

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.

Case IPR2023-00371
U.S. Patent No. 8,339,997

PETITION FOR *INTER PARTES* REVIEW OF
U.S. PATENT NO. 8,339,997

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1004	<i>Curriculum Vitae</i> for Dr. Henry H. Houh
1005	File History of Application No. 12/646,892 (the ’892 application)
1006	U.S. Patent No. 7,180,997 (“Knappe”)
1007	U.S. Patent No. 6,690,654 (“Elliott”)
1008	U.S. Patent No. 7,089,285 (“Drell”)
1009	U.S. Patent No. 6,701,437 (“Hoke”)
1010	Guichard <i>et al.</i> , “MPLS and VPN Architectures, A practical guide to understanding, designing and deploying MPLS and MPLS-enabled VPNs,” Cisco Press, 2001 (“VPN Textbook”)
1011	Declaration of Ingrid Hsieh-Yee, Ph.D., under 37 C.F.R. § 1.68
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1015	U.S. Patent No. 4,796,293
1016	A Primer on the T.120 Series Standard
1017	T.120 Standard (1996)
1018	U.S. Patent No. 6,237,025
1019	U.S. Patent No. 6,782,413

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1020	U.S. Patent No. 6,980,526
1021	Caputo, “Cisco Packetized Voice & Data Integration,” McGraw-Hill, 2000
1022	de Moraes <i>et al.</i> , “The Internet Multicast from ITS: How it was Done and Implications for the Future,” IEEE Communications Magazine, January 1995
1023	U.S. Patent Publication No. 2004/0261116 A1
1024	U.S. Patent No. 6,850,496
1025	U.S. Patent No. 6,553,515
1026	U.S. Patent No. 6,633,848
1027	Computer Desktop Encyclopedia (Freedman)
1028	RFC 760
1029	RFC 791
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1031	RFC 2401
1032	RFC 2406
1033	H.323 Standard
1034	U.S. Patent No. 7,281,058 (“Shepherd”)
1035	U.S. Provisional Patent Application No. 60/453,307
1036	U.S. Patent No. 7,664,056
1037	Declaration of C.J. Alice Chuang

I. INTRODUCTION

Zoho Corporation and Zoho Corporation Pvt., Ltd. (“Petitioner”) respectfully requests *inter partes* review (“IPR”) under 35 U.S.C. §§ 311, 312, 314(a), and 37 C.F.R. § 42.100, for claims 1-18 (“Challenged Claims”) of U.S. Patent No. 8,339,997, to Thomas Dye, et al., titled “Media Based Collaboration Using Mixed-Mode PSTN and Internet Networks” (“’997 patent,” Ex._1001). Meetrix IP, LLC (“Meetrix” or “Patent Owner”) is the patent owner of record. Ex_1002 (conveying the family of the ’997 patent to Meetrix through a series of assignments at Reel/frame Nos. 034715/0212 and 034759/0397 recorded January 14, 2015; Reel/frame No. 029932/0913 recorded March 6, 2013; Reel/frame Nos. 034005/0249, 034032/0082, and 034005/0904 recorded October 22, 2014; Reel/frame No. 053185/0298 recorded July 10, 2020).

The ’997 patent is directed to conferencing technology allowing “standard telephone users to audio conference with video conferencing participants,” where “a mixed mode hybrid network architecture ... conferences video and audio ... within the conference.” Ex_1001 at Abstract, 1:25-26. The hybrid network includes a Public Switched Telephone Network (PSTN) and an Internet with multicast enabled routing. *Id.* at 5:55-61, 6:28-67, FIGS. 3-4. As described below and in the Declaration of Dr. Henry H. Houh (Ex. 1003), these concepts were well known by the claimed priority date for the ’997 patent. The primary reference

(“Knappe,” Ex.) describes a multiparty audio/video conference system capable of “bridging, multicasting, call hold, conference call and other multiparty communications,” teaching receiving and mixing audio data from multiple participants, including a moderator, other Internet-connected devices, and PSTN telephone clients. Ex_1006, 1:8-27, 3:41-49, 4:18-53, 6:62-67, 8:52-57. Other claimed concepts, such as using virtual private network (VPN) and encapsulating a multicast IP packet as a unicast packet for transmission over VPN, were also well known in the prior art. The combination of these prior art teachings would have been obvious to one of ordinary skill in the art, and thus the claims of the ’997 patent are invalid.

II. MANDATORY NOTICES UNDER 37 C.F.R § 42.8(A)(1) AND (B)

A. Real Party-In-Interest Under 37 C.F.R. § 42.8(b)(1)

The real parties-in-interest are Zoho Corporation and Zoho Corporation Pvt., Ltd.

B. Lead and Back-Up Counsel and Service Information Under 37 C.F.R. § 42.8(b)(3) and (b)(4)

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Petitioner consents to electronic service by delivering the documents to the email addresses of primary and backup counsel. A Power of Attorney is being filed concurrently under 37 C.F.R. § 41.10(b).

C. Related matters Per 37 C.F.R. § 42.8(b)(2)

Patent Owner has asserted infringement of the '997 patent in the following pending district court lawsuits: *Meetrix, LLC v. Zoho Corporation*, No. 6:21-cv-01288 (W.D. Tex.).

III. PAYMENT OF FEES – 37 C.F.R. § 42.103

Petitioner pays the fee for this petition as required by 37 C.F.R. § 42.15(a) contemporaneously with the filing of this petition.

IV. GROUND FOR STANDING UNDER 37 C.F.R. § 42.104(A)

Petitioner certifies under 37 C.F.R. § 42.104(a) that the '997 patent is available for IPR and that Petitioner is not barred or estopped from requesting an IPR challenging the validity of the challenged claims on the identified grounds. Petitioner has not filed a civil action challenging the validity of any claim of the '997 patent.

V. CHALLENGE UNDER 37 C.F.R. § 42.104(B) AND RELIEF REQUESTED

Petitioner requests IPR and cancellation of claims 1-18 of the '997 patent under pre-AIA 35 U.S.C. § 103. Pursuant to 37 C.F.R. § 42.6(c), copies of the Exhibits are filed herewith.

Under 37 C.F.R. §§ 42.104(b)(1) and (2), these grounds are offered as reasons for cancelling claims 1-18 of the '997 patent:

Ground	Claims	Statutory Basis	Reference(s)
1	1 and 3-7	§ 103	Knappe, Elliott, VPN Textbook, and de Moraes
2	2 and 8-10	§ 103	Knappe, Elliott, VPN Textbook, de Moraes, and Shepherd

U.S. Patent No. 7,180,997 to Knappe (“Knappe” – Ex_1006) was filed on September 6, 2002.

U.S. Patent No. 6,690,654 to Elliott (“Elliott” – Ex_1007) was filed on October 1, 1998.

U.S. Patent No. 7,768,913 to Shepherd *et al.* (“Shepherd” – Ex_1034) was filed on October 9, 2002.

“MPLS and VPN Architectures,” (“VPN Textbook” – Ex_1010) by Guichard *et al.*, was published in 2000. *See* Ex_1011, ¶¶ 92-106.

“The Internet Multicast from ITS: How it was Done and Implications for the Future,” (“de Moraes” – Ex_1022) by de Moraes *et al.*, was published in 1995. See Ex_1011, ¶¶ 67-75.

Knappe and Elliott are prior art under 35 U.S.C. § 102(e). The VPN Textbook is prior art under 35 U.S.C. § 102(b).

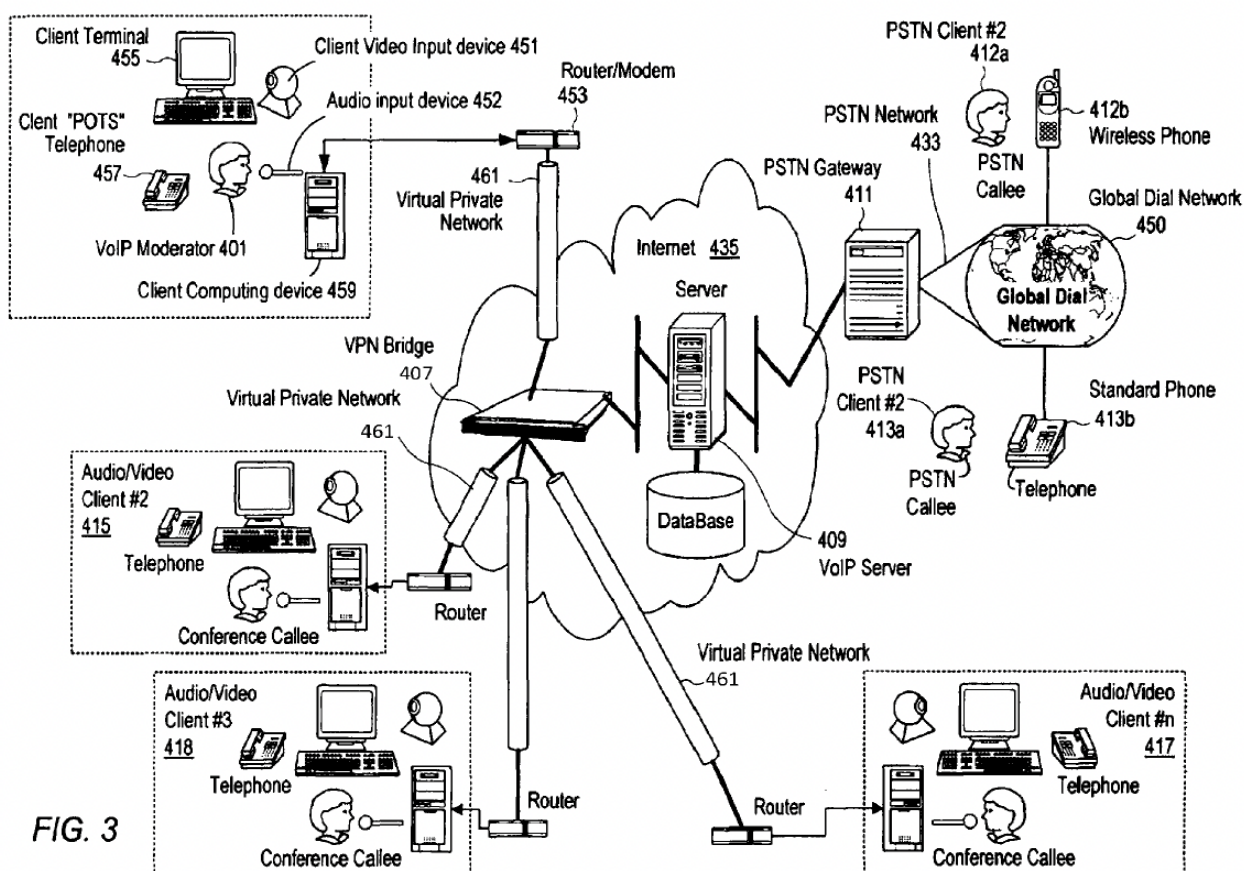
VI. OVERVIEW OF THE '997 PATENT

U.S. Patent No. 8,339,997 (Ex_1001) titled “Media Based Collaboration Using Mixed-Mode PSTN and Internet Networks” was filed on Dec. 23, 2009, as a continuation in a string of applications, the first of which was a provisional application filed March 10, 2003—the earliest possible priority date for the '997 patent. Ex_1001, Title page; Ex_1003, ¶ 48.

A. The '997 Patent Specification

The '997 patent is directed to a “method which allows standard telephone users to audio conference with video conferencing participants over IP. Networks in a private secure environment.” Ex_1001 at Abstract; Ex_1003, ¶ 49. This hybrid network connects a moderator, several audio video clients, and a PSTN Gateway to one or more Public Switched Telephone Network (PSTN) clients. Ex_1001, FIG. 3, 5:62-6:27 (illustrating and describing VoIP Moderator 401, Audio/Video Clients 415, 417, 418, PSTN Gateway 411, PSTN Clients 412a-413a, and VPN bridge 407 connecting various VPNs 461); Ex_1003, ¶ 49. “[T]he

Internet-based clients 401, 415, 418, and 417 are connected through routers or modems 453 preferably in a virtual private network configuration 461” with “the VPN bridge 407 to the voice over IP server 409 [being] used to transfer conference audio from any participant on the IP network to any participant in the PSTN,” the VPN bridge and the voice over IP server 409 located at the center of a “star topology” connecting audio video clients with PSTN clients. Ex_1001, 6:16-23; Ex_1003, ¶ 49.



The '997 Patent also discloses transporting audio, video, and other media data among client groups that share the same multicast group address, mentioning

the possibility of “encapsulating the multicast IP packet as a unicast packet” and “transmitting the unicast packet over the virtual private networks across the Internet.” Ex_1001, 4:61-63, 6:28-7:29, FIG. 4; Ex_1003, ¶ 50.

B. The Challenged Claims

Petitioner requests IPR of claims 1-10. The '997 patent has two (2) independent method claim directed to adding a telephone participant to a multi-participant audio-video conference. Independent claim 1 is directed to a method:

1. A method for adding a telephone participant to a multi-participant audio-video conference, the method comprising:

[step 1] sending a first message to each of a plurality of multicast appliances over the Internet, wherein the first message comprises a group address which identifies a plurality of participants;

[step 2] each of the multicast appliances receiving the first message;

[step 3] establishing a plurality of virtual private networks across the Internet routes between the multicast appliances;

[step 4] enabling at least one of the participants to communicate in the multi-participant video conferences;

[step 5] the telephone participant joining the multi-participant video conference, wherein said joining comprises:

[step 5a] the telephone participant calling into a gateway server;

[step 5b] the telephone participant providing conference ID information;

[step 5c] the gateway server establishing communication with a conferencing server;

[step 5d] authenticating the telephone participant; and

[step 5e] transmitting multicast group information to the gateway server;

[step 6] wherein the gateway server is operable to use the multicast group information to enable the telephone participant to participate in the multi-participant video conference.

Ex_1001, 10:64-11:23. Dependent claim 2 further adds the following sub-steps for “the telephone participant participating in the multi-participant video conference” (step 5 above¹):

[step 5f] the telephone participant speaking in the video conference;

[step 5g] generating digital voice data in response to the telephone participant speaking;

[step 5h] the gateway transforming the digital voice data[sic] into IP packets;

[step 5i] configuring the IP packet with a group address according to a multicast protocol to create a multicast IP packet;

[step 5j] encapsulating the multicast IP packet as a unicast packet;

¹ Although this is not the exact wording of step 5 of claim 1, step 5 appears to be the closest limitation to the element that claim 2 purports to limit, so for the purposes of this IPR petition and proceedings, Petitioner interprets claim 2 to modify step 5 in claim 1.

[step 5k] transmitting the unicast packet over the virtual private networks across the Internet between one or more appliances;

[step 5l] one or more of the appliances determining the multicast data from the unicast packet; and

[step 5m] the appliances providing the multicast data to each of the other participants in the group address.

Id., 11:24-42. Claim 3 is an independent claim for a method for adding a telephone participant to a multi-participant audio-video conference that includes a subset of steps from claims 1-2. Ex_1003, ¶ 50. Independent claim 3 recites:

[claim 1 step 1] sending a first message to each of a plurality of multicast appliances over the Internet, wherein the first message comprises a group address which identifies a plurality of participants;

[claim 1 step 2] each of the multicast appliances receiving the first message;

[claim 1 step 3] establishing a plurality of virtual private networks across the Internet routes between the multicast appliances;

[claim 1 step 4] enabling at least one of the participants to communicate in the multi-participant video conferences;

[claim 1 step 5] the telephone participant joining the multi-participant video conference, wherein said joining comprises:

[claim 1 step 5b] the telephone participant providing conference ID information;

[claim 1 step 5d] authenticating the telephone participant; and

[claim 2 step 5] the telephone participant participating in the multi-participant video conference comprises:

[claim 2 step 5f] the telephone participant speaking in the video conference; and

[claim 2 step 5g] generating digital voice data in response to the telephone participant speaking.

Id., 11:43-65. Claims 4-10 further reiterate elements from claims 1-2. *Id.*, 11:66-12:24, 12:25-43.

C. Level of Ordinary Skill in the Art

The subject matter of the '997 patent generally relates to the technical field of audio/video conferencing systems. A Person of Ordinary Skill in the Art ("POSITA") as of March 10, 2003, would have had a working knowledge of available audio and video conferencing art. Ex_1003, ¶ 27. A POSITA would have had a bachelor's degree in electrical engineering, computer science, computer engineering, or an equivalent, and three years of professional experience relating to conferencing systems in packet-based networks. *Id.* Someone with less technical education but more experience, or more technical education but less experience could also have met this standard. *Id.*

D. Claim Construction

During IPR claims are construed according to the standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (*en banc*). See 83 Fed. Reg. 51341 (October 11, 2018). Petitioner believes that, for purposes of this proceeding and the prior art assertions presented herein, no claim term requires

express construction for the Board to evaluate the patentability of the claims.²

Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc., 200 F.2d 795, 803 (Fed. Cir. 1999).

Accordingly, this Petition analyzes the claims consistent with ordinary and customary meaning as would be understood by a POSITA in light of the specification. *Phillips*, 415 F.3d at 1314-17; *see also* Ex_1003, ¶ 31.

E. The '997 Patent Priority Date

The '997 patent issued from U.S. Patent Application No. 12/646,892 (the "'892 application"), filed December 23, 2009. Ex_1001, Title page. The '892 application is a continuation of U.S. Patent Application No. 10/796,560, filed March 9, 2004, now U.S. Patent No. 7,664,056 (the "'056 patent"), which claimed the benefit of U.S. Provisional Patent Application No. 60/453,307 ("Provisional application"), filed March 10, 2003. Ex_1036, Title page. Figure 4 and the description of Figure 4 in the specification of the '892 application was not included in the Provisional application. *Compare* Ex_1001, 6:28-7:28 & FIG. 4 (including Figure 4 with description) *with* Ex_1035 (provisional application does not include Figure 4 and its description from the '997 patent). The Figure 4 from the '997

² Petitioner reserves its rights to: (1) respond to assertions by Patent Owner that any claim term requires construction for the purposes of this IPR proceeding; and (2) seek construction of any claim term in other forums as appropriate.

patent does not appear until the first non-provisional application filed in the family on March 9, 2004. *See* Ex_1036, Title page, FIG. 4, 6:21-7:20. However, for the purposes of this Petition, Petitioner uses March 10, 2003, as the priority date for the Challenged Claims.

F. Summary of the Prosecution History of the '997 Patent

The '892 application was first presented with only two method claims. During examination the Examiner rejected the two method claims originally presented for obviousness-type double patenting over claims 1-8 of the parent '056 patent. Ex_1005, pp. 103-106. There was no further substantive examination of the '892 application, even though new independent and dependent claims were added—these new claims were merely permutations of the first two claims, as is shown above in section VI.B. of this Petition (Challenged Claims). *Id.*, pp. 56-69 (Amendment and Response submitted on July 3, 2012). The Examiner allowed the new claims without explaining reasons for allowance. *Id.*, pp. 33-37 (Notice of Allowance and Fee(s) Due and Notice of Allowability mailed on August 16, 2012). The Examiner did not consider during prosecution, and Patent Owner did not disclose in any Information Disclosure Statements, the prior art patents and printed publications that form the grounds on which Petitioner brings this challenge to the claims of the '997 patent. *See id.*, pp. 12, 39-43, 71-97, 107-108 (references cited by the applicant and Examiner).

VII. THE BOARD’S DISCRETION UNDER 35 U.S.C. § 314(A) SHOULD NOT PRECLUDE INSTITUTION

On June 21, 2022, the Director of the USPTO issued a memorandum setting forth interim procedures for determining whether to institute IPR proceedings in view of the factors set forth in *Apple Inc. v. Fintiv, Inc.* (*Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020)). See https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf (“Memorandum”). The Memorandum clarified (1) that the PTAB will not rely on the *Fintiv* factors to discretionarily deny institution where a petition presents compelling evidence of patentability, and (2) consistent with *Sotera Wireless* (*Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 (PTAB Dec. 1, 2020)), the PTAB will not discretionarily deny institution where a petitioner presents a stipulation not to pursue in a parallel proceeding the same grounds or any grounds that could have been raised before the PTAB. In light of both these factors, the Board should not exercise its discretion to deny institution here.

First, this Petition presents compelling evidence of unpatentability. As set forth below in this Petition and in the accompanying declaration of Dr. Houh (Ex_1003), the subject matter of the ’997 patent relates to well-known concepts of audio and video conferencing over IP networks between multicast appliances. By the earliest claimed priority date of the ’997 patent, there were many

available audio and video conferencing systems over IP networks between multicast appliances, and as set forth in detail in Dr. Houh's declaration, a POSITA was well aware of how to use known communications technologies such as audio and video conferencing, codecs, VPN tunneling, and multicast IP packets to communicate conferencing data across IP networks. *See e.g.* Ex_1003 ¶¶ 51-101. Thus, this is not a case in which Petitioner barely meets the IPR standards with obscure technical references. Here there is compelling evidence that the claims of the '997 patent merely recite known and well-established multi-party conferencing technology.

Second, upon the filing of this Petition, Petitioner intends to file in the pending district court litigation a request for pre-institution stay of proceedings with a stipulation that, if the IPR is instituted, Petition will not rely in the district court litigation on any grounds that is raised or could have been in this Petition.

Finally, the remaining *Fintiv* factors weigh against denial:

Fintiv factor 1, likelihood of a stay.

As noted, Petitioner is seeking a pre-institution stay and if needed, will renew the request for a stay upon institution. Even if Patent Owner suggests that district court litigation may not be stayed, the Board "will not attempt to predict how the district court in the related district court litigation will proceed because the court may determine whether or not to stay any individual case, including

the related one, based on a variety of circumstances and facts beyond [its] control and to which the Board is not privy.” *Sand Revolution II, LLC v. Continental Intermodal Group-Trucking LLC*, IPR2019-01393, Paper 24, 7 (June 16, 2020) (Informative); see *Intel Corp. v. VLSI Tech. LLC*, IPR2020-00158, Paper 16, *7 (May 20, 2020).

Fintiv factor 2, trial date proximity to Final Written Decision (FWD).

No trial date has been set in the district court litigation. The district court litigation is still in the early stages, having been transferred between divisions in the W.D. Texas and stayed for several months pending re-assignment. Given the parties have yet to initiate discovery or conduct claim construction, it is likely a Final Written Decision would issue far in advance of any potential trial date in the district court litigation, particularly as Petitioner will be seeking a stay of the litigation.

Fintiv factor 3 and 4, investment in the parallel proceedings and overlap in issues.

As of the date of filing this Petition, the district court remains in the early stages. While the case was originally filed in December 2021, early procedural motions and an intra-district transfer and stay of the case means that, as of the filing of this Petition, there has been no fact discovery, no substantive motions, and no claim construction. In short, no substantive action has been taken in the

district court litigation and very little court and party investment has been made in that proceeding. *Sand Revolution*, IPR2019-01393, Paper 24 at 10-11 (two-page *Markman* Order did not demonstrate high level of investment of time and resources).

Critically, however, the invalidity grounds, arguments, and evidence presented in this Petition will be different than those presented in the district court. As noted above, Petitioner will stipulate in the Litigation that if the Board institutes IPR of the challenged claims in this Petition, it will not pursue invalidity of the challenged claims on the same grounds at issue in this Petition or any grounds that could have been raised in this Petition. This mitigates concerns of duplicated efforts and conflicting decisions. *See Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 (PTAB Dec 1, 2020); *see also VMware, Inc. v. Intellectual Ventures I LLC*, IPR2020-00470, Paper 13 at 20 (PTAB Aug. 18, 2020) (finding similar stipulation “mitigates any concerns of duplicative efforts between the district court and the Board, as well as concerns of potentially conflicting decisions”). As such, these factors weigh against discretionary denial.

VIII. IDENTIFICATION OF WHERE EACH ELEMENT OF EACH CLAIM IS FOUND IN THE PRIOR ART

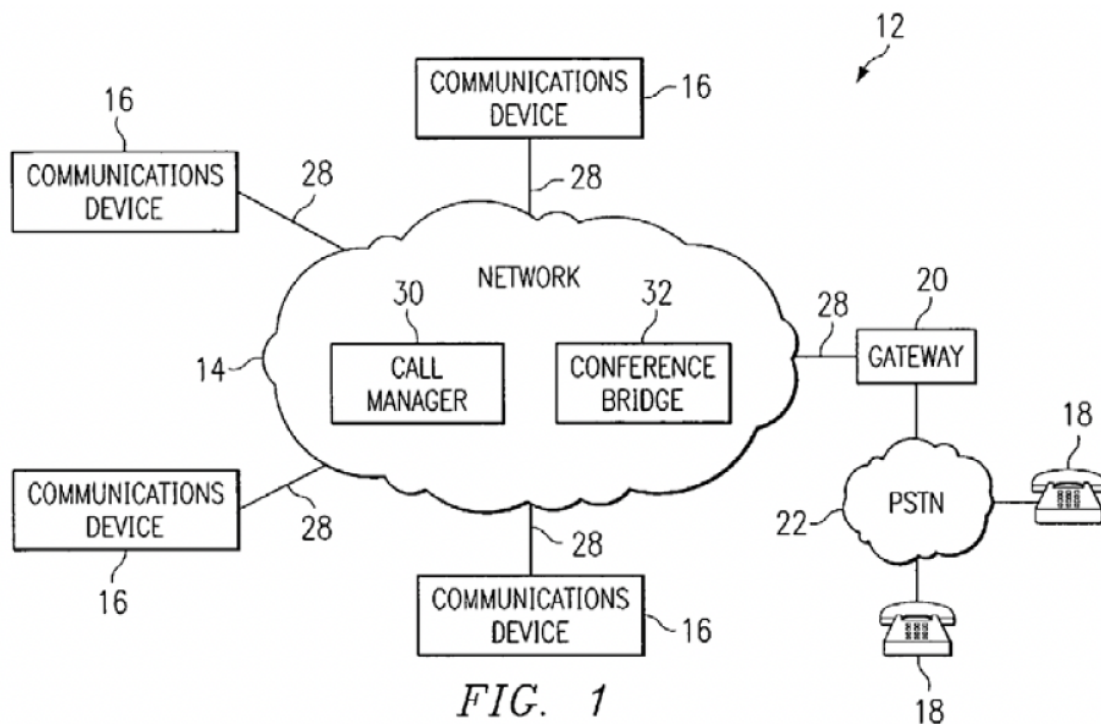
Petitioner respectfully requests cancellation of claims 1-10 of the '997 patent.

A. Ground 1: Claims 1 and 3-7 are obvious under 35 U.S.C. § 103(a) over Knappe in view of Elliott, the VPN Textbook, and de Moraes

1. Summary of Knappe

United States Patent No. 7,180,997 (“Knappe”) entitled “Method and System for Improving the Intelligibility of a Moderator During a Multiparty Communication Session” was filed September 6, 2002. Ex_1006; Ex_1003, ¶ 106.

Like the '997 patent, Knappe discloses a method and system where a moderator participates in “a multi-party communication session” with “a plurality of participant voice streams from a plurality of respective conference participants.” Ex_1006, Abstract, 1:8-11, 8:46-10:50, FIGS. 1-8; Ex_1003, ¶ 107. Knappe illustrates multiple conference endpoints (e.g., communication devices 16 and PSTN telephones 18) in Figure 1 below:



Ex_1006, FIG. 1; *see also, id.*, 3:41-4:28 (“Referring to FIG. 1, communication system 12 includes a network 14 connecting a plurality of communication devices 16 to each other and to standard analog telephones 18 through a gateway 20 and the public switched telephone network (PSTN) 22. ... network 14 is the Internet, a wide area network (WAN), a local area network (LAN) or other suitable packet-switched network. ... A codec (coder/decoder) converts audio, video or other suitable signals generated by users from analog signals to digital form. The digital encoded data is encapsulated into IP or other suitable packets for transmission over the network 14. IP packets received from the network 14 are converted back into analog signals and played to the user.”). The “participants are connected and stream media through the conference bridge 32.” *Id.*, 5:32-33; Ex_1003, ¶ 107.

Knappe describes an “Internet embodiment, [where] the network 14 transmits information in Internet Protocol (IP) packets. Telephony voice information is transmitted in the Voice over IP (VoIP) format. Real-time IP packets such as VoIP packets are encapsulated in real-time transport protocol (RTP) packets for transmission over the network 14,” which is known in the art to allow data transfer to multiple destinations using multicast IP packets. *Id.*, 3:53-58; Ex_1003, ¶ 108; *see also* Ex_1006, 4:9-28 (further expanding on encapsulating digital encoded data into IP packets). Thereby “each participant receives the audio input of each other participant,” as well as “video, voice, data and other suitable

types of real-time and/or non real-time” data. Ex_1006, 7:1-2, 3:27-28; *see also*, *id.*, 7:2-15; Ex_1003, ¶ 108.

2. Summary of Elliott

United States Patent No. 6,690,654 (“Elliott”) entitled “Method and System for Multi-Media Collaboration Between Remote Parties” was filed October 1, 1998. Ex_1007; Ex_1003, ¶ 109.

Elliott generally relates to the field of conferencing systems. Ex_1007, Abstract; Ex_1003, ¶ 110. Elliott teaches conferencing features such as “collaborative Web browsing, audio conferencing, video conferencing, and application sharing.” *Id.*, 1:40-44; Ex_1003, ¶ 110. Elliott further teaches the use of “a virtual private network (VPN) ... which uses IP or IP-tunneling” for the transmission of “voice, fax, data, video” and “[o]ther types of collaboration ... data” during the conference. Ex_1007, 2:66-3:1, 4:29-34, 6:53-54; Ex_1003, ¶ 110.

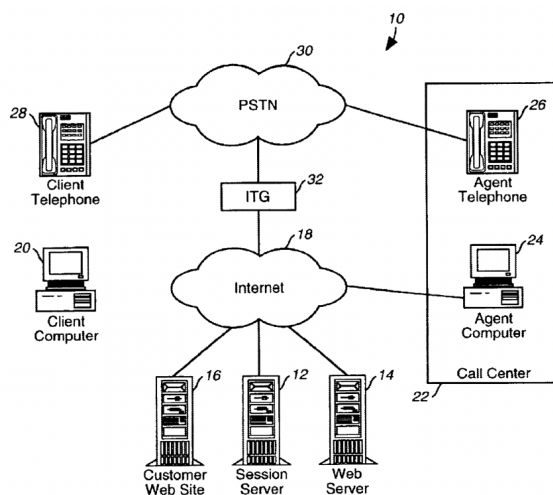


FIG. 1

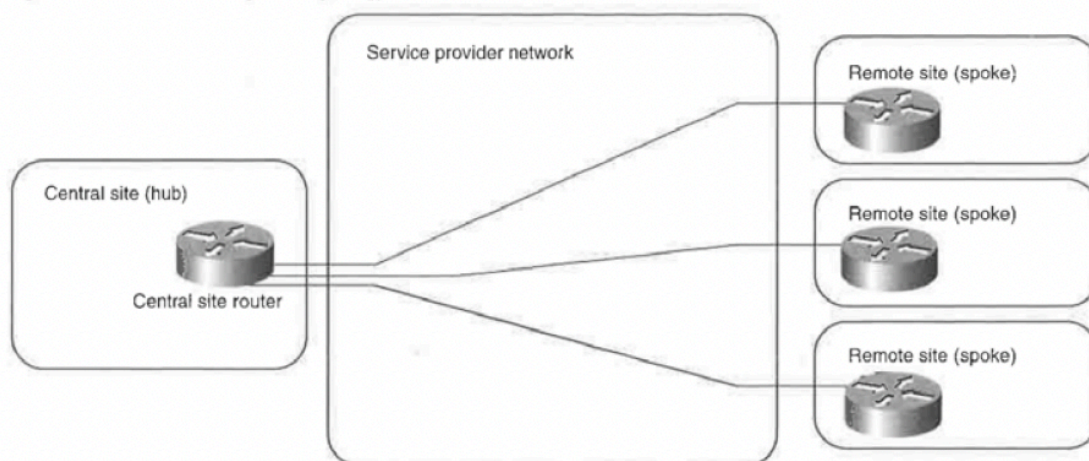
Figure 1 of Elliott shows a “session server 12 [that] is a conference server that follows the ITU T.120 standard” which “contains a series of communication and application protocols and services that provide support for real-time, multi-point data communications.” Ex_1007, FIG. 1, 5:49-54; Ex_1003, ¶ 110. “[N]etwork 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.” Ex_1007, 4:28-32; Ex_1003, ¶ 110.

3. Summary of VPN Textbook

The textbook “MPLS and VPN Architectures, A practical guide to understanding, designing and deploying MPLS and MPLS-enabled VPNs,” (“VPN Textbook” – Ex_1010) by Guichard *et al.*, was published in 2000 by Cisco Press. Ex_1011, ¶¶ 95-111; Ex_1003, ¶ 111.

The VPN Textbook describes well-known topologies for implementing VPNs. Ex_1010, p. 129-133; Ex_1003, ¶ 112. The VPN Textbook describes that “[t]he most commonly encountered topology is a hub-and-spoke topology, where a number of remote offices (spokes) are connected to a central site (hub).” Ex_1010, p. 129; Ex_1003, ¶ 112. In the art, the “hub-and-spoke” topology, shown in Figure 7-10 of the VPN Textbook, also is referred to as a “star” topology. Ex_1030, p. 438; Ex_1003, ¶ 112.

Figure 7-10 *Hub-and-spoke Topology*



Ex_1010, p. 130. The VPN Textbook describes this hub-and-spoke (aka star) topology as being the “most commonly encountered topology,” chosen often “for cost or complexity reasons.” *Id.*, p. 129; Ex_1003, ¶ 112. The VPN Textbook explains that “hub-and-spoke VPN topology is more common than you might expect.” *Id.*

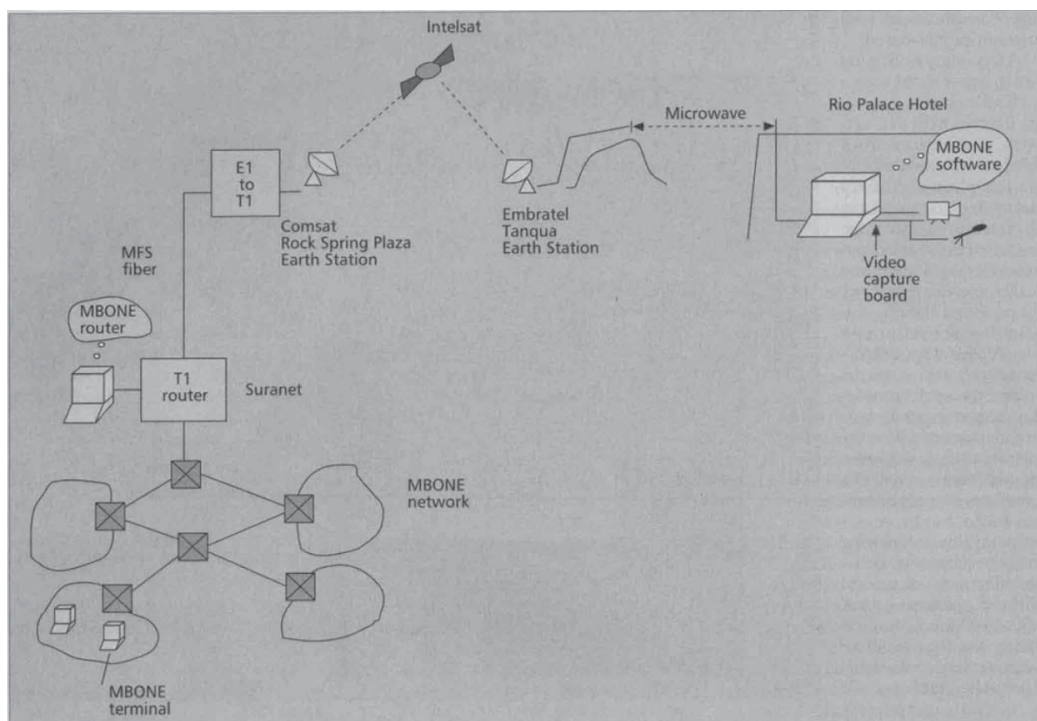
4. Summary of de Moraes

The article “The Internet Multicast from ITS: How it was Done and Implications for the Future,” (“de Moraes” – Ex_1022) by de Moraes *et al.*, was published in 1995 in the journal *IEEE Communications Magazine*. See Ex_1011, ¶¶ 70-78; Ex_1003, ¶ 113.

De Moraes describes the concept of multicast backbones (“MBONES”), enabling unicast connections between multicast routers. Ex_1022, p. 6 (“IP multicast packets are encapsulated for transmission through tunnels, so that they look like normal unicast packets to intervening routers and subnets.”); Ex_1003,

¶ 114. Connected hosts operating as multicast routers perform multicast routing using unicast connections between multicast routers. *Id.* MBONE enables a multicast router to forward multicast packets to a host or participant, as well as an IP multicast packet with a destination address being the address of a group of hosts. Ex_1022, p. 6 (“IP multicast addressing is an Internet standard (RFC 1112)”); Ex_1003, ¶ 114; *see also* Ex_1030, pp. 1, 9-16 (describing configuring, sending, and receiving of multicast packets comprising “group-address” and/or “IP host group address,” and explaining that “IP multicasting is the transmission of an IP datagram to a ‘host group’, a set of zero or more hosts identified by a single IP destination address.”). Using MBONE, a host can multicast to a group of hosts by sending an IP multicast packet to one or more multicast routers (e.g., the group of hosts) with a destination group address—the address of the group of hosts—through tunnels between the hosts. Ex_1022, p. 6 (“IP multicast addressing is an Internet standard (RFC 1112)”); Ex_1003, ¶ 114. The tunnels were often unicast connections between the one or more multicast routers. Ex_1022, p. 6 (“IP multicast addressing is an Internet standard (RFC 1112)”); Ex_1003, ¶ 114. A successful demonstration of transmitting “digital compressed audio/video signals” over MBONE is detailed in de Moraes wherein a remote user in College Park, Maryland, was able to participate in a conference at the Rio Palace Hotel in Brazil. Ex_1022, p. 7-8; Ex_1003, ¶ 114. “Figure 2 shows the essential systems

components. Workstations functioned as Internet hosts and as media processors (...) at the two ends, which were a conference room in the Rio Palace hotel and the facilities of SURANet, an Internet access provider in College Park, Maryland. ... A microwave link carried the digital compressed audio/video signals from the workstation at the Rio Palace Hotel to ... COMSAT's headquarters in Bethesda, MD." Ex_1022, p. 6 ("IP multicast addressing is an Internet standard (RFC 1112)"); Ex_1003, ¶ 114.



Id.

5. Reasons to Combine Knappe and Elliott

A POSITA would have been motivated to combine the teachings of Knappe and Elliott to produce the obvious, beneficial, and predictable results of using

different types of collaboration data and VPN tunneling within Knappe's system, among other benefits. Ex_1003, ¶ 115. A POSITA, when considering the teachings of Knappe, also would have considered the teachings of Elliott since they are analogous prior art both pertaining to the same field of endeavor of multiparty conferencing. *See, e.g.*, Ex_1006, Abstract, 3:26-29; Ex_1007, Abstract; Ex_1003, ¶ 115. Also, both Knappe and Elliott support computer and PSTN telephone conference participants. *See, e.g.*, Ex_1006, 3:41-49, FIG. 1; Ex_1007, 5:35-39, 6:1-11, 8:16-39, FIG. 1; Ex_1003, ¶ 115.

A first predictable and beneficial result of combining Knappe and Elliott includes the sharing of collaboration data, as disclosed in Elliott, with the various ways of conveying information among participants in a multiparty conference, as disclosed in both Knappe and Elliott. Ex_1003, ¶ 116. As discussed above, Knappe teaches a communications system capable of "transmitting audio, video, voice, data and other suitable types of ... traffic between source and destination endpoints." Ex_1006, 3:26-29; Ex_1003, ¶ 116. To a POSITA, Knappe's disclosure of transmitting "data" or other "traffic" would suggest the transmission of various types of data during the conference call to facilitate collaboration among the participants. Ex_1003, ¶ 116. Similarly, Elliott expressly teaches the sharing of collaboration data, including "collaborative Web browsing, audio conferencing, video conferencing, and application sharing." Ex_1007, 1:43-44; Ex_1003, ¶ 116.

Like Knappe, Elliott also discloses connecting calls “over the public switched telephone network (PSTN) 30” using “session server 12 ... that follows the ITU T.120 standard” capable of “support[ing] real-time, multi-point data communications,” the server “able to set up to conduct video conferences, audio conferences, and data conferences with application sharing,” as well as “[c]ollaborative Web browsing.” Ex_1007, 5:35-61; Ex_1003, ¶¶ 116; *see also* Ex_1016; Ex_1017; Ex_1011, ¶¶ 45-52 (attesting to publication dates of the T.120 Standard and the Primer on the T.120 Series Standard). Given the similar conferencing systems described in Knappe and Elliott, a POSITA would have had a reasonable expectation of success in the combination, particularly since exchanging collaboration data was standardized (e.g., under the T.120 standard) and VPN tunneling was conventional by the time of Knappe and Elliott, and before the earliest claimed priority of the ’997 patent.³ Ex_1003, ¶ 116 (Dr. Houh personally, prior to the earliest claimed priority date of the ’997 patent, configured, deployed, and utilized VPN technology for carrying VoIP traffic using the NBX

³ The T.120 standard was established by the International Telecommunications Union (ITU) and contains a series of application protocols (e.g., T.122, T.123, T.124, and T.125), including standardizing the exchange of collaboration data. *See, e.g.*, Ex_1016; Ex_1001, 3:10-12.

100 system, which was capable of performing conference calls); *see also* Ex_1019, 4:23-29, 6:36-41; Ex_1007, 5:49-57.

It would have been obvious to a POSITA, in view of Elliott's teachings, to implement Knappe's transmission of various types of data as collaboration data, including the "video conferences, audio conferences," "data conferences with application sharing," and "collaborate Web browsing," (Ex_1007, 5:49-57) described in Elliott because this type of collaboration data would allow for conveying a greater variety of information among the participants thereby improving the conferencing experience and enhancing the effectiveness of collaboration in a variety of contexts. Ex_1003, ¶¶ 116-117. Indeed, other patents and printed publications confirm that it was known in the art at the time of the priority date of the '997 patent that additional collaboration data improves the conferencing experience:

"... collaboration often involves the sharing of visual information—e.g., printed material such as articles, drawings, photographs, charts and graphs, as well as video-tapes and computer-based animations, visualizations and other displays—in such a way that the participants can collectively and interactively examine, discuss, annotate and revise the information. This combination of spoken words, gestures,

visual cues and interactive data sharing **significantly enhances the effectiveness of collaboration in a variety of contexts, ...”**

Ex_1018, 1:30-39 (emphasis added); Ex_1003, ¶ 117. Sharing collaborative information such as written or graphic material during a video conference had been known in the conferencing art for over 30 years prior to the priority date of the ’997 patent. *See, e.g.*, Ex_1014, Abstract, 17:20-41 (claims 7-11), 18:30-49 (claims 21-24); Ex_1003, ¶ 117; *see also*, Ex_1003, ¶¶ 51-58; Ex_1012, 1:11-13 (describing multiparty audio telephone conferencing from the 1960s); Ex_1013, Abstract (describing “telephone conference system includ[ing] a conference bridge for coupling” multiple parties from the 1970s). Accordingly, a POSITA would have recognized that collaboration data (e.g., web browsing data, application data, and data provided by the T.120 standard, as Elliott teaches) would be beneficial to Knappe’s participants. Ex_1003, ¶ 117. Such a combination would have simply involved combining prior art elements—collaboration data taught by Elliott with conferencing system of Knappe—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, the combination of Knappe and Elliott being merely the ordinary use of common techniques to improve the similar conference systems of Knappe and Elliott. Ex_1003, ¶ 117.

A second predictable and beneficial result of combining Knappe and Elliott includes the use of a VPN, as disclosed in Elliott, to protect communications between participants in Knappe's conferencing system. Ex_1003, ¶ 118. It was known in the art that data transmitted over public IP networks is vulnerable to eavesdropping and other problems. Ex_1010, p. 119 (stating that "more and more business-to-business traffic takes place over the Internet," which is "riddled with security issues"); Ex_1003, ¶ 118. It was known that a solution for securing communications over public networks was by using a VPN. Ex_1010, p. 115 ("A Virtual Private Network (VPN) ... [provides] connectivity amongst multiple sites ... with the same access or security policies as a private network."); Ex_1003, ¶ 118. Thus, it would have been obvious to a POSITA to use VPNs for conferencing systems, as described in Elliott, and to beneficially use said security with Knappe's multiparty conferencing communications over the Internet. Ex_1003, ¶ 118; Ex_1006, 1:32-67 ("Modern business practices often require that several persons meet on the telephone to engage in a conference call. ... The present invention provides an improved method and system for ... a multiparty communication session that substantially eliminate or reduce the disadvantages and problems associated with previous systems and methods."); Ex_1003, ¶ 118.

The obviousness of adding a VPN feature to Knappe's conferencing system is further demonstrated by the work of others in the art making similar feature

combinations as evidenced by other prior art patents. Ex_1003, ¶ 119; *see, e.g.*, Ex_1020, 2:65-3:3, 5:52-55 (disclosing “need for a videoconferencing system ... for delivering secure ... services over an IP network” by using a “VPN ... over public networks ... which is encrypted to make it secure from outside access and interference”); Ex_1019, 2:66-3:1, 4:23-27, 6:36-41 (describing a “conference bridge application” that transmits data “over public networks, using technologies such as ... [a] Virtual Private Network (VPN”). Therefore, a POSITA would have found it obvious to combine Knappe’s conferencing system with the VPN technology described in Elliott and the VPN Textbooks (discussed below).

Ex_1003, ¶¶ 85-90, 119; *see also* Ex_1023, ¶¶ 1412, 1452-1453 (describing “VPN connectivity,” including “hub-and-spoke or mixed topologies” in the context of “services [that] include Internet Access, ... chat and Video-conferencing etc.”).

More specifically, Elliott teaches using a “virtual private network (VPN) ... which uses IP or IP-tunneling” to transmit “voice, fax, data, video” and “[o]ther types of collaboration ... data.” Ex_1007, 2:66-3:1, 4:29-34, 6:53-54; Ex_1003, ¶ 120. In view of Elliott’s VPN teachings, it would have been obvious to a POSITA to use VPN tunneling when communicating audio, video, and collaboration data across Knappe’s Internet network 14 to make the transmitted data secure without the need to lease private data lines and otherwise reduce costs for implanting a private network securely over the Internet. Ex_1003, ¶¶ 77-86,

120; *see* Ex_1020, 5:52-55 (“VPN refers to a network that is carried over public networks, but which is encrypted to make it secure from outside access and interference.”); Ex_1026, 44:10-12 (“[O]ffices [] create virtual private networks (VPNs) to save money on remote access and interoffice connectivity.”); *see also* Ex_1020, 5:51-55 (“a Virtual Private Network (VPN) may be created between the [enterprise video] gateway 36 and [videoconferencing services] switch 12. VPN refers to a network that is carried over public networks, but which is encrypted to make it secure from outside access and interference”). Indeed, the combination of Knappe and Elliott is merely the ordinary use of the common technique of VPN tunneling of conferencing data, as disclosed in Elliott, in the similar conferencing system of Knappe to yield predictable results, including securing transmitted data and reducing costs associated with leasing private data lines. Ex_1003, ¶ 120.

Petitioner’s proposed combination permits, but does not require, physical incorporation of elements from Elliott and Knappe. *See In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012); *In re Etter*, 756 F.2d 852, 859 (Fed. Cir. 1985) (en banc) (noting that the criterion for obviousness is not whether the references can be combined physically, but whether the claimed invention is rendered obvious by the teachings of the prior art as a whole); Ex_1003, ¶ 121.

6. Reasons to Combine Knappe and VPN Textbook

A POSITA 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. Ex_1003, ¶¶ 77-86, 122.

As discussed above, Knappe teaches a conferencing system capable of “transmitting audio, video, voice, data and other suitable types of ... traffic between source and destination endpoints,” and Elliott teaches VPN tunneling of conferencing data for a conferencing system like Knappe’s. Ex_1006, 3:26-29; Ex_1003, ¶¶ 115-120, 123; *see* Ex_1007, 2:66-3:1, 4:29-34, 6:53-54. A POSITA would have been familiar with conventional VPN tunneling implementations well documented in readily available textbooks, such as the VPN Textbook. Ex_1003, ¶ 123; *see also* Ex_1003, ¶¶ 77-86, 111-112.

The VPN Textbook describes various VPN topologies. Ex_1010, pp. 116-133; Ex_1003, ¶ 124. A POSITA 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).” Ex_1010, p. 129; Ex_1030, p. 438; Ex_1003, ¶ 124.

Combining 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. Ex_1003, ¶ 124 (Dr. Houh personally researched and purchased VPN hardware routers for a project in the 1998-1999 time frame). A POSITA 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 participants (e.g., remote clients) over secure VPN tunnels. Ex_1003, ¶ 124.

Furthermore, a POSITA would have been motivated to combine the teachings of Knappe, as modified by Elliott, with the teachings of the VPN Textbook for cost and complexity savings. Ex_1010, p. 129 (“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”); Ex_1003, ¶ 125 (implementing VPN tunneling in Knappe's conferencing system, per Elliott's teaching, would beneficially constrain cost and limit complexity).

A POSITA would have had a reasonable expectation of success in combining Knappe with the VPN Textbook's hub-and-spoke topology because the hub-and-spoke topology was conventional and known to be applied in the

conferencing context. Ex_1003, ¶¶ 67-72, 126. For example, U.S. Patent No. 6,782,412, filed February 11, 2000, describes a “conference bridge application” that can transmit data “over public networks, using technologies such as ... Virtual Private Network (VPN) or any other conventional communication method.” Ex_1019, 4:23-27, 6:36-41; *see also* Ex_1023, ¶¶ 1411-1412, 1451-1453 (disclosing VPN connectivity, including hub-and-spoke or mixed topologies, for services including video-conferencing); Ex_1003, ¶¶ 85-86, 111-112 (modifications to Knappe to accommodate teachings of the VPN Textbook would have been well within the level of ordinary skill in the art, as demonstrated by the numerous examples of systems, patents, and printed publications combining conferencing and VPN technologies); Ex_1003, ¶ 126 (Dr. Houh personally configured, deployed, and used VPN technology for carrying VoIP traffic using the NBX 100 system, capable of performing conference calls, before the earliest claimed priority date of the ’997 patent).

Petitioner’s proposed combination permits, but does not require, physical incorporation of elements from the VPN Textbook into Knappe’s system. *See In re Mouttet*, 686 F.3d at 1322; Ex_1003, ¶ 127.

7. Reasons to Combine Knappe and de Moraes

A POSITA would have been motivated to combine the teachings of Knappe and de Moraes to produce the obvious, beneficial, and predictable results of

transmitting data to multicast appliances (e.g., routers) using multicast packets.

Ex_1003, ¶ 128.

As discussed above, Knappe teaches a conferencing system capable of “provid[ing] voicemail, bridging, multicasting, call hold, conference call and other multiparty communications and/or other suitable services,” including “transmit[ting] information in Internet Protocol (IP) packets.” Ex_1006, 3:50-61, 4:51-54; Ex_1003, ¶ 129. A predictable and beneficial result of combining Knappe and de Moraes would be accomplishing the multicasting and multiparty communications by transmitting and receiving requests and other data between multicast routers at hosts over unicast connections. Ex_1003, ¶ 129; *see* Ex_1022, p. 6.

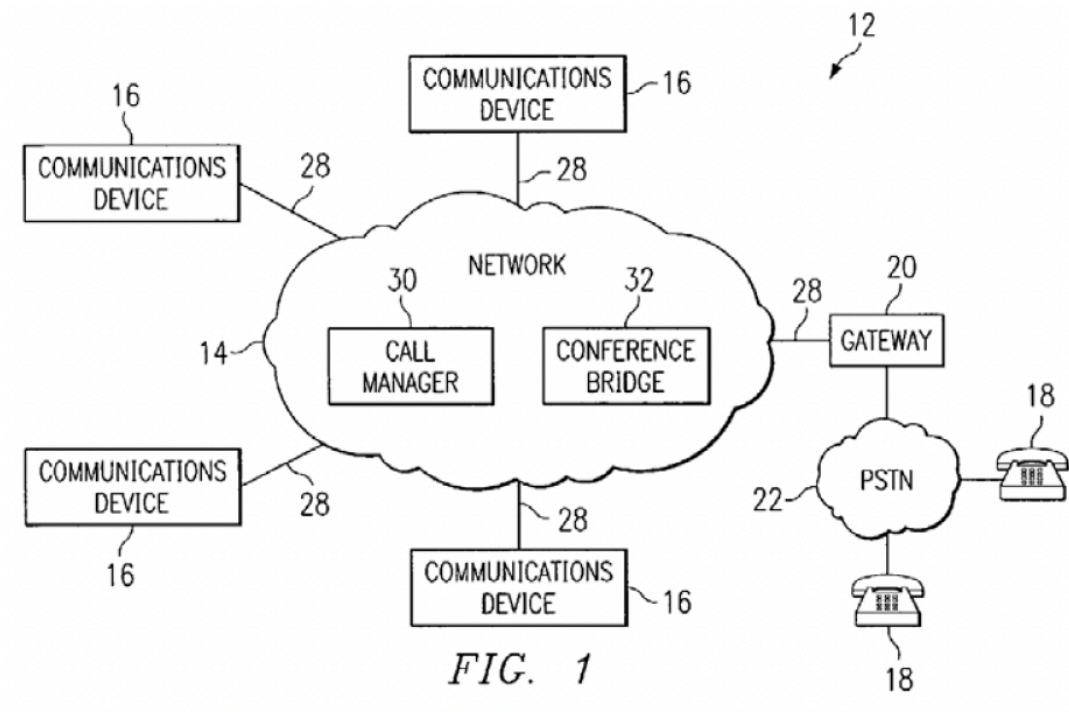
A POSITA would have had a reasonable expectation of success in combining Knappe with de Moraes to transmit multicast IP packets over the Internet to a group of remote hosts for the purpose of multiparty conferencing because de Moraes describes a successful demonstration of just such an implementation wherein a remote user in College Park, Maryland, was able to participate in a conference at the Rio Palace Hotel in Brazil. Ex_1022, p. 7-8 (“Figure 2 shows the essential systems components. Workstations functioned as Internet hosts and as media processors (...) at the two ends, which were a conference room in the Rio Palace hotel and the facilities of SURANet, an Internet

access provider in College Park, Maryland. ... A microwave link carried the digital compressed audio/video signals from the workstation at the Rio Palace Hotel to ... COMSAT's headquarters in Bethesda, MD."); Ex_1003, ¶ 130.

8. Claim 1 is Obvious in Light of the Combination of Knappe, Elliott, the VPN Textbook, and de Moraes

[1.P] A method for adding a telephone participant to a multi-participant audio-video conference, the method comprising:

Knappe and Elliott, individually and in combination, disclose the preamble of claim 1. Knappe discloses “a multi-party communication session,” including “transmitting audio, video, voice, data and other suitable types of real-time and/or non real-time traffic between source and destination endpoints” and “connecting a plurality of communication devices 16 to each other and to standard analog telephones 18 through a gateway 20 and the public switched telephone network (PSTN) 22.” Ex_1006, Abstract, 3:26-29, 3:41-45; Ex_1003, ¶ 131. As shown in Figure 1 of Knappe, Knappe's system can support multiple participants in an audio/video conference call, including one or more telephone participants 18:



Ex_1006, FIG. 1; Ex_1003, ¶ 131.

Elliott also discloses a “method of communicating with a plurality of remote parties allow[ing] for multi-media collaboration,” which “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,” using “telephony, multi-party conferencing, virtual private networks.” Ex_1007, 2:66-3:6; Ex_1003, ¶ 132. As shown in Figure 1 of Elliott, Telephones 26 and 28 may be added to a multi-participant conference through PSTN 30:

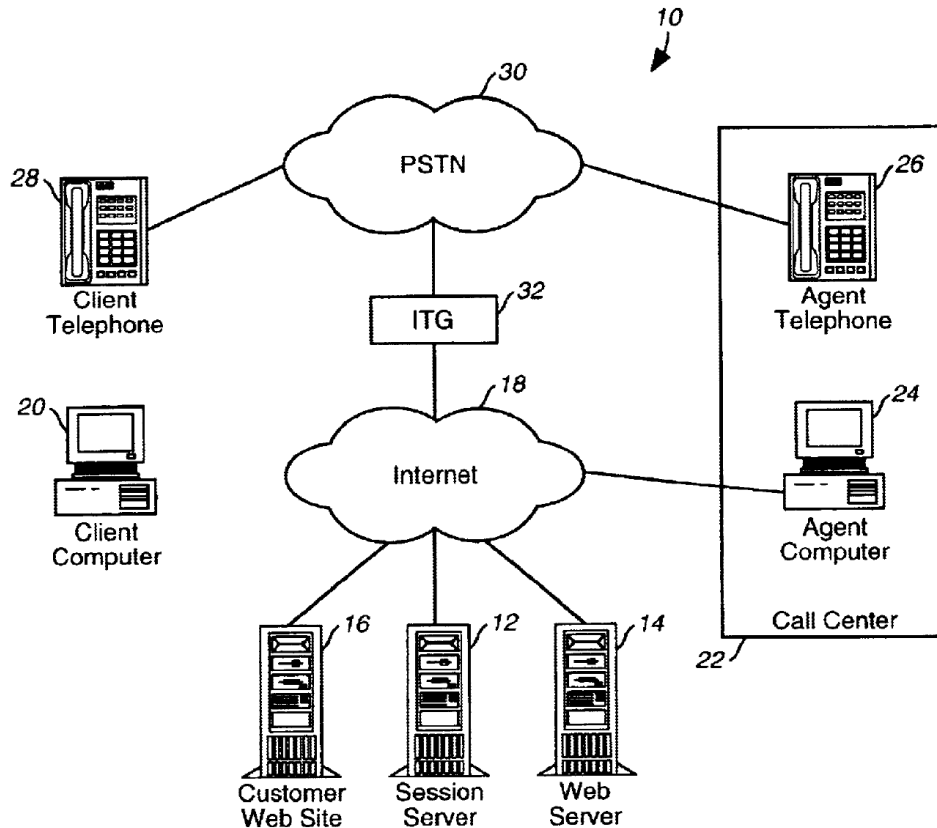


FIG. 1

Ex_1007, FIG. 1; Ex_1003, ¶ 132.

Thereby Knappe and Elliott, individually and in combination, teach the preamble of claim 1 of the '997 patent. Ex_1003, ¶ 133.

[1.1] sending a first message to each of a plurality of multicast appliances over the Internet, wherein the first message comprises a group address which identifies a plurality of participants;

Knappe and de Moraes in combination disclose this element of claim 1.

Ex_1003, ¶ 134. Knappe describes “conference parameters 62 for each conference call include an identification of participants 64 and the priority assigned to each participant (priority parameters) 66 for the conference call.” Ex_1006, 6:43-51;

see also id., FIG. 1 (showing system capable of sending message to each of a plurality of multicast appliances (e.g., communications devices 16) over the Internet), 5:27-29 (“the call manager 30 identifies participants based on the called number or other suitable criteria”).

De Moraes describes “IP multicast addressing” using “an Internet standard (RFC 1112).” Ex_1022, p. 7; Ex_1003, ¶ 135. A POSITA would have understood that using an Internet standard like RFC 1112 in an MBONE network as described in de Moraes would enable a host to send messages to a plurality of multicast appliances (e.g., routers), such messages including “a group address which identifies a plurality of participants” as claimed in this element of claim 1. Ex_1003, ¶ 135; *see also* Ex_1030, p. 1, 11-16 (describing the sending and receiving of “IP host group address” and explaining that “IP multicasting is the transmission of an IP datagram to a ‘host group’, a set of zero or more hosts identified by a single IP destination address.”).

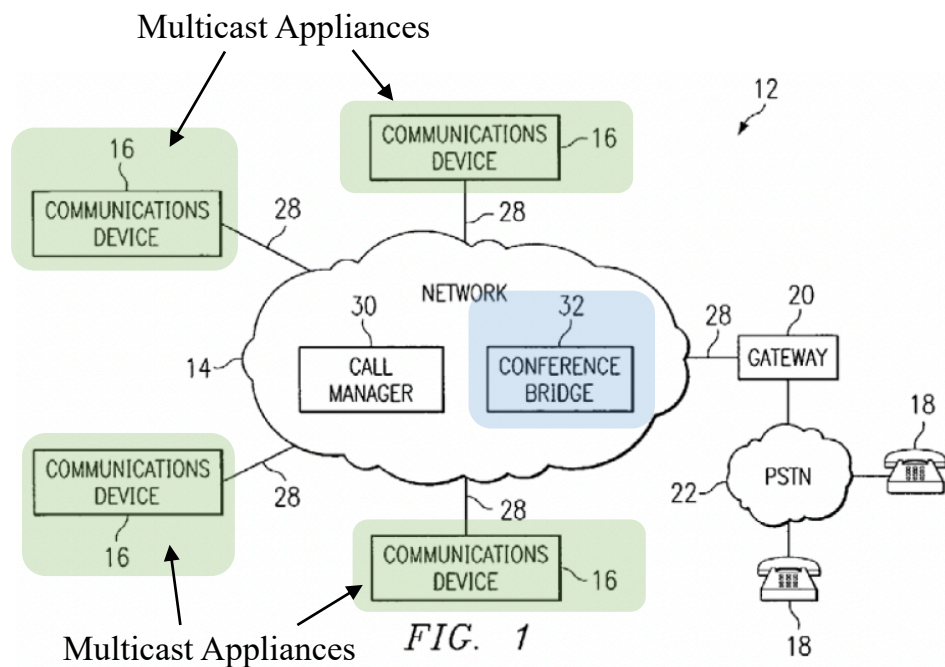
Thus, a POSITA would have understood Knappe in combination with de Moraes to disclose “*sending a first message to each of a plurality of multicast appliances over the Internet, wherein the first message comprises a group address which identifies a plurality of participants,*” and this element of claim 1 of the ’997 patent is obvious in view of the combination of Knappe and de Moraes. Ex_1003, ¶ 136.

[1.2] each of the multicast appliances receiving the first message;

Knappe and de Moraes disclose in combination this element of claim 1.

Ex_1003, ¶ 137. As claim 1 indicates, “the first message” refers to “a group address which identifies a plurality of participants.” Ex_1001, Claim 1. Knappe describes “[a] multiparty communication session [that] includes three or more parties exchanging audio and/or other suitable information,” including a conference bridge 32 configured to send to each communication device 16

“conference parameters 62 for each conference call include an identification of participants 64”:



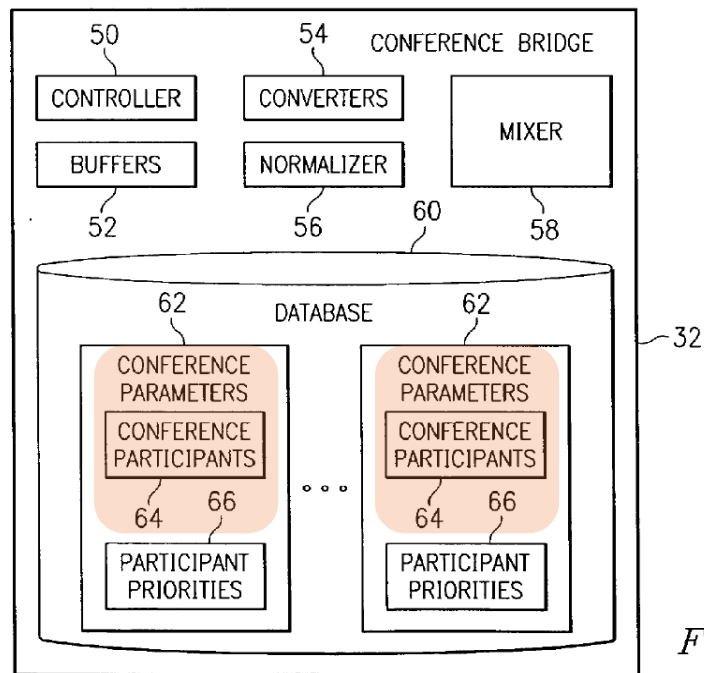


FIG. 2

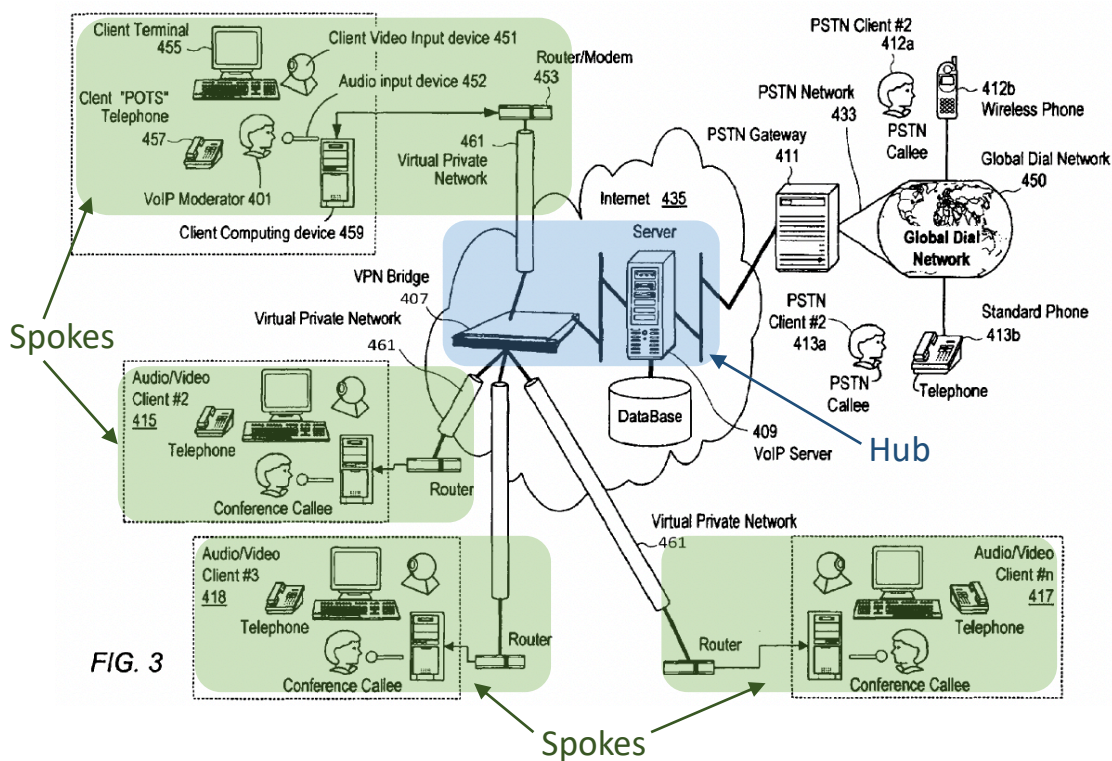
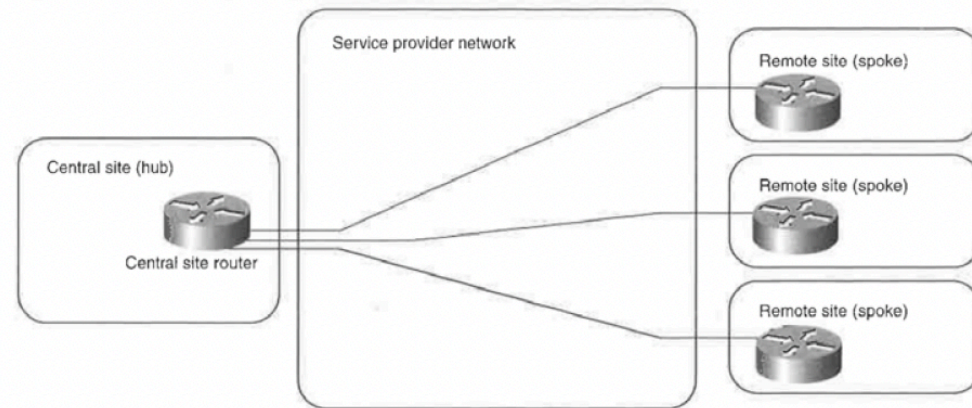
Ex_1006, FIGS. 1-2 (annotated), 4:58-5:1, 6:54-61; Ex_1003, ¶ 137. A POSITA would have known that each communication device 16 can be a multicast appliance capable of receiving the first message. Ex_1003, ¶ 137. For example, a POSITA would have understood that communication devices 16 could be implemented as de Moraes' "endpoints ... with operating system support for IP multicast" capable of receiving "IP multicast packets [that] are encapsulated for transmission through tunnels." Ex_1022, p. 6; Ex_1003, ¶ 137. Thus, a POSITA would have understood Knappe in combination with de Moraes to disclose "*each of the multicast appliances receiving the first message,*" and this element of claim 1 of the '997 patent is obvious in view of the combination of Knappe and de Moraes. Ex_1003, ¶ 137.

[1.3] establishing a plurality of virtual private networks across the Internet routes between the multicast appliances;

Knappe, in combination with Elliott and the VPN Textbook, disclose this element of claim 1. Ex_1003, ¶ 138. Knappe discloses multicast appliances connected through a network 14 in a multi-party conferencing system, network 14 in some embodiments being the Internet. Ex_1006, 3:50-54 (“... network 14 is the Internet, ... In the Internet embodiment, the network 14 transmits information in Internet Protocol (IP) packets.”); Ex_1003, ¶ 138. Elliott elaborates that in such a multi-party conferencing system, the network (e.g., Knappe’s network 14 and Elliott’s network 18) “can be either a public or a carrier supported virtual private network (VPN) ... which uses IP or IP-tunneling.” Ex_1007, 4:20-34; Ex_1003, ¶ 138.

Methods of implementing VPNs were well known in the art before the earliest priority date for the ’997 patent, as evidenced by the VPN Textbook. Ex_1003, ¶ 139; Ex_1010, pp. 129-133 (describing well-known topologies for implementing VPNs). In particular, the VPN Textbook describes and shows the hub-and-spoke (i.e., “star”) topology that is shown in the ’997 patent:

Figure 7-10 Hub-and-spoke Topology



Ex_1010, p. 130 (Figure 7-10); Ex_1001, FIG. 3 (annotated); Ex_1003, ¶ 139.

Thus, a POSITA would have understood Knappe, in view of Elliott and the VPN Textbook, to teach “*establishing a plurality of virtual private networks across the Internet routes between the multicast appliances,*” and this element of claim 1 of

the '997 patent is obvious in view of the combination of Knappe, Elliott and the VPN Textbook. Ex_1003, ¶ 139.

[1.4] enabling at least one of the participants to communicate in the multi-participant video conferences;

Knappe discloses this element of claim 1. Ex_1003, ¶ 140. As established above, Knappe describes a multi-participant video conferencing system. Ex_1006, FIGS. 1-2, Abstract, 1:8-11, 3:24-40; Ex_1003, ¶ 140. Specifically, Knappe discloses a “communication system 12 [for] transmitting audio, video, voice, data and other suitable types of real-time ... traffic between source and destination endpoints,” which enables any of communications devices 16 (i.e., participants) to communicate in a multi-participant video conference. Ex_1006, 3:24-40; Ex_1003, ¶ 140; *see also* Ex_1006, 5:31-33 (“During the multiparty communications sessions, participants are connected and stream media through the conference bridge 32.”). A POSITA would have understood Knappe to disclose “*at least one of the participants to communicate in the multi-participant video conferences,*” as claimed in this element of claim 1 in the '997 patent. Ex_1003, ¶ 140.

[1.5] the telephone participant joining the multi-participant video conference, wherein said joining comprises;

Knappe discloses this element of claim 1. Ex_1003, ¶ 141. Knappe shows and describes “a network 14 connecting a plurality of communication devices 16 to

each other and to standard analog telephones 18 through gateway 20 and the public switched telephone network (PSTN) 22,” wherein “gateway 20 provides conversion between analog and/or digital formats,” converting IP packets “into standard telephony signals” and vice versa. Ex_1006, 3:41-49, 4:5-28; Ex_1003, ¶ 141; *see also* Ex_1006, FIG. 1. A POSITA would have understood this system to enable a telephone participant to join a multi-participant video conference. Ex_1003, ¶ 141. Thus, Knappe teaches this element of claim 1 of the ’997 patent. *Id.*

[1.5.a] the telephone participant calling into a gateway server;

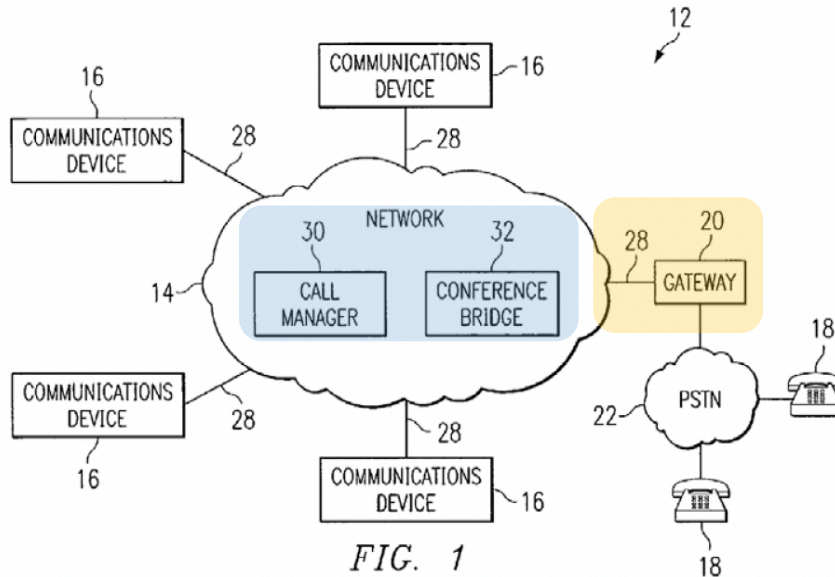
Knappe discloses this element of claim 1. Ex_1003, ¶ 142. Knappe shows gateway 20 through which “standard analog telephones 18” (i.e., one or more telephone participants) are connected to network 14. Ex_1006, FIG. 1, 3:41-49; Ex_1003, ¶ 142. “The standard analog telephones 18 communicate standard telephony signals through PSTN 22 to the gateway 20,” at which “the signals are converted to IP packets in the VoIP format.” Ex_1006, 4:18-22; Ex_1003, ¶ 142. Given these disclosures in Knappe, POSITA would have understood Knappe’s system to include a “telephone participant calling into a gateway server.” Ex_1003, ¶ 142. Therefore, Knappe teaches this element of claim 1 of the ’997 patent. *Id.*

[1.5.b] the telephone participant providing conference ID information;

Elliott discloses this element of claim 1. Ex_1003, ¶ 143. Elliott describes the establishment of “a session” that may provide for “video conferencing, audio conferencing, data conferencing, and collaborative browsing,” wherein a participant may “log ... into the session with a session ID.” Ex_1007, 6:46-64, FIGS. 1-2; Ex_1003, ¶ 143. A POSITA would have understood the telephone participants 18 in Knappe’s system to be able to provide the “*conference ID information*,” such as Elliott’s “session ID.” Compare Ex_1006, FIG. 1 with Ex_1007, FIGS. 1-2; Ex_1003, ¶ 143. Therefore, this element of claim 1 of the ’997 patent is disclosed by Elliott. Ex_1003, ¶ 143.

[1.5.c] the gateway server establishing communication with a conferencing server;

Knappe and Elliott, individually and in combination, disclose this element of claim 1. Ex_1003, ¶ 144. Knappe shows “gateway 20 ... connected to the network 14 and/or PSTN 22 through twisted pair, cable, fiber optic, radio frequency, infrared, microwave and/or any other suitable type of wireline or wireless links 28”:



Ex_1006, FIG. 1 (annotated); Ex_1003, ¶ 144. Network 14, with which gateway 20 can establish connection 28, includes call manager 30 and conference bridge 32, either or both of which “may be located in a central facility or have their functionality distributed across and/or at the periphery of the network 14.” *Id.*, 4:30-33; Ex_1003, ¶ 144. A POSITA would have understood one or both of Knappe’s call manager 30 and conference bridge 32 to be a conferencing server. Ex_1003, ¶ 144. “The call manager 30 manages calls in the network 14,” including functions such as “bridging, multicasting, call hold, conference call and other multiparty communications and/or other suitable services for the communications devices 16,” while “[t]he conference bridge 32 provides conference call and other suitable audio, video, and/or real-time multiparty communication sessions between communication devices 16” including “receiv[ing] media from participating device 16 and, using suitable signal

processing techniques, mixes the media to produce conference signals.” Ex_1006, 4:42-66; Ex_1003, ¶ 144. A POSITA would have understood some or all of these functions to be performed by a conferencing server. Ex_1003, ¶ 144.

Elliott describes an “internet telephone gateway (ITG) 32 which is provided as an interface between the circuit-switched PSTN 30 and the packet switched IP network 18” through which ITG (i.e., gateway) 32 can establish a connection to session server 12 and web server 14, as shown in Figure 1:

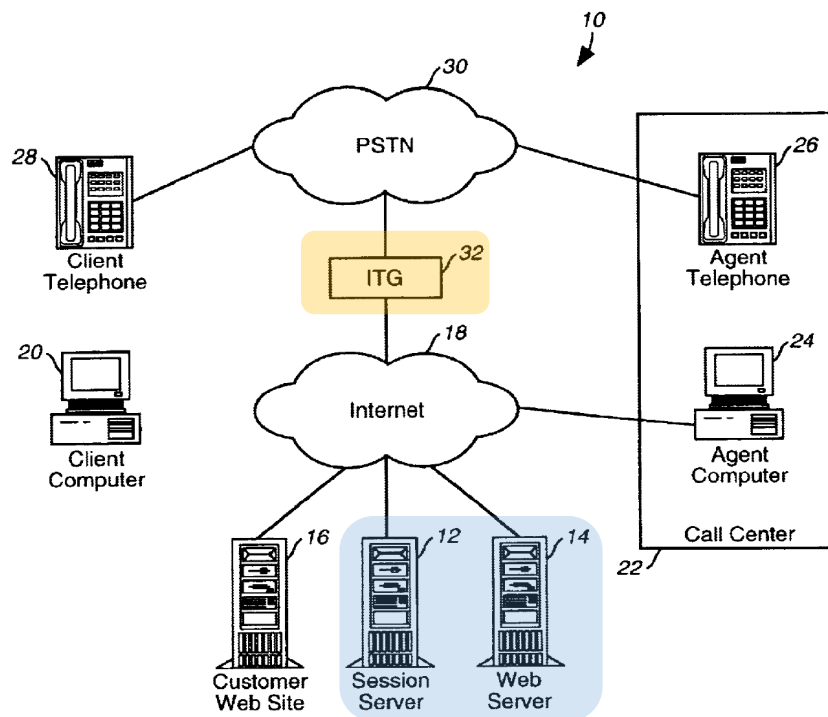


FIG. 1

Ex_1007, FIG. 1 (annotated); Ex_1003, ¶ 145. “Session server 12 ... manages communication sessions among one or more agents and one or more clients” and “is preferably able to set up to conduct video conferences, audio conferences, and data conferences with application sharing,” while “[w]eb server 14 provides

software for communication with client computer 20.” Ex_1007, 5:39-56; Ex_1003, ¶ 145. A POSITA would have understood both Elliott’s gateway 32 to be capable of establishing a communication with one or both of session server 12 and web server 14. Ex_1003, ¶ 145.

Thus, a POSITA would have understood Knappe and Elliott, individually and in combination, to teach this element of claim 1. Ex_1003, ¶ 146.

[1.5.d] authenticating the telephone participant; and

Knappe discloses this element of claim 1. Ex_1003, ¶ 147. Knappe describes how “conference parameters 62 for each conference call include an identification of participants 64,” one of which may be a telephone participant 18, and “participants are identified at the beginning of a conference call based on caller ID, phone number or other suitable identifier.” Ex_1006, 6:45-50; Ex_1003, ¶ 147; *see also* Ex_1006, 5:12-23 (describing how “the call manager 30 receives the call initiation request,” which may be “generated by ... the gateway 20 for telephones 18”). A POSITA would have understood Knappe’s verification of a telephone participant’s identity to be an authentication of the telephone participant. Ex_1003, ¶ 147. Thus, Knappe discloses “*authenticating the telephone participant*,” this element of claim 1 in the ’997 patent.

[1.5.e] transmitting multicast group information to the gateway server;

Knappe and de Moraes in combination disclose this element of claim 1. Ex_1003, ¶ 148. As discussed in [1.1]-[1.3] above, any or all of Knappe's communications devices 16 can be multicast appliances connected over a network capable of transmitting multicast group information (e.g., MBONE as described in de Moraes) to other participants in the multi-party conference. Ex_1003, ¶ 148; *see also* Ex_1003, ¶¶ 134-139. Knappe further states "media streaming occurs between the gateway 20 and the destination device" gateway 20 then "transmits the media to the telephone 18." Ex_1006, 5:23-26; Ex_1003, ¶ 148. A POSITA would have known to combine Knappe and de Moraes to transmit multicast group information to a gateway such as Knappe's gateway 20, and thus would have understood Knappe and de Moraes in combination to teach this element of claim 1. Ex_1003, ¶ 148.

[1.6] wherein the gateway server is operable to use the multicast group information to enable the telephone participant to participate in the multi-participant video conference.

Knappe and Elliott, each in combination with de Moraes, disclose this element of claim 1. Ex_1003, ¶ 149. Knappe's "gateway 20 provides conversion between analog and/or digital formats. ... 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." Ex_1006, 4:18-28; Ex_1003, ¶ 149. As discussed in [1.5.e] above, Knappe teaches that "media

streaming occurs between the gateway 20 and the destination device” and “gateway 20 then transmits the media to the telephone 18.” Ex_1006, 5:23-26; Ex_1003, ¶¶ 148-149. A POSITA would have known to combine Knappe’s teachings with de Moraes’ teachings to implement Knappe’s gateway server 20 to use multicast group information from Knappe’s destination devices (e.g., multicast appliances) to enable a telephone participant (e.g., telephones 18) to participate in the multi-participant video conference. Ex_1003, ¶ 149.

Elliott also teaches a gateway (e.g., ITG 32) “which is provided as an interface between the circuit-switched PSTN 30 and the packet switched IP network 18” through which “multi-media collaboration between the agent and client is enabled,” multi-media collaboration including “video conferencing.” Ex_1007, 1:41-44, 6:7-10; Ex_1003, ¶ 150. A POSITA would have known to combine Elliott with de Moraes’ disclosure of an MBONE with multicast endpoints capable of sharing multicast group information over the Internet to enable a telephone participant to participate in a multi-participant video conference with said multicast endpoints. Ex_1022, pp. 6-7; Ex_1003, ¶ 150.

Thus Knappe and Elliott, each in combination with de Moraes, discloses “wherein the gateway server is operable to use the multicast group information to enable the telephone participant to participate in the multi-participant video

conference,” thereby rendering obvious this element of claim 1 of the ’997 patent.

Ex_1003, ¶ 151.

9. Claim 3 is Rendered Obvious by the Combination of Knappe, Elliott, the VPN Textbook, and de Moraes

[3.P] A method for adding a telephone participant to a multi-participant audio-video conference comprising:

See [1.P] above. Ex_1003, ¶ 152.

[3.1] sending a first message to each of a plurality of multicast appliances over the Internet, wherein the first message comprises a group address which identifies the participants;

See [1.1] above. Ex_1003, ¶ 153.

[3.2] each of the multicast appliances receiving the first message;

See [1.2] above. Ex_1003, ¶ 154.

[3.3] establishing a plurality of virtual private networks across the Internet routes between the multicast appliances;

See [1.3] above. Ex_1003, ¶ 155.

[3.4] enabling at least one of the participants to communicate in the multi-participant video conferences;

See [1.4] above. Ex_1003, ¶ 156.

[3.5] the telephone participant joining the multi-participant video conference, wherein said joining comprises:

See [1.5] above. Ex_1003, ¶ 157.

[3.5.a] the telephone participant providing conference ID information;

See [1.5.b] above. Ex_1003, ¶ 158.

[3.5.b] authenticating the telephone participant; and

See [1.5.d] above. Ex_1003, ¶ 159.

[3.6] the telephone participant participating in the multi-participant video conference comprises:

See [1.5] above.⁴ Ex_1003, ¶ 160.

***[3.6.a] the telephone participant speaking in the video conference;
and***

Knappe discloses this element of claim 3. Ex_1003, ¶ 161. For example, Knappe discloses a method wherein a “telephone conference has begun and participant voice streams are received.” Ex_1006, 9:9-10; Ex_1003, ¶ 161. As shown in Knappe’s Figure 1, one or more of those participant voice streams may be from telephone participants (e.g., telephones 18) connected to the video conference through PSTN 22 and gateway 20. Ex_1006, FIG. 1; Ex_1003, ¶ 161. Knappe states, “If the moderator is not speaking, at step 208 the participant voice streams are transmitted to all participants.” Ex_1006, 9:13-15; Ex_1003, ¶ 161. Therefore, a telephone participant in Knappe can be speaking in the video conference, thereby disclosing this element of claim 3. Ex_1003, ¶ 161. Thus,

⁴ The wording of this element matches that of the preamble in claim 2, which purports to limit a step in claim 1, the closest match being step 5 in claim 1 (*i.e.*, [1.5] above), so for the purposes of this IPR petition and proceedings, Petitioner interprets claim 2 and claim element 3.6 to modify [1.5].

Knappe discloses “*the telephone participant speaking in the video conference,*” and this element of claim 3 of the ’997 patent is obvious in view of Knappe. *Id.*

[3.6.b] generating digital voice data in response to the telephone participant speaking.

Knappe discloses this element of claim 3. Ex_1003, ¶ 162. Knappe describes gateway 20 as “provid[ing] conversion between analog and/or digital formats,” specifically converting “standard telephony signals ... to IP packets in the VoIP format.” Ex_1006, 4:18-26; Ex_1003, ¶ 162. Knappe further describes “audible sounds [being] encoded into digital data and placed into packets,” and more specifically, “[a] codec (coder/decoder) converts audio, video or other suitable signals generated by users from analog signals into ... digital encoded data [that] is encapsulated into IP or other suitable packets for transmission over the network 14.” Ex_1006, 1:21-23, 4:9-13; Ex_1003, ¶ 162. Therefore, this element of claim 3 is disclosed by Knappe. Ex_1003, ¶ 162.

10. Claim 4 is Rendered Obvious by the Combination of Knappe, Elliott, the VPN Textbook, and de Moraes

[4.P] The method for adding a telephone participant to a multi-participant audio-video conference of claim 3, wherein the telephone participant joining the multi-participant video conference further comprises:

See [3.P]-[3.6.b] above. Ex_1003, ¶ 163.

[4.1] the telephone participant calling into a gateway server; and

See [1.5.a] above. Ex_1003, ¶ 164.

[4.2] the gateway server establishing communication with a conferencing server.

See [1.5.c] above. Ex_1003, ¶ 165.

11. Claim 5 is Rendered Obvious by the Combination of Knappe, Elliott, the VPN Textbook, and de Moraes

[5.P] The method for adding a telephone participant to a multi-participant audio-video conference of claim 4, wherein the telephone participant joining the multi-participant video conference further comprises:

See [4.P]-[4.2] above. Ex_1003, ¶ 166.

[5.1] transmitting multicast group information to the gateway server; and

See [1.5.e] above. Ex_1003, ¶ 167.

[5.2] wherein the gateway server is operable to use the multicast group information to enable the telephone participant to participate in the multi-participant video conference.

See [1.6] above. Ex_1003, ¶ 168.

12. Claim 6 is Rendered Obvious by the Combination of Knappe, Elliott, the VPN Textbook, and de Moraes

[6] The method for adding a telephone participant to a multi-participant audio-video conference of claim 4 wherein the gateway server includes a PSTN gateway server.

See [1.P] & [1.5.c] above. Ex_1003, ¶ 169.

13. Claim 7 is Rendered Obvious by the Combination of Knappe, Elliott, the VPN Textbook, and de Moraes

[7] The method for adding a telephone participant to a multi-participant audio-video conference of claim 4, wherein the telephone participant participating in the multi-participant video conference further comprises:

See [4.P]-[4.2] above. Ex_1003, ¶ 170.

[7.1] the gateway transforming the digital voice data into IP packets; and

Knappe discloses this element of claim 2. Ex_1003, ¶ 171. As described above in [1.6] and [3.6.b], Knappe describes a gateway 20 capable of “provid[ing] conversion between analog and/or digital formats,” specifically converting “standard telephony signals ... to IP packets in the VoIP format.” Ex_1006, 4:18-26; Ex_1003, ¶ 171. Knappe further describes “audible sounds [being] encoded into digital data and placed into packets,” and more specifically, “[a] codec (coder/decoder) converts audio, video or other suitable signals generated by users from analog signals into ... digital encoded data [that] is encapsulated into IP or other suitable packets for transmission over the network 14.” Ex_1006, 1:21-23, 4:9-13; Ex_1003, ¶ 171. Therefore, this element is disclosed by Knappe. Ex_1003, ¶ 171.

[7.2] configuring the IP packet with a group address according to a multicast protocol to create a multicast IP packet.

De Moraes discloses this element of claim 2. Ex_1003, ¶ 172. De Moraes describes “IP multicast addressing” using “an Internet standard (RFC 1112).” Ex_1022, p. 7; Ex_1003, ¶ 172. A POSITA would have understood that using an Internet standard like RFC 1112 in an MBONE network as described in de Moraes would include configuring an IP multicast packet with a group address according to a multicast protocol. Ex_1003, ¶¶ 72-73, 114, 172; *see also* Ex_1030, p. 1, 9-16

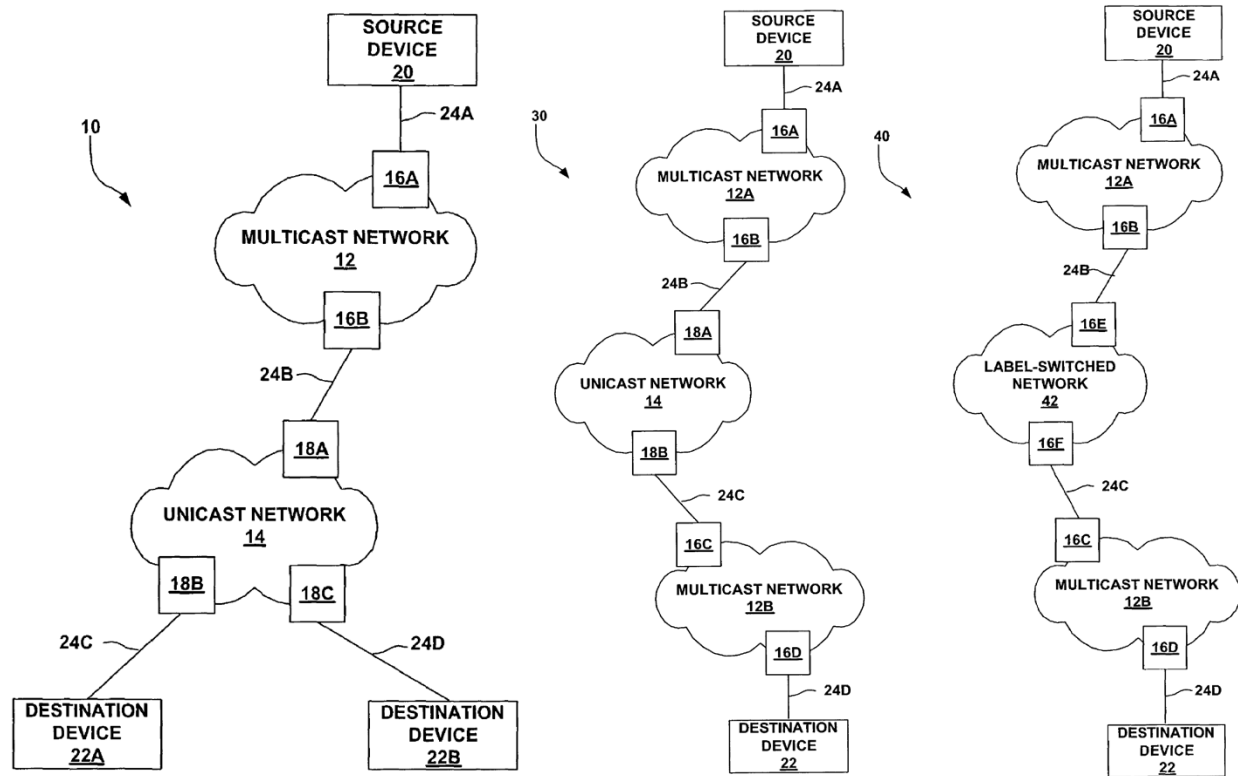
(describing configuring, sending, and receiving of multicast packets comprising “group-address” and/or “IP host group address,” and explaining that “IP multicasting is the transmission of an IP datagram to a ‘host group’, a set of zero or more hosts identified by a single IP destination address.”). Therefore, this element is disclosed by de Moraes. Ex_1003, ¶ 172.

B. Ground 2: Claims 2 and 8-10 are obvious under 35 U.S.C. § 103(a) over Knappe in view of Elliott, the VPN Textbook, de Moraes and Shepherd

1. Summary of Shepherd

United States Patent No. 7,281,058 (“Shepherd”) entitled “Delivering and Receiving Multicast Content Across a Unicast Network” was filed October 9, 2002. Ex_1034, Title page; Ex_1003, ¶ 173.

Like the '997 patent, Shepherd describes “[t]echniques for delivering and receiving multicast content across a unicast network.” Ex_1034, Abstract; Ex_1003, ¶ 174. Shepherd describes various network embodiments in which multicast content, including “video, audio, data, or other information,” may be delivered across a unicast network, as well as exemplary methods related to delivering and receiving multicast content over a unicast network. *See, e.g.*, Ex_1034, Figs. 1-7, 5:15-17; Ex_1003, ¶ 174. Figures 1-3 in Shepherd show several exemplary network embodiments:



Ex_1034, Figs. 1-3; Ex_1003, ¶ 174.

Shepherd describes encapsulating multicast packets as unicast packets for delivery over unicast networks. Ex_1034, 7:54-55 (“multicast-enabled router 16B will deliver multicast packets to destination device 22A as unicast packets”), 9:57-64 (“multicast-enabled router 16B supports delivery of multicast content across unicast network 14 in that multicast-enabled router 16B is able to intercept unicast request messages that are sent by requesting devices and include as a destination address an address associated with source device 20, and deliver the multicast packets to the requesting devices as unicast packets in response to the unicast request messages”); Ex_1003; ¶ 175.

Shepherd also describes multicast-enabled routers (e.g., appliances) determining the multicast data from the unicast packet and providing the multicast data to each of the other participants in the group address. *See, e.g.*, Ex_1034, 18:20-28 (“The multicast-enabled router 16 that sent the unicast request message and receives the unicast packets may remove the encapsulation or labels to expose the multicast packets for the source/group address pair indicated in the unicast request message [], replicate the multicast packets if more than one interface is indicated in multicast forwarding information maintained by the multicast-enabled router for the source/group address pair, and forward the multicast packets via the indicated interfaces”), 7:65-8:5 (describing multicast-enabled routers that can “maintain multicast forwarding information for the source/group address pair indicated by the unicast request message intercepted from destination device 22A that includes information from the unicast request message” and “store the address of destination device 22A as multicast forwarding information for the source/group address pair indicated in by (sic) the unicast request message.”), 9:64-10:8 (“Additionally, multicast-enabled router 16C supports reception of multicast content across unicast network in that multicast-enabled router 16C is able to determine whether the route to source device 20 is multicast-enabled, send a unicast request message that includes as a destination address an address associated with source device 20 and is marked for interception by an intermediate network

device, and receive multicast packets as unicast packets from the intermediate network device across unicast network 14 so that it (sic) the multicast packets may be delivered to a destination device 22.”), 11:60-67 (“If one of the multicast-enabled routers 16 has received multiple unicast request messages and/or multicast join messages for the same source/group address pair, the multicast-enabled router 16 may replicate the received multicast packets, and readdress and deliver, encapsulate and deliver, or forward the replicated packets as indicated by the multicast forwarding information maintained by the multicast-enabled router 16”); Ex_1003, ¶ 176.

Shepherd also describes transmitting unicast packets over virtual private networks across the Internet between one or more appliances. Ex_1003, ¶ 177. Figure 3 in Shepherd shows a “network 40 that supports delivery and reception of multicast content across a unicast network, which in this case is a label-switched network 42.” Ex_1034, 12:1-4; Ex_1003, ¶ 177. “Moreover, the ability of multicast-enabled routers 16 to deliver and receive multicast content across label-switched networks may provide additional advantages, such as allowing the delivery of multicast content in a virtual private network (VPN) utilizing a label-switched network of a provider of the VPN service. For example, referring to FIG. 3, multicast networks 12 may be geographically distributed site networks of a single enterprise, which form a VPN via label-switched network 42. A provider of

the VPN service to the enterprise may provide access to label-switched network 42 via multicast-enabled routers 16E and 16F that are maintained by the VPN service provider. ... Further, the delivery of the multicast packets within the VPN via label-switched network 42 may be more secure than delivery via a packet-switched network.” Ex_1034, 15:24-42; Ex_1003, ¶ 177.

2. Reasons to combine Knappe and Shepherd

A POSITA would have been motivated to combine the teachings of Knappe and Shepherd to produce the obvious, beneficial, and predictable results of delivering and receiving multicast packets comprising “video, audio, data, or other information” in Knappe’s conferencing system over unicast networks. Ex_1034, 5:15-17; Ex_1003, ¶ 178. According to Shepherd, doing so “advantageously reduces the costs that are born by the content provider in delivering content to destination device 22 that is unable to receive multicast packets.” Ex_1034, 10:8-10:12; Ex_1003, ¶ 178; *see also* Ex_1034, 6:6-11 (“The ability of multicast-enabled router 16B to deliver multicast content across unicast networks in this manner may advantageously reduce the costs that are born by the content provider in delivering content to destination devices 22), 15:19-23 (“The ability of multicast-enabled routers 16 to deliver and receive multicast content across label-switched networks advantageously reduces the costs that are born by the content provider in delivering content to destination devices that would otherwise be

unable to receive multicast packets”). Delivering Knappe’s video conferencing content over unicast networks would simply require combining known methods to achieve the predictable and beneficial result of cost savings. Ex_1003, ¶ 178.

Also, de Moraes MBONE multicast routers are interconnected with IP tunnels, which are unicast tunnels and which use unicast IP addresses to get to the next MBONE router. Ex_1022, p. 6 (“The tunnel endpoints are typically workstation-class machines with operating system support for IP multicast and running the “mrouted” multicast routing daemon (always-running background process); Ex_1003, ¶ 179. IP multicast packets are encapsulated for transmission through tunnels, so that they look like normal unicast packets to intervening routers and subnets.”). A POSITA would have viewed Shepherd’s multicast-enabled router 16 to be an exemplary implementation of an MBONE router. *See, e.g.*, Ex_1034,18:20-28 (“The multicast-enabled router 16 that sent the unicast request message and receives the unicast packets may ... replicate the multicast packets if more than one interface is indicated in multicast forwarding information maintained by the multicast-enabled router for the source/group address pair, and forward the multicast packets via the indicated interfaces”), FIGS. 1-3 and 5-7; Ex_1003, ¶ 179.

Petitioner's proposed combination permits, but does not require, physical incorporation of elements from Shepherd into Knappe's system. *See In re Mouttet*, 686 F.3d at 1322; Ex_1003, ¶ 180.

3. Claim 2 is Rendered Obvious by the Combination of Knappe, Elliott, the VPN Textbook, de Moraes and Shepherd

[2.P] The method of claim 1, wherein the telephone participant participating in the multi-participant video conference comprises:

See [1.P]-[1.7] and [3.6] above. Ex_1003, ¶ 181.

[2.1] the telephone participant speaking in the video conference;

See [3.6.a] above. Ex_1003, ¶ 182.

[2.2] generating digital voice data in response to the telephone participant speaking; and

See [3.6.b] above. Ex_1003, ¶ 183.

[2.3] the gateway transforming the digital voice data into IP packets;

See [7.1] above. Ex_1003, ¶ 184.

[2.4] configuring the IP packet with a group address according to a multicast protocol to create a multicast IP packet;

See [7.2] above. Ex_1003, ¶ 185.

[2.5] encapsulating the multicast IP packet as a unicast packet;

de Moraes and Shepherd, both individually and in combination, disclose this element of claim 2. Ex_1003, ¶ 186. As discussed above, de Moraes MBONE multicast routers are interconnected with IP tunnels, which are unicast tunnels and use unicast IP addresses to get to the next MBONE router. Ex_1022, p. 6 ("The

tunnel endpoints are typically workstation-class machines with operating system support for IP multicast and running the “mrouted” multicast routing daemon (always-running background process); Ex_1003, ¶ 186. IP multicast packets are encapsulated for transmission through tunnels, so that they look like normal unicast packets to intervening routers and subnets.”). Shepherd describes ways in which these unicast tunnels can be implemented. *See, e.g.*, Ex_1034, 18:20-28 (“The multicast-enabled router 16 that sent the unicast request message and receives the unicast packets may ... replicate the multicast packets if more than one interface is indicated in multicast forwarding information maintained by the multicast-enabled router for the source/group address pair, and forward the multicast packets via the indicated interfaces”), FIGS. 1-3 and 5-7; Ex_1003, ¶ 186.

For example, Shepherd discloses this element of claim 2. Ex_1003, ¶ 187. For example, the method in Figure 5 of Shepherd describes a “delivery mode indicated in a unicast request message” that may be “encapsulated delivery, indicating that the multicast packets received should be encapsulated with a header that includes the address of the destination device,” such that a unicast request message contains “information that will cause a multicast-enabled router 16 ... identify the unicast request message as containing a request to receive multicast packets as unicast packets.” Ex_1034, 16:47-62; Ex_1003, ¶ 187; *see also*

Ex_1034, 9:64-10:8 (“Additionally, multicast-enabled router 16C supports reception of multicast content across unicast network in that multicast-enabled router 16C is able to determine whether the route to source device 20 is multicast-enabled, send a unicast request message that includes as a destination address an address associated with source device 20 and is marked for interception by an intermediate network device, and receive multicast packets as unicast packets from the intermediate network device across unicast network 14 so that it (sic) the multicast packets may be delivered to a destination device 22.”), 16:63-67 (“After the unicast request message is intercepted and processed by a multicast-enabled router 16 ..., the destination device 22 will receive unicast packets containing the requested multicast content”), 18:7-28 (describing similar encapsulation and delivery of multicast packets as unicast packets with regard to the method in Figure 6). Shepherd further describes “multicast-enabled router 16B will deliver multicast packets to destination device 22A as unicast packets” and “deliver[ing] the multicast packets to the requesting devices as unicast packets in response to the unicast request messages.” Ex_1034, 7:54-55, 9:62-64; Ex_1003, ¶ 187.

Therefore, de Moraes and Shepherd disclose this element of claim 2 in the '997 patent. Ex_1003, ¶ 188.

[2.6] transmitting the unicast packet over the virtual private networks across the Internet between one or more appliances;

Shepherd discloses this element of claim 2. Ex_1003, ¶ 189. Figure 3 in Shepherd shows a “network 40 that supports delivery and reception of multicast content across a unicast network, which in this case is a label-switched network 42” and “may provide additional advantages, such as allowing the delivery of multicast content in a virtual private network (VPN) utilizing a label-switched network of a provider of the VPN service.” Ex_1034, 12:1-4, 15:26-29; Ex_1003, ¶ 189. “For example, referring to FIG. 3, multicast networks 12 may be geographically distributed site networks of a single enterprise, which form a VPN via label-switched network 42. A provider of the VPN service to the enterprise may provide access to label-switched network 42 via multicast-enabled routers 16E and 16F that are maintained by the VPN service provider.” Ex_1034, 15:30-36; Ex_1003, ¶ 187. Therefore, Shepherd disclose this element of claim 2 in the ’997 patent. Ex_1003, ¶ 189.

[2.7] one or more of the appliances determining the multicast data from the unicast packet; and

de Moraes and Shepherd, both individually and in combination, disclose this element of claim 2. Ex_1003, ¶ 190. As discussed above, de Moraes MBONE multicast routers are interconnected with IP tunnels, which are unicast tunnels and use unicast IP addresses to get to the next MBONE router. Ex_1022, p. 6 (“The tunnel endpoints are typically workstation-class machines with operating system support for IP multicast and running the “mrouted” multicast routing daemon

(always-running background process). IP multicast packets are encapsulated for transmission through tunnels, so that they look like normal unicast packets to intervening routers and subnets.”); Ex_1003, ¶ 190. Shepherd describes ways in which these unicast tunnels can be implemented. *See, e.g.*, Ex_1034, 18:20-28 (“The multicast-enabled router 16 that sent the unicast request message and receives the unicast packets may ... replicate the multicast packets if more than one interface is indicated in multicast forwarding information maintained by the multicast-enabled router for the source/group address pair, and forward the multicast packets via the indicated interfaces”), FIGS. 1-3 and 5-7; Ex_1003, ¶ 190.

For example, Shepherd discloses this element of claim 2. Ex_1003, ¶ 191. For example, Shepherd describes a “multicast-enabled router 16 that ... receives the unicast packets may remove the encapsulation or labels to expose the multicast packets for the source/group address pair indicated in the unicast request message,” thereby enabling a destination device to “*determin[e] the multicast data from the unicast packet,*” as claimed in this element. Ex_1034, 18:20-24; Ex_1003, ¶ 191. As discussed in [2.5] above, Shepherd’s “multicast-enabled router 16” can determine multicast data from a unicast packet “so that it (sic) the multicast packets may be delivered to a destination device 22.” Ex_1034, 10:6-8; Ex_1003, ¶ 191; *see also* Ex_1034, 18:20-28 (“The multicast-enabled router 16 that sent the

unicast request message and receives the unicast packets may ... replicate the multicast packets if more than one interface is indicated in multicast forwarding information maintained by the multicast-enabled router for the source/group address pair, and forward the multicast packets via the indicated interfaces”), 7:65-8:5 (describing multicast-enabled routers that can “maintain multicast forwarding information for the source/group address pair indicated by the unicast request message intercepted from destination device 22A that includes information from the unicast request message” and “store the address of destination device 22A as multicast forwarding information for the source/group address pair indicated in by (sic) the unicast request message.”); Ex_1003, ¶ 191. Therefore, de Moraes and Shepherd disclose this element of claim 2 in the ’997 patent. Ex_1003, ¶ 191.

[2.8] the appliances providing the multicast data to each of the other participants in the group address.

de Moraes and Shepherd, both individually and in combination, disclose this element of claim 2. Ex_1003, ¶ 192. As discussed above, de Moraes MBONE multicast routers are interconnected with IP tunnels, which are unicast tunnels and use unicast IP addresses to get to the next MBONE router. Ex_1022, p. 6 (“The tunnel endpoints are typically workstation-class machines with operating system support for IP multicast and running the “mrouted” multicast routing daemon (always-running background process). IP multicast packets are encapsulated for transmission through tunnels, so that they look like normal unicast packets to

intervening routers and subnets.”); Ex_1003, ¶ 192. Shepherd describes ways in which these unicast tunnels can be implemented. *See, e.g.*, Ex_1034, 18:20-28 (“The multicast-enabled router 16 that sent the unicast request message and receives the unicast packets may ... replicate the multicast packets if more than one interface is indicated in multicast forwarding information maintained by the multicast-enabled router for the source/group address pair, and forward the multicast packets via the indicated interfaces”), FIGS. 1-3 and 5-7; Ex_1003, ¶ 192.

For example, Shepherd discloses this element of claim 2. Ex_1003, ¶ 193. Shepherd describes appliances (e.g., “multicast-enabled routers 16”) throughout its embodiments that “may replicate the received multicast packets, and readdress and deliver, encapsulate and deliver, or forward the replicated packets as indicated by the multicast forwarding information,” where the appliances “received multiple unicast request messages and/or multicast join messages for the same source/group address pair.” Ex_1034, 11:60-67; Ex_1003, ¶ 193; *see also* Ex_1034, 18:20-28 (“The multicast-enabled router 16 that sent the unicast request message and receives the unicast packets may remove the encapsulation or labels to expose the multicast packets for the source/group address pair indicated in the unicast request message [], replicate the multicast packets if more than one interface is indicated in multicast forwarding information maintained by the multicast-enabled router for

the source/group address pair, and forward the multicast packets via the indicated interfaces”).

Therefore, this element of claim 2 in the '997 patent is disclosed by de Moraes and Shepherd. Ex_1003, ¶ 194.

4. Claim 8 is Rendered Obvious by the Combination of Knappe, Elliott, the VPN Textbook, de Moraes and Shepherd

[8.P] The method for adding a telephone participant to a multi-participant audio-video conference of claim 7, wherein the telephone participant participating in the multi-participant video conference further comprises:

See [7.P]-[7.2], [4.P] above. Ex_1003, ¶ 191.

[8.1] encapsulating the multicast IP packet as a unicast packet.

See [2.5] above. Ex_1003, ¶ 192.

5. Claim 9 is Rendered Obvious by the Combination of Knappe, Elliott, the VPN Textbook, de Moraes and Shepherd

[9] The method for adding a telephone participant to a multi-participant audio-video conference of claim 8, wherein the telephone participant participating in the multi-participant video conference further comprises: transmitting the unicast packet over the virtual private networks across the Internet between one or more appliances.

See [8.P]-[8.1] & [2.6] above. Ex_1003, ¶ 193.

6. Claim 10 is Rendered Obvious by the Combination of Knappe, Elliott, the VPN Textbook, de Moraes and Shepherd

[10.P] The method for adding a telephone participant to a multi-participant audio-video conference of claim 9, wherein the telephone participant participating in the multi-participant video conference further comprises:

See [9] & [4.P] above. Ex_1003, ¶ 194.

[10.1] one or more of the appliances determining the multicast data from the unicast packet; and

See [2.7] above. Ex_1003, ¶ 195.

[10.2] the appliances providing the multicast data to each of the other participants in the group address.

See [2.8] above. Ex_1003, ¶ 196.

IX. CONCLUSION

For the reasons given above, Petitioner has demonstrated a reasonable likelihood of success in establishing the unpatentability of claims 1-7 and 9-17 of the '689 patent and respectfully requests institution of IPR for each of the grounds presented herein and cancellation of the challenged claims.

Respectfully submitted,

Date: November 31, 2022

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CERTIFICATE OF WORD COUNT PURSUANT TO 37 C.F.R. § 42.24(D)

The undersigned hereby certifies that the word count for the above Petition for *inter partes* review is 13,224, which is less than the 14,000 allowed under 37 CFR § 42.24(a)(1)(i).

Date: December 16, 2022

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CERTIFICATE OF SERVICE PURSUANT TO
37 C.F.R. § 42.6 AND 37 C.F.R. § 42.105

Pursuant to 37 C.F.R. § 42.6(e)(4) and 42.105(b), the undersigned certifies that on December 14, 2022, a complete and entire copy of this Petition for *inter partes* review and all supporting exhibits were provided via FedEx First, to the Patent Owner by serving the correspondence address of record as follows:

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