UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

_____

ZOHO CORPORATION and ZOHO CORPORATION PVT., LTD.,
Petitioners,

v.

MEETRIX IP, LLC,
Patent Owner.

_____

Case IPR2023-00377
Patent 9,253,332 B2

_____

PATENT OWNER'S NOTICE OF APPEAL

To the Director of the United States Patent and Trademark Office,

Pursuant to 35 U.S.C. §§ 141 and 142 and 37 C.F.R. § 90.2-90.3, notice is hereby given that Patent Owner Meetrix IP, LLC ("Patent Owner") appeals to the United States Court of Appeals for the Federal Circuit from the Final Written Decision of the Patent Trial and Appeal Board ("Board"), entered on July 16, 2024 (Paper 26) in IPR2023-00377 regarding U.S. Patent No. 9,253,332 B2 ("the '332 Patent"), and from all underlying findings, orders, decisions, rulings, and opinions decided adversely to Patent Owner in the above-captioned proceeding.

In accordance with 37 C.F.R. § 90.2(a)(3)(ii), Patent Owner states that the appeal will address all aspects of the Board's decision decided adversely to Patent Owner, including, without limitation, whether the Board erred in concluding that Petitioners have proven by a preponderance of the evidence that claims 1-12 of the '332 Patent are unpatentable; the Board's consideration of the expert testimony, prior art, and other evidence in the record; and the Board's factual findings, conclusions of law, or other determinations supporting or relating to the above issues. Patent Owner further reserves the right to challenge any finding or determination relating to the issues and matters listed above and to challenge any other issues or matters decided against Patent Owner in any order, decision, ruling, or opinion by the Board in the above-captioned proceeding.

Pursuant to 35 U.S.C. § 142 and 37 C.F.R. § 90.2(a), this Notice is being filed with the Director of the United States Patent and Trademark Office, and a

copy of this Notice is being concurrently filed with the Patent Trial and Appeal Board. In addition, a copy of this Notice is being filed with the Clerk of the United States Court of Appeals for the Federal Circuit, along with the applicable filing fee, via CM/ECF and pay.gov.

Date: September 17, 2024

Respectfully Submitted,

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CERTIFICATE OF FILING AND SERVICE

I hereby certify that, in addition to being filed electronically through the Patent Trial and Appeal Board's P-TACTS System, the original version of the foregoing PATENT OWNER'S NOTICE OF APPEAL was filed by Express Mail on September 17, 2024, with the Director of the United States Patent and Trademark Office, at the following address:

Director of the United States Patent and Trademark Office
c/o Office of the General Counsel
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

The undersigned also hereby certifies that a true and correct copy of the foregoing PATENT OWNER'S NOTICE OF APPEAL and the filing fee is being filed with the Clerk's Office for the United States Court of Appeals for the Federal Circuit on September 17, 2024 via the Court's CM/ECF filing system.

The undersigned also hereby certifies that pursuant to 37 C.F.R. § 42.6(e), a copy of the foregoing PATENT OWNER'S NOTICE OF APPEAL was served on counsel of record for Petitioners on September 17, 2024 at the email addresses listed below:

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ATTACHMENT A

Trials@uspto.gov
571-272-7822

Paper 26
Date: July 16, 2024

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ZOHO CORPORATION and ZOHO CORPORATION PVT., LTD.,
Petitioner,

v.

MEETRIX IP, LLC,
Patent Owner.

IPR2023-00377
Patent 9,253,332 B2

Before KARL D. EASTHOM, CHARLES J. BOUDREAU, and KARA L. SZPONDOWSKI, *Administrative Patent Judges*.

BOUDREAU, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

Zoho Corporation and Zoho Corporation Pvt., Ltd. (collectively, "Petitioner") filed a Petition requesting *inter partes* review of claims 1–12 of U.S. Patent No. 9,253,332 B2 (Ex. 1001, "the '332 patent"). Paper 1 ("Pet."). Patent Owner Meetrix IP, LLC did not file a Preliminary Response. We instituted an *inter partes* review of the challenged claims. Paper 6 ("Institution Decision" or "Dec.").

After institution, Patent Owner filed a Response to the Petition (Paper 10, "PO Resp."), Petitioner filed a Reply (Paper 13, "Pet. Reply"), and Patent Owner filed a Sur-reply (Paper 15, "PO Sur-reply"). We held a consolidated oral hearing with IPR2023-00371, IPR2023-00378, IPR2023-00379, IPR2023-00380, and IPR2023-00382 on April 25, 2024, and a transcript of the hearing is included in the record. Paper 25 ("Tr.").

We have jurisdiction under 35 U.S.C. § 6 (2018). Under the applicable evidentiary standard, Petitioner has the burden to prove unpatentability by a preponderance of the evidence. *See* 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d) (2023). "Preponderance of the evidence means the greater weight of evidence, evidence which is more convincing than the evidence which is offered in opposition to it." *United States v. C.H. Robinson Co.*, 760 F.3d 1376, 1383 (Fed. Cir. 2014) (internal quotations omitted). This Final Written Decision as to the patentability of the claims on which we instituted trial is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73.

For the reasons discussed below, we determine Petitioner has established by a preponderance of the evidence that claims 1–12 of the '332 patent are unpatentable.

II. BACKGROUND

A. Real Parties in Interest

The parties identify themselves as the real parties in interest. Pet. 2; Paper 23, 2 (Amended Mandatory Notices of Patent Owner and Related Matters).

B. Related Matters

The parties identify *Meetrix IP, LLC v. Zoho Corp.*, No. 1:22-cv-00588-LY (W.D. Tex.) (transferred from No. 6:21-cv-01288 (W.D. Tex.), filed Dec. 10, 2021); and *Meetrix IP, LLC v. Verizon Communications, Inc.*, No. 1:22-cv-00758-LY (W.D. Tex.) (transferred from No. 6:21-cv-01289 (W.D. Tex.), filed Dec. 10, 2021) as related cases. Pet. 3; Paper 23, 2.

Patent Owner also identifies as related matters IPR2023-00371, IPR2023-00378, IPR2023-00379, IPR2023-00380, and IPR2023-00382, involving the same parties and patents related to the '332 patent. Paper 23, 2.

We additionally note that the '332 patent previously was the subject of two petitions for *inter partes* review filed by Cisco Systems, Inc. in IPR2019-00539 and IPR2019-00540, both of which proceedings settled and were dismissed prior to any decision on institution. IPR2019-00539, Papers 1, 8; IPR2019-00540, Papers 1, 8.

C. The '332 Patent

The '332 patent, titled "Voice Conference Call Using PSTN and Internet Networks," issued February 2, 2016, from U.S. Patent Application No. 13/674,227, filed November 12, 2012, as a continuation of U.S. Patent Application No. 12/646,892, filed December 23, 2009 (now U.S. Patent No. 8,339,997), which was in turn a continuation of U.S. Patent Application No. 10/796,560, filed March 9, 2004 (now U.S. Patent No. 7,664,056).

Ex. 1001, codes (21), (22), (45), (54), (63). The '332 patent also claims priority from U.S. Provisional Application No. 60/453,307, filed March 10, 2003. *Id.* at code (60).

The '332 patent discloses a system and method for supporting a multi-participant voice conference call using the public switched telephone network (PSTN) and Internet networks. Ex. 1001, code (57). The method includes (i) receiving voice data from a PSTN client, (ii) receiving voice data from a moderator and from at least one remote client connected to the Internet, (iii) mixing, using an audio mixer, the voice data from the PSTN client with the voice data from the moderator into a first mixed voice data that is transmitted to the remote client that is connected to the Internet, and (iv) mixing, using a voice-over-Internet-Protocol (VoIP) mixer, the voice data from the moderator with the voice data from the remote client connected to the Internet into a second mixed voice data that is transmitted to the PSTN client. *Id.* at code (57), 3:20–45.

Figure 3 of the '332 patent is reproduced below.

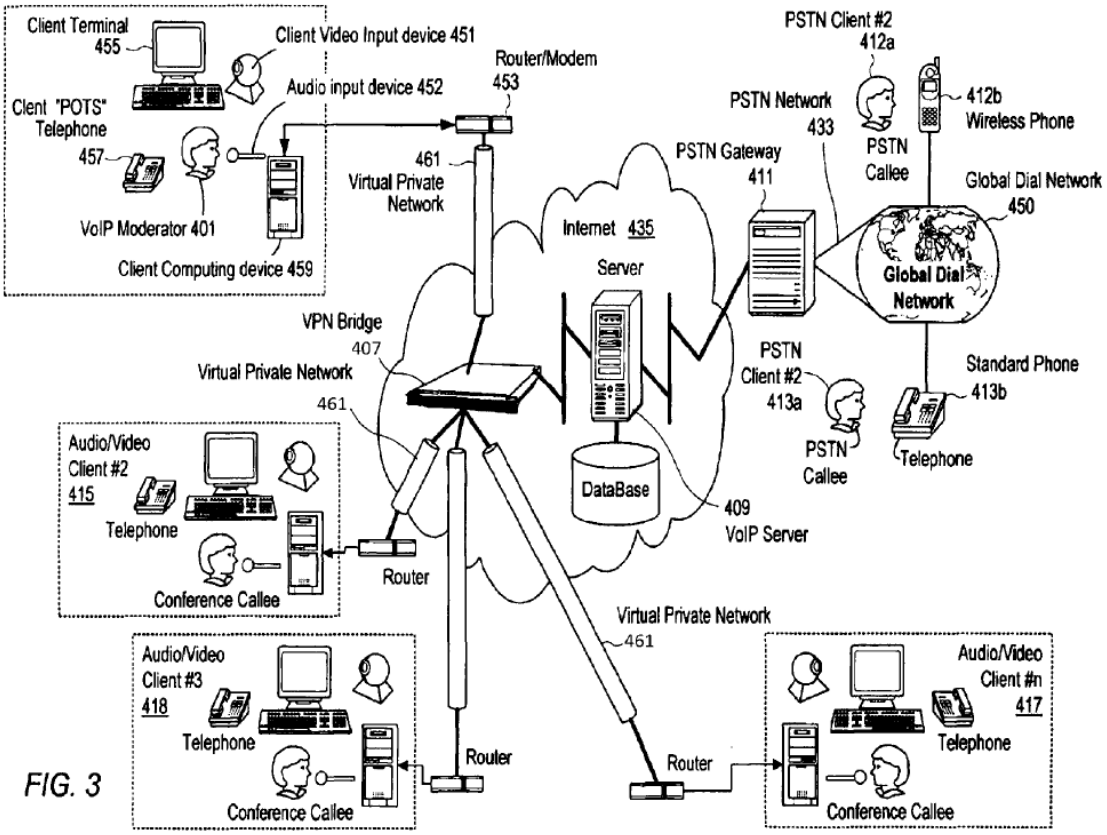

FIG. 3

Figure 3, above, illustrates an embodiment that "allows audio video and data collaboration information to be securely transferred between a plurality of local and remote clients preferably within a virtual private network." *Id.* at 4:3, 4:39–42. This embodiment "provides the ability for a moderator (single member of the conference) to dial out from a desktop computer or terminal (using a novel hybrid network structure) connecting an external telephone user's audio into the audio/video conference" and "integrates full duplex audio, video, and data connections between clients conferencing on the Internet and clients conferencing on standard telephone systems." *Id.* at 4:44–50. "The Internet/PSTN hybrid network is the medium used for transport." *Id.* at 4:50–51.

Figure 3 "depicts the necessary equipment and protocols to complete the dial out to PSTN network method and process" and includes VoIP moderator 401, Internet audio video clients 415, 417, and 418, and PSTN clients 412 and 413. Ex. 1001, 4:51–5:6. VoIP moderator 401 typically has a number of peripherals used for real input output devices at the desktop. *Id.* at 4:54–5:6. The peripherals include client computing device (e.g., a PC or other computer) 459, client terminal 455, standard desktop telephone 457, video input device or camera 451, and microphone 452. *Id.* at 4:56–61. PSTN clients 412 and 413 are connected to a wireless cell phone and standard telephone handset, respectively, which are connected to global dial network 450 based on PSTN 433. *Id.* at 5:1–6. Internet clients 401, 415, 417, and 418 "are connected through routers or modems 453 preferably in a virtual private network configuration 461." *Id.* at 5:7–9. "A virtual private network bridge 461 is used to connect local and remote clients together within a secure private network." *Id.* at 5:10–11. "A local connection from the VPN bridge 407 to the voice over IP server 409 is used to transfer conference audio from any participant on the IP network to any participant in the PSTN." *Id.* at 5:11–14. "Thus, the voice over IP server 409 is responsible for transcoding audio information from the virtual private network 461 to and from the PSTN gateway 411, thus bridging the PSTN and VPN together." *Id.* at 5:14–18.

Figure 5 of the '332 patent is reproduced below.

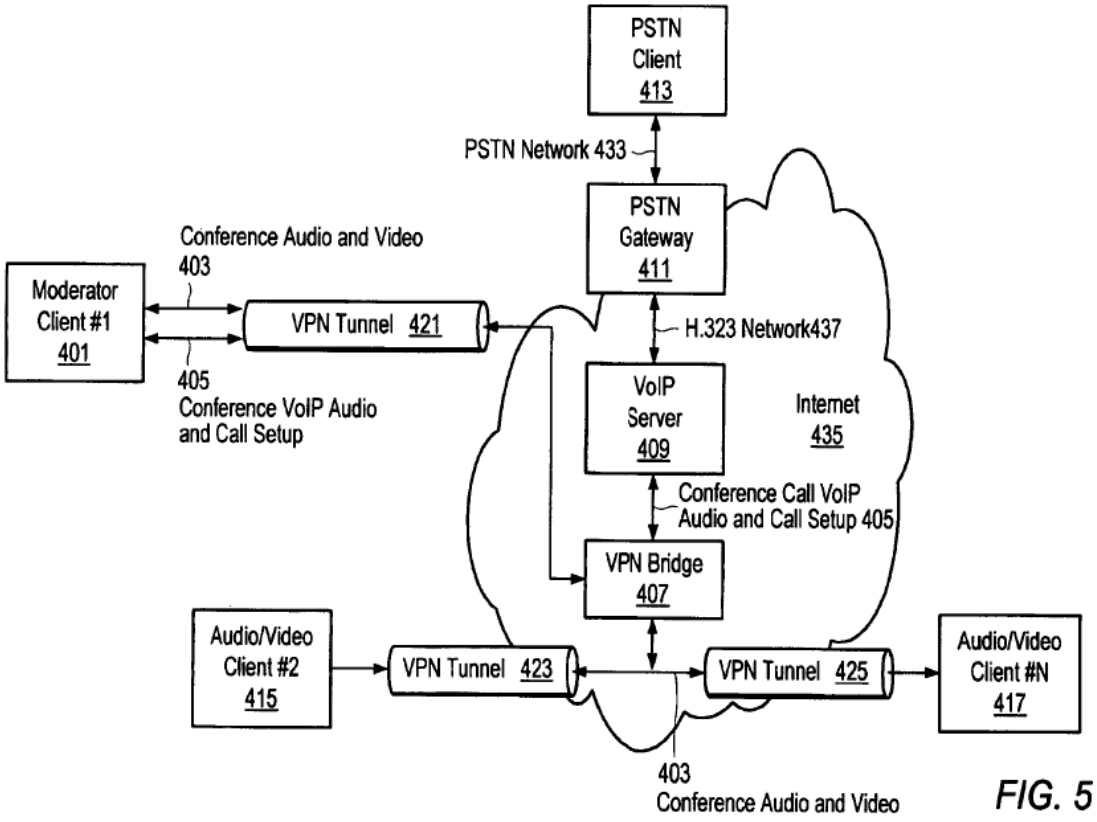

FIG. 5

Figure 5, above, illustrates a detailed block diagram of a system implementing the '332 patent's method for supporting a multi-participant voice conference call using PSTN and Internet networks, particularly showing the audio and video data flow over hybrid networks. Ex. 1001, 4:4–6, 6:20–21. Moderator client #1 (401) initiates a call using the application code running on VoIP server 409. *Id.* at 6:20–60. Call initiation and call transfer may be accomplished through VPN tunnel 421 connected to moderator client 401. *Id.* at 6:23–25. Two connections to moderator client 401 through VPN tunnel 421 are established, with the first connection 405 connecting the VoIP conference data for call initiation, set-up, and control 405, and the second connection through the VPN tunnel connecting the conference audio and video 403 between moderator client 401 and multiple

remote clients 413, 415, 417 connected via Internet 435. *Id.* at 6:25–31. VPN tunnel 421 is connected into VPN bridge 407, which may be located within Internet 435 at either local or remote sites. *Id.* at 6:31–34. As indicated in Figure 5, VPN bridge 407, which bridges the tunnels for data transfer, is responsible for connecting and establishing the VPN used for secure conferencing. *Id.* at 6:34–36. An additional tunnel containing the conference VoIP audio and call set-up data 405 is connected to a separate VoIP server 409. *Id.* at 6:42–45.

Server 409 is responsible for transcoding the VoIP audio and call set-up control 405 in preparation for data transfer across network 437 employing the International Telecommunications Union H.323 standard for transmission of audio and video information through the Internet or switched private networks. Ex. 1001, 1:53–57, 6:45–60. H.323 network 437 traverses the Internet to one of many PSTN gateways 411, which form a bridge between the Internet and the public switched telephone network 433. *Id.* at 6:47–49. The VoIP gateways are typically located at a local exchange carrier at individual points of presence throughout the world. *Id.* at 6:51–53. Audio telephony calls are terminated at VoIP client 413. *Id.* at 6:53–54. These termination points may be located throughout the world. *Id.* at 6:54–55. Thus, the system illustrated in Figure 5 allows for dial-out to standard phones from a client terminal with audio and video capability over IP networks, thereby allowing conferencing between multiple remote sites including secure VoIP audio components over the PSTN. *Id.* at 6:55–60.

D. Illustrative Claims

Independent claims 1 and 8, reproduced below with bracketed alphanumeric reference identifiers used by Petitioner, are illustrative of the challenged claims.

> 1. [1.P] A method for supporting a multi-participant audio/video conference call, the method comprising:
>
> [1.1] receiving first audio data from a Public Switched Telephone Network (PSTN) client;
>
> [1.2] receiving second audio data from a moderator;
>
> [1.3.1] receiving third audio data, video data, and collaboration data from at least one remote client [1.3.2] through a first Virtual Private Network (VPN) tunnel;
>
> [1.4] mixing the first audio data from the PSTN client with the second audio data from the moderator into a first mixed audio data;
>
> [1.5] transmitting the first mixed audio data to the remote client through the first VPN tunnel;
>
> [1.6] mixing the second audio data from the moderator with the third audio data from the remote client into a second mixed audio data; and
>
> [1.7] transmitting the second mixed audio data to the PSTN client.

> 8. [8.P] A system for supporting a multi-participant audio/video conference call comprising:
>
> [8.1.1] a first mixer configured to mix audio data from a Public Switched Telephone Network (PSTN) client with audio data from a moderator [8.1.2] and collaboration data from the moderator into a mixed data;
>
> [8.2] a transport output configured to transmit the first mixed data to at least one remote client through a first Virtual Private Network (VPN) tunnel;
>
> [8.3] a second mixer configured to mix audio data from the moderator with audio data from the remote client connected to the Internet into a first mixed audio data; and

[8.4] a VoIP encoder to encode the first mixed audio data into a compressed audio data;

[8.5] the transport output further configured to transmit the compressed audio data to the PSTN client through the first VPN tunnel.

Ex. 1001, 9:52–10:5, 10:30–46.

E. Asserted Grounds of Unpatentability

Petitioner asserted, and we instituted *inter partes* review on, the following grounds of unpatentability:

Claim(s) Challenged	35 U.S.C. §[1]	Reference(s)/Basis
1, 2, 4, 5, 7	103(a)	Knappe,[2] Elliott,[3] VPN Textbook[4]
3, 6, 8–11	103(a)	Knappe, Elliott, VPN Textbook, Drell[5]
12	103(a)	Knappe, Elliott, VPN Textbook, Drell, Hoke[6]

Pet. 4, 14–81.

In support of its contentions, Petitioner relies on a declaration of Henry H. Houh, Ph.D. (Ex. 1003). In opposition, Patent Owner relies on a declaration of Thomas Dye (Ex. 2001).

[1] The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) ("AIA"), amended 35 U.S.C. § 103, effective March 16, 2013. Because the '332 patent issued from an application filed before that date, we refer to the pre-AIA version of § 103.

[2] Knappe, US 7,180,997 B2, issued February 20, 2007 (Ex. 1006).

[3] Elliott et al., US 6,690,654 B2, issued February 10, 2004 (Ex. 1007).

[4] Excerpts from Jim Guichard & Ivan Pepelnjak, *MPLS and VPN Architectures* (2001) (Ex. 1010).

[5] Drell, US 7,089,285 B1, issued August 8, 2006 (Ex. 1008).

[6] Hoke et al., US 6,701,437 B1, issued March 2, 2004 (Ex. 1009).

III. ANALYSIS

A. Legal Standards

"In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (2012) (requiring *inter partes* review petitions to identify "with particularity . . . the evidence that supports the grounds for the challenge to each claim")).

A claim is unpatentable under 35 U.S.C. § 103(a) if "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made 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 skill in the art; and (4) when presented, objective evidence of obviousness or nonobviousness, i.e., secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

Additionally, a patent claim "is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." *KSR*, 550 U.S. at 418. An obviousness determination requires finding "both 'that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.'" *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367–68 (Fed. Cir. 2016) (citation omitted); *see KSR*, 550 U.S. at 418.

Further, an assertion of obviousness "cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR*, 550 U.S. at 418; *In re NuVasive, Inc.*, 842 F.3d 1376, 1383 (Fed. Cir. 2016) (a finding of a motivation to combine "must be supported by a 'reasoned explanation'" (citation omitted)).

B. Level of Ordinary Skill in the Art

Determining whether an invention would have been obvious under 35 U.S.C. § 103 requires resolving the level of ordinary skill in the pertinent art at the time of the effective filing date of the claimed invention. *Graham*, 383 U.S. at 17. The person of ordinary skill in the art is a hypothetical person who knows the relevant art. *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). Factors in determining the level of ordinary skill in the art include the types of problems encountered in the art, the sophistication of the technology, and educational level of active workers in the field. *Id.* One or more factors may predominate. *Id.*

> Petitioner asserts a person of ordinary skill in the art
>
> would have had a bachelor's degree in computer science, computer engineering, or an equivalent, and three or more years of professional experience relating to conferencing systems in packet-based networks, or without said professional experience, further education relating to conferencing systems in packet-based networks.

Pet. 9 (citing Ex. 1003 ¶¶ 24–28).

Patent Owner disagrees with Petitioner's proposal "because it is too specialized and would instead be properly characterized as a person of extraordinary skill in the art." PO Resp. 11 (citing Ex. 2001 ¶¶ 3–4). Instead, according to Patent Owner, a person of ordinary skill in the art

"would have a bachelor's degree in electrical engineering, computer science, or equivalent with two years or more of experience in computing systems development." *Id.* (citing Ex. 2001 ¶ 3).

Petitioner disputes Patent Owner's proposal, arguing that "[t]he '332 patent specifically notes that the invention 'relates to computer system architectures, and more particularly to audio and video telecommunications for collaboration over hybrid networks.'" Reply 1. Petitioner also argues that none of Patent Owner's arguments rest on the alleged difference in the proposed level of skill in the art, and under either definition the result is the same. *Id.* at 1–2.

We agree with Petitioner. Although Patent Owner proposes an alternative level of ordinary skill in the art, Patent Owner does not explain how it impacts Petitioner's contentions or Patent Owner's arguments in opposition. Indeed, at the hearing, Patent Owner's counsel stated "I can't point to a material difference that would change the outcome of this." Tr. 49:10–15. Therefore, it appears that neither party contends that the differences in their proposals affects the outcome of this proceeding.

Nothing in the full record persuades us that our preliminary finding in the Institution Decision, adopting Petitioner's proposal, was incorrect. *See* Dec. 10–11. Therefore, we maintain our adoption of Petitioner's proposed level of ordinary skill in the art, as consistent with the evidence of record, including the asserted prior art and the '332 patent's specification, except that we delete the qualifier "or more" in the phrase "three or more years" to eliminate vagueness as to the stated amount of professional experience. However, our findings would not change even under Patent Owner's proposed level of skill in the art.

C. Claim Construction

In an *inter partes* review, we apply the same claim construction standard as would be used by a district court to construe a claim in a civil action involving the validity or infringement of a patent. 37 C.F.R. § 42.100(b). Under that standard, claim terms are given their ordinary and customary meaning, as would have been understood by a person of ordinary skill in the art at the time of the invention, in light of the language of the claims, the specification, and the prosecution history of record. *Id.*; *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–19 (Fed. Cir. 2005) (en banc); *Thorner v. Sony Comput. Entm't Am. LLC*, 669 F.3d 1362, 1365–66 (Fed. Cir. 2012). "The Board is required to construe 'only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.'" *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (quoting *Vivid Techs., Inc. v. Am. Sci. Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

Petitioner alleges that "no claim term requires express construction for the Board to evaluate the patentability of the claims" and relies on the ordinary and customary meaning under *Phillips*. Pet. 9–10. Patent Owner disagrees, arguing that the claim terms should instead be construed consistent with how they were construed in a claim construction order in *Meetrix IP, LLC v. Citrix Systems, Inc. et al.*, Case No. 1:16-cv-1033-LY, Dkt. No. 69 (W.D. Tex.).[7] PO Resp. 12 (citing Ex. 2002 (claim construction order)). Patent Owner provides the district court's construction for thirteen

[7] Petitioner was not a party to this district court litigation. *See* Tr. 8:21–23 (Petitioner's counsel stating "We were not involved, Zoho was not involved in that claim construction process that resulted in the construction from the Western District of Texas.").

terms, including "virtual private network (VPN)," "VPN tunnel," and "first mixed audio data," as recited, for example, in claims 1 and 8; "second mixed audio data," as recited in claims 1, 7, and 9; "third mixed audio data," as recited in claim 2; "first mixer" and "second mixer," as recited in claim 8; and "third mixer," as recited in claim 9. *Id.* at 12–13. Petitioner responds that Patent Owner's alleged disagreement is irrelevant because "only a handful of the listed terms appears in the claims of the '332 patent," and "[m]oreover, the subsequent Patent Owner arguments do not rely on any of these claim constructions." Reply 2. Still further, Petitioner contends, "[t]he application of the prior art references in the Petition to the claim language of the challenged claims does not require any of these constructions nor is it at odds with them," and "[u]nder the plain and ordinary meaning of the claim terms, the challenged claims are unpatentable." *Id.*

We agree with Petitioner that no claim construction is necessary for purposes of this Decision. Patent Owner does not argue, and we do not discern, that any claim terms are in controversy on the current record.[8] *See*

[8] Although Patent Owner mentions the district court's claim construction for "Virtual Private Network (VPN)" and "VPN tunnel" in connection with its arguments for claims 1 and 8 (PO Resp. 21, 28), Petitioner argues, and we agree, that Patent Owner's arguments do not suggest that Petitioner's arguments are inconsistent with any of these constructions. Reply 2; *see* Tr. 8:1–9:1 (Petitioner's counsel stating that "We don't actually have a problem with [the district court's] construction [of VPN]. I think it may be overly broad, but it doesn't impact our analysis in either way."); Tr. 9:2–14 (Petitioner's counsel stating that "[T]here's no difference between how Dr. Houh applied tunneling and how the [district court] construed it, so we're fine with either construction . . . In fact, I see them as the same construction."); Tr. 47:11–13 (Patent Owner's counsel stating "I agree with [Petitioner's counsel] that it may not matter whether his construction, his

Realtime Data, LLC v. Iancu, 912 F.3d 1368, 1375 (Fed. Cir. 2019) ("The Board is required to construe 'only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.'" (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

D. Obviousness over Knappe, Elliott, and VPN Textbook (Petitioner's Ground 1)

Petitioner alleges claims 1, 2, 4, 5, and 7 of the '332 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over Knappe, Elliott, and VPN Textbook. Pet. 4, 14–50. After reviewing the entire record developed at trial, we determine that Petitioner has shown, by a preponderance of the evidence, that claims 1, 2, 4, 5, and 7 would have been obvious on the asserted ground.

We begin our analysis with an overview of Knappe, Elliott, and VPN Textbook.

1. Knappe

Knappe, titled "Method and System for Improving the Intelligibility of a Moderator During a Multiparty Communication Session," relates "generally to the field of multiparty communications." Ex. 1006, code (54), 1:8–9. Knappe's system receives a plurality of participant voice streams from a plurality of conference participants, with an incoming moderator voice stream received from a moderator. *Id.* at code (57). The plurality of participant voice streams and the moderator voice stream are transmitted such that the intelligibility of the moderator voice stream is improved relative to at least one of the participant voice streams. *Id.*

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expert's construction from the textbook is used or ours is for virtual private network.").

Figure 1 of Knappe is reproduced below.

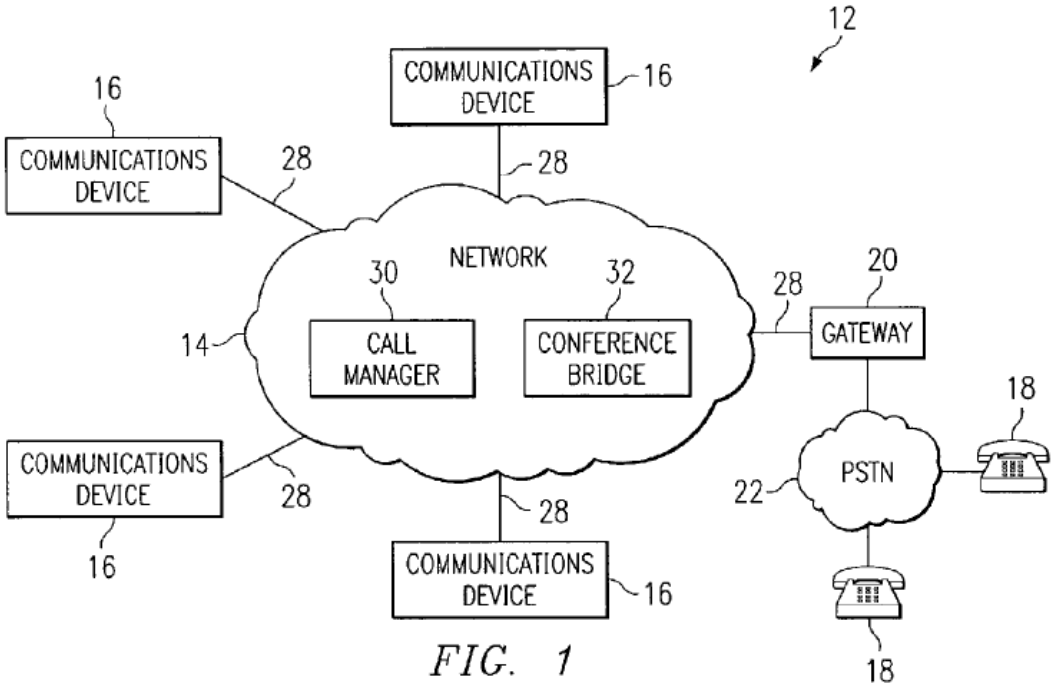


FIG. 1

Figure 1, above, is a block diagram of an embodiment of Knappe's communication system 12. Ex. 1006, 2:59–61, 3:24–25. In the illustrated embodiment, communication system 12 is a distributed system transmitting audio, video, voice, data, and other suitable types of real-time and/or non-real-time traffic between source and destination endpoints. *Id.* at 3:25–29. Communication system 12 may be used to conduct multi-party telephone conference communication sessions, and components of the system may be configured to automatically improve the intelligibility of a moderator during a multi-party communication session, while allowing the moderator to exercise control and influence over the telephone conference, without completely silencing the other participants. *Id.* at 3:29–38. Communication system 12 includes a network 14 connecting a plurality of communication devices 16 to each other and to analog telephones 18 through gateway 20 and public switched telephone network (PSTN) 22. *Id.* at 3:41–45.

Communication devices 16, analog telephones 18, and gateway 20 are connected to network 14 and/or PSTN 22 through twisted pair, cable, fiber optic, radio frequency, infrared, microwave, or other wireline or wireless links 28. *Id.* at 3:45–49.

Network 14 may be the Internet, a wide area network (WAN), a local area network (LAN), or other suitable packet-switched network. Ex. 1006, 3:50–52. In the Internet embodiment, network 14 transmits information in Internet Protocol (IP) packets. *Id.* at 3:53–54. Telephony voice information in communication system 12 is transmitted in the VoIP format, and real-time IP packets (such as VoIP packets) are encapsulated in real-time transport protocol (RTP) packets for transmission over network 14. *Id.* at 3:54–58. For voice calls, according to Knappe, communication devices 16 comprise real-time applications that play traffic as it is received, and to which packet delivery cannot be interrupted without severely degrading performance. *Id.* at 4:5–9. A codec (coder/decoder) converts audio, video, or other suitable signals generated by users, from analog signals into digital form. *Id.* at 4:9–11. The digital encoded data is encapsulated into IP or other suitable packets, for transmission over network 14. *Id.* at 4:11–13. IP packets received from network 14 are converted back into analog signals, and played to the user. *Id.* at 4:13–14.

Gateway 20 included in communication system 12 in Figure 1 provides conversion between analog and/or digital formats. Ex. 1006, 4:18–19. Analog telephones 18 communicate standard telephony signals through PSTN 22 to gateway 20, where the signals are converted to IP packets in VoIP format. *Id.* at 4:19–22. Similarly, VoIP packets received from network 14 are converted into standard telephony signals for delivery to destination telephone 18 through PSTN 22. *Id.* at 4:22–25. Gateway 20

also translates between the network call control system and the Signaling System 7 (SS7) protocol and/or other signaling protocols used in PSTN 22. *Id.* at 4:25–28.

As shown in Figure 1, network 14 includes a call manager 30, which manages calls in the network and provides voicemail, bridging, multicasting, call hold, conference call, and other multiparty communications for communications devices 16. Ex. 1006, 4:29–57. Network 14 also includes a conference bridge 32, which provides conference call and other suitable audio, video, and/or real-time multiparty communication sessions between communication devices 16. *Id.* at 4:29–41, 4:58–5:2. Conference bridge 32 includes a controller, buffers, converters, a normalizer, a mixer, and a database. *Id.* at 5:49–55. "[C]all manager 30 controls the conference bridge 32 to set up, process and tear down conference calls and other multiparty communication sessions." *Id.* at 5:29–31. "The call manager 30 and the conference bridge 32 may be located in a central facility or have their functionality distributed across and/or at the periphery of the network 14." *Id.* at 4:30–33.

For conference calls, call manager 30 identifies participants based on the called number or other suitable criteria. Ex. 1006, 5:26–39. Call manager 30 controls conference bridge 32 to set up, process, and tear down conference calls and other multiparty communication sessions. *Id.* During multiparty communications sessions, participants are connected and stream media through conference bridge 32. *Id.* The media is cross-connected and mixed to produce conference output streams for each participant. *Id.* The conference output stream for a participant includes the media of all other participants, or of a subset of other participants (or of other suitable mix dictated by the type of multiparty session and/or participant). *Id.*

Figure 2 of Knappe is reproduced below.

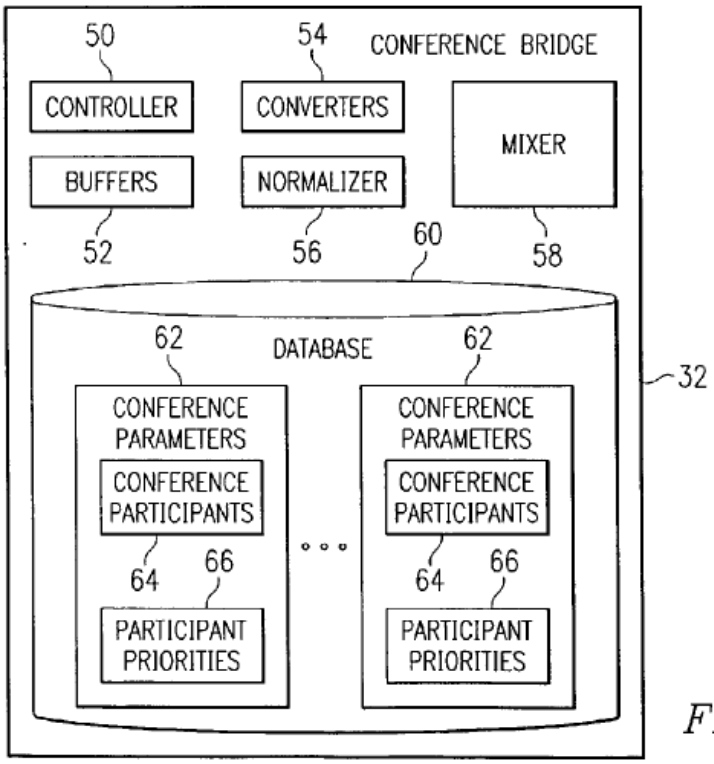


FIG. 2

Figure 2, above, is a block diagram illustrating details of conference bridge 32. Ex. 1006, 2:62–64. As illustrated, conference bridge 32 includes mixer 58. "[M]ixer 58 includes a plurality of summers or other suitable signal processing resources each operable to sum, add or otherwise combine a plurality of input streams into conference output streams for participants to a conference call." *Id.* at 6:33–37.

Figure 3 of Knappe is reproduced below.

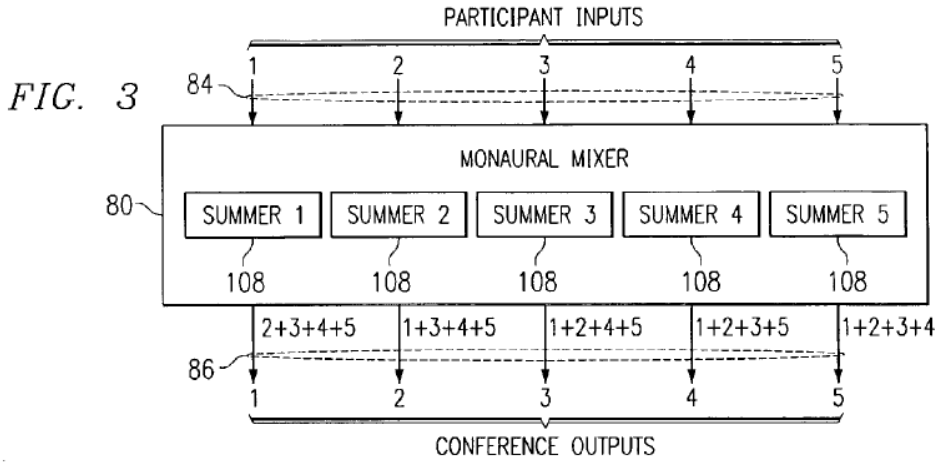


Figure 3, above, is a block diagram illustrating an embodiment of Knappe's mixer 58 (*supra* Figure 2) in the form of monaural mixer 80. Ex. 1006, 2:65–67, 6:52–55. Monaural mixer 80 illustrated in Figure 3 receives participant input streams 84, and combines the streams in summers 82 to generate conference output streams 86 for each participant to a conference call. *Id.* at 6:59–62. In one embodiment, a summer 82/108 assigned to each participant "receives audio input streams from each other participant to the conference call," and "combines the audio input streams to generate a conference output stream for delivery to the participant." *Id.* at 6:63–67.[9] During normal operation, each participant receives the audio input of each other participant. *Id.* at 7:1–2. For example, the conference output stream of participant 1 includes the audio inputs of participants 2–5, the conference output stream of participant 2 includes the audio inputs of participants 1 and

[9] Knappe refers to "summer 108" in connection with Figure 7 and "summers 82" in connection with Figure 3, although Figure 3 shows summers 108. *Compare* Ex. 1006, 8:24–26, *with id.* at 6:59–63.

3–5, the conference output stream of participant 3 includes the audio inputs of participants 1–2 and 4–5, the conference output stream of participant 4 includes the audio inputs of participants 1–3 and 5, and the conference output stream of participant 5 includes the audio inputs of participants 1–4. *Id.* at 7:2–11.

2. Elliott

Elliott, titled "Method and System for Multi-Media Collaboration Between Remote Parties," relates to "computer networks and specifically to a method and system for multi-media collaboration between remote parties." Ex. 1007, code (54), 1:27–30. According to Elliott, "[m]ulti-media collaboration refers to the use of more than one media stream (e.g.: voice, fax, data, video, etc.) used in collaboration with more than one party." *Id.* at 2:66–3:1. "Multi-media collaboration services allow two or more parties to exchange information in a conference setting," and "[t]hese services can be readily provided over the Internet and include collaborative Web browsing, audio conferencing, video conferencing, and application sharing." *Id.* at 1:40–44. With Elliott's multi-media collaboration method, a first party, which may be a call center, receives requests for access from first and second remote parties. *Id.* at code (57). Each of these remote parties is provided a computer program, and a session is initiated for each party. *Id.* The first party can then independently communicate with the first and second remote parties via the computer program. *Id.* The method of communicating with a remote party begins with the initiation of a link over an internet, such as the public Internet. *Id.* at 1:60–2:2. While maintaining this link, a number of web sites may be viewed, each of these web sites addressable by a unique URL (universal resource location). *Id.* The viewing party can then selectively push the URL for some (but not

necessarily all) of the viewed web sites, to the remote party. *Id.* Elliott explains that its "method is useful for customer information and assistance, on-line training and other collaborative browsing applications." *Id.*

Figure 1 of Elliott is reproduced below.

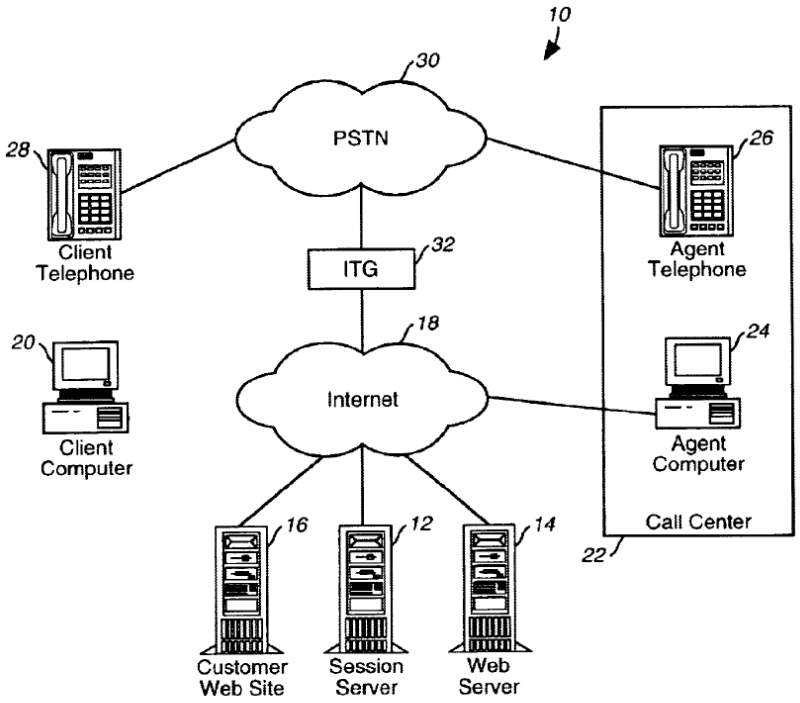


FIG. 1

Figure 1, above, illustrates a block diagram of a system architecture 10 for multi-media collaboration between remote parties. Ex. 1007, 2:38–40, 3:57. The architecture shown in Figure 1 uses shared network resources, including a session server 12, a web server 14, and a customer web site 16, to provide services for a plurality of parties, such as call centers, agents, and clients. *Id.* at 3:57–63. The architecture allows remote parties (e.g., parties separated by a network 18, such as an Internet Protocol (IP)-based network) to communicate. *Id.* at 3:64–4:20. Network 18 may be a public or a carrier supported VPN or LAN that uses IP or IP-tunneling. *Id.* at 4:20–34.

Client computer 20 communicates with call center 22 (a company, organization, person, or entity that is responsible for servicing a form of communication, the call center employing several agent workstations 24) via network 18. Ex. 1007, 4:35–48. Client computer 20 is equipped with software, such as Internet telephone software, for placing Internet telephony calls. *Id.* at 5:34–39. A client may also have a traditional telephone 28 for placing calls to call center agents over public switched telephone network (PSTN) 30. *Id.* Session server 12 is software that manages communication sessions among one or more agents and one or more clients. *Id.* at 5:39–61. Session server 12 may be a conference server that follows the ITU T.120 standard (a standard that contains a series of communication and application protocols and services that provide support for real-time, multi-point data communications). *Id.* Session server 12 enables video conferences, audio conferences, and data conferences with application sharing. *Id.* Collaborative Web browsing can also be enabled with URL push technology. *Id.* During the course of a collaborative session, one party can push a URL to another party. *Id.*

Web server 14 provides software for communication with client computer 20. Ex. 1007, 5:62–6:11. While illustrated as being run on a single computer 14, web server 12 can operate on one or more computers, including the same one or ones that session server 12 is operating on. *Id.*

Figure 2 of Elliott is reproduced below.

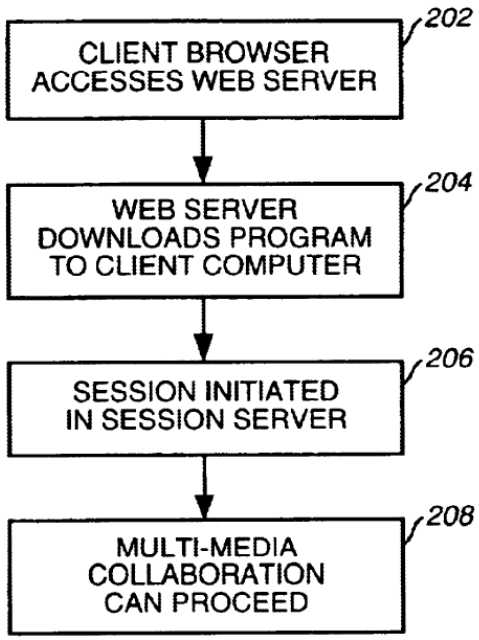


FIG. 2

Figure 2, above, illustrates a method for initiating a link between remote parties. Ex. 1007, 2:38–40, 6:12–15. The method shown in Figure 2 starts with client computer 20 accessing web server 14 (step 202). *Id.* at 6:12–28. When web server 14 is accessed by a client browser, the Web site causes client computer 14 to run a program which enables remote access to the browser (step 204 in Figure 2). *Id.* Web server 14 then downloads to client computer 20 a Java applet, which is automatically launched. *Id.* The Java applet can be run stand-alone or with a real-time Java run time engine in the browser. *Id.* The Java applet runs on client computer 20 in a window that is separate from the client's Web browser. *Id.* at 6:33–45. This program causes client computer 20 to initiate a session with session server 12 (step 206). *Id.* A session begins when the two computers begin communicating, and continues until the communication ceases. *Id.* For

example, the program may provide a session identifier (ID), and log the client into a session. *Id.* While the Java applet is logging the client into a session, the client can browse the Web independently, since the applet is a separate process from the Web browser. *Id.* The applet's window displays the progress of the call to session server 12. *Id.*

Once a session is established, multi-media collaboration between the agent and client is enabled (step 208 in Figure 2). Ex. 1007, 6:46–54. For example, the Java applet running on client computer 20 monitors the client computer's IP socket connection for incoming URLs. *Id.* When a URL is pushed by an agent or another client, the applet will feed that URL to the client's Web browser, which will then go to the Web site addressed by the URL. *Id.* Other types of collaboration, such as audio, video, or data conferencing can also be performed. *Id.* Web server 14 can download various Java applets for establishing different types of sessions. *Id.* at 6:55–67. These include video conferencing, audio conferencing, data conferencing, and collaborative browsing. *Id.* When downloaded and executed, the applet will take the client to session server 12, execute on client computer 20 the appropriate application for participating in a particular type of session (e.g., a video application for video conferences, or an Internet telephone application for audio conferences), log the client into the session with a session ID, and then conduct that session (e.g., for a collaborative browsing session, the applet will accept URL pushes from an agent, and feed them to the browser). *Id.*

3. VPN Textbook

In relevant part, VPN Textbook describes VPN implementation options that include typical VPN network topologies. Ex. 1010, 115, 129.[10] VPN Textbook notes that "VPN is a concept that is more than 10-years old and is well known in the service provider market space." *Id.* at 115. According to VPN Textbook, "[t]he most commonly encountered VPN topology is a hub-and-spoke topology, where a number of remote offices (spokes) are connected to a central site (hub), similar to the setup in Figure 7–10." *Id.* at 129.

Figure 7-10 of VPN Textbook is reproduced below.

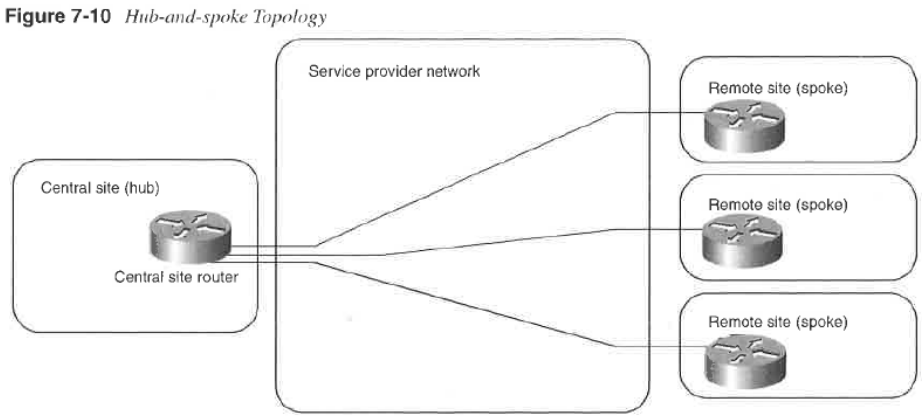


Figure 7-10, above, illustrates a generic hub-and-spoke topology configuration, with a central site (hub) router connected in a hub-and-spoke topology over service provider network lines secured by VPN technology and terminated at three different remote sites (spokes). Ex. 1010, 129–30.

VPN Textbook provides that "[t]he remote offices [connected in a hub-and-spoke topology] usually can exchange data (there are no explicit

[10] Following Petitioner's usage, we cite the original page numbers at the top left and right corners of VPN Textbook's pages rather than the page numbers added by Petitioner in the lower right corner of the pages.

security restrictions on inter-office traffic)" but "the amount of data exchanged between them is negligible." Ex. 1010, 129. The hub-and-spoke topology may be used in organizations with strict hierarchical structures, such as banks, governments, and retail stores. *Id.*

4. Independent Claim 1

Petitioner contends that Knappe, Elliott, and VPN Textbook teach each limitation of independent claim 1. Pet. 28–42. In support, Petitioner identifies certain passages and figures in the references and explains their significance with respect to the corresponding claim limitation. *Id.* Petitioner also provides reasons, supported by the testimony of Dr. Houh, why it would have been obvious to one of ordinary skill in the art to combine Knappe with Elliott and VPN Textbook. *Id.* at 21–27. Petitioner's contentions for each limitation, and Patent Owner's arguments in opposition, are set forth below.

a. "[1.P] A method for supporting a multi-participant audio/video conference call, the method comprising:"

Petitioner argues that Knappe teaches a method as recited in the preamble of claim 1, contending that "Knappe discloses 'a method and system for improving . . . a multiparty communication session . . . [that] allow[s] multiple people to participate in . . . a "conference call"'" and that "Knappe's system supports 'transmitting audio, video, voice, data . . . between source and destination endpoints . . . to conduct multiple party telephone conference communication sessions.'" Pet. 28 (alterations in original) (quoting Ex. 1006, 1:8–27, 3:24–31) (citing Ex. 1003 ¶¶ 118–120, 122–125, 164; Ex. 1006, 4:58–63, 8:46–10:50, Fig. 8). Referring to Figure 1 of Knappe (*see supra* § III.D.1), Petitioner further contends that

"Knappe explains that 'conference bridge 32 provides conference call and other suitable audio, video, and/or real-time multi-party communication sessions between communication devices 16'" and thereby shows that its system can support multiple participants in an audio/video conference call. Pet. 28–29 (quoting Ex. 1006, 4:58–5:1) (citing Ex. 1003 ¶ 165; Ex. 1006, Fig. 1).

Patent Owner does not specifically respond to Petitioner's arguments regarding the preamble of claim 1. *See generally* PO Resp. After considering the evidence and arguments of the complete record, we determine that Petitioner has shown, by a preponderance of the evidence, that Knappe teaches the recited preamble elements.[11]

b. "[1.1] receiving first audio data from a Public Switched Telephone Network (PSTN) client"

Petitioner relies on Knappe as teaching recited step [1.1]. Pet. 29–32. In particular, Petitioner contends, with reference to Figure 1 of Knappe, "Knappe teaches '[c]ommunication networks' with one or more telephones 18 and a gateway 20 connected to a PSTN network 22, for 'transporting electrical representations of audible sounds,'" where "telephones 18 communicate standard telephony signals through PSTN 22 to the gateway 20." *Id.* at 29 (alteration in original) (quoting Ex. 1006, 1:16–17, 4:18–20) (citing Ex. 1003 ¶ 167; Ex. 1006, Fig. 1). Thus, Petitioner argues, "a [person of ordinary skill in the art] reviewing Knappe would have understood that audio signals from PSTN telephone 18 are sent to

[11] Although we find that the evidence supports that the prior art teaches the preamble, we make no determination whether the preamble of claim 1 is limiting.

gateway 20, which communicates corresponding audio data to conference bridge 32, which facilitates the multiparty communications, as shown in . . . [Knappe's] Figure 1." *Id.* at 29–30 (citing Ex. 1003 ¶¶ 168, 169; Ex. 1006, Fig. 1).[12]

Patent Owner does not specifically challenge Petitioner's arguments with respect to step [1.1]. *See generally* PO Resp. After considering the evidence and arguments of the complete record, we determine that Petitioner has shown, by a preponderance of the evidence, that Knappe teaches "receiving first audio data from a Public Switched Telephone Network (PSTN) client," as recited in this step.

c. "[1.2] receiving second audio data from a moderator"

Petitioner relies on Knappe as teaching recited step [1.2]. Pet. 32–34. In particular, Petitioner contends, with reference to Figure 1 of Knappe (*see supra* § III.D.1), "Knappe teaches 'communication devices 16 comprise IP or other digital telephones, personal and other suitable computers or computing devices . . . capable of communicating real-time audio, video and/or other information over the network 14,'" and "Knappe further teaches that 'at least one participant may be given the priority of moderator for a particular conference call.'" Pet. 32–33 (alteration in original) (quoting Ex. 1006, 3:42–4:1, 8:52–56) (citing Ex. 1003 ¶ 175; Ex. 1006, 7:12–15). Thus, Petitioner argues, "a [person of ordinary skill in the art] reviewing Knappe would understand that one of Knappe's communications devices 16 may be designated a moderator." *Id.* at 33 (citing Ex. 1003 ¶ 175). Further,

[12] It is clear from the cited reference numerals 18, 20, and 32 that Petitioner's arguments relate to Knappe's Figure 1 rather than to the '332 patent's Figure 1.

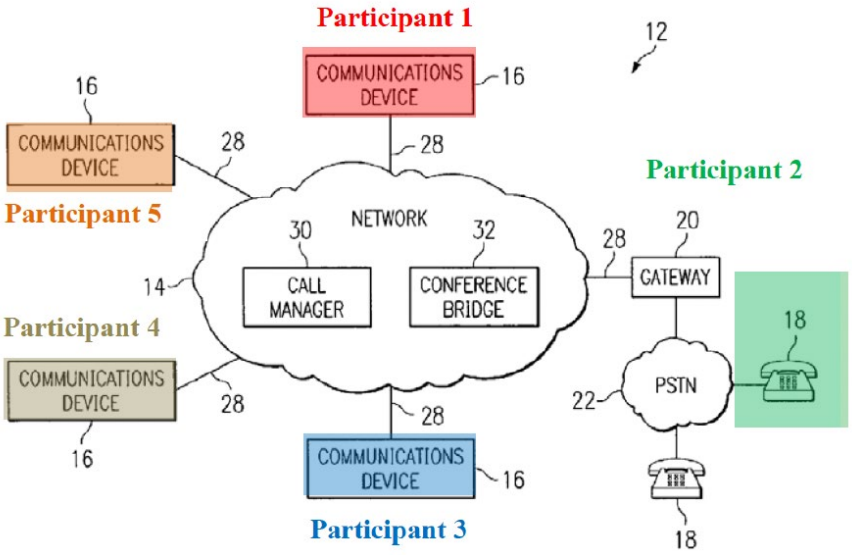
Petitioner contends, Knappe teaches that "input buffers receive and buffer packets of input audio streams from participants for processing by conference bridge 32," as depicted in Knappe's Figure 1, which would include audio streams from the moderator. *Id.* at 33–34 (citing Ex. 1003 ¶¶ 176–179; Ex. 1006, 6:3–6, Fig. 1).

Patent Owner does not specifically challenge Petitioner's arguments with respect to step [1.2]. *See generally* PO Resp. After considering the evidence and arguments of the complete record, we determine that Petitioner has shown, by a preponderance of the evidence, that Knappe teaches "receiving second audio data from a moderator," as recited in this step.

d. "[1.3.1] receiving third audio data, video data, and collaboration data from at least one remote client"

Petitioner relies on Knappe, or in the alternative, the combination of Knappe and Elliott, as teaching recited step [1.3.1]. Pet. 34–37. First, as in connection with limitation [1.2] above, Petitioner contends that "Knappe teaches 'communication devices 16 comprise IP or other digital telephones, personal and other suitable computers or computing devices . . . capable of communicating real-time audio, video and/or other information over the network 14.'" *Id.* at 34–35 (alteration in original) (quoting Ex. 1006, 3:62–4:1). Further, Petitioner contends, Knappe "teaches . . . 'transmitting audio, video, voice, data and other suitable types of real-time . . . traffic'" and "also teaches communication between remote clients over a network and PSTN where 'each participant in the conference call may share information with all of the other participants,' contrasting the disclosed system with 'a meeting with all persons in the same physical location' and noting the benefit of 'minimizing travel expenses.'" *Id.* at 35 (alterations in original) (quoting

Ex. 1006, 1:29–47, 3:24–29) (citing Ex. 1003 ¶¶ 181–182. Citing the testimony of Dr. Houh, Petitioner argues that a person of ordinary skill in the art "would have understood that the participants and their devices were physically remote from one another." *Id.* (citing Ex. 1003 ¶ 183). In support of its arguments, Petitioner provides the following annotated version of Knappe's Figure 1:



In the annotated figure above, Petitioner labels communications devices 16 as "Participant 1" (red), "Participant 3" (blue), "Participant 4" (tan), and "Participant 5" (orange) and labels telephone 18 connected to gateway 20 as "Participant 2" (green). Pet. 36. As explained in the overview of Knappe above, gateway 20 and communications devices 16 each are connected to network 14 via links 28. *See supra* § III.D.1. With reference to the annotated Figure 1, Petitioner contends that "Knappe discloses at least a third remote client connected to the network over link(s) 28 exchanging 'audio, video, and/or . . . other suitable information.'" Pet. at 35–36 (quoting Ex. 1006, 4:61–63) (citing Ex. 1003 ¶ 183; Ex. 1006, 4:58–5:1).

Petitioner further argues that a person of ordinary skill in the art would have understood Knappe's reference to "data and other suitable types

of real-time . . . traffic" (Ex. 1006, 3:27–28) to include "data to be used for collaboration, including well-known collaboration data such as T.120 standard data" (Pet. 36 (quoting Ex. 1003 ¶ 185) (citing Ex. 1006, 3:27–28)). Although Petitioner cites no express disclosure of "collaboration data" in Knappe, Petitioner contends that a person of ordinary skill in the art "would have understood that Knappe's conferencing system could be implemented with Elliott's teachings (*e.g.*, application sharing data, web browsing data, and other collaboration data)." *Id.* at 37 (citing Ex. 1003 ¶¶ 136–144, 186–187; Ex. 1007, 1:40–44, 5:49–61, 6:46–54). Thus, Petitioner argues, a person of ordinary skill in the art "would have understood the prior art to render obvious this limitation." *Id.* (citing Ex. 1003 ¶ 188).

According to Petitioner, a person of ordinary skill in the art, "when considering Knappe, also would have considered Elliott since they are analogous, both pertaining to the field of multiparty conferencing" and "both . . . support[ing] computer and PSTN telephone conference participants." Pet. 21 (citing Ex. 1003 ¶ 137; Ex. 1006, code (57), 3:26–29, 3:41–49, Fig. 1; Ex. 1007, code (57), 5:35–39, 6:1–11, 8:16–39, Fig. 1). Further, Petitioner argues, the person of ordinary skill "would have been motivated to combine the teachings of Knappe and Elliott to produce . . . obvious, beneficial, and predictable results," including "the sharing of collaboration data in a multiparty conference" and "the use of a VPN to protect communications between conference participants." *Id.* at 21–25 (citing Ex. 1003 ¶¶ 136, 138–153). For example, Petitioner argues, "[e]xchanging collaboration data was standardized (e.g., under the T.120 standard) and VPN tunneling was conventional by the time of Knappe and Elliott and the earliest claimed priority of the '332 patent," and "implement[ing] Knappe's transmission of various types of data as

collaboration data" "would have been obvious . . . in view of Elliott's teachings . . . because this type of collaboration data would allow a greater variety of information among the participants, improving the experience and enhancing the effectiveness of collaboration in a variety of contexts." *Id.* at 22 (citing Ex. 1003 ¶¶ 140–141). Still further, Petitioner contends, "[s]uch a combination would have simply involved combining prior art element according to known elements to yield predictable results, namely allowing participants in Knappe's system to share various types of data during a conference for collaboration purposes." *Id.* at 23 (citing Ex. 1003 ¶ 144).

Patent Owner does not specifically challenge Petitioner's arguments with respect to step [1.3.1]. *See generally* PO Resp.[13] We are persuaded that Petitioner provides a rational underpinning to support combining the teachings of Knappe and Elliott, and after considering the evidence and arguments of the complete record, we determine that Petitioner has shown, by a preponderance of the evidence, that the combination of Knappe and Elliott teaches "receiving third audio data, video data, and collaboration data from at least one remote client," as recited in this step.

[13] To be sure, we note that Patent Owner in fact argues that a person of ordinary skill in the art "WOULD NOT BE MOTIVATED TO COMBINE KNAPPE AND ELLIOTT IN THE MANNER CLAIMED" (PO Resp. 26); nonetheless, Patent Owner's arguments in that regard concern the alleged failure of the asserted prior art to teach use of a VPN tunnel, as discussed in greater detail in subsection III.D.4.e below regarding step [1.3.2], rather than to the recitation of step [1.3.1] (*see id.* at 26–28).

e. "[1.3.2] through a first Virtual Private Network (VPN) tunnel"

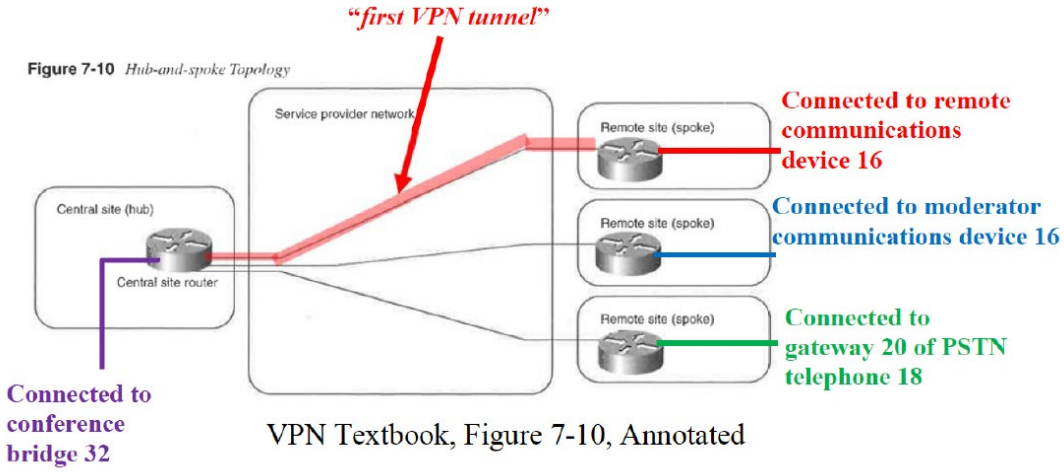
Petitioner relies on the combination of Knappe, Elliott, and VPN Textbook as teaching recited step [1.3.2]. Pet. 37–39. First, Petitioner contends, further to its showing with respect to limitation [1.3.1], that "Elliott teaches that such 'collaborative Web browsing, audio conferencing, video conferencing, and application sharing' is made over Internet network 18 and can be a 'virtual private network (VPN) . . . which uses IP or IP-tunneling.'" *Id.* at 37 (alteration in original) (quoting Ex. 1007, 1:43–44, 4:31–34) (citing Ex. 1003 ¶ 189; Ex. 1007, 4:6–12). According to Petitioner, a person of ordinary skill in the art "would have been motivated to combine Elliott's VPN tunneling for communicating conferencing audio, video, and collaboration data between Knappe's remote communication devices 16 and conference bridge 32 to provide efficient and secure communications." *Id.* (citing Ex. 1003 ¶¶ 145–153, 189–190).

Further, Petitioner contends, "VPN Textbook teaches 'a hub-and-spoke topology' where a number of remote sites are connected to a central site (hub) through a VPN tunnel," and

> it would have been obvious that when implementing this topology, Knappe's remote communications device 16, moderator communications device 16, and gateway 20 connected to the PSTN telephone 18 would be connected to different remote site (spoke) routers, while the conference bridge 32 would be connected to the central site (hub) router.

Id. at 37–38 (citing Ex. 1003 ¶¶ 191–193; Ex. 1010, 129, Fig. 7-10).

In support of its arguments, Petitioner provides the following annotated version of VPN Textbook's Figure 7-10:



VPN Textbook, Figure 7-10, Annotated

Pet. 38. In the annotated figure above, Petitioner labels the hub of the illustrated hub-and-spoke architecture as being connected to conference bridge 32 of Knappe (purple) and labels the illustrated spokes as being connected to Knappe's remote communications device 16 (red), moderator communications device 16 (blue), and gateway 20 of PSTN telephone 18 (green). Further, Petitioner labels the route from the hub to remote communications device 16 as "first VPN tunnel." With reference to the annotated figure, Petitioner argues, "the remote site route (spoke) of the remote communications device 16 and the central router (hub) of the conference bridge 32 are connected through a VPN tunnel," and "[w]hen the conference bridge 32 receives data from or transmits data to the remote communications device 16, the data would be received/sent through the same VPN tunnel, which corresponds to 'a first VPN tunnel.'" *Id.* at 38–39 (emphasis omitted) (citing Ex. 1003 ¶¶ 154–162, 193–194). Thus, Petitioner argues, a person of ordinary skill in the art would have understood the prior art to render obvious this limitation. *Id.* at 39 (citing Ex. 1003 ¶¶ 189–194).

According to Petitioner, a person of ordinary skill in the art "would have been motivated to combine the teachings of Knappe and the VPN Textbook to produce the obvious, beneficial, and predictable results of providing hub-and-spoke VPN topology when implementing VPN tunneling in the Knappe and Elliott combination, and to provide a cost effective and streamlined VPN implementation." Pet. 26 (citing Ex. 1003 ¶ 154); *see also id.* at 27 (citing Ex. 1003 ¶ 159 (implementing VPN tunneling in Knappe's conferencing system, per Elliott's teaching, would beneficially constrain cost and limit complexity); Ex. 1010, 129 ("[T]here are many examples where the customer could benefit from a different topology but has nonetheless chosen the hub-and-spoke topology for cost or complexity reasons.").

First, Petitioner contends, the person of ordinary skill "would have been familiar with conventional VPN tunneling implementations well documented in readily available textbooks, such as the VPN Textbook," and such a person looking to implement Knappe's system with VPN tunneling "would have looked to the VPN Textbook to consider various topologies, including the 'most commonly encountered topology is a hub-and-spoke topology, where a number of remote offices (spokes) are connected to a central site (hub).'" Pet. 26 (quoting Ex. 1010, 129) (citing Ex. 1003 ¶¶ 96–97, 129, 133–135, 155–157; Ex. 1027, 438 (definition of "hub and spoke" in McGraw Hill Computer Desktop Encyclopedia, 9th ed.)).

Further, Petitioner contends, "[c]ombining Knappe with the VPN Textbook would merely be a combination of prior art elements (e.g., VPN topology teachings of the VPN Textbook and Knappe's system) according to known methods to yield predictable results—securing traffic exchanged in Knappe's conferencing system." *Id.* (citing Ex. 1003 ¶ 157).

Moreover, Petitioner argues, the person of ordinary skill "would have been able to predict the result of combining a hub-and-spoke VPN topology, as described in the VPN Textbook, in Knappe's system, for example, as modified by Elliott (as described above), to communicate data between conferencing participates (e.g., remote clients) over secure VPN tunnels." *Id.* at 26–27 (citing Ex. 1003 ¶ 158). Finally, Petitioner contends, the person of ordinary skill "would have had a reasonable expectation of success in combining Knappe with the VPN Textbook's hub-and-spoke topology because the topology was conventional and known in the conferencing context." *Id.* at 27 (citing, *inter alia*, Ex. 1003 ¶¶ 160–162).

In response to Petitioner's arguments, Patent Owner argues that "NONE OF KNAPPE, ELLIOTT OR VPN TEXTBOOK DISCLOSE 'THROUGH A FIRST VIRTUAL PRIVATE NETWORK (VPN) TUNNEL.'" PO Resp. 21. First, Patent Owner contends, "Knappe does not teach securing multi-party communication and does not disclose communication using a VPN tunnel adapted to the use of multiple protocols." *Id.* at 19, 22. More particularly, according to Patent Owner, "Knappe teaches a method of multipoint video conferencing between multiple users" and "presents a conference call configuration involving numerous participants (more than two) connected to a unified call, wherein audio and video data from these participants are combined and then relayed to all the participants/attendees." *Id.* at 19. Conversely, Patent Owner contends, "Elliot discloses two independent one-to-one calls, wherein data (audio) from one participant is transmitted to the call center only, and is not transmitted to any third user/participant." *Id.* at 19–20. "Due to this fundamental difference," Patent Owner alleges, "Elliot lacks the motivation or even capability to be integrated with Knappe, unless one were to

improperly use the claimed invention as a template, using the benefit of hindsight to achieve the results of the claimed invention." *Id.* (citing Ex. 2001 ¶¶ 18–19). Patent Owner contends:

> Elliott teaches combining a traditional analog phone connection with an agent workstation. Neither of the two disparate parts of the invention—a one-to-one POTS or PSTN phone connection or URL sharing between computers using conventional Internet protocols—would suggest to a person or ordinary skill in the art that a VPN tunnel should or could be implemented to protect voice over the Elliott POTS phone connection or access to a publicly-available URL on the Web. First, a VPN, or—"a private network of securely connected appliances configured within a public network"—cannot be implemented over PSTN. Even less so, a VPN tunnel allowing multiple protocols. Second, there would be no motivation to protect a direct PSTN connection in the manner claimed.

Id. at 20–21 (citing Ex. 2001 ¶¶ 20–22); *id.* at 22 (citing Ex. 2001 ¶¶ 20–24).

Patent Owner further argues that "Knappe discloses conference scenarios involving the simultaneous connection of multiple participants," whereas "Elliott's disclosure pertains solely to isolated interactions." PO Resp. 23. Therefore, Patent Owner argues, "[t]he limitation regarding provision of a VPN tunnel to protect ***mixed audio*** is taught by neither [Knappe nor Drell]." *Id.*; Sur-reply 18. Patent Owner continues that "[a]lthough Elliott mentions in passing a Virtual Private Network (VPN), its application can only be understood as directed to 'network 18,' which is used to connect two computers over the Internet, and not audio data, mixed or otherwise." PO Resp. 23–24 (citing Ex. 1007, 4:6–19); Sur-reply 18. According to Patent Owner, "the mechanism detailed in the '332 patent operates such that data arriving from a remote endpoint via a VPN tunnel is decrypted at the local moderator's end before being shared with the [PSTN] client," and "[g]iven this specific, combining either Drell's or Knappe's

teachings with Elliot's is inherently unsuitable for these limitations." PO Resp. 24; Sur-reply 18–19. Patent Owner argues that the '332 patent "employ[s] a VPN bridge . . . which is not present in any of the prior arts even by combining it with Elliott." PO Resp. 24.

In addition, Patent Owner argues that Petitioner fails to distinguish between a VPN and a VPN tunnel, which is "crucial." PO Resp. 24; Sur-reply 19. Patent Owner argues that a VPN[14] is not shown by Knappe, Elliott, or Drell, and that "in Elliott, the VPN is mentioned only in the context of network 18, which is unrelated to audio communication." PO Resp. 24–25; Sur-reply 19. Patent Owner also argues that a VPN tunnel[15] "is not disclosed or suggested for mixed audio data by the art of record." *Id.* at 25–26; *see also* Sur-reply 19–20.

Regarding VPN Textbook, Patent Owner asserts that "the USPTO has already determined that general VPN textbooks are not invalidating prior art." PO Resp. 14. According to Patent Owner "the principal references disclose nothing about how to implement a VPN or VPN tunnel in a web videoconferencing network," and Petitioner "rel[ies] on a textbook, like a catalog of electronic components, to recreate the invention using hindsight." *Id.* To the extent Patent Owner otherwise addresses the textbook in its

[14] Patent Owner relies on the district court's construction of VPN, which is "a private network of securely connected appliances configured within a public network." PO Resp. 24; Ex. 2002, 32; Sur-reply 19.

[15] Patent Owner relies on the district court's construction of VPN tunnel, which is "a connection between two devices that permits encapsulating a first packet from one protocol in a second packet from a different protocol." PO Resp. 25; Ex. 2002, 32.

Response,[16] Patent Owner concedes that it "briefly mentions a 'hub-and-spoke' topology used in some VPN networks" but contends that it "does not demonstrate or disclose the use of this topology in a multi-party conference call context" and "does not reveal anything about VPN tunnels." PO Resp. 33–34; Sur-reply 20. In the Sur-reply, Patent Owner also argues that the "general concepts discussed in the VPN Textbook" combined with Elliott also do not render obvious the teachings in the '332 patent. Sur-reply 9–10.

We are persuaded that the combination of Knappe, Elliott, and VPN Textbook teaches step [1.3.2]. As described above, Petitioner provides extensive reasoning, supported by testimony from Dr. Houh, explaining how the combination teaches this step, and provides reasoning for why a person of ordinary skill in the art would combine the references. Pet. 21–27 (citing Ex. 1003 ¶¶ 136–162), 37–39 (citing Ex. 1003 ¶¶ 145–162, 189–194; Ex. 1007, 1:43–44, 4:6–12, 4:31–34; Ex. 1010, 129, Fig. 7-10); Reply 9–19. Patent Owner's arguments largely do not address Petitioner's contentions and fail to address Petitioner's arguments in support of the combination. Petitioner supports its arguments with citations to the references and credible declarant testimony from the vantage of a person of ordinary skill in the art, while Patent Owner's arguments as to the interpretation of the references and motivations (or lack thereof) of a person of ordinary skill in the art substantially lack meaningful support from the viewpoint of a person of ordinary skill in the art or citation to the references. *See* PO Resp. 21–28; *see also* 37 C.F.R. 42.65(a) ("Expert testimony that does not disclose the

[16] Patent Owner does not specifically address VPN Textbook in connection with claim 1 but does so in its arguments with respect to claim 8. PO Resp. 33–34; *see infra* § III.4.E.4.

underlying facts or data on which the opinion is based is entitled to little or no weight."). We find Petitioner's interpretation of the references and motivation to combine more persuasive than Patent Owner's insufficiently supported attorney argument on these issues. In addition, notwithstanding Patent Owner's argument that "Knappe does not teach securing multi-party communication" (PO Resp. 19, 22), "securing multi-party communication" is not recited or implied in step [1.3.2].

We also disagree with Patent Owner that "the USPTO has already determined that general VPN textbooks are not invalidating prior art." PO Resp. 14; *see also* Sur-reply 3 (arguing that "general references like a textbook cannot be meaningfully combined with other references unless there is a reason to combine; otherwise, general purpose references could be used as a template to generate nearly any circuit or network configuration out of constituent components."). In support, Patent Owner lists several Cisco Systems, Inc. documents that are listed in the "References Cited" section of the '332 patent (PO Resp. 14), but we are not persuaded that the mere citation of these references leads to the determination that any and all general VPN textbooks are not invalidating prior art.

In its Sur-reply, Patent Owner further contends that "Petitioners have identified absolutely nothing present in VPN Textbook . . . that was not already presented and considered in the other three VPN guides from Cisco" and that VPN Textbook "adds nothing that was not previously considered and over which the claimed invention was properly determined patentable by the USPTO." Sur-reply 3. Patent Owner's arguments do not undermine Petitioner's showing because Petitioner does not rely on VPN Textbook alone, and the record shows that artisans of ordinary skill knew how to implement a VPN tunnel in a web videoconferencing scheme as indicated in

the summary above and as discussed further below. For example, and as outlined above, Elliott discloses use of a VPN tunnel in a web conferencing scheme. Petitioner specifically relies on Elliott's teaching of "collaborative Web browsing, audio conferencing, video conferencing, and application sharing" over a variety of networks 18, including "virtual private network (VPN) . . . which uses IP or IP-tunneling," and argues that a person of ordinary skill in the art "would have been motivated to combine Elliott's VPN tunneling for communicating conferencing audio, video, and collaboration data between Knappe's remote communication devices 16 and conference bridge 32 to provide efficient and secure communications." Pet. 37 (quoting Ex. 1007, 1:43–44, 4:31–34) (citing Ex. 1007, 4:6–12; Ex. 1003 ¶¶ 145–153, 189–190). Moreover, Petitioner persuasively shows that VPN Textbook teaches that a hub-and-spoke VPN topology was a known security option chosen for cost effectiveness and complexity reasons. *See* Pet. 37–38 (citing Ex. 1003 ¶¶ 191–193; Ex. 1010, 129 (noting "[t]he most commonly encountered topology is a hub-and-spoke topology," "the hub-and-spoke VPN topology is more common than you might expect," and "there are many examples where the customer could benefit from a different topology but has nonetheless chosen the hub-and-spoke topology for cost or complexity reasons")).

We also disagree that Petitioner has "recreate[d] the invention using hindsight." PO Resp. 14. As set forth above, Petitioner relies on VPN Textbook to support the underlying technical functionality of VPN tunneling, as well as to provide rationale for the combination, which is not explicitly described in Knappe or Elliott. Aside from Patent Owner's conclusory attorney argument, Patent Owner provides no further support for its hindsight argument, and does not expressly address Petitioner's

motivation to combine the references, for example, to provide secure communications.

Further, many of Patent Owner's arguments address the cited prior art references individually, rather than the combination proposed by Petitioner. Patent Owner argues, for example, that "Knappe . . . does not disclose communication using a VPN tunnel adapted to the use of multiple protocols" and that Elliott's disclosure "related to a VPN is never in relation to mixed audio as claimed." PO Resp. 19; *see id.* at 21–26; Sur-reply 7–14. Petitioner, however, relies on the combination of Knappe, Elliott, and VPN Textbook, not on Knappe or Elliott alone, and provides reasoning for why a person of ordinary skill in the art would combine the references. Pet. 21–27, 37–39; Reply 9–19. Indeed, Elliott generally discloses "[m]ulti-media collaboration" and expressly discloses VPN and VPN tunneling over a network. *See* Ex. 1007, 2:66–3:6 ("Multi-media collaboration refers to the *use of more than one media stream* (e.g.: voice, fax, data, video, etc.) used in collaboration with more than one party . . . *[and may] include* . . . web browsing, chat, telephony, multi-party conferencing, audio-on-demand, video-on-demand, integrated messaging, *virtual private networks*, and electronic commerce.") (emphasis added); 4:6–34 ("[C]ommunications between the parties can be made over a variety of networks 18[, where] . . . network 18 can be either a public or a carrier supported virtual private network (VPN) or local area network (LAN) which uses IP or IP-tunneling."). Elliott states that "network 18 is at least two (and preferably more) computers interconnected together so that communication between them is possible." *Id.* at 4:6–8; *see also id.* at 4:20–21 ("Network 18 could also comprise other IP-based networks as well as other networks."). Elliott also describes the ability to place internet telephony calls over PSTN, which

"are facilitated by internet telephone gateway (ITG) 32 which is provided as an interface between the circuit-switched PSTN 30 and the packet switched IP network 28." *Id.* at 5:34–39, 6:7–10, Fig. 1. Given this disclosure in Elliott, we are not persuaded by Patent Owner's argument that Elliott's network 18 is "unrelated to audio communication." *See* PO Resp. 24–25. Regarding VPN Textbook, as noted above, Patent Owner contends that it "does not demonstrate or disclose the use of [hub-and-spoke] topology in a multi-party conference call context" and "does not reveal anything about VPN tunnels." PO Resp. 33–34. Patent Owner, however, does not explain, or provide citation to evidence supporting this argument.

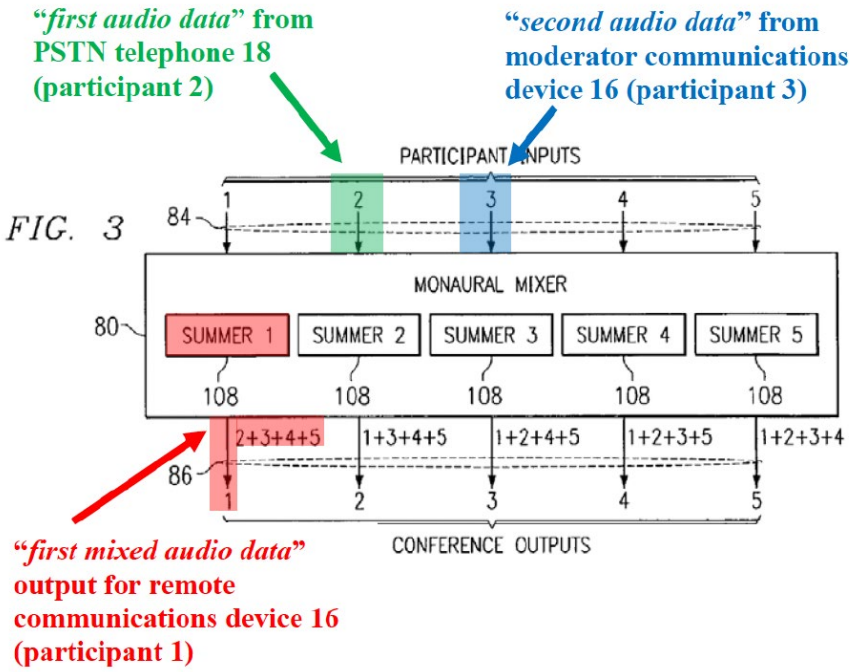
Further, Patent Owner attempts to distinguish Knappe from Elliott, contending that Knappe relates to conferencing scenarios with multiple participants, whereas Elliott's disclosure pertains solely to one-to-one interactions. PO Resp. 19, 22–23, 26. However, neither Patent Owner nor Mr. Dye provide any citations to Elliott in support of these arguments. Elliott's disclosure does not support these arguments. Elliott states that "the present invention also enables services for one-to-many and *many-to-many* IP-based collaboration." Ex. 1007, 2:10–13 (emphasis added); *see also id.* at 7:59–61 (discussing "multiple 1:1, 1:n, n:1, and n:n sessions").

We are persuaded that Petitioner provides a rational underpinning to support combining the teachings of Knappe, Elliott, and VPN Textbook with a reasonable expectation of success, and after considering the evidence and arguments of the complete record, we determine that Petitioner has shown, by a preponderance of the evidence, that the combination of Knappe, Elliott, and VPN Textbook teaches the recited step.

f. "[1.4] mixing the first audio data from the PSTN client with the second audio data from the moderator into a first mixed audio data"

Petitioner relies on Knappe as teaching recited step [1.4]. Pet. 39–40. Referring back to its contentions with respect to limitations [1.1] and [1.2], discussed above, that Knappe "teaches receiving 'the first audio data from the PSTN client' and 'the second audio data from the moderator,'" Petitioner further argues that "Knappe also teaches that mixers 58, 80, and 100, of conference bridge 32 mixes [sic] the audio data received from PSTN telephone 18 with audio data received from a moderator's communications device 16 into 'a first mixed audio data.'" *Id.* at 39 (emphasis omitted) (citing Ex. 1003 ¶¶ 166–179, 196). For example, Petitioner contends, "Knappe explains that 'monaural mixer 80 receives participant input streams 84 and combines the streams in summers 82 to generate conference output streams 86 for each participant.'" *Id.* (quoting Ex. 1006, 6:59–67) (citing Ex. 1003 ¶ 197). As a result, Petitioner alleges, "'the conference output stream of participant 1 includes the audio inputs of participants 2–5 . . . the conference output stream of participant 2 includes the audio inputs of participants 1 and 3–5,' and so on." *Id.* (quoting Ex. 1006, 7:1–11) (citing Ex. 1003 ¶ 197). Petitioner contends that a person of ordinary skill in the art "would have understood Knappe to disclose the 'mixing the first audio data from the PSTN client with the second audio data from the moderator into a first mixed audio data.'" *Id.* (emphasis omitted). In support of its

arguments, Petitioner provides the following annotated version of Knappe's Figure 3:



Id. at 40. In the annotated figure above, Petitioner labels participant input 2 as providing "'first audio data' from PSTN telephone 18 (participant 2)" (green), participant input 3 as providing "'second audio data' from moderator communications device 16 (participant 3)" (blue), and summer 1 together with conference output 1 (including a summing of audio data from participants 2–5) as "'first mixed audio data' output for remote communications device 16 (participant 1)" (red).

Patent Owner does not specifically challenge Petitioner's arguments with respect to step [1.4]. *See generally* PO Resp. Patent Owner, however, does argue that the references relied on in the Petition fail to disclose "mixing of different *audio streams comprising different input signals for different recipients*." *Id.* at 16–18 (emphasis added). Nonetheless, as Petitioner points out, that argument is not expressly directed to any claim limitation or ground set forth in the Petition, and we agree with Petitioner

that the challenged claims do not recite mixing of "audio streams." Reply 5 & n.1. To the extent Patent Owner intends that argument to refer to "mixing" of "audio data" recited in step [1.4] (and likewise in step [1.6], discussed in Section III.D.4.h below), we are persuaded by Petitioner's showing that such mixing is described and illustrated by Knappe. Pet. 39–40; Reply 5–8. Accordingly, after considering the evidence and arguments of the complete record, we determine that Petitioner has shown, by a preponderance of the evidence, that Knappe teaches the recited step.

g. "[1.5] transmitting the first mixed audio data to the remote client through the first VPN tunnel"

Petitioner relies on the combination of Knappe, Elliott, and VPN Textbook as teaching recited step [1.5]. Pet. 40–41. Referring back to its contentions with respect to limitations [1.3] and [1.4], discussed above, that Knappe teaches generating "the first mixed audio data" (e.g. output streams 86) and "remote client[s]" (e.g., remote communications devices 16)," Petitioner further argues that "Knappe also discloses 'transmitting audio . . . between source and destination endpoints,' including 'a conference output stream for delivery to the participant.'" *Id.* at 40 (alteration in original) (quoting Ex. 1006, 3:24–29, 6:65–67) (citing Ex. 1003 ¶¶ 180–200; Ex. 1006, 5:35–39 ("The conference output stream for a participant includes the media of all other participants, a subset of other participants or other suitable mix . . . .")). Thus, Petitioner argues, a person of ordinary skill in the art "would have understood Knappe to disclose 'transmitting the first mixed audio data to the remote client.'" *Id.* at 41 (emphasis omitted) (citing Ex. 1003 ¶ 200). Further, Petitioner alleges, referring back to its contentions with respect to limitation [1.3.2], "Knappe in combination with Elliott and

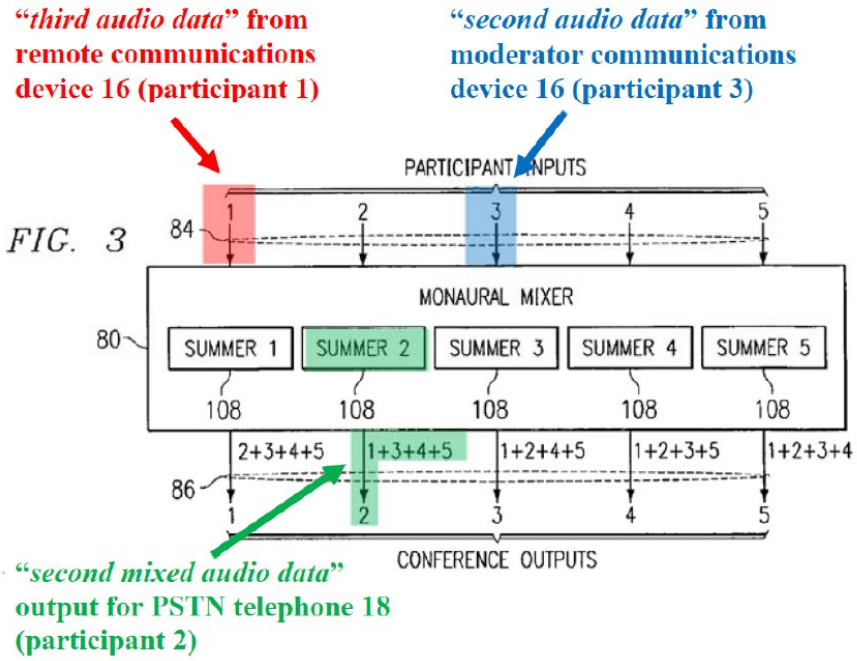
the VPN Textbook teaches using a VPN tunnel between a central site (e.g., Knappe's conference bridge 32) and a remote client (e.g., remote communications devices 16)," and "[i]t would have been obvious to a POSITA to transmit 'the first mixed audio data to the remote client' using a VPN tunnel set up between conference bridge 32 and remote communications devices 16." *Id.* (citing Ex. 1003 ¶¶ 189–194, 201–202).

Apart from its arguments discussed in connection with the "VPN tunnel" recitation of step [1.3.2] (*see supra* § III.D.4.e), Patent Owner does not separately challenge Petitioner's arguments with respect to step [1.5]. *See generally* PO Resp. Moreover, the reasons for adding a VPN tunnel for audio data as addressed above apply with equal force for mixed audio data, as Petitioner argues. *See* Reply 17–18 ("With respect to transmission of mixed audio data via a VPN tunnel, Knappe discloses transmission of the claimed mixed audio data (*see e.g.* Petition at 39–40 re limitation 1.4) and it would have been obvious to utilize conventional VPN tunnels within Knappe's conference system for transmission of mixed audio data as recited in limitation 1.5. *See* e.g., Petition at 40–41."). After considering the evidence and arguments of the complete record, we determine that Petitioner has shown, by a preponderance of the evidence, that the combination of Knappe, Elliott, and VPN Textbook teaches the recited step.

> *h. "[1.6] mixing the second audio data from the moderator with the third audio data from the remote client into a second mixed audio data; and"*

Petitioner relies on Knappe as teaching recited step [1.6]. Pet. 41–42. In support of this argument, Petitioner refers back to its contentions with respect to limitations [1.2] and [1.3], discussed above, that "Knappe teaches receiving 'the second audio data from the moderator,' and 'the third audio

data from the remote client'" and that "Knappe teaches that mixers 58, 80, and 100, of conference bridge 32, mixes the audio data from PSTN telephone 18 with audio data from a moderator's communications device 16 into 'a first mixed audio data,'" and further provides the following annotated version of Knappe's Figure 3:



Id. (citing Ex. 1003 ¶¶ 174–199, 204). In the annotated figure above, Petitioner labels participant input 1 as providing "'third audio data' from remote communications device 16 (participant 1)" (red), participant input 3 as providing "'second audio data' from moderator communications device 16 (participant 3)" (blue), and summer 2 together with conference output 2 (including a summing of audio data from participants 1 and 3–5) as "'second mixed audio data' output for PSTN telephone 18 (participant 2)" (green). Petitioner contends that, "[a]s shown in annotated Figure 3 . . . , 'monaural mixer 80 receives participant input streams 84 and combines the streams in summers 82 to generate conference output streams 86 for each participant,' which also may include mixing audio data from a moderator's

communications device 16 with another participant's communications device 16." *Id.* (quoting Ex. 1006, 6:59–67) (citing Ex. 1003 ¶ 205). As a result, Petitioner argues, "Knappe's 'conference output stream of participant 2' can comprise 'a second mixed audio data' resulting from a mix of 'the audio inputs of participants 1 and 3–5,' which may include 'the second audio data from the moderator with the third audio data from the remote client.'" *Id.* at 42 (emphasis omitted) (quoting Ex. 1006, 7:1–11) (citing Ex. 1003 ¶ 205). Thus, Petitioner argues, a person of ordinary skill in the art would have understood Knappe to disclose this limitation. *Id.* (citing Ex. 1003 ¶¶ 203–206).

Patent Owner does not specifically challenge Petitioner's arguments with respect to step [1.6]. *See generally* PO Resp.; *see also supra* § III.D.4.f (addressing Patent Owner's argument regarding alleged failure of prior art to teach mixing of "audio streams"). After considering the evidence and arguments of the complete record, we determine that Petitioner has shown, by a preponderance of the evidence, that Knappe teaches the recited step.

i. "[1.7] transmitting the second mixed audio data to the PSTN client"

Petitioner relies on Knappe as teaching recited step [1.7]. Pet. 42–43. Referring back to its contentions with respect to limitation [1.5], discussed above, that Knappe teaches "transmitting audio . . . between source and destination endpoints," including "a conference output stream for delivery to the participant," Petitioner further argues that "Knappe teaches the transmitted audio data is received at gateway 20 and converted to standard telephony signals for delivery to destination PSTN telephones 18." *Id.* (citing Ex. 1003 ¶¶ 200–202, 205, 209; Ex. 1006, 3:24–29, 4:21–25 ("At the gateway 20 . . . VoIP packets received from the network 14 are converted

into standard telephony signals for delivery to the destination telephone 18 through PSTN 22."), 7:1–7 ("[E]ach participant receives the audio input of each other participant."), 6:65–67). Thus, Petitioner argues, a person of ordinary skill in the art would have understood Knappe to disclose this limitation. *Id.* at 43 (citing Ex. 1003 ¶¶ 207–210).

Patent Owner does not specifically challenge Petitioner's arguments with respect to this step. *See generally* PO Resp. After considering the evidence and arguments of the complete record, we determine that Petitioner has shown, by a preponderance of the evidence, that Knappe teaches step [1.7].

j. Conclusion Regarding Claim 1

For the reasons given, we conclude that Petitioner has demonstrated by a preponderance of the evidence that claim 1 would have been obvious over the combination of Knappe, Elliott, and VPN Textbook.

5. Dependent Claims 2, 4, 5, and 7

Claims 2, 4, 5, and 7 depend from independent claim 1. Petitioner contends that the additional limitations of claims 2, 4, and 7 are taught or suggested by Knappe and that the additional limitations of claim 5 are taught by the combination of Knappe, Elliott, and VPN Textbook. Pet. 43–49. In support, Petitioner relies on the testimony of Dr. Houh and provides citations to the references' teachings. *Id.*

On this record, Petitioner persuasively maps the steps of claims 2, 4, 5, and 7 to the asserted prior art and provides reasons supported by factual underpinnings of record to combine the reference teachings with a reasonable expectation of success. *See* Pet. 43–49.

Patent Owner does not address these claims separately but relies on the same arguments regarding the "VPN tunnel" limitations addressed above in connection with claim 1. *See* PO Resp. 21–28.

Accordingly, we determine that Petitioner shows by a preponderance of evidence that claims 2, 4, 5, and 7 would have been obvious based on the combined teachings of Knappe, Elliott, and VPN Textbook.

E. Obviousness over Knappe, Elliott, VPN Textbook, and Drell (Petitioner's Ground 2)

Petitioner alleges claims 3, 6, and 8–11 are unpatentable under 35 U.S.C. § 103(a) as obvious over Knappe, Elliott, VPN Textbook, and Drell. Pet. 4, 50–76. After reviewing the entire record developed at trial, we determine that Petitioner has shown, by a preponderance of the evidence, that claims 3, 6, and 8–11 would have been obvious on the asserted ground.

1. Drell

Drell, titled "Videoconferencing Apparatus Having Integrated Multi-Point Conference Capabilities," relates to a "videoconferencing apparatus" that includes "a multi-point (MP) conference application that enables the apparatus to combine and distribute audio and video signals received from a plurality of remote conference endpoints." Ex. 1008, codes (54), (57).

Figure 1 of Drell is reproduced below and depicts an exemplary operating environment of the multi-point conferencing application:

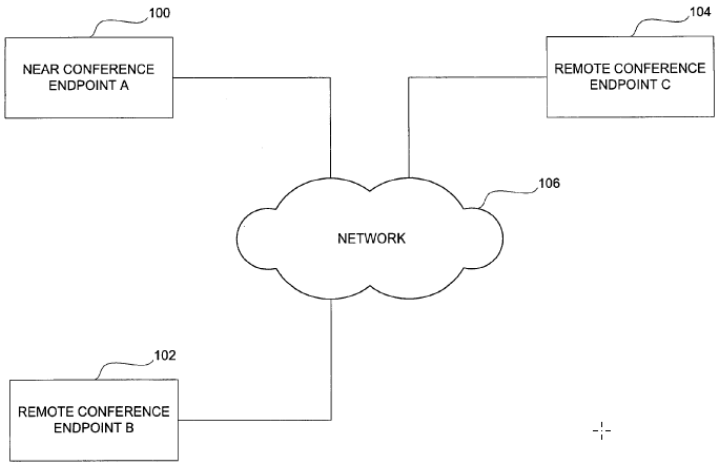


FIG. 1

Figure 1 depicts remote conference endpoint 100 and remote conference endpoint 104 connected via network 106 to near conference endpoint 102, which includes Drell's "multi-point (MP) conferencing application" and "call manager application." Ex. 1008, 3:4–8, 4:11–13. "Remote conference endpoints 102 and 104 may comprise, for example, conventional videoconferencing devices equipped to transmit and receive both video (image) data and audio (speech) data." *Id.* at 3:8–12.

"Typically, network 106 will comprise the public switched telephone network (PSTN) or comparable circuit switched network to which each of the conference endpoints is connected by one or more [Integrated Services Digital Network (ISDN)] lines." Ex. 1008, 3:24–26. "Alternatively, network 106 may comprise a packet switched network, such as the Internet." *Id.* at 3:33–34. Although Figure 1 illustrates a "single network 106[,] . . . the invention contemplates the use of two or more networks (for example, the PSTN and the Internet) to connect conference endpoints utilizing different communication protocols." *Id.* at 3:34–38.

"Call manager application 232 controls the establishment and termination of connections between near conferencing endpoint 100 and remote conference endpoints 102 and 104." Ex. 1008, 4:15–18. "MP conferencing application 234 is configured to instantiate a processing train for each remote conference endpoint 102 and 104 to which near conference endpoint 100 is connected." *Id.* at 4:21–24. "The processing trains process audio and video data streams received from remote conferencing endpoints 102 and 104." *Id.* at 4:25–26. "The processed audio and video data streams are combined with each other and with locally generated audio and video streams, and the combined audio and video streams are thereafter distributed to remote conferencing endpoints 102 and 104." *Id.* at 4:27–31.

Figure 3, which depicts components of MP conferencing application 234, is reproduced below:

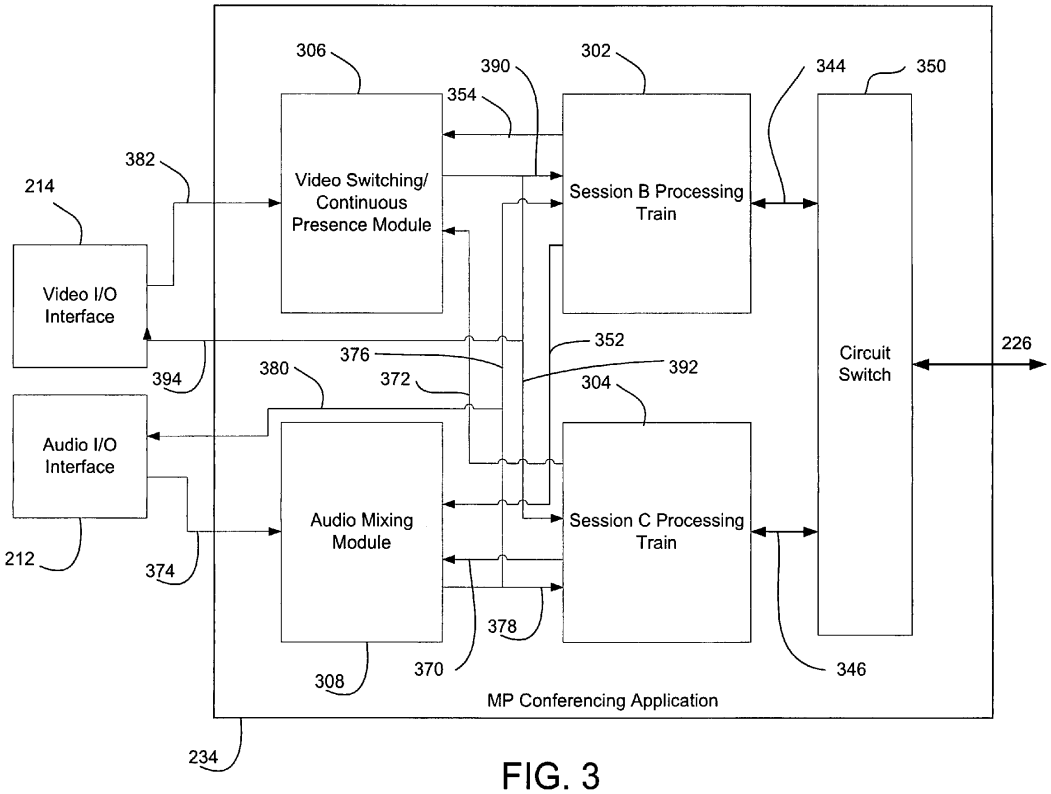


FIG. 3

Figure 3 depicts MP conferencing application, including circuit switch 350, a plurality of processing trains 302 and 304, a video switching/continuous presence module 306, and an audio mixing module 308. Ex. 1008, 4:32–38. Audio mixing module 308 "is configured to combine audio data received from remote conference endpoints 102 and 104 with locally generated audio data" and "generates an output audio data stream (or plurality of output audio data streams)." *Id.* at 5:8–18. Video switching/continuous presence module 306 "combines video data received from remote conference endpoints 102 and 104 with locally generated video data" and generates an output video stream (or a plurality of output video streams). *Id.* at 5:26–46. The output audio and video data streams are "encoded and combined to form a mixed encoded audio/video data stream." *Id.* at 5:50–52. Processing train 302 includes communication process 404 that "multiplexes the encoded audio and video data streams into a single audio/video data stream 344." *Id.* at 5:65–66, 6:46–48; *see id.* at Fig. 4.

2. Dependent Claim 3

Claim 3 depends from claim 1 and further recites "wherein the receiving first audio data from the PSTN client includes receiving IP packets and decoding the IP packets containing the first audio data from the PSTN client at a moderator computer system." Ex. 1001, 10:11–14. Petitioner contends that this additional limitation is taught by Knappe in combination with Drell. Pet. 56–59. In support, Petitioner relies on the testimony of Dr. Houh and provides citations to the references' teachings. *Id.* In particular, Petitioner argues that Knappe discloses "receiving IP packets and decoding the IP packets containing the first audio data from the PSTN client," as recited in claim 3, and "further recognizes that the implementation of the conference bridge 32 is not limited to a central facility." *Id.* at 56–57 (citing

Ex. 1006, 3:54–58 (disclosing that telephony voice information is transmitted in "Voice over IP VoIP) format"), 4:9, 4:21–22, 4:31-33; Ex. 1003 ¶¶ 265–269)). Petitioner further argues "Drell supplements this idea and teaches that a conference bridge like that in Knappe could be implemented in software at a conference endpoint." *Id.* at 57 (citing Ex. 1008, 3:39–41, 4:11–13; Ex. 1003 ¶¶ 269–272). Thus, Petitioner contends, "it would have been obvious to a [person of ordinary skill in the art] to distribute Knappe's conference bridge 32 functionality as software located at a conference endpoint because doing so would reduce the cost of facilitating conference communications." *Id.* at 57–58 (citing Ex. 1003 ¶ 272). Further, Petitioner argues, "it would have been obvious that in the combination, Knappe's communications devices 16, including the device designated as the moderator (as discussed at [1.2]), would include a conference bridge implemented as software similar to Drell's conference endpoint." *Id.* at 58 (citing Ex. 1003 ¶ 272). Still further, Petitioner argues, "Drell also teaches that conferencing application 234 (which could be implemented in Knappe's moderator computer) receives packets containing audio data from remote endpoints, including PSTN telephones," and then "decodes the received packets." *Id.* (citing Ex. 1008, 2:26–33, 4:21–31, 6:18–27; Ex. 1003 ¶¶ 273–274). Relying on Dr. Houh's testimony, Petitioner contends that a person of ordinary skill in the art "would have understood that Drell's disclosure of decoding received packetized audio corresponds to converting received audio as Knappe discloses," and further that it would have been obvious to a person of ordinary skill in the art "for Knappe's conference bridge 32 (implemented as software in the moderator communications device 16) to decode received IP packet data" and to "receive IP packets and convert the audio signals from the remote

participants, including audio from the PSTN telephone 18." *Id.* at 58–59 (citing Ex. 1003 ¶¶ 274–277).

Patent Owner does not specifically address Petitioner's arguments with respect to claim 3. *See generally* PO Resp. On this record, we determine Petitioner persuasively maps the steps of claim 3 to the asserted prior art and provides reasons supported by factual underpinnings of record to combine the reference teachings with a reasonable expectation of success. *See* Pet. 53–56. Accordingly, we determine that Petitioner has shown by a preponderance of evidence that claim 3 would have been obvious based on the combined teachings of Knappe, Elliott, VPN Textbook, and Drell.

3. Dependent Claim 6

Claim 6 depends from claim 1 and further recites "encoding the first mixed audio data into a first compressed audio data before transmitting the first mixed audio data to the remote client." Ex. 1001, 10:23–26. Petitioner contends that the combination of Knappe and Drell renders this additional step obvious. Pet. 59–60. In particular, Petitioner contends,

> Knappe teaches mixing "*the first mixed audio data*" and "*transmitting the first mixed audio data to the remote client.*" Ex_1003 ¶¶194–202, 280. Drell teaches using a compression algorithm to compress mixed audio data before transmission to a remote endpoint. Ex_1008, 6:33-45 ("In the transit mode . . . **[a]udio codec 408 encodes the audio data stream output by 60 audio mixing module 308** . . . using a standard or proprietary audio **compression algorithm** … and delivers the encoded audio data . . ."); Ex_1003 ¶281; *see also id.* ¶282. Since Knappe also discloses "a codec (coder/decoder) converts audio," (*see* [3.1]) it would have been obvious to a [person of ordinary skill in the art] to use in Knappe a codec that compresses the mixed audio data before transmission to a remote communications device 16

> because this would result in the known benefit of reducing the amount of data transmitted over the network. *Id.* ¶283.
>
> Thus, the prior art renders obvious this limitation. *Id.* ¶¶279–284.

Id.

In response to Petitioner's arguments, Patent Owner contends that neither Knappe nor Drell discloses the additional step recited in claim 6. PO Resp. 34–35. More specifically, Patent Owner argues that Knappe "lacks security provided in multi-party conference call via VPN tunnel" and "discloses a centralized system wherein processes like encoding, mixing, transmission of data to every user etc. are done at the network using conference bridge and call manager," whereas Drell "employs a straightforward method where a mixer blends the audio and video data from all participants, whether they are from near conference endpoint or the remote endpoints." *Id.* According to Patent Owner, "[i]n the Drell model, the near conference endpoint utilizes an application for tasks like mixing and encoding," and "[d]ue to this fundamental difference, a [person of ordinary skill in the art] would not be motivated to combine the Knappe design with the alternative Drell approach." *Id.* at 35. Further, Patent Owner contends, "Knappe teaches the codec (coder/decoder) at the communication device" and "does not provide any information regarding encoding of the mixed audio data and transmitting the encoded mixed data to the remote device." *Id.*; *see also* Sur-reply 21–22.

We are persuaded that the combination of Knappe and Drell teaches the recited "encoding" step of claim 6. Petitioner provides articulated reasoning, supported by the cited references and Dr. Houh's testimony, explaining how the combination teaches this step, and provides reasoning for why a person of ordinary skill in the art would combine the references with a

reasonable expectation of success. Pet. 53–56, 59–60. In contrast, as Petitioner points out in its Reply, Patent Owner provides only attorney argument unsupported by any citation to evidence as to what a person of ordinary skill in the art would have understood regarding Knappe and Drell. *See* Reply 22–23. And indeed, notwithstanding Patent Owner's attorney argument alleging a "fundamental difference" between Knappe and Drell (*see* PO Resp. 35; *see also* Sur-reply 21–22), Petitioner cites disclosure in Knappe that, for example, "call manager 30 and conference bridge 32" may "have their functionality distributed across and/or at the periphery of the network 14" (Reply 24 (quoting Ex. 1006, 4:31–33)), while "Drell further teaches a 'MP conferencing application' that performs functions similar to Knappe's call manager 30 and conference bridge 32 implemented as software at a conference endpoint" (*id.* at 24 (citing Ex. 1008, 1:65–2:6, 6:63–66)).

In view of the evidence cited by Petitioner, we are persuaded that Knappe and Drell are analogous prior art and that "it would have been obvious to a [person of ordinary skill in the art] that the moderator communications device 16 of Knappe could implement the call manager and conference bridge 32 functionality (like Drell's MP conferencing application) as software at the moderator," as Petitioner contends. Reply 24 (citing Ex. 1003 ¶ 256). We are likewise persuaded that such a person of ordinary skill "also would have been motivated to implement Drell's '[a]udio codec' capable of encoding/decoding 'in accordance with a standard . . . or proprietary audio compression algorithm' and 'video codec 406' capable of encoding/decoding 'in accordance with a standard . . . or proprietary video compression algorithm' with Knappe's 'communication devices 16 compris[ing] . . . [a] codec (coder/decoder).'" *Id.* (citing

Ex. 1003 ¶ 258; Ex. 1006, 4:5–11; Ex. 1008, 6:18–45); *see also* Ex. 1003 ¶ 283 (Dr. Houh testifying that the use in Knappe of a codec as taught by Drell "would result in the known benefit of reducing the amount of data transmitted over the network").

For the reasons given, we conclude that Petitioner has demonstrated by a preponderance of the evidence that claim 6 would have been obvious over the combination of Knappe, Elliott, VPN Textbook, and Drell.

4. Independent Claim 8

As reproduced in Section II.D above, independent claim 8 is directed to a "system for supporting a multi-participant audio/video conference call," where the system includes components that essentially carry out the steps recited in independent claim 1 and dependent claim 6, with certain minor differences, most notably, whereas step [1.4] recites mixing only "the first audio data from the PSTN client with the second audio data from the moderator into a first mixed audio data," limitation [8.1] recites "[8.1.1] a first mixer configured to mix audio data from a [PSTN] client with audio data from a moderator [8.1.2] *and collaboration data from the moderator* into a mixed data."[17] *Compare* Ex. 1001, 9:52–10:5, *with id.* at 10:30–46.

In support of its contention that claim 8 is unpatentable over the combination of Knappe, Elliott, VPN Textbook, and Drell, Petitioner relies largely on the same teachings of those references for the limitations of claim 8 as in its contentions for the corresponding steps of claims 1, 3, and 6, as well as additional portions of Dr. Houh's testimony and Drell. Pet. 60–

[17] Conversely, whereas step [1.3.1] recites "receiving third audio data, *video data, and collaboration data* from at least one remote client," limitation [8.3] does not recite receiving video data or collaboration data from a remote client.

71 (citing Ex. 1003 ¶¶ 163–179, 189–206, 239–243, 279–300, 302, 304–309, 311–316, 318–321; Ex. 1006, 1:8–27, 3:24–29, 4:58–61, 6:65–67, 8:46–10:50, Figs. 1, 3, 8; Ex. 1008, code (57), 2:45–48, 5:8–23, 5:48–54, 6:18–62, Figs. 3, 5; Ex. 1010, Fig. 7-10).

Patent Owner's arguments with respect to claim 8 repeat essentially verbatim its arguments with respect to claim 1 (*compare* PO Resp. 21–25, *with id.* at 28–33) but further include several additional paragraphs: first, a paragraph regarding "claims 19 and 23," apparently copied from a brief in a different proceeding, given that the '332 patent contains only twelve claims; and second, the following argument with respect to VPN Textbook:

> Furthermore, Petitioner refers to the VPN textbook, which briefly mentions a "hub-and-spoke" topology used in some VPN networks. Using a textbook as a menu from which to recreate an invention using the claim as a template is improper.
>
> The VPN Textbook does not demonstrate or disclose the use of this topology in a multi-party conference call context. Petitioner would rely on Dr. Houh's personal experience with configuring and deploying VPN technology for VoIP traffic using the NBX 100 system, which is capable of conference calls, but does not point to prior art that can be relied up under Section 103. Moreover, the corresponding disclosure of VPN Textbook does not reveal anything about VPN tunnels.
>
> It is crucial to distinguish between a VPN and a VPN tunnel. A VPN (Virtual Private Network) represents a secure network formed by interconnected devices, functioning within a public network framework. On the other hand, a VPN tunnel is a connection between two devices that permits encapsulating a first packet from one protocol in a second packet from a different protocol.

Id. at 33–34; *see also supra* § III.D.4.e & n.16 (referencing this argument); Sur-reply 16–21 (repeating arguments from the Patent Owner Response).

On this record, Petitioner persuasively maps the limitations of claim 8 to the asserted prior art and provides reasons supported by factual

underpinnings of record to combine the reference teachings with a reasonable expectation of success. For the reasons set forth in the above discussion of Patent Owner's materially identical arguments with respect to claims 1 and 6 (*see supra* §§ III.D.4, III.E.3), we find that Patent Owner's arguments largely fail to address Petitioner's contentions and fail to address Petitioner's arguments in support of the combination.

Accordingly, we conclude that Petitioner has demonstrated by a preponderance of the evidence that claim 8 would have been obvious over the combination of Knappe, Elliott, VPN Textbook, and Drell.

5. Dependent Claims 9–11

Claims 9–11 depend from independent claim 8. Petitioner contends that the additional limitations of claims 9–11 are taught or suggested by the combination of Knappe and Drell. Pet. 71–76. In support, Petitioner relies on the testimony of Dr. Houh and provides citations to the references' teachings. *Id.*

On this record, Petitioner persuasively maps the limitations of claims 9–11 to the asserted prior art and provides reasons supported by factual underpinnings of record to combine the reference teachings with a reasonable expectation of success. *See* Pet. 71–76.

Patent Owner does not address these claims separately but relies on the same arguments regarding the "VPN tunnel" limitations addressed above in connection with claim 8. *See* PO Resp. 28–34.

Accordingly, we determine that Petitioner shows by a preponderance of evidence that claims 9–11 would have been obvious based on the combined teachings of Knappe, Elliott, VPN Textbook, and Drell.

F. Obviousness over Knappe, Elliott, VPN Textbook, Drell, and Hoke (Petitioner's Ground 3)

Petitioner alleges claim 12 is unpatentable under 35 U.S.C. § 103(a) as obvious over Knappe, Elliott, VPN Textbook, Drell, and Hoke. Pet. 4, 77–81. After reviewing the entire record developed at trial, we determine that Petitioner has shown, by a preponderance of the evidence, that claim 12 would have been obvious on the asserted ground.

1. Hoke

Hoke, titled "Method and Apparatus for Processing Communications in a Virtual Private Network," is generally directed to computer systems for processing communications in a VPN. Ex. 1009, codes (54), (57). Among other things, Hoke describes the compression and decompression of data communicated over a VPN. *See, e.g.*, *id.* at 2:50, 5:40–42 ("Many of the elements may be configured using well-known structures, particularly those designated as relating to various compression or encryption techniques."), Figs. 3, 4, 7. Hoke explains that "[w]hen VPN traffic is sent between source and destination endstations . . . , the VPN unit serving the source endstation processes the data packet, encrypts it, compresses it (if necessary), and . . . [t]he receiving VPN unit authenticates, decrypts and decompresses the packet (as necessary) before forwarding it toward the destination endstation." *Id.* at 8:38–50.

2. Dependent Claim 12

Claim 12 of the '332 patent depends from claim 8 and further recites "an encoder configured to encode the mixed data into a compressed data before transmitting the compressed data to the remote client." Ex. 1001, 10:61–63.

Petitioner relies on Hoke as teaching an encoder as recited in claim 12. Pet. 80–81 (citing Ex. 1009, 8:39–44, 9:6–12, 10:16–18; Ex. 1003 ¶¶ 363–370). Citing the testimony of Dr. Houh, Petitioner contends that a person of ordinary skill in the art "would have been motivated to combine the conferencing system of Knappe to include sharing of collaboration data through a VPN as taught in Elliot and the VPN Textbook," and further "would have considered the teachings of Hoke, as well, for teachings relevant to VPN tunneling implementations." *Id.* at 78 (citing Ex. 1003 ¶¶ 136–162, 355). In particular, Petitioner argues, the person of ordinary skill "would have recognized the desirability of compressing data before it is transmitted over a network, as it was well known in the art that compressing data would reduce bandwidth usage and improve performance." *Id.* (citing Ex. 1003 ¶ 356. For example, Petitioner contends, "Hoke's description of a VPN unit that performs both encryption and compression would have suggested to a [person of ordinary skill in the art] to include a compression feature in the VPN routers described in the VPN Textbook," and "[a]ny modifications needed to Knappe's system to accommodate the teachings of Hoke would have been within the level of ordinary skill in the art." *Id.* at 78–79 (citing Ex. 1003 ¶¶ 358–361).

Patent Owner does not specifically challenge Petitioner's arguments with respect to claim 12. *See generally* PO Resp. After considering the evidence and arguments of the complete record, we determine that Petitioner has shown, by a preponderance of the evidence, that Hoke teaches an encoder as recited in claim 12 and that claim 12, accordingly, would have been obvious over the combination of Knappe, Elliott, VPN Textbook, Drell, and Hoke.

IV. CONCLUSION

For the foregoing reasons, we conclude that Petitioner has demonstrated by a preponderance of the evidence that claims 1–12 of the '332 patent are unpatentable.[18]

In summary:

Claims	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 2, 4, 5, 7	103(a)	Knappe, Elliott, VPN Textbook	1, 2, 4, 5, 7	
3, 6, 8–11	103(a)	Knappe, Elliott, VPN Textbook, Drell	3, 6, 8–11	
12	103(a)	Knappe, Elliott, VPN Textbook, Drell, Hoke	12	
Overall Outcome			1–12	

[18] 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).

V. ORDER

It is hereby:

ORDERED that claims 1–12 of the '332 patent are determined to be unpatentable; and

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

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