Triple Data Encryption Standard (TDES), as claimed. *Id*. at 75 (citing Ex. 1002 ¶¶ 70–72, 189; Ex. 1006, 6, 10). Claims 15 and 16 contain similar limitations to those of claims 2–4, and Petitioner relies upon similar evidence in Hosner for teaching the claim limitations related to encryption. *Id*. at 75–76. For claim 23, Petitioner relies upon similar argument and evidence previously presented that is related to Krtolica's teachings, in addition to Hosner's teachings relating to encrypting and decrypting. *Id*. at 76–81. For claims 24–30, Petitioner relies upon similar arguments and evidence previously presented in the Petition. *Id*. at 81–84.

Petitioner asserts that one of ordinary skill in the art would have been motivated to modify Krtolica and Kirchhoff to encrypt the packets of Krtolica, and would have had a reasonable expectation of success in doing so. Pet. 73. Petitioner contends that Krtolica and Hosner are in the same field of endeavor, that is, using the concept of tunneling to securely traverse firewalls. *Id*. (citing Ex. 1002 ¶¶ 76, 84, 185). Dr. Lavian testifies that Hosner teaches the use of SSL, a single-port communication protocol, and that "[l]ong before 2006, encryption was a ubiquitous security feature in network communications." Ex. 1002 ¶¶ 184–185. Dr. Lavian further asserts that Krtolica itself suggests security measures such as encryption by its disclosure that an object of its invention is to "maintain high security." *Id*. ¶ 187 (citing Ex. 1004, 2:33–36). Petitioner contends that encrypting Krtolica's data stream, as taught in Hosner, would have been predictable to a person of ordinary skill in the art. Pet. 73 (citing Ex. 1002 ¶ 185). Petitioner

further contends that incorporating Hosner's encryption teachings into Krtolica's firewall traversal system would have been no more than combining prior art elements according to known methods to yield predictable results, and a person of skill would have understood a tunneling scheme, such as Krtolica, to include encryption. *Id*. (citing Ex. 1002 ¶¶ 185; Ex. 1006, 4).

Patent Owner asserts that a person of ordinary skill would not have looked to Hosner to modify Krtolica for the reasons that Petitioner argues, that is: (1) because Hosner is "in the same filed of endeavor—using the concept of tunneling to securely traverse firewalls" and/or (2) because "ensuring secure communications is a goal of Krtolica." PO Resp. 44–46 (citing Pet. at 73–74). On the first issue, Patent Owner argues that Hosner discloses a generic VPN solution not particularly suited for the claimed firewall traversal of multiport communications. *Id*. (citing Ex. 2009 ¶¶ 58–63, 110, 171–182). More specifically, Dr. Jeffay testifies that Hosner distinguishes its systems from firewalls. Ex. 2009 ¶ 171. Here, we determine that, although Hosner discusses differences in firewalls/SSL gateways, it nonetheless is directed to tunneling, which is from the same field of endeavor as the '978 patent. On the second issue, Patent Owner repeats a similar argument to that presented for the first ground, which is that Krtolica's goal of network security is distinct from securing communications using encryption. PO Resp. 45–46. We do not find this argument persuasive for the reasons discussed above.

Patent Owner additionally argues that the Petition fails to explain how the system of Krtolica would be modified by the teachings of Hosner. PO Resp. 46. Patent Owner points to the differences in Hosner's disclosure of OpenVPN as tunneling traffic over UDP and Krtolica's disclosure of the use

of TCP as its network transmission protocol. *Id*. Patent Owner asserts that the Petition does not account for the incompatibility of the two systems, and a person of skill in the art would understand that implementing encryption through the use of SSL/TLS would result in TCP "meltdown." *Id*. (citing Ex. 1006, 14).

In its Reply, Petitioner argues that many of Patent Owner's arguments are irrelevant because the Petition is combining Hosner's teachings of encryption into Krtolica, and not Hosner's VPN solution. Pet. Reply 18.

We are not persuaded by Patent Owner's arguments because Petitioner is not relying on the bodily incorporation of Hosner and its OpenVPN system into Krtolica, but relies on Hosner, in part, for its teachings on encryption including the use of SSL in HTTPS protocol. *See* Ex. 1006, 5. As we discussed above, contrary to Patent Owner's arguments, we have weighed the evidence of record and determine that it supports the predictability of the use of encryption in a single-port protocol like that of Krtolica. The '978 patent does not refer to any issues that arise with the use of encryption or that there is anything inventive associated with the implementation of encryption in single-port protocol, and instead states that "[a]ny method or algorithm of encryption may be used" with its invention. *See* Tr. 44:6–20; *see also* Ex. 1001, 6:5–6.

Patent Owner also argues that a person of ordinary skill in the art would have understood that modifying the system of Krtolica to perform the claimed encrypting would introduce excessive latency, rendering the system inoperable for multimedia communications. PO Resp. 47. We addressed that argument above in the previous ground, and do not find it persuasive in this ground for similar reasons.

We have reviewed Petitioner's explanations and supporting evidence as to how the combination of Kirchhoff and Krtolica teach the limitations of claim 2, 3, 15, 23, 25, 26, 29, and 30, and we agree with and adopt Petitioner's analysis. Pet. 72–82, 84.

Claims 4, 16, and 24 are not included in the first ground. These claims recite that the encryption is in accordance with one of AES, TDES, or a Skipjack algorithm. Ex. 1001, 9:18–27, 10:43–48, 12:8–13. Petitioner asserts that according to Hosner, "common symmetric ciphers" include TDES ("3DES") and AES, and a person of ordinary skill would have been motivated to use these algorithms for the reasons provided for claim 2. Pet. 75. As part of the discussion on the alleged problems with performance and latency associated with encryption, Dr. Jeffay refers to Hosner's data on AES and testifies that the use of this algorithm would limit a system's ability to fully utilize the capacity on contemporary network links. Ex. 2009 ¶ 180 (citing Ex. 1006, 23). Dr. Jeffay further testifies that in light of this disclosure, and consistent with NIST, a person of skill in the art would find that this teaches away from the use of SSL. *Id*.

Where the prior art contains "apparently conflicting" teachings (i.e., where some references teach the combination and others teach away from it) each reference must be considered "for its power to suggest solutions to an artisan of ordinary skill . . . consider[ing] the degree to which one reference might accurately discredit another." *In re Young*, 927 F.2d 588, 591 (Fed. Cir. 1991). In Hosner, AES encryption appears to have one of the higher processing speeds of the algorithms tested. *See* Ex. 1006, 23. Further, the '978 patent itself supports the acceptable performance of AES encryption in single-port protocol, stating that "[a]ny method or algorithm of encryption may be used" with its invention "including, but not limited to 128-bit

Advanced Encryption Standard (AES)." Ex. 1001, 6:5–7. Thus, we do not find Patent Owner's argument on the use of AES to be persuasive.

We have reviewed Petitioner's explanations and supporting evidence as to how the combination of Kirchhoff and Krtolica teach the limitations of claims 4, 16, and 24, and we agree with and adopt Petitioner's analysis. Pet. 75–76, 81.

Claims 27 and 28 rely on the evidence and argument presented for claims 8 and 9, respectively. Pet. 82–83. As discussed above, we do not find that Petitioner has met its burden for the challenges to claims 8 and 9 under the Krtolica-Kirchhoff combination. Hosner is relied upon only for its encryption teaching, and fails to remedy the deficiencies in the teachings of Krtolica and Kirchhoff for the limitations of claims 27 and 28. Thus, we do not find that Petitioner has met its burden in its challenges to claims 27 and 28.

We have considered Patent Owner's arguments concerning objective indicia of nonobviousness. PO Resp. 47–57. For the reasons discussed above, we find that Patent Owner's evidence purportedly showing long-felt need, unexpected results, and industry praise, does not outweigh Petitioner's evidence concerning the obviousness of claims 2–4, 15, 16, 23–26, 29, and 30. On the full record, Petitioner has established by a preponderance of the evidence that claims 2–4, 15, 16, 23–26, 29, and 30 would have been obvious over the combination of Krtolica, Kirchhoff, and Hosner. Additionally, on the full record, it has not been established by Petitioner by a preponderance of the evidence that claims 27 and 28 would have been obvious over the combination of Krtolica, Kirchhoff, and Hosner.

III. MOTION TO SEAL

Patent Owner filed a Motion to Seal and for Entry of a Protective Order. Paper 30. Patent Owner seeks to seal portions of Exhibit 2008, and a version with the redactions has been filed. *See* Ex. 2008. Patent Owner asserts that Exhibit 2008 contains a claim chart with an identification of highly confidential source for the STNS system, and seeks to seal that identification. Paper 30, 1. The Motion is unopposed.

We have reviewed the redacted portion of the document, as well as the explanations of the confidential nature of the materials for which sealing is sought, as discussed in the Motion. We grant the Motion and the associated request to enter the Protective Order.

III. CONCLUSION[16]

In summary:

Claims[17]	35 U.S.C. §	References	Claims Shown Unpatentable	Claims Not Shown Unpatentable
2, 3, 5, 8, 9, 15, 17, 19, 20, 23, 25–30	103(a)	Krtolica, Kirchhoff	2, 3, 5, 15, 17, 23, 25, 26, 29, 30	8, 9, 19, 20, 27, 28
2–4, 15, 16, 23–30	103(a)	Krtolica, Kirchhoff, Hosner	2–4, 15, 16, 23–26, 29, 30	27, 28
Overall Outcome			2–5, 15–17, 23–26, 29, 30	8, 9, 19, 20, 27, 28

IV. ORDER

For the reasons given, it is:

ORDERED that Petitioner has shown by a preponderance of the evidence that claims 2–5, 15–17, 23–26, 29, and 30 of U.S. Patent No. 7,710,978 B2 are unpatentable;

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[16] Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding. See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

[17] Patent Owner disclaimed claims 1, 6, 7, 10–14, 18, 21, and 22 of the '978 patent. *See* Ex. 2049.

FURTHER ORDERED that Petitioner has not shown by a preponderance of the evidence that claims 8, 9, 19, 20, 27, and 28 of U.S. Patent No. 7,710,978 B2 are unpatentable;

FURTHER ORDERED that the Motion to Seal (Paper 30) is granted;

FURTHER ORDERED that the request to enter the protective order is granted; and

FURTHER ORDERED because this is a final written decision, the parties to this proceeding seeking judicial review of our Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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