

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MOTOROLA SOLUTIONS, INC.

Petitioner

v.

STA GROUP LLC

Patent Owner

Inter Partes Review No.: IPR2024-0207

U.S. Patent No. 8,145,249 B2

**PETITION FOR INTER PARTES REVIEW OF U.S. PATENT NO.
8,145,249 UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. §§ 42.1-100, ET SEQ**

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1001	U.S. Patent No. 8,145,249
1002	Declaration of Dr. Sayfe Kiaei (this document)
1003	File History of U.S. Pat. No. 8,145,249
1004	U.S. Patent No. 8,121,057 (“Botha”)
1005	U.S. Pat. Pub. No. 2003/0182001 (“Radenkovic”)
1006	U.S. Pat. No. 7,580,706 (“Koren”)
1007	U.S. Pat. Pub. No. 2002/0097746 (“McDonald”)
1008	U.S. Pat. No. 6,647,020
1009	T. G. Ekstrom, "Site hand off operation in a SmartZone system," Proceedings of IEEE Vehicular Technology Conference (VTC), Stockholm, Sweden, 1994, pp. 106-110 vol.1, doi: 10.1109/VETEC.1994.345134
1010	U.S. Pat. No. 5,081,669 (“Slaninka”)
1011	U.S. Pat. Pub. No. 2005/0239486 (“D’Avello”)
1012	U.S. Pat. No. 6,882,856 (“Alterman”)
1013	U.S. Pat. No. 6,404,861
1014	U.S. Pat. Pub. No. 2005/0125553
1015	De Smet & Stichele, “Subband Based MPEG Audio Mixing for Internet Streaming Applications, 2001 IEEE Int’l Conf. on Acoustics, Speech and Signal Processing Proceedings, pages 1393-1396
1016	Zhihong Qian, “Audio Mixers for Centralized VoIP Conferencing, thesis submitted to Ottawa Carleton Institute for Electrical and Computer Engineering, Carleton University, May 2003

CHART OF CLAIMS	
[1pre]	A method for providing a push-to-talk proxy media service, comprising:
[1a]	receiving a plurality of monitored push-to-talk communication streams over a high bandwidth connection, each monitored push-to-talk communication stream comprising audio communications from a plurality of users;
[1b]	mixing the plurality of monitored push-to-talk communication streams into a mixed communication stream such that the audio communications communicated in each of the monitored push-to-talk communication streams can be heard on the mixed stream; and
[1c]	transmitting the mixed communication stream to a user endpoint over a low bandwidth connection.
[2]	The method of claim 1, wherein each of the push-to-talk communication streams comprises communications from a respective virtual talk group comprising a plurality of endpoints of different communication networks.
[3pre]	The method of claim 2:
[3a]	wherein the mixed communication stream comprises a first communication of a first virtual talk group; and
[3b]	further comprising transmitting an identification of the first virtual talk group when transmitting the mixed communication stream comprising the first communication.
[4]	The method of claim 2, wherein the plurality of monitored push-to-talk communication streams are received over the high bandwidth connection from an interoperability system operable to configure each virtual talk group to facilitate communications among its member endpoints.
[5]	The method of claim 2, wherein at least one of the virtual talk groups comprises a plurality of endpoints of different communication networks whose communications are mapped to a multicast IP address or SIP dialed nailed connection.
[6]	The method of claim 2, wherein at least one of the virtual talk groups comprises a plurality of endpoints of different communication networks whose communications are bridged.
[7]	The method of claim 1, wherein receiving a plurality of monitored push-to-talk communication streams comprises receiving eight monitored push-to-talk communication streams.
[8pre]	The method of claim 1, further comprising:

CHART OF CLAIMS	
[8a]	receiving from the user endpoint volume instructions associated with at least one of the push-to-talk communication streams; and
[8b]	adjusting the volume of the at least one of the push-to-talk communication streams according to the instructions when mixing the plurality of monitored push-to-talk communication streams into a mixed communication stream.
[9pre]	The method of claim 1:
[9a]	further comprising receiving from the user endpoint a selection of a group of the push-to-talk communication streams for mixing; and
[9b]	wherein mixing the plurality of monitored push-to-talk communication streams into a mixed communication stream comprises mixing the selected group of the push-to-talk communication streams into a mixed communication stream.
[10pre]	The method of claim 2, further comprising receiving from the user over the low bandwidth connection:
[10a]	a user communication; and
[10b]	a selection of a plurality of virtual talk groups of the respective virtual talk groups; and
[10c]	transmitting the received user communication to the selected plurality of virtual talk groups over the high bandwidth connection.
[11]	The method of claim 10, further comprising transmitting to the user endpoint an identification of the selected plurality of virtual talk groups when transmitting the received user communication to the selected plurality of virtual talk groups.
[12]	The method of claim 1, further comprising presenting functionality indicators for a user at the user endpoint in the same manner as if the plurality of monitored push-to-talk communication streams had been individually transmitted over a high bandwidth connection to the user endpoint and mixed at the user endpoint for the user.
[13pre]	A system for providing a push-to-talk proxy media service, comprising:
[13a]	an interface operable to receive a plurality of monitored push-to-talk communication streams over a high bandwidth connection, each monitored push-to-talk communication stream comprising audio communications from a plurality of users;
[13b]	a mixer coupled to the interface and operable to mix the plurality of monitored push-to-talk communication streams into a mixed communication

CHART OF CLAIMS
stream such that the audio communications communicated in each of the monitored push-to-talk communication streams can be heard on the mixed stream; and
[13c] a processor operable to transmit the mixed communication stream to a user endpoint over a low bandwidth connection.
[14] The system of claim 13, wherein each of the push-to-talk communication streams comprises communications from a respective virtual talk group comprising a plurality of endpoints of different communication networks.
[15pre] The system of claim 14:
[15a] wherein the mixed communication stream comprises a first communication of a first virtual talk group; and
[15b] wherein the processor is further operable to transmit an identification of the first virtual talk group when transmitting the mixed communication stream comprising the first communication.
[16] The system of claim 14, wherein the plurality of monitored push-to-talk communication streams are received over the high bandwidth connection from an interoperability system operable to configure each virtual talk group to facilitate communications among its member endpoints.
[17] The system of claim 14, wherein at least one of the virtual talk groups comprises a plurality of endpoints of different communication networks whose communications are mapped to a multicast IP address or SIP dialed nailed connection.
[18] The system of claim 14, wherein at least one of the virtual talk groups comprises a plurality of endpoints of different communication networks whose communications are bridged.
[19] The system of claim 13, wherein an interface operable to receive a plurality of monitored push-to-talk communication streams comprises an interface operable to receive eight monitored push-to-talk communication streams.
[20pre] The system of claim 13, wherein:
[20a] the interface is further operable to receive from the user endpoint volume instructions associated with at least one of the push-to-talk communication streams; and
[20b] the mixer is further operable to adjust the volume of the at least one of the push-to-talk communication streams according to the instructions when mixing

CHART OF CLAIMS	
	the plurality of monitored push-to-talk communication streams into a mixed communication stream.
[21pre] The system of claim 13, wherein:	
	[21a] the interface is further operable to receive from the user endpoint a selection of a group of the push-to-talk communication streams for mixing; and
	[21b] a processor operable to mix the plurality of monitored push-to-talk communication streams into a mixed communication stream comprises a processor operable to mix the selected group of the push-to-talk communication streams into a mixed communication stream.
[22pre] The system of claim 14, wherein:	
	[22a] the interface is operable to receive from the user over the low bandwidth connection:
	[22b] a user communication; and
	[22c] a selection of a plurality of virtual talk groups of the respective virtual talk groups; and
	[22d] the processor is operable to transmit the received user communication to the selected plurality of virtual talk groups over the high bandwidth connection.
	[23] The system of claim 22, wherein the processor is further operable to transmit to the user endpoint an identification of the selected plurality of virtual talk groups when transmitting the received user communication to the selected plurality of virtual talk groups.
	[24] The system of claim 13, wherein the processor is further operable to present functionality indicators for a user at the user endpoint in the same manner as if the plurality of monitored push-to-talk communication streams had been individually transmitted over a high bandwidth connection to the user endpoint and mixed at the user endpoint for the user.
[25pre] A system for providing a push-to-talk proxy media service, comprising:	
	[25a] means for receiving a plurality of monitored push-to-talk communication streams over a high bandwidth connection, each monitored push-to-talk communication stream comprising audio communications from a plurality of users;
	[25b] means for mixing the plurality of monitored push-to-talk communication streams into a mixed communication stream such that the audio communications

CHART OF CLAIMS	
	communicated in each of the monitored push-to-talk communication streams can be heard on the mixed stream; and
	[25c] means for transmitting the mixed communication stream to a user endpoint over a low bandwidth connection.
	[38pre] A method for providing a push-to-talk proxy media service, comprising:
	[38a] receiving from a user endpoint over a low bandwidth connection:
	[38b] a user communication; and
	[38c] a selection of a plurality of virtual talk groups, each virtual talk group comprising a push-to-talk communication stream comprising communications from a plurality of endpoints of different communication networks, each push-to-talk communication stream comprising audio communications from a plurality of users; and
	[38d] transmitting the received user communication to each of the selected plurality of virtual talk groups over a high bandwidth connection.
	[39] The method of claim 38, further comprising transmitting to the user endpoint an identification of the selected plurality of virtual talk groups when transmitting the received user communication to the selected plurality of virtual talk groups.

I. INTRODUCTION

The claims of the 249 patent are directed toward bridging communications between disparate communications systems including push-to-talk systems such as used with mobile radios to create a type of virtual conference call so that endpoints in these disparate systems could communicate with each other. This bridging technology was not new technology at the time of the 249 patent. The 249 patent claims were allowed on the basis of two limitations: one requiring receiving a plurality of push-to-talk communications streams with “each monitored push-to-talk communication stream comprising audio communications from a plurality of users” and another requiring mixing those streams “such that the audio communications communicated in each of the monitored push-to-talk communication streams can be heard on the mixed stream.” But these limitations were also known in the art as demonstrated by prior art relied on in this Petition, and the challenged claims are unpatentable as shown below.

II. STATEMENT OF PRECISE RELIEF REQUESTED

In accordance with 35 U.S.C. § 311, Petitioner requests cancelation of claims 1-25, 38, and 39 of the 249 patent (the “Challenged Claims”) in view of the following grounds in combination with the knowledge of one of ordinary skill in the art:

Ground	Claims	Stat. Basis	Prior Art
1	1-7, 9, 13-19, 21, 25, 38 and 39	35 U.S.C. § 103	Botha
2	1, 7-9, 12-13, 19-21, 24, 25, 38, 39	35 U.S.C. § 103	Radenkovic and McDonald
3	2-6, 10-11, 14-18 and 22-23	35 U.S.C. § 103	Radenkovic, McDonald and Koren

III. THE 249 PATENT

A. Overview of the 249 patent

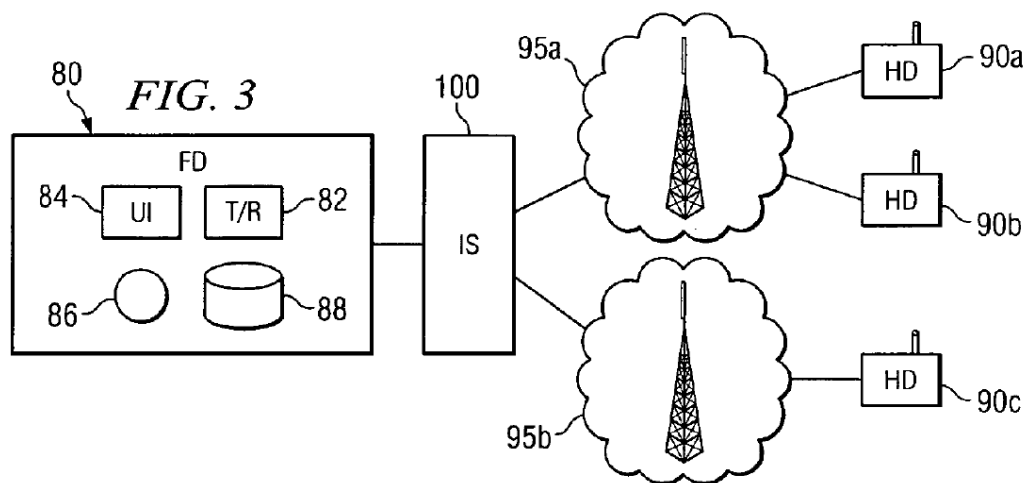
The 249 discloses that public and private groups, such as police and firefighters, often employ communications systems (e.g., land mobile radios communicating through push-to-talk, or “PTT,” technology) with different communications technologies, which makes communication among endpoints of such different communications system difficult. EX1001, 1:24-45. Land mobile radios are typically half-duplex (“HD”) endpoints that cannot support both outgoing and incoming communications at the same time. EX1001, 1:41-45. This is in contrast to full-duplex (“FD”) endpoints, such as phones (such as mobile phones), which can support both outgoing and incoming communications at the same time. EX1001, 3:34-53; EX1002, ¶58. In such HD PTT systems, an endpoint can only transmit or receive at any one time and only one party can talk at any one time. Thus, a user must “control the floor” by pressing or otherwise activating a PTT button on an endpoint device, which sends a signal to the other PTT endpoints on the same channel to inform them that the user who as pushed the PTT button

has control of the floor. *Id.* Many networks such as police and fire utilize through push-to-talk land mobile radio communication technologies. The communications among different endpoints of different networks such as endpoints of different police, fire or other security networks may be difficult. EX1001, 1:27-32; EX1002, ¶58.

The 249 patent is directed toward solutions to the problem of facilitating communications among endpoints on such different communications systems. In one embodiment relevant to this IPR, the solution involves a method for providing a “push-to-talk proxy media service” that includes “receiving a plurality of monitored push-to-talk communication streams over a high bandwidth connection and mixing the plurality of monitored push-to-talk communication streams into a mixed communication stream” and “transmitting the mixed communication stream to a user endpoint over a low bandwidth connection.” EX1001, 2:21-28; EX1002, ¶59.

The 249 patent discloses an interoperability system (“IS”) to facilitate interoperable communication sessions between and among various communication devices, such as endpoints of radio communication networks and endpoints of IP networks such as PDAs, IP phones and laptops. EX1001, 3:25-30. The IS can connect communications between HD and FD endpoints, including land mobile radios (“LMRs”), cellular phones, IP phones, personal computers, PDAs, PSTN

(public switched telephone network) phones, video monitors, etc., using Internet Protocol. EX1001, 4:58-64. The IS may control gateways (which may be part of the IS) in order to map radio frequencies of mobile radios to IP addresses for communication to other types of radio endpoints or IP devices. One embodiment of an IS 100 including a floor control proxy for facilitating communications between multiple HD LMRS 90a,b of one radio network 95a (e.g., as may be used by firefighters), HD LMR 90c of a second radio network 95b (e.g., as may be used by police) and a FD endpoint 80 such as a PSTN or cellular phone is shown in Fig. 3 of the 249 patent below (EX1003, 10:30-13:46; EX1002, ¶160):



In Fig. 3 above, communications between endpoints 80, 90 travel through the IS 100. However, the 249 patent also discloses embodiments in which the communications do not pass through the IS 100 but instead travel through devices

such as gateways and other network components controlled by the IS 100.

EX1001, 10:16-20 and 10:39-42; EX1002, ¶61.

The 249 patent discusses concepts referred to as “talk groups” and “virtual talk groups.” The “talk group” term in the context of the 249 patent refers to a channel on a radio network that is used by a subgroup of users who sharing some common interest, such as a common functional responsibility and who typically coordinate actions amongst themselves without radio interference from other groups. For example, a police department radio system may include various talk groups of various users. EX1001, 9:42-53; EX1002, ¶62.

The 249 patent extends the talk group concept to “virtual talk groups” facilitated by an IS. The 249 patent virtual talk group allows a group of endpoints to communicate using a particular IP address, and the use of multicast IP addresses allows IS 20 to facilitate communications among communication devices and endpoints of various communication networks to provide audio, data, video and control network interoperability. Ex. 1001, 5:32-40. The 249 patent describes virtual talk groups as follows:

A virtual talk group (VTG) represents interoperability of a group of channels, for example, as an audio conference or meeting. A virtual talk group may include an associated virtual channel and an ID. Virtual channels may comprise an address, such as an IP address, associated with a virtual talk group through which users

may access the virtual talk group and/or through which communications from VTG member endpoints are bridged . . .

As an example, a particular virtual talk group may comprise a conference or meeting of the following: (1) a channel or other multicast path used by certain users of a police department's radio network, (2) a channel or other multicast path used by certain users of a fire department's radio network, (3) a channel or other multicast path used by certain users of a corporation's security radio network and (4) a plurality of users of IP-enabled endpoints such as IP phones, IP-enabled PDAs or PCs.

EX1001, 9:54-10:20; EX1002, ¶63.

B. Overview of the 249 patent's File History

The independent claims originally filed for the application that led to the 249 patent were rejected by the examiner over the combination of Denman and Lillie. EX1003 139-140 (4/14/2010 Final Rejection) at 4-5. In response, the applicants amended claims 1, 13, and 25 to recite “each monitored push-to-talk communication stream comprising audio communications from a plurality of users” and “such that the audio communications communicated in each of the monitored push-to-talk communication streams can be heard on the mixed stream,” and amended claim 38 to recite “each virtual talk group comprising a push-to-talk communication stream comprising communications from a plurality of endpoints of different communication networks” and argued that Denman and Lillie did not

disclose these limitations. EX1003 108-118, 121-123 (7/14/2010 Request For Continued Examination) at 2-12, 15-17; EX1002, ¶64.

The examiner responded to these arguments by issuing a rejection over Denman, Lillie and Löppönen, relying on Löppönen for the disclosure of the limitations added by amendment. EX1003 86-88 (2/4/2011 Non-final Rejection) at 2-4. The applicants argued that Löppönen did not disclose these limitations because “even in the multi-group disclosure of *Löppönen*, ***the user still hears only one group at a time***. There is ***no disclosure*** in *Löppönen* of receiving a plurality of push-to-talk streams where each stream comprises audio communications from a plurality of users and ***mixing the streams into a mixed stream such that the audio communications can be heard on the mixed stream***.” EX1003, 76-77 (5/4/2011 Applicant Response) at 15-16. While the examiner initially rejected this argument and issued another rejection, she later relented and allowed the claims with these amendments. EX1003, 48-49 (7/21/2011 Final Rejection) at 2-3; 24 (11/21/2011 Interview Summary) at 1. EX1002, ¶65.

C. Person of Ordinary Skill in the Art

A person of ordinary skill in the art (“POSITA”) at the time of the earliest alleged priority of the 249 patent (November 4, 2005) would have had at least a B.S. degree in electrical engineering, computer science, or a similar field, plus approximately three years of industry in networking or communication systems, in

particular address interoperability between different types of networks and satellite communications. Additional education in the fields of electrical engineering or computer science, such as a masters or doctorate degree, could substitute for professional experience in the field. A person with less or different education but more relevant practical experience, or vice versa, may also meet this standard. The prior art also evidences the level of skill in the art. EX1002, §68.

D. Claim Construction Under 37 C.F.R. § 42.104(b)(3)

The Challenged Claims are interpreted using the same claim construction standard that is used to construe the claim in a civil action in federal district court. 37 C.F.R. § 42.100(b).

Petitioner does not contend that its proposed constructions are complete constructions of these limitations or the claims for any other purpose, including for issues that have been raised in the related litigation. Because the prior art asserted herein discloses the preferred embodiment within the indisputable scope of the claims, the Board need not construe the outer bounds of the claims as part of these proceedings. The district court may have to address other bounds of the claims in addressing infringement. *See, e.g., Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)) (providing that only those

terms that are in controversy need be construed, and only to the extent necessary to resolve the controversy).

Any claim terms not listed below should be construed according to their plain and ordinary meaning to a POSITA at the time of the 249 patent. EX1002, ¶69.

1. “a high bandwidth connection” (claims 1, 13, 25 and 38)

The 249 patent does not define either the lower or upper boundary of a “high bandwidth connection” with reasonable certainty, and this limitation is therefore indefinite. However, the 249 patent does make clear that a DSL connection is not a high bandwidth connection while a commercial-grade LAN is. EX1001, 2:39-46 (distinguishing home DSL connection from a “high bandwidth LAN” in a company or other organization); *see also* EX1002, §70. This distinction is sufficient to resolve the challenges in this IPR, and the indefiniteness of this term therefore does not preclude institution of this IPR. *See Samsung Elecs. Am. Inc. v. Prisia Eng’g Corp.*, 948 F.3d 1342, 1352-53, 55 (Fed. Cir. 2020) (remand to PTAB to consider obviousness challenge despite indefiniteness issue).

2. “a low bandwidth connection” (claims 1, 13, 25 and 38)

The 249 patent does not define either the lower or upper boundary of a “low bandwidth connection” with reasonable certainty, and this limitation is therefore indefinite. However, the 249 patent refers to a WAN (wide area network) as a low

bandwidth network and implies that low bandwidth communication such as WAN through the DSL connection is a low bandwidth connection. EX1001, 2:34-46 (referring to “a low bandwidth network, such as a WAN” and distinguishing home DSL connection from a “high bandwidth LAN” in a company or other organization); *see also* EX1002, §71. Based on these disclosures, a POSITA would have known that phone lines, and DSL systems operating using the phone lines, are low-bandwidth connections. EX1002, §71. This distinction is sufficient to resolve the challenges in this IPR, and the indefiniteness of this term therefore does not preclude institution of this IPR as discussed in the preceding section.

3. “means for receiving” (claim 25)

This is a means-plus-function limitation subject to construction under 35 U.S.C. § 112, sixth paragraph (pre-AIA). The recited function is “receiving a plurality of monitored push-to-talk communication streams over a high bandwidth connection.” The corresponding structure from the specification is interface 51 of the interoperability system 50 of Fig. 2. EX1001, 7:40-47; EX1002, ¶72.

4. “means for mixing” (claim 25)

This is a means-plus-function limitation subject to construction under 35 U.S.C. § 112, sixth paragraph (pre-AIA). The recited function is “mixing the plurality of monitored push-to-talk communication streams into a mixed communication stream such that the audio communications communicated in each

of the monitored push-to-talk communication streams can be heard on the mixed stream.” The corresponding structure disclosed in the specification includes mixer 223 of Fig. 5, which a POSITA would recognize based on the 249 patent’s description as corresponding to known linear time domain mixers. EX1001, 17:60-65; EX1002, ¶73 (citing EX1015 and EX1016).¹

5. “means for transmitting” (claim 25)

This is a means-plus-function limitation subject to construction under 35 U.S.C. § 112, sixth paragraph (pre-AIA). The recited function is “transmitting the mixed communication stream to a user endpoint over a low bandwidth connection.” The corresponding structure from the specification is interface 51 of the interoperability system 50 of Fig. 2. EX1001, 7:40-47; EX1002, ¶74.

IV. OVERVIEW OF THE PRIOR ART REFERENCES

A. EX1004 – Botha

Botha was filed on October 29, 2004 and was issued on February 21, 2012. EX1004, 1. Botha is prior art to the 249 patent under 35 U.S.C. § 102(e) (pre-AIA).

¹ Petitioner may assert in district court that this limitation is indefinite because the 249 defines the scope of this limitation as including structures beyond this class of known structures, but resolution of that claim construction issue is not necessary to resolve this IPR.

Botha, like the 249 patent, is directed toward enabling communications between different endpoints in disparate communications systems. EX1004, Abstract and 2:7-8. As shown in Fig. 1 reproduced below, these disparate systems and devices can include an IP telephone 120; personal computer or PDA 140 (not numbered in Fig. 1); audio input and output devices 150; digital, analog and/or cellular phones 160; server computer 170; and a land mobile radio system 180 including a plurality of mobile radios 180 – all communicating over channels 110 in the communication network 100 (EX1004, 11:55-12:3 and 2:27-3:11); EX1002, ¶76.

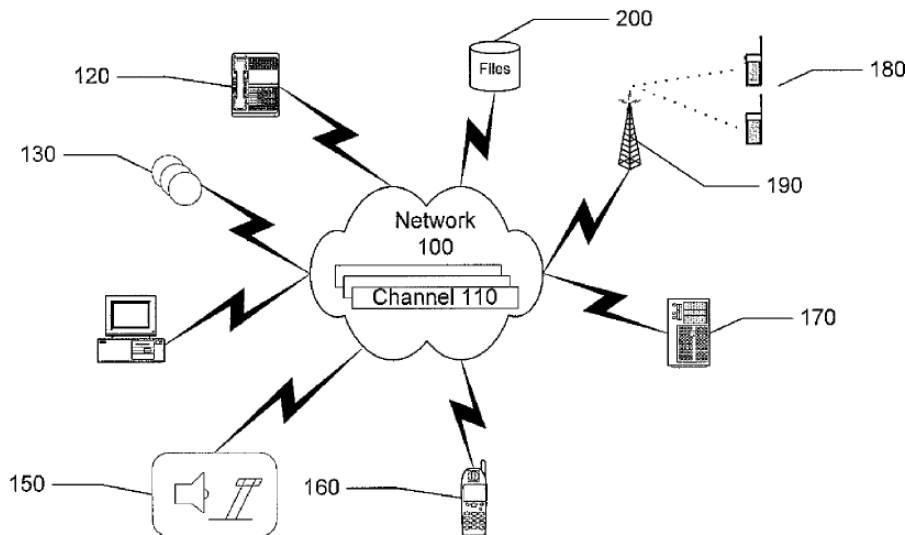


Fig. 1

Botha discusses a method which allows disparate communication devices to communicate with each other. The method includes converting, if needed,

information communicated from any one of the communication devices into packets. Botha adds identification data for a particular IP session to the packets, which are placed on a communications network utilizing the internet protocol (“IP”), such as an internet or the public Internet. EX1004, 2:8-17. The session identification data corresponds to a “virtual channel” to which devices (or, as discussed further below, proxies for devices) that are interested in the communications can “tune” to receive packets corresponding to the virtual channel. EX1004, 7:7-28; EX1002, ¶77.

Botha discloses that a gateway 230 can be used to connect a non-packetized communications system or device (e.g., cellular phone 160) to a channel 110 on the network 100. For example, as illustrated in Fig. 2 below, Botha discloses that a gateway 230 is used to connect a two-way radio system with multiple two-way radios 180, 190 to a channel 110 in the network 100:

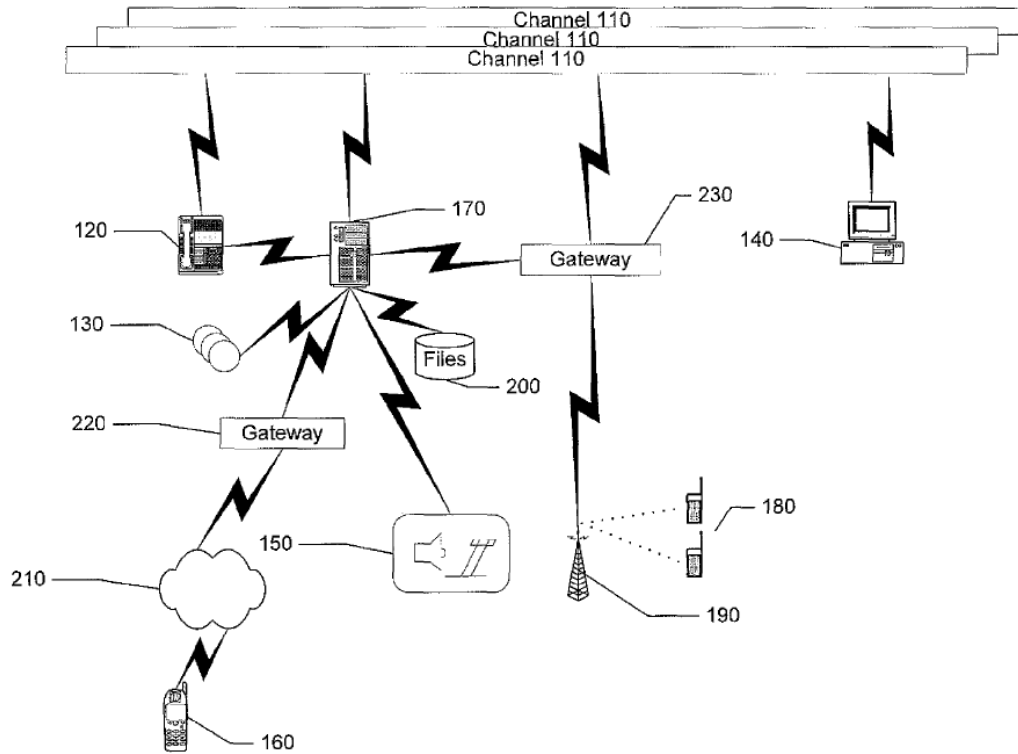


Fig. 2

EX1004, 13:63-14:10 and Fig. 9 (reproduced below); *see also* 13:36-54 and Fig. 8 (discussing use of gateway 220 to interface analog, digital or cellular phone 160 to channel 110 in network 100). The gateway 230 includes logic to allow it to communicate directly on the channels 110. EX1004, 14:6-10; EX1002, ¶78.

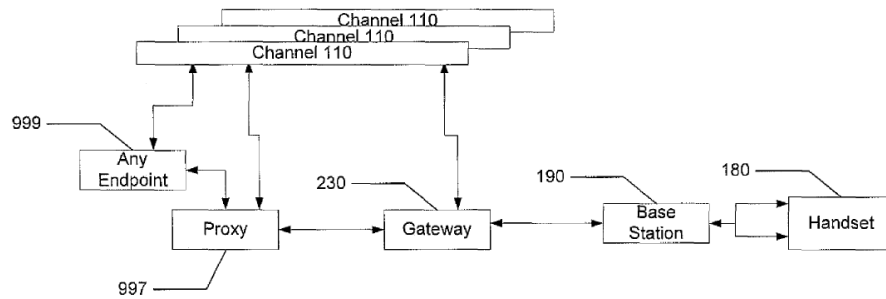


Fig. 9

Botha discloses that the channels 110 may be implemented using multicast technology in some embodiments. EX1004, 7:7-10. Multi-cast technology uses an IP address that is received by multiple recipients. EX1004, 7:7-21. In some embodiments, the session ID associated with a channel 110 is a combination of a multi-cast IP address and a port number. EX1004, 12:64-65. As disclosed in the 249 patent:

a “virtual” channel of one example embodiment is present by virtue of participants' packets that contain session identification (ID) or other ID information that identifies the particular multicast and/or unicast session or group that is associated with the participant. Thus, participants' devices or proxy devices can “tune” to a **virtual channel** by monitoring the network for particular packets having the relevant ID information and then receiving such packets. Other examples for determining the particular IP session for the packets include determining a transmitter source for each packet according to a network

address of the transmitter, data type transmitted by the transmitter, media type transmitted by the transmitter, and other pertinent information embedded in the packet or sent alongside the packet by the transmitter or its proxy.

EX1004, 7:13-28; EX1002, ¶79.

Embodiments of Botha's system work on a peer-to-peer model where communications from each speaker are output on a desired channel and each endpoint or a proxy for a plurality of endpoints performs a mixing function.

EX1004, 6:15-30; 7:29-61; 8:1-12. In one example described in the 249 patent, a proxy that performs a mixing function for a conference system with four participants and two speakers outputs a single multicast stream rather than four unicast streams. EX1004, 7:42-61; EX1002, ¶80.

This proxy mixing can support a distributed conferencing functionality using a single channel 110 as a backbone. EX1004, 16:1-7. In such distributed conferencing, the network traffic generated by each proxy is an aggregation of the audio from each endpoint connected to that proxy, and as a result, the amount of traffic on a channel is a multiple of the number of proxies on the channel rather than the number of endpoints. EX1004, 16:42-53. For example, in a situation where four proxies were connected to a channel, multiple endpoints each call into a respective local proxy. The local proxy mixes the audio from each endpoint at that local proxy into a single multicast stream and outputs it on the channel. Thus, the

total number of streams on the channel is equal to four – one from each proxy.

EX1004, 16:7-25 and 16:42:51. Using this technique, each endpoint at a local proxy would be heard not only by every other endpoint on the same local proxy, but also by all other participants on the other three proxies on the channel due to the use of a multicast channel added to the conference by each of the proxies.

EX1004, 16:15-20. In the two-way radio context, streams placed on the channel by other proxies are similarly relayed to the two-way radio interface by the gateway device 230 to transmit the received data onto the airwaves for reception by the two-way radio endpoints, with real-time generation of signaling (e.g., audio tones) referred to as “keying” appropriate for a PTT two-way radio system by the local proxy. EX1004, 14:24-49; EX1002, ¶81.

The 249 patent also describes channel-to-channel bridging performed by a proxy device. Such channel-to-channel bridging can, for example, “allow different ‘talk groups’ on two-way radio systems to communicate between each other – for example, a UHF two-way radio system on one channel and a VHF two-way radio system on the other.” EX1004, 15:39-46. Other examples of the use of this bridging technology disclosed in the 249 patent include bridging channels managed by different entities, such as different law enforcement agencies, so that end-users within those entities are able to talk to each other regardless of the type of equipment they use. EX1004, 15:46-50; EX1002, ¶82.

B. EX1005 - Radenkovic

Radekovic was filed as a PCT application on August 9, 2001 and was published on September 25, 2003. EX1005, 1. Radenkovic is therefore prior art to the 249 patent under 35 U.S.C. §§ 102(a) and (b) (pre-AIA).

Radenkovic is directed toward methods and systems for providing audio services that employ selective mixing of audio streams corresponding to simultaneous speakers for distribution over a communication network such as packet data network. EX1005, ¶¶[0001], [0002], [0011]-[0014]. The audio streams are selectively mixed depending on a variety of factors including available network bandwidth, relationships between audio sources, receiver quality of service requirements, and/or receiver capabilities. EX1005, ¶¶[0025]-[0032] ; EX1002, ¶83.

The selective mixing can be accomplished by audio mixers 104 connected between internet access servers 106 to which user terminals 100 connect and the Internet 102 as shown in Fig. 1 below. EX1005, ¶[0048]; EX1002, ¶84.

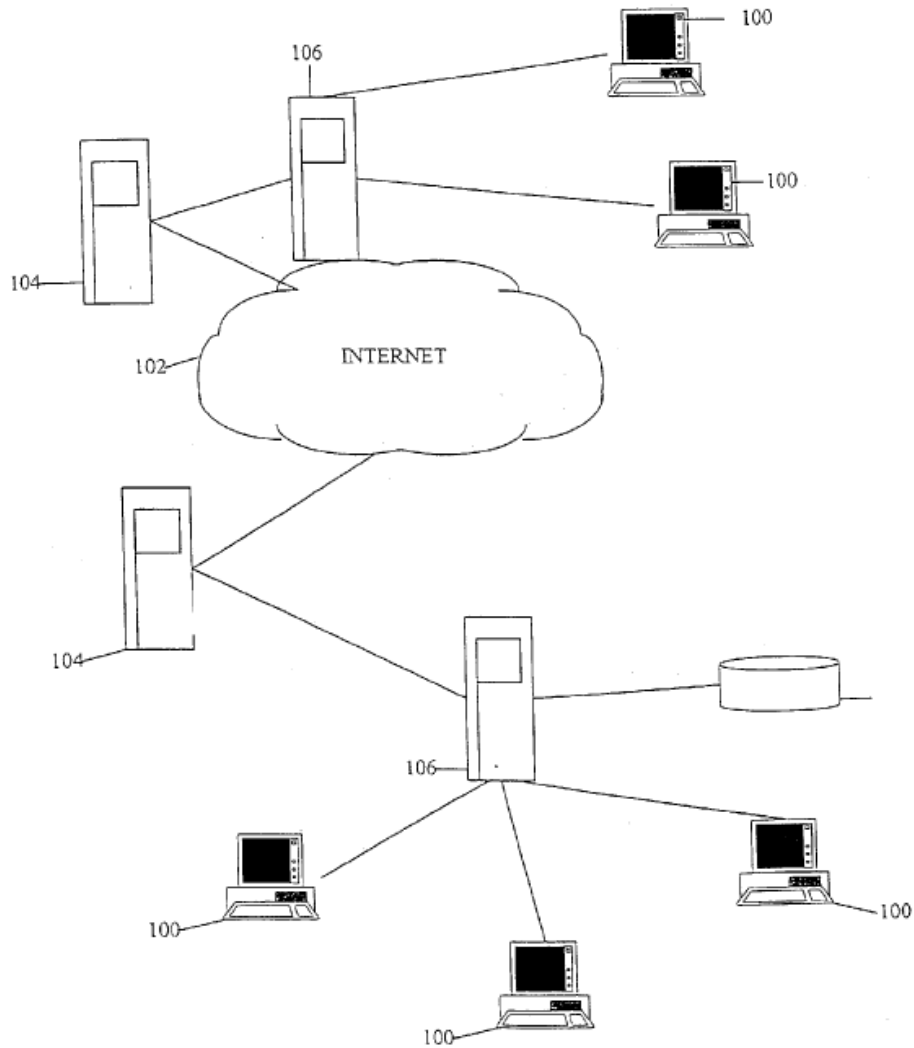


Figure 1

As illustrated in the logical network diagram of Fig. 2, the mixers 204 (104 in Fig. 1) connect sources 200 and sinks 202 in the network via audio data streams 206, where the same user device may be both a source 200 and a sink 202:

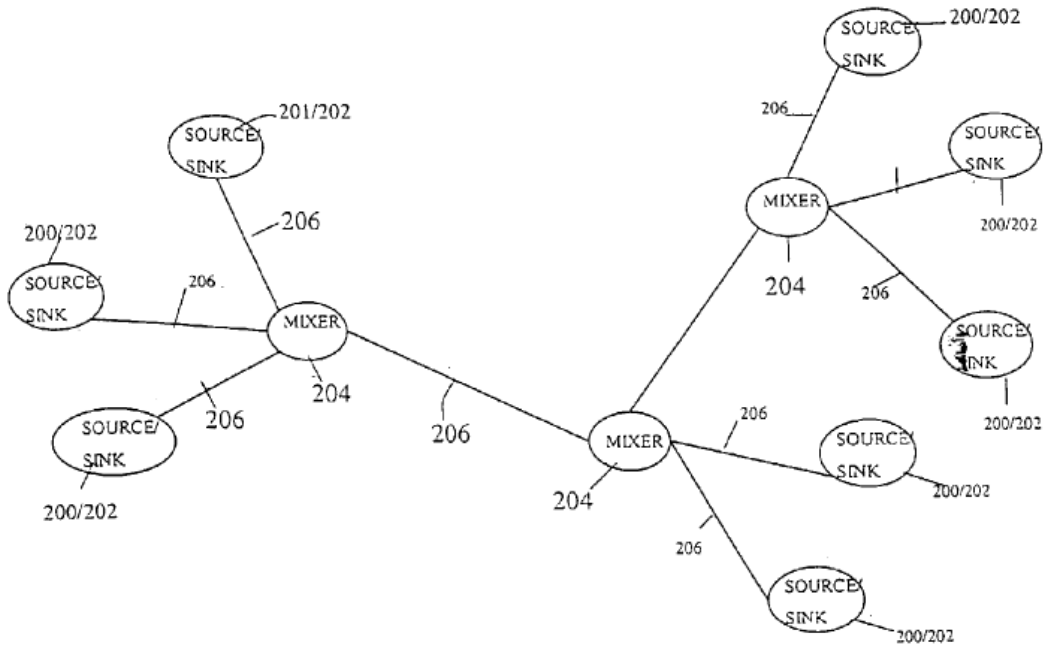


Figure 2

EX1005, ¶[0049]. The mixer 204 of Fig. 2 can be incorporated as mixer 304 into a router 300 as shown in Fig. 3. EX1005, ¶[0050]. The mixer 104/204/304 performs the selective mixing discussed above to create mixed streams, and those mixing decisions may be made dynamically. EX1005, ¶¶[0051]-[0053]. The congestion monitor 308 monitors congestion on the links 206 connecting the router 300 to sinks 202 to allow the router 300 to make those dynamic mixing decisions. EX1005, ¶[0050]; EX1002, ¶85.

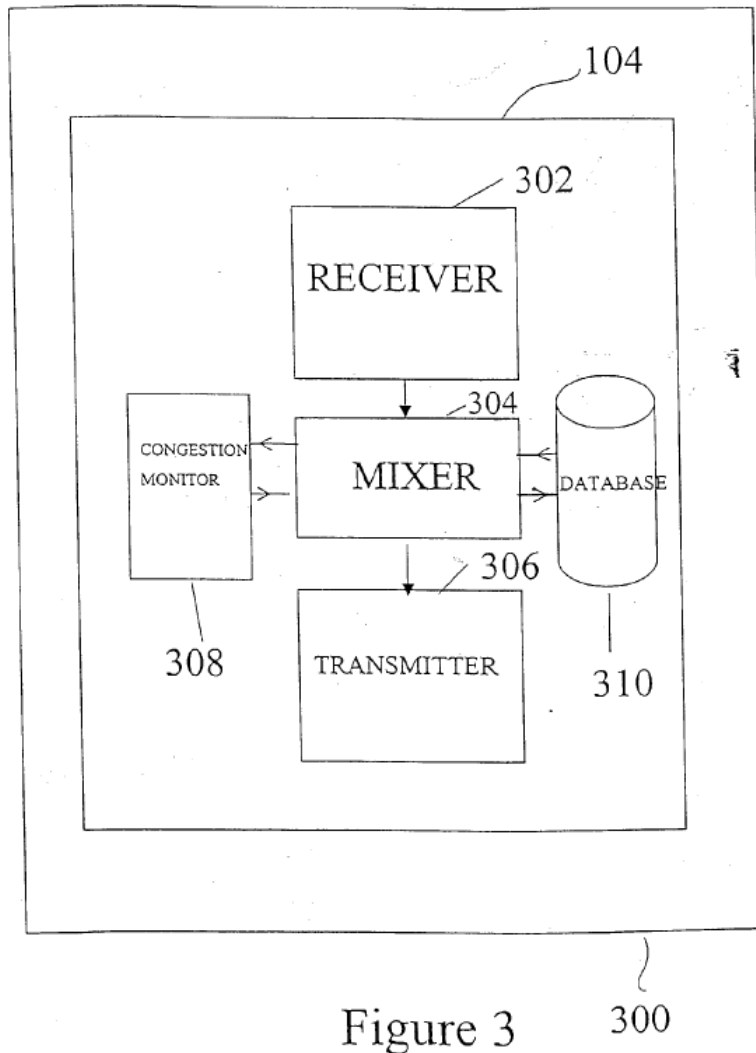


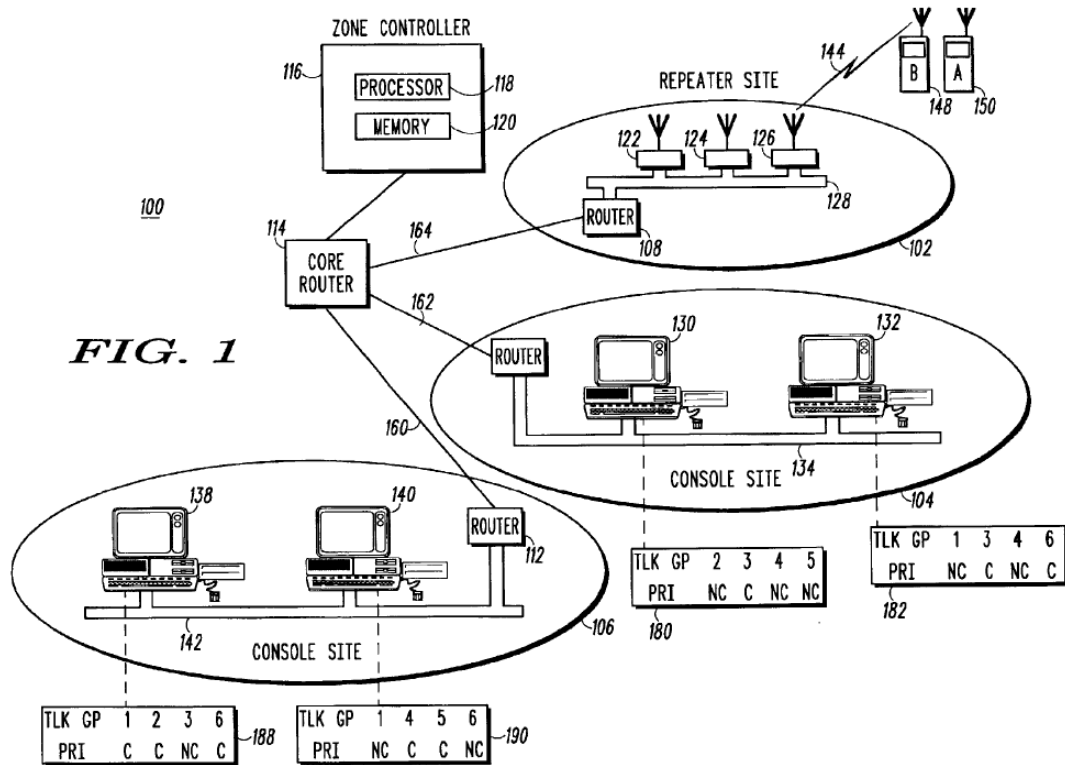
Figure 3

C. EX1007 – McDonald

McDonald was published on July 25, 2002. EX1001, 1. McDonald is prior art to the 249 patent under 35 U.S.C. § 102(b) (pre-AIA).

McDonald is directed toward a system in which dispatch consoles monitor talkgroups including mobile radios. EX1007, ¶[0002]. An example of such a system is shown in Fig. 1, in which consoles 130, 132, 138, 140 at console sites

104, 106 that monitor talkgroups that include mobile radios 148, 150 connected to repeater sites 102. EX1007, ¶[0014].



In McDonald's system, a console 130-140 receives audio from mobile radios 148, 150 in talkgroups over a packet-based connection via the router 108 to the core router 114 to another router 112 at the console sites 104, 106 via links 160, 162 which have limited bandwidth, such as T1 or E1 links which are digital links typically used for packetized communications. EX1007, ¶¶[0004], [0014]-[0016]; EX1002, ¶86. The core router 114 is controlled by a zone controller 116. EX1007, ¶[0014]. The consoles 130-140 allow a console operator to select one or multiple talkgroups for monitoring, and to select a priority for each talkgroup. For example,

a console 142 can select talkgroups with identification numbers 1, 2, 3 and 6 for monitoring, and to designate talkgroups 1, 2, and 6 as critical and talkgroup 3 as non-critical, as shown in box 188. EX1007, ¶[0021]. These selections from the console are communicated to the zone controller 119. EX1007, ¶¶[0010], [0021]. McDonald discloses that a console may select from up to 64 talkgroups for monitoring. EX1007, ¶[0004]. The monitoring can be passive or active. EX1007, ¶[0004]. McDonald discloses that it may not be possible to send audio streams from all selected talkgroups to a console due to limited bandwidth on links 160, 162, and thus no audio for a selected non-critical talkgroup may be received. EX1007, ¶¶[0010], [0020], [0032]; EX1002, ¶86.

D. EX1006 - Koren

Koren was filed on September 2, 2004 and was issued on August 25, 2009. EX1006, 1. Koren is prior art to the 249 patent under 35 U.S.C. § 102(e) (pre-AIA).

Koren is directed toward interoperability systems that use a packet data network such as the Internet to provide for communications between different radio systems used by local, state and federal authorities such as first responders, including both conventional and trunked two-way radio systems, as well as cellular and PSTN phones as shown in Fig. 1 below. EX1006, 1:16-61; EX1002, ¶87.

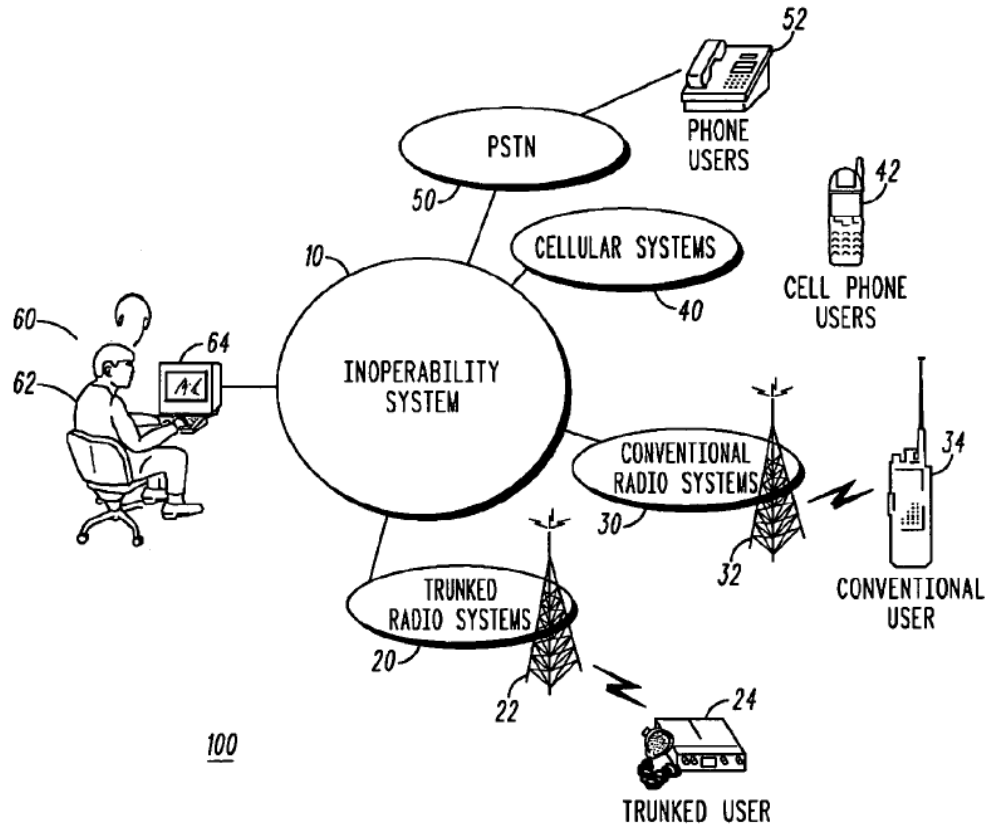


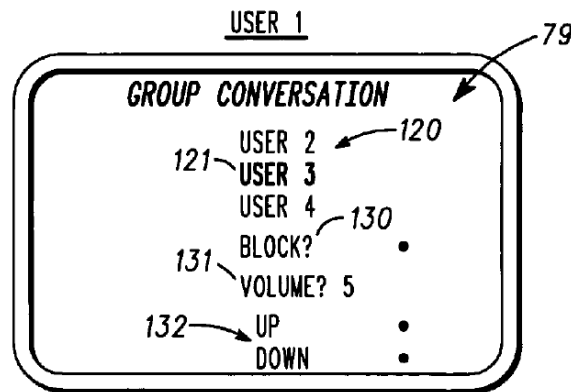
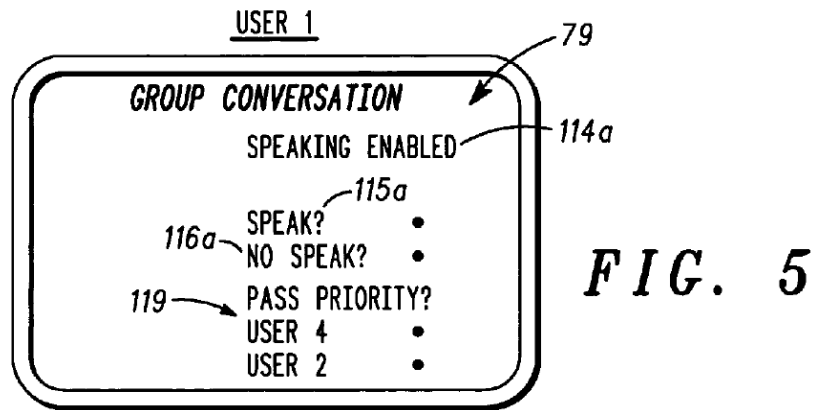
FIG. 1

E. EX1011 - D'Avello

D'Avello was filed on April 5, 2004 and was published on October 27, 2005. EX1004, 1. D'Avello is prior art to the 249 patent under 35 U.S.C. §§ 102(a) and (e) (pre-AIA).

D'Avello is directed toward controlling communications in a communications network and provides for user interfaces and associated functionality that allow a user to set up group conversations, set group member priorities, and control volumes of individual group members as shown below.

EX1011, ¶¶[0030], [0048], [0055] ; EX1002, ¶88.



V. LEGAL STANDARDS FOR OBVIOUSNESS

A claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious to a person having ordinary skill in the art to which said subject matter pertains. See *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of

skill in the art; and (4) where in evidence, so-called secondary considerations, including commercial success, long-felt but unsolved needs, failure of others, and unexpected results. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

With respect to factor (3), the level of skill in the art at the time of the alleged invention of the 844 patent is discussed above. With respect to factor (4), PO has not provided any evidence of secondary considerations that would weigh in favor of non-obviousness, let alone any evidence that establishes a nexus between any secondary consideration and the challenged claims. In any event, the showing of invalidity in this Petition is strong and any alleged secondary considerations are insufficient to establish non-obviousness in light of this strong *prima facie* showing. *Intercontinental Great Brands (Kraft) v. Kellogg N. Am. Co.*, 869 F.3d 1336, 1347 (Fed. Cir. 2017). Factors (1) and (2) are addressed below.

VI. GROUND 1: CLAIMS 1-7, 9, 13-19, 21, 25, 38 AND 39 ARE OBVIOUS OVER BOTHA

A. Introduction

As discussed above in Section IV.A, incorporated here by reference, Botha discloses a method and systems that allow for endpoint devices in disparate communications systems to communicate with each other. EX1004, Abstract and 2:7-8. Of particular relevance here, Botha discloses embodiments in which communications between two different two-way radio systems, such as communications between two different “talk groups” on different UHF and VHF

two-way radio systems connected to a respective computer data network channels 110-A and 110-D, are bridged via a device 997 so that end-users within those different two-way radio systems may communicate with each as shown in Fig. 13:

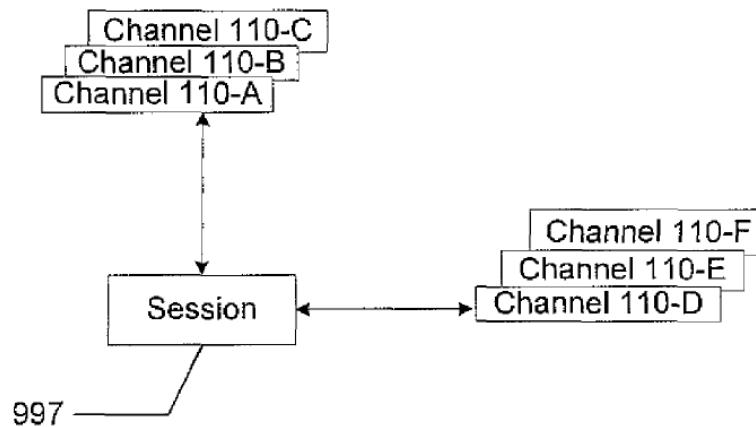


Fig. 13

EX1004, 3:27-31 and 15:39-58; EX1002, ¶89.

Botha further discloses that a two-way radio system 190 (basestation), which includes and monitors multiple endpoints 180 (PT radio handset), may be connected to a channel 110 via a gateway 230 to other communication systems such as mobile phones, PDAs, computers and phones or “any endpoint” 999 as

described in EX1004 at 13:63-14:10 and as shown in Figs. 2 and 9 below

(annotated); EX1002, ¶90:

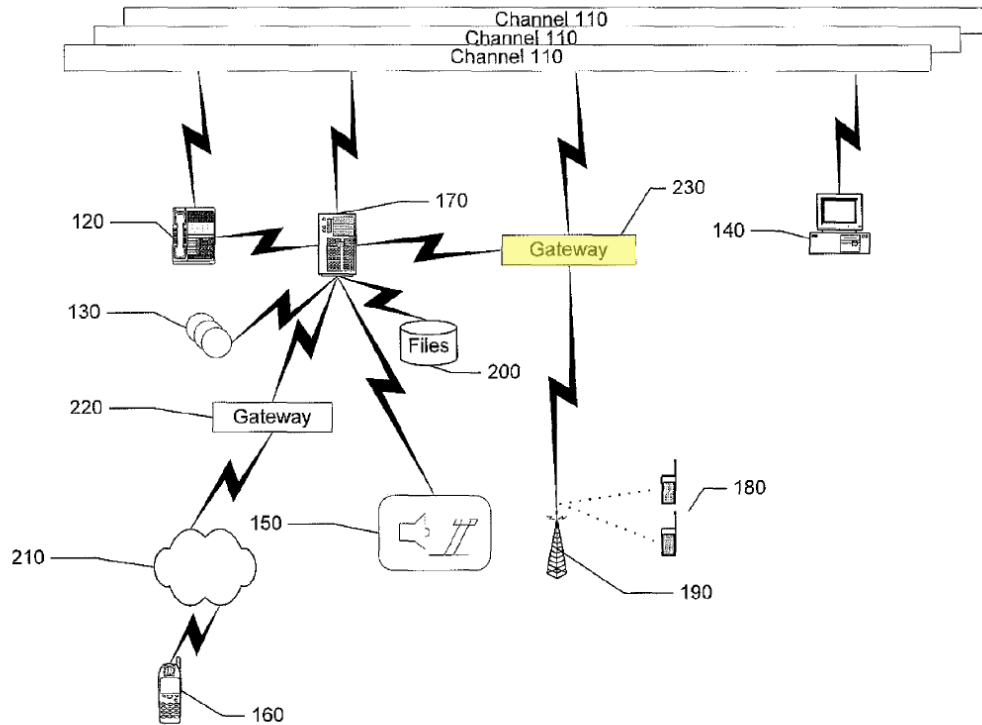


Fig. 2

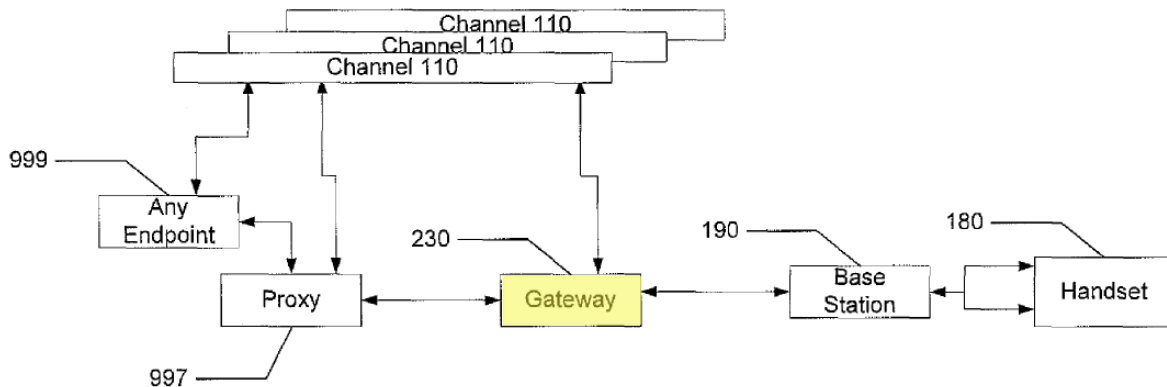


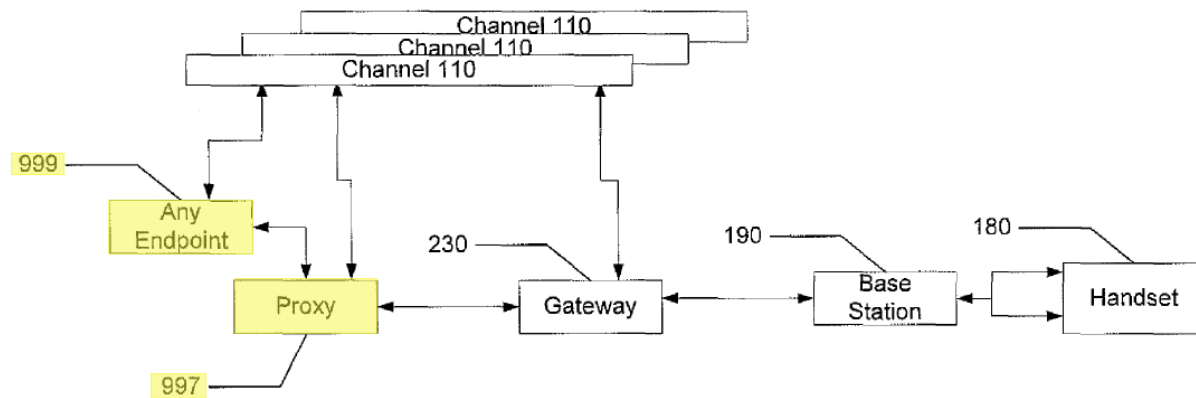
Fig. 9

When a radio system 190 is connected to a channel 110 via a gateway 230 with an embodiment of the invention installed on the gateway 230, data (i.e., a communication stream) from the two-way radio system 190 is converted to digital data if necessary at the gateway 230 and transmitted to the channel 110. EX1004, 13:63-14:10. Data (i.e., a communications stream) from any other endpoint outside the two-way radio system that is connected to the channel 110 is relayed by the gateway 230 to the two-way radio system 190 for transmission over the airwaves to the endpoints 180 on that radio system. EX1004, 14:24-49. This transmission may include audio tones or other signaling (referred to in Botha as “keying”) generated by either the transmitting endpoint, a proxy device, or the gateway 230,

and sent along with the communication stream to the radio system 190 for transmission over the airwaves. EX1004:14:24-15:4; EX1002, ¶91. Keying:

is accomplished through ... the real-time generation of a sequence of specific audio tones embedded into the data stream, on behalf of instructions delivered to the gateway device 230 from the proxy device 997, or by digital, analog, electrical, or mechanical signaling relayed to the two-way radio interface device by the gateway device. This "keying" of the radio causes the relayed data to be transmitted onto the airwaves and therefore propagate to subscriber devices such as portable two-way radios, base stations, consoles, repeaters, and all other devices capable of receiving the data stream over the airwaves (collectively 180). EX1004, 14:24-40.

In the embodiments shown in Figs. 2 and 9 above, the radio system 190 and the respective endpoints 180 in one talk group connected to a channel 110 are also in communication with another endpoint 999 via a proxy 997 as shown in the annotated version of Fig. 9 below:



The endpoint 999 may be any endpoint, including an endpoint such as a cellular, digital or analog telephone. EX1004, 13:36-54. Such a phone 160 participates on a channel 110 by dialing into a gateway 220 via the public switched telephone network or “PSTN” 210 to a proxy 997, which proxies data to the channel 110 as shown in Fig. 8. *Id.*; EX1002, ¶92.²

² Botha discloses that it is possible for a gateway 230 connected to a two way radio system 190 to communicate to a proxy for another endpoint in manners other than over a channel 110. For example, Botha discloses an alternative where a gateway 230 makes use of a signaled call using a protocol such as H.323, SIP or MCGP using a dial-in or dial-out connection. EX1004, 14:11-20. This technique is an alternative to establishing communications with an endpoint proxy via a channel 110 as shown in Fig. 8. EX1002, ¶92.

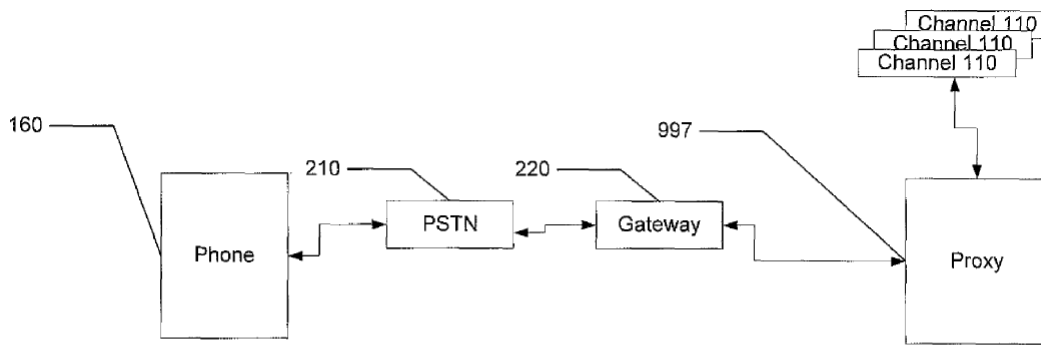


Fig. 8

The proxy 997 of Fig. 8 performs a mixing function. A communication stream from the phone 160 is bridged onto a channel 110 using “n-minus-x” mixing such that data (e.g., communication streams) from the device 160 is propagated to the channel 110 and an aggregate (i.e., mixed) communication stream corresponding to all other multicast or unicast streams on the channel is sent to the device (in this case, the phone 160) by the proxy 997. EX1004, 13:49-51 and 13:18-31; EX1002, ¶93.

Combinations of embodiments disclosed in Botha, including those discussed above, are explicitly taught by Botha:

The flow may be of numerous, and potentially recursive, combinations of the channels’ participation in the operation being carried out on the device 997 including, but not limited to direct channel-to-channel streaming, aggregation of data from

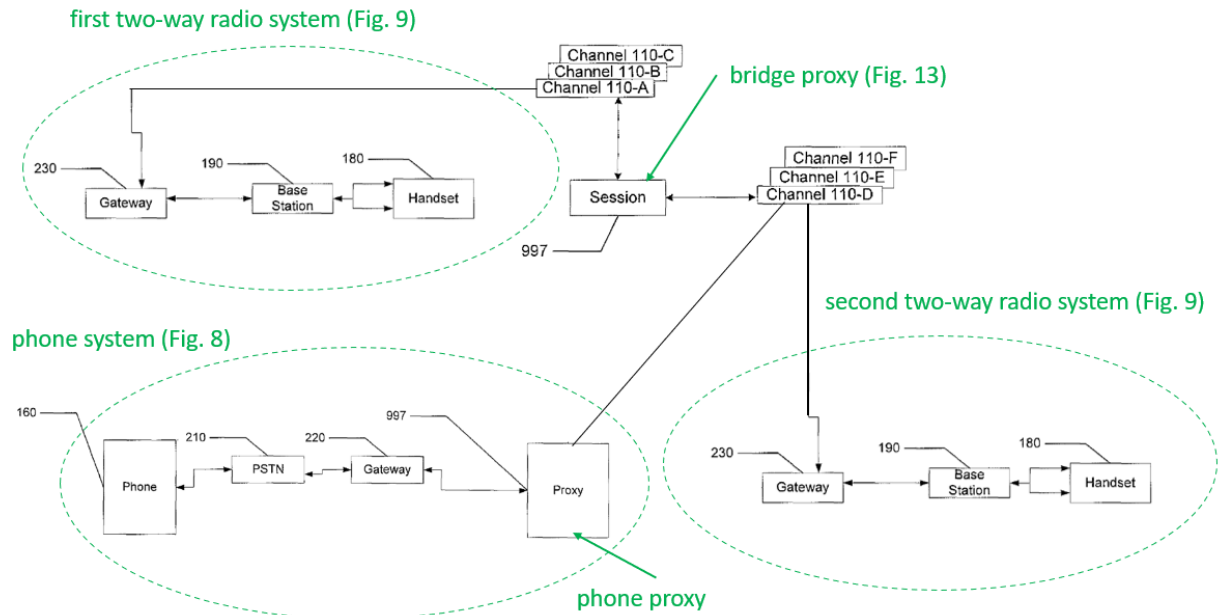
one or more channels to one or more channels, conversion of data from one or more channels to one or more channels, translation of data from one or more channels to one or more channels, or any inclusive or exclusive combination thereof.

EX1004, 15:59-67; *see also* 8:28-31 (“It is noted that an embodiment of the invention is itself recursive in nature, in that the output of an instance of the invention may be input to another instance of the invention.”), and 11:55-12:3; EX1002, ¶94.

In light of this teaching, a POSITA would have understood Botha as contemplating a wide variety of combined embodiments that would satisfy the limitations of the challenged claims. As one example, a POSITA would have found it obvious to configure a system with a proxy 997 such as shown in Fig. 13 configured to bridge communications streams between (a) PTT two-way radio endpoints 180 on a first two-way radio system 190 on a first communication channel 110A, (b) PTT two-way radio endpoints 180 on a second two-way radio system 190 on a second communication channel 110D, and (c) one or more telephones 160 connected to channel 110A, 110D or another channel 110 via the PSTN 210, a gateway 220 and another proxy 997 as shown in Fig. 8 configured to perform mixing of communications streams from the two radio systems 190 to the telephone 160 as described above. An illustration of such an embodiment, which

will be referred to herein as the Botha System, is shown in the block diagram

below composed from parts of Figs. 8, 9 and 13. EX1002, ¶95.



In such an embodiment of the Botha System, the phone proxy 997 to which the phone 160 is connected performs the mixing recited in limitation [1b], and includes the mixer recited in limitation [13b] and the “means for mixing” in limitation [25b]; EX1002, ¶96.

A POSITA would have been motivated to configure the Botha System in the way described above in order to, for example, allow two (or more) different monitored PTT two-way radio systems, such as operated by different police and/or fire departments, to communicate with each other and with, for example, a civilian in need of assistance or a remote supervisor via a phone connection. A POSITA would have understood, or at least found obvious, that PTT two-way radio systems

such as those operated by police and fire departments are monitored, for example by a dispatcher. A POSITA would further have understood how to configure each of the proxies 997, gateways 230 or other devices connected to the channels 110 to perform appropriate mixing as discussed in Botha at 7:29-56, 10:29-11:25, 13:17-62, 16:42-17:31, 18:8-46, and Figs. 15 and 21. A POSITA would have had a reasonable expectation of success in configuring a system such as described in Botha in this way because the gateways, mixers, proxies, computer channels and other devices and techniques disclosed in Botha were known to those of skill in the art and involved only routine skill. EX1002, ¶97.

B. Claims 1, 13 and 25

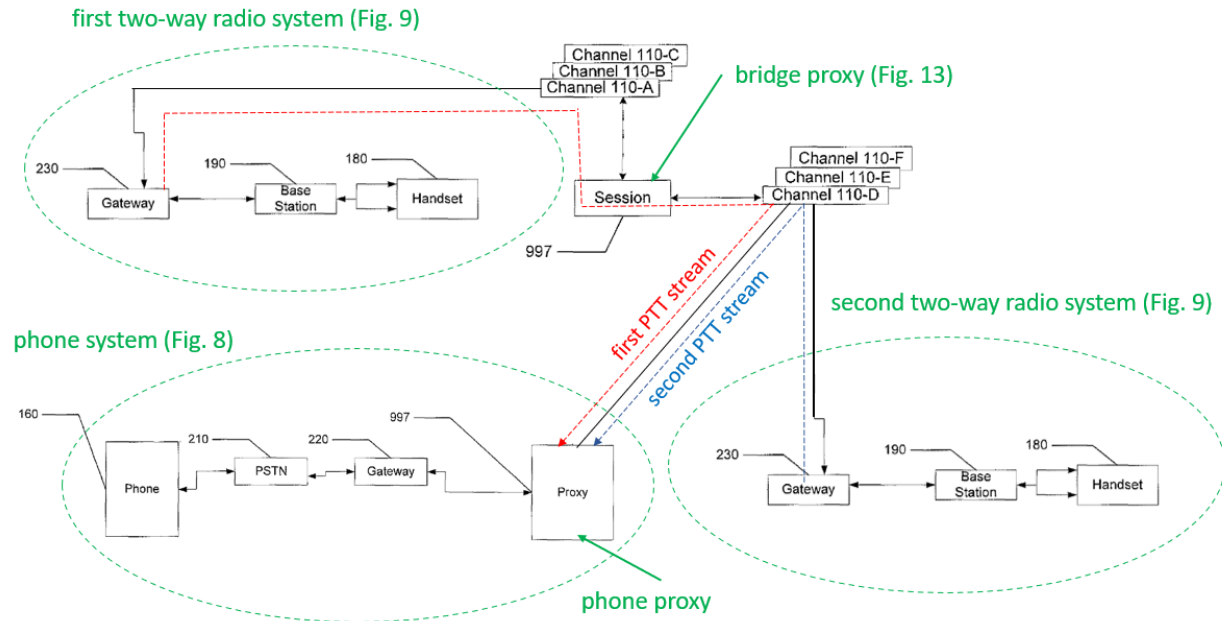
1. [1pre], [13pre], [25pre]

To the extent that the preambles are limiting, a Botha System includes them. The proxy 997 via which a phone 160 connects to a channel 110 to communicate with PTT radio systems 190 provides a push-to-talk proxy media service. EX1002, ¶98. Alternatively, the proxy 997 that bridges channels 110-A and 110-D to which the two-way radio system 190 provide a push to talk proxy media service. EX1002, ¶98.

2. [1a], [13a], [25a]

The Botha System includes these limitations. As discussed above in the Introduction to Ground 1, the Botha system includes two PTT two-way radio systems 190. EX1004, 15:39-46. Each radio system 190 includes a plurality of

PTT two-way radios 180 that communicate in a virtual “talk group.” EX1004, 14:39-40 (referring to “all other devices capable of receiving the data stream over the airwaves (collectively 180)”) and 14:61-67; *see also* Fig. 2 (showing multiple PTT two-way radios 180 connected to radio communications system 190). In the Botha System, the data is sent from the two-way radio system (collectively 190 and 180) through a gateway device 230 to convert analog or digital data received from a two-way radio interface device 190 into a packetized data stream, such as a multicast stream, and then transmitted over the network on a channel 110 to other endpoints. EX1004, 13:63-14:6. The streams from each of these channels are received at a phone proxy 997 to which the phone 160 is connected as shown in the annotated Botha System diagram below. EX1004, 13:49-51 and 13:18-31; EX1002, ¶99. Thus, the phone proxy 997 to which the phone 160 is connected receives at least two multicast streams, each stream including push-to-talk communications from a plurality of endpoints 180 monitored by a respective radio system 190; EX1002, ¶99.



Botha discloses a connection between a proxy and a channel implemented on a LAN. EX1004, 17:9-11. A LAN is a high bandwidth connection as discussed in Section III.D.3. A POSITA would have understood or found obvious in view of this disclosure that the phone proxy 997 in the Botha System would be connected to the channel 110-D via a LAN. This is because, as a practical matter, the phone proxy and at least some of the devices that implement and that are connected to the channels 110 would be in the same physical structure and would be connected to an Internet Service Provider via a LAN in that structure. When the phone proxy 997 in the figure above is connected to channel 110-D via a LAN, the phone proxy 997 receives the two multicast streams, each stream including push-to-talk communications from a plurality of endpoints 180 monitored by a respective radio

system 190, over a high bandwidth connection as required by these limitations.

EX1002, ¶100.

With respect to limitation [25a], a POSITA would have recognized that the phone proxy 997 discussed above would include a network interface card (“NIC”) such as an Ethernet NIC for communications with the channels 110, or would have found it obvious to do so, because NICs were ubiquitous at the time of the 249 patent and were known to a POSITA as being suitable for connecting a proxy to a network. E.g., EX1014, ¶[0045]. Such a NIC performs the identical function recited in this limitation and is at least equivalent structure to the interface 51 of the 249 patent. EX1002, ¶101.

3. [1b], [13b], [25b]

The Botha System includes these limitations. The Botha System mixes the first and second monitored push-to-talk communication streams into a mixed communication stream such that the audio communications communicated in each of the monitored push-to-talk communication streams can be heard on the mixed stream. In the Botha System, the data from the first PTT two-way system 190 connected to channel 110-A streams into the phone proxy 997 via the gateway 230 and the bridge proxy 997, and the data from the second PTT two-way radio system 190 connected to channel 110-D streams into the phone proxy 997 via the bridge proxy 997. Botha teaches that the proxy 997 to which the data is sent bi-

directionally from one endpoint to another. EX1004, 13:5-11. The phone proxy 997 connected to the phone 160, or alternatively the gateway 220 (the location of the mixing function is a design choice), creates an aggregate/mixed communication stream corresponding to all other multicast or unicast streams on the channel 110 and sends that stream to the phone 160 via the PSTN 210. EX1004, 13:49-51 and 13:18-31; 10:29-11:25; EX1002, ¶102.

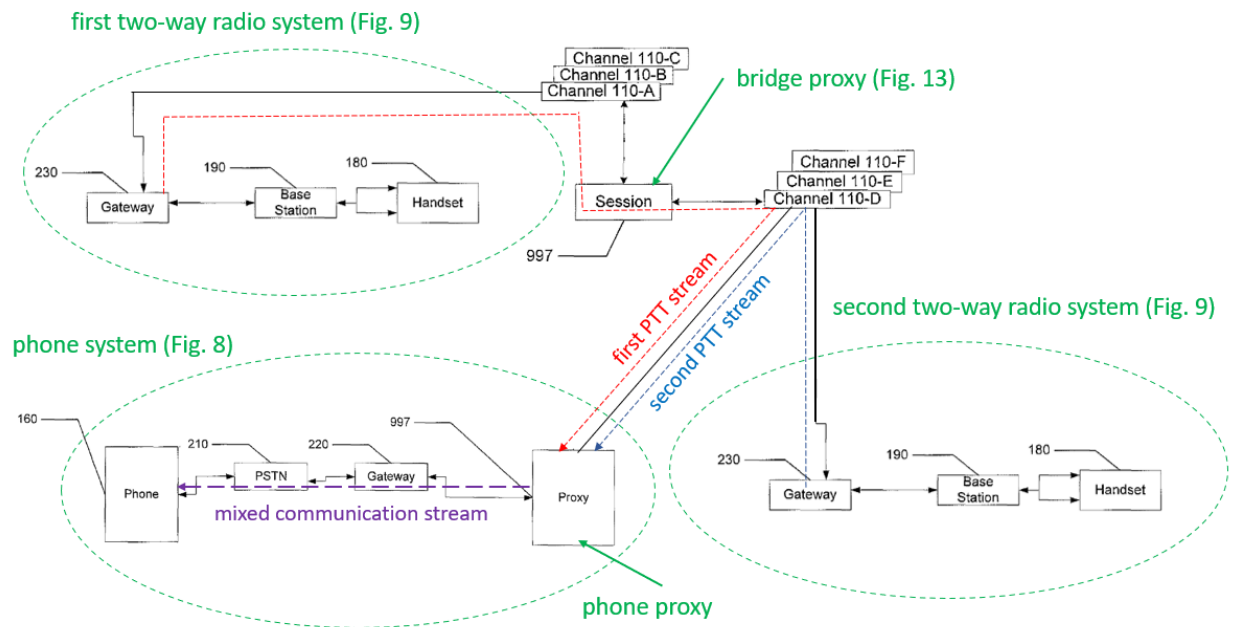
In the Botha System, the multicast streams include a stream from each of the radio systems 190 (e.g. the UHF and VHF radios systems), each of which monitors PTT communications from a plurality of endpoints 180. This allows each of the endpoints 180 on both of these first and second PTT radio systems 190 and the phone 160 to connect to form a virtual talkgroup. EX1004, 15:39-50; EX1002, ¶103. As discussed in Section III.D.4, the PSTN 210 is a low bandwidth connection as that term is used in the 249 patent. A POSITA would have known that the communication via phone lines and DSL are low-bandwidth communication. EX1002, ¶103.

With respect to limitation [25b], a POSITA would have recognized Botha's "N minus 1" and "N minus x" mixing as described at EX1004, 10:47-11:25 and Fig. 21 performing the identical function of the "means for mixing" of this limitation, and as being at least equivalent structure to the class of known structures recognized by a POSITA as corresponding to the mixer 223 of the 249

patent. EX1002, ¶104 (citing's Botha's description of "N minus x" mixing as summation of pulse-code modulation samples from desired participants in EX1004, 10:53-58).

4. [1c], [13c], [25c]

The Botha System includes these limitations. In the Botha system, the mixed communication stream is transmitted from the phone proxy 997 via the gateway 220 (or alternatively from the gateway 220 if it is configured to perform the mixing function) over the low-bandwidth connection to the phone 160 as shown in the annotated Botha System diagram below:



See, e.g., EX1004, Fig. 8 discussion in the Introduction to Ground 1. As discussed in Section III.D.4, DSL is a low bandwidth connection, and since DSL is implemented over the PSTN, the PSTN 210 is also a low bandwidth connection as

that term is used in the 249 patent. EX1002, ¶105. The proxy 997 and/or the gateway 220 can be implemented using a processor, such as user and server computers, single board computers, and custom designed computer circuitry. EX1004, 7:57-61; EX1002, ¶105.

With respect to limitation [25c], the NIC discussed above for limitation [25a] would also perform the identical function recited in limitation [25c] for the “means for transmitting” and is at least equivalent structure to the interface 51 of the 249 patent. EX1002, ¶106.

C. Claims 2 and 14

This claim is obvious over Botha. As discussed above, in the Botha System, a multi-cast communication stream on a first channel 110-A includes audio from a plurality of endpoints on one two-way radio system 190, and a multi-cast communication stream on a second channel 110-D includes audio from a second two-way radio system 190. EX1002, ¶107.

Botha’s channels 110 are not limited to a communications stream from a single two-way radio system 190. Botha also discloses a “distributed conferencing” concept that uses a single channel as a backbone onto which multiple proxies 997-A through 997-D (some of which are in different physical locations) transmit multicast streams. EX1004, 16:1-25 and Fig. 22; EX1002, ¶108:

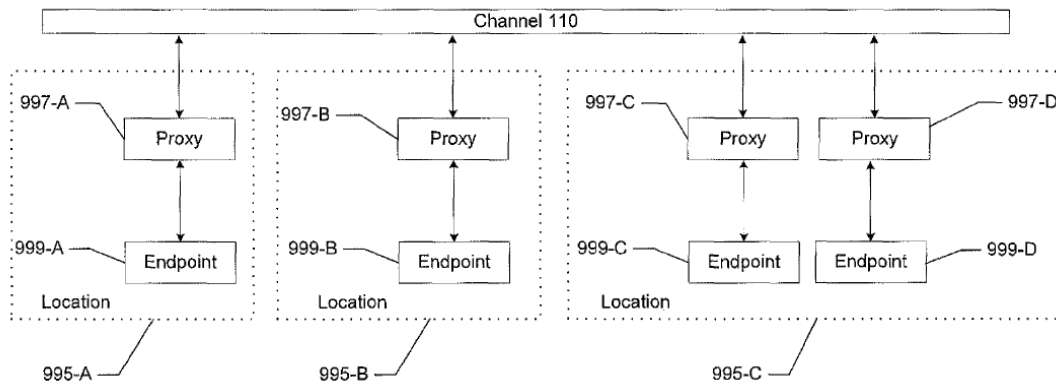
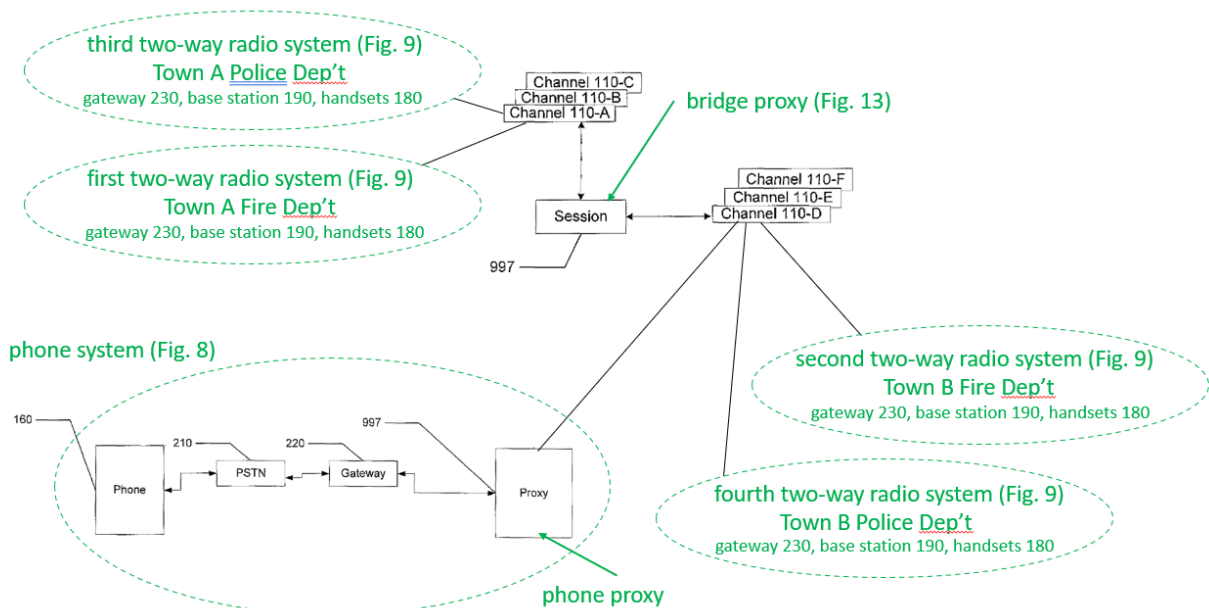


Fig. 22

In light of this disclosure, a POSITA would have found it obvious to connect multiple two-way radio systems 190 onto each of the channels in the Botha System as shown in the modified Botha System block diagram below (the “Extended Botha System”). EX1002, ¶109.



For example, a POSITA would have found it obvious to connect disparate police and fire department two-way radio systems 190 for one town A to channel 110-A in the Extended Botha System to form a first virtual talkgroup, and to connect disparate police and fire department two-way radio systems 190 from another neighboring town B on another channel 110-D in the Extended Botha system to form a second virtual talkgroup. Each such channel 110-A and 110-D thereby constitutes a virtual talk group that includes a plurality of endpoints 180 from each of disparate radio systems 190 on that channel. A POSITA would have understood that disparate radio systems connected to a single channel constitute a virtual talkgroup as that term is used in the 844 patent (see discussion of virtual talkgroups in Section III.A). A POSITA would have been motivated to do so in order to enable communications between these first responders. EX1002, ¶110.

A POSITA would also have found it obvious to bridge these multiple channels 110-A, 110-D together via a proxy 997 as shown in Fig. 17. A POSITA would have found it obvious and been motivated to do so, for example, in order to facilitate coordination among first responders in an emergency situation involving residents from such neighboring towns. Such a configuration of the Botha System is envisioned by Botha at 15:59-67, which teaches that the communications streams on the channels 110 may be numerous and recursive, and which also discloses communications among talk groups in different law-enforcement

agencies across geographical boundaries such as mountain ranges and oceans at 15:39-58. In such a configuration of the Botha system, the proxy 997 that bridges channels 110-A and 110-D receives PTT communications streams from multiple channels 110 with each such stream comprising communications from a virtual talk group comprising a plurality of endpoints on different radios systems 190. EX1002, ¶111.

D. Claims 3 and 15

1. [3pre], [15pre]

See §VI.C (Claim 2); EX1002, ¶112.

2. [3a] and [15a]

See supra §VI.B.2 As discussed above for limitations [1b], [13b] and [25b], the audio from each of the radio systems 190 in the Botha System (and the Extended Botha System) are mixed into a multicast stream by the phone proxy 997 (or alternatively the gateway 220) to which the phone 160 is connected. This mixed stream, which constitutes a virtual talk group including all of the endpoints in the radio systems 190, includes at least a first communication from at least one endpoint in at least one of the radio systems 190. EX1002, ¶113.

3. [3b], [15b]

See supra §VI.B.3 As discussed above for limitations [1c], [13c] and [25c], the phone proxy 997 that mixes the communications from the radio systems 190 into a stream for the phone 160 and will send that stream to the gateway 220.

Botha further discloses that channels 110 are virtual and are identified using a session ID or other identification that is sent along with the packet by a proxy.

EX1004, 7:28. To the extent not disclosed in Botha, it would have been obvious to a POSITA to include the session ID with the packets sent to the gateway 220 in order to allow the gateway 220 (or software-implemented virtual instances of the gateway running on a single physical machine) to identify the particular session so that the gateway 220 could service multiple phones (not shown in the diagrams above) on different sessions. EX1002, ¶114.

E. Claims 4 and 16

As discussed above in the Introduction for Ground 1, in the Botha System, each gateway 230 that is connected to the radio systems 190 includes logic that facilitates signaling referred to as “keying” that is transmitted to the radio system 190 for transmission over the airwaves to the endpoints 180 in that system. EX1004, 14:24-49. This keying can include “changing frequencies and talk groups on the two-way radio, switching between high and low power transmission levels, selecting individual or groups of repeaters, and so forth,” which serves to facilitate communication among member endpoints in a virtual talk group. EX1004, 14:61-67; EX1002, ¶115. The combination of gateways 230 and, in some embodiments, any proxy device that sends keying instructions to the gateways for transmission to the radio systems 190, collectively constitute an interoperability system that

facilitates interoperability between the disparate radio systems 190 and the phone 160 in the Botha System. EX1002, ¶115. The phone proxy 997 receives the communications stream from the gateways 230 via a high bandwidth LAN connection to the channels 110 as discussed above for limitation [1a]. EX1002, ¶115.

F. Claims 5 and 17

As discussed above in the Introduction for Ground 1 for the Botha System, and in the Extended Botha System discussed above for claim 2, one of the channels 110-D includes a phone 160 and a radio system 190 with PTT two-way radio endpoints 180. To the extent not disclosed in Botha, a POSITA would have found it obvious to configure the proxy 997 that bridges that channel 110 to the other channel 110 to perform a mixing function that aggregates the two streams (one from the phone 160 and one from the radio system 190, as well as any other stream on that channel) into a single multicast stream with a multicast IP address for transmission onto the other channel 110 and reception by whatever entities choose to “tune in” to that channel. EX1004, 10:29-11:25 and 16:54-17:31 and Fig. 23; *see also* 7:42-50; EX1002, ¶116.

G. Claims 6 and 18

In the Botha System discussed above in the Introduction to Ground 1, one of the channels includes a phone 160 and a radio system 190 that together form a

virtual talk group. The phone 160 and the endpoints 180 of the radio system 190 are endpoints of different communications networks, i.e., a radio network and the PSTN. EX1002, ¶117.

H. Claims 7 and 19

See claims 1 and 13 above. As discussed above, Botha shows multiple PTT communication streams interfacing with the channel and other streams via the proxy. Furthermore, as discussed above in §VI.C (Claim 2), Botha discloses a “distributed conferencing” concept that allows proxies for multiple systems to connect to each other via the channel 110. EX1004, 16:1-25 and Fig. 22:

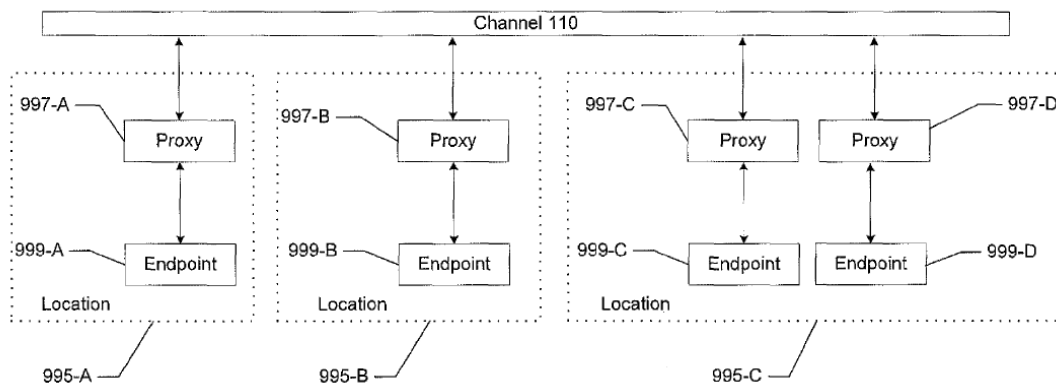


Fig. 22

Botha discloses that the system of Fig. 22 is scalable and any number of proxies can connect (i.e., “tune”) to the channel. *Id.* A POSITA would further have recognized that each such proxy can be connected to a respective radio system 190 with its own set of endpoints 180. EX1002, ¶118. In such a distributed

conferencing embodiment with nine connected proxies, each proxy would receive a multicast stream with the audio from a respective radio system from each of the eight other proxies, each of which would constitute a monitored push-to-talk communications stream. EX1004, 16:42-53; EX1002, ¶119. The system shown in Botha enables receiving a plurality of monitored push-to-talk communication streams comprises receiving eight monitored push-to-talk communication streams.

I. Claims 9 and 21

1. [9pre], [21pre]

See § VI.B (Claim 1). EX1002, ¶120.

2. [9a], [21a]

Botha discloses that an end user computing device allows a user to monitor multiple channels 110 simultaneously and to direct the media (e.g., audio) from any of those channels to one or more rendering systems 250 (such as speakers or a computer display) connected to the computing device 140 in a channel-by-channel basis. EX1004, 12:4-15. A POSITA would have found it obvious to modify the Botha System by including such an end user computer for use by, e.g., a dispatcher, to allow the user to select streams from those channels for mixing and output to, e.g., speakers as taught by Botha. EX1002, ¶121.

3. [9b], [21b]

See limitations [9a] and [21a] immediately above. A POSITA would have found it obvious to mix the streams selected by the user, e.g., in the manner

discussed at 10:29-11:9, for output to a rendering system such as a speaker.

EX1002, ¶122.

J. Claim 38

1. [38pre]

See §VI.B.1, limitation [1a]; EX1002, ¶123.

2. [38a]

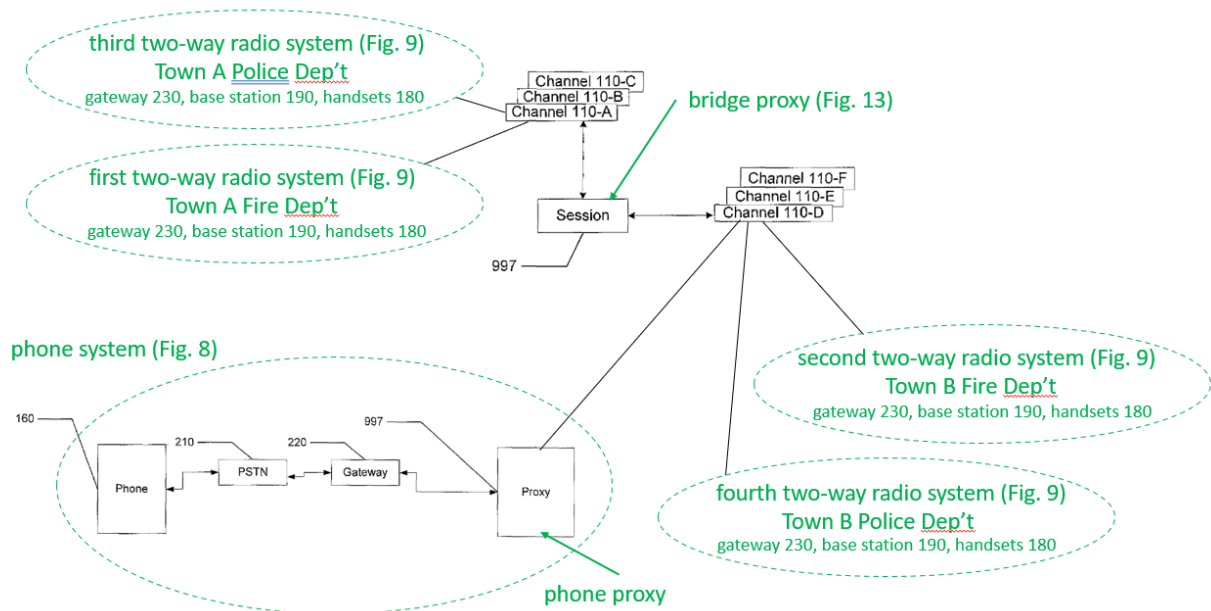
The Extended Botha System includes this limitation. As discussed in the Introduction to Ground 1, a phone 160 (a user endpoint) in the Botha System (and the Extended Botha System) is connected to a gateway 220 via the PTSN, which is a low bandwidth connection for the reasons discussed in Section V.B.4, in the Botha System. EX1002, ¶124.

3. [38b]

The Extended Botha System includes this limitation. Audio communication from the phone 160 (“user communication”) is received, via the PSTN 210 and gateway 220, at the proxy 997. EX1002, ¶125.

4. [38c]

The Extended Botha System renders obvious this limitation. As shown in the Extended Botha System diagram below, a phone 160 connects via the gateway 220 in order to participate in a virtual talk group on a channel 110-D. EX1004, 13:36-62; EX1002, ¶126.



Botha does not explicitly disclose how a user of the phone 160 makes the selection of a virtual talk group, but two ways in which this selection could be accomplished would have been obvious to a POSITA: using a particular phone number for a particular virtual talk group, or allowing a user to issue a voice command or press a particular key on the phone keypad to make the selection. EX1002, ¶126. In both cases, the user selection is received over the PSTN 210. As discussed above for claim 2, it would have been obvious to a POSITA for each channel to include communication streams from multiple virtual talk groups on multiple two-way radio systems 190. In such an embodiment of the Botha System, the user's selection would result in the user being joined to an aggregated virtual talk group comprising a plurality of virtual talk groups on each channel, each including audio

communications from a plurality of endpoints 180 in at least two disparate PTT radio systems 190. EX1002, ¶127.

5. [38d]

The Extended Botha System modified as discussed for limitation [38c] renders this limitation obvious. In the Extended Botha System, audio communications from a user on a phone 160 are received at the phone proxy 997, which is connected to and transmits those communications over a channel 110-D, which Botha discloses can be a high bandwidth channel on a LAN. EX1004, 16:66-17:1; EX1002, ¶128.

K. Claim 39.

The Extended Botha System renders this claim obvious. As discussed in Section VI.D.3, Botha discloses sending session IDs together with communications streams on the channels 110. Botha further discloses that the gateway 230 to which the radio system 190 is connected is configured to send “keying” signals to the radio system 190 for transmission to the endpoints 180, and that these keying signals include in some embodiments instructions to change talk groups. EX1004, 14:24-67. Such a keyed instruction constitutes an identification of an aggregated virtual talk group that includes a plurality of selected virtual talk groups as discussed above for limitation [38c]. EX1002, ¶129.

Furthermore, Botha discloses transmission of the identification of the virtual talkgroup:

In an embodiment, a physical “channel” is not per se generated. Rather, a “virtual” channel of one example embodiment is present by virtue of participants' packets that contain session identification (ID) or other ID information that identifies the particular multicast and/or unicast session or group that is associated with the participant. Thus, participants' devices or proxy devices can "tune" to a virtual channel by monitoring the network for particular packets having the relevant ID information and then receiving such packets. Other examples for determining the particular IP session for the packets include determining a transmitter source for each packet according to a network address of the transmitter, data type transmitted by the transmitter, media type transmitted by the transmitter, and other pertinent information embedded in the packet or sent alongside the packet by the transmitter or its proxy.

EX1004,7:10-28; EX1002, ¶130.

VII. GROUND 2: CLAIMS 1, 7-9, 12-13, 19-21, 24, 25, 38 AND 39 ARE OBVIOUS OVER THE COMBINATON OF RADENKOVIC AND MCDONALD

A. Introduction

As discussed above in Section IV.B, Radenkovic discloses a system for providing audio services in which mixers 104/204/304 in devices such as routers 300 selectively mix audio streams from “sources” for distribution to “sinks” (i.e.,

consumers of audio data) over a packet data network such as the Internet.

Radenkovic discloses that the selection of streams to be mixed may be performed dynamically, and that the mixing may be performed in a hybrid approach in which some audio streams sent to a sink are mixed into a single stream for transmission while other audio streams are forwarded to the same sink as received without mixing with any other stream. EX1005, ¶¶[0017], [0049], [0053]. Among the reasons why audio streams may be mixed before transmission to a sink include limited network bandwidth available for transmission to the sink. EX1005, ¶¶[0017], [0025], [0062]. Streams may be selected for mixing based on their priorities/significance, with low priority streams being mixed before higher priority streams. EX1005, ¶¶[0029], [0063]; EX1002, ¶¶131132.

McDonald discloses a system in which consoles 130-140 can select audio streams from talkgroups including mobile radios 148-150 for monitoring, and can assign priorities to those streams and transmit those priorities to the zone controller 116. EX1007, ¶[0021]. McDonald discloses that the monitoring can be active or passive. EX1007, ¶[0004]. McDonald further discloses that it may not be possible to transmit audio streams from all of the selected talkgroups to a console 130-140 due to bandwidth limitations. EX1007, ¶¶[0020], [0032];. When the bandwidth is so limited, McDonald's system ensures that the high priority, critical streams are

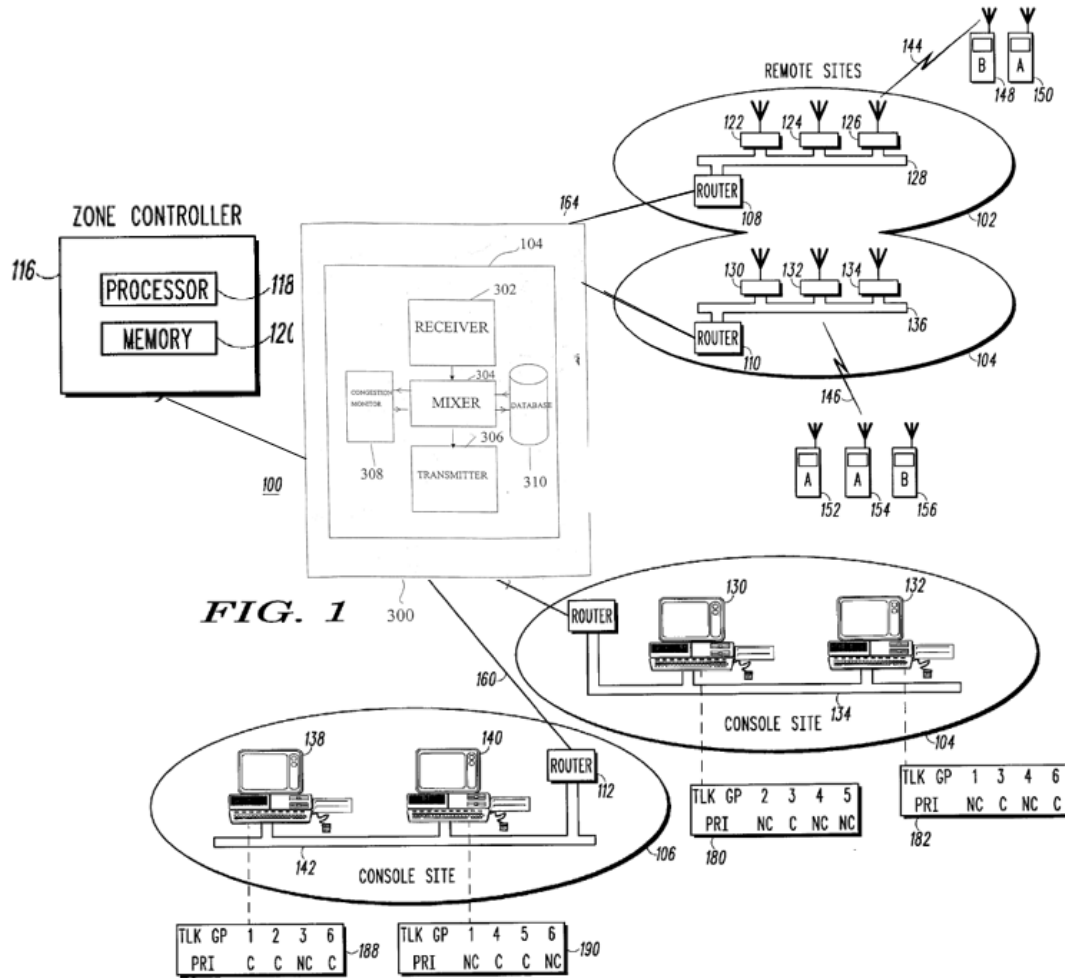
transmitted, but it still suffers from the drawback that one or more low priority, non-critical streams will not be transmitted to a console. EX1002, ¶¶132-136.

It would have been obvious to a POSITA to address this problem of being unable to transmit audio streams for all selected talkgroups to one of McDonald's dispatcher consoles 132-140 due to bandwidth constraints by combining the hybrid selective dynamic mixing technique disclosed in Radenkovic with a system as taught by McDonald to allow audio from all talkgroups selected a console to be received at that console. In situations where there was not sufficient bandwidth to transmit audio streams for all talkgroups selected by a dispatcher, a POSITA would have found it obvious to dynamically mix two or more selected non-critical talkgroup audio streams into a single audio stream as taught by Radenkovic so that the mixed audio stream including all audio from both selected streams could be transmitted to a console 132-140 for passive monitoring by the dispatcher. When mixed in this fashion, speakers in the two or more selected non-critical talkgroups may be speaking at the same time as there is no attempt to coordinate floor control between the two or more selected talkgroups (each talkgroup may implement its own floor for its own members, but nothing precludes talkgroup members in different talkgroups from speaking at the same time). EX1002, ¶¶138-139.

A POSITA would have found it obvious to accomplish this by using a router including a mixer and other circuitry such as a congestion monitor as taught by

Radenkovic as a core router as disclosed in McDonald, and configuring the zone controller to transmit the selected talkgroups and priorities to the core router to enable the core router to mix streams as necessary to transmit audio from all selected talkgroups to the console. One trivial example that illustrates the advantage of such a combination is as follows: assume a console site having two operator consoles linked to a core router that implements Radenkovic's dynamic hybrid mixing via a single link that has sufficient bandwidth to accommodate only three audio streams. Further assume that there are four active talkgroups numbered 1 through 4, that the first console has designated talkgroup 1 as critical and talkgroups 3 and 4 as non-critical, and that the second console has designated talkgroup 2 as critical and talkgroups 3 and 4 as non-critical. Without Radenkovic's dynamic hybrid mixing technique, McDonald's system would transmit audio streams for the two critical talkgroups 1 and 2, and one of either talkgroup 3 or 4, over the link, but not transmit an audio stream for the other talkgroup. However, when modified in accordance with Radenkovic's teaching, the modified system transmits separate audio streams for talkgroups 1 and 2 and a mixed stream with the audio for talkgroups 3 and 4 (a total of three streams) over the link. The result is that both consoles 3 and 4 receive audio for all of their selected talkgroups. EX1002, ¶¶140-144.

A POSITA would have been motivated combine the teachings of Radenkovic and McDonald in this manner in order to allow a dispatcher to hear and monitor audio from all talkgroups of interest that were selected by the console operator. A POSITA would have had a reasonable expectation of success combining the teachings of Radenkovic and McDonald in this manner involved techniques that were known to those of skill in the art and required only ordinary skill. EX1002, ¶145. This combination of Radenkovic and McDonald is referred to herein as a “Mixed McDonald System.” A notional block diagram illustrating a Mixed McDonald system, which was formed by combining parts of drawings from EX1005, EX1007 and EX1008 (EX1008 is introduced and explained below), is shown below. However, the challenges in this Ground 2 should not be understood to be limited to the precise components and configuration illustrated in the figure or as a bodily incorporation of Radenkovic’s router as a direct replacement for McDonald’s core router, but rather should be understood to be based on the combined teachings of Radenkovic and McDonald. For example, the zone controller 116 may be incorporated into the router 300 in the figure below. EX1002, ¶145.



The Mixed McDonald System renders obvious claims challenged in Ground 2 as demonstrated below. EX1002, ¶145.

B. Claims 1, 13 and 15

1. [1pre], [13pre], [25pre]

To the extent that the preambles are limiting, the Mixed McDonald System includes them or, at a minimum, renders them obvious. The router with the mixer in the Mixed McDonald System provides a proxy media service for audio streams

transmitted from a radio system site 102. McDonald discusses a trunked radio system which is a push-to-talk radio system.

In trunked systems, or in mixed trunked and conventional systems, there is usually provided a central controller (sometimes called a “**zone controller**”) for allocating communication resources among multiple sites. The central controller may reside within a single device or multiple devices and may be located at a fixed equipment site or may be distributed among the repeater or console sites.

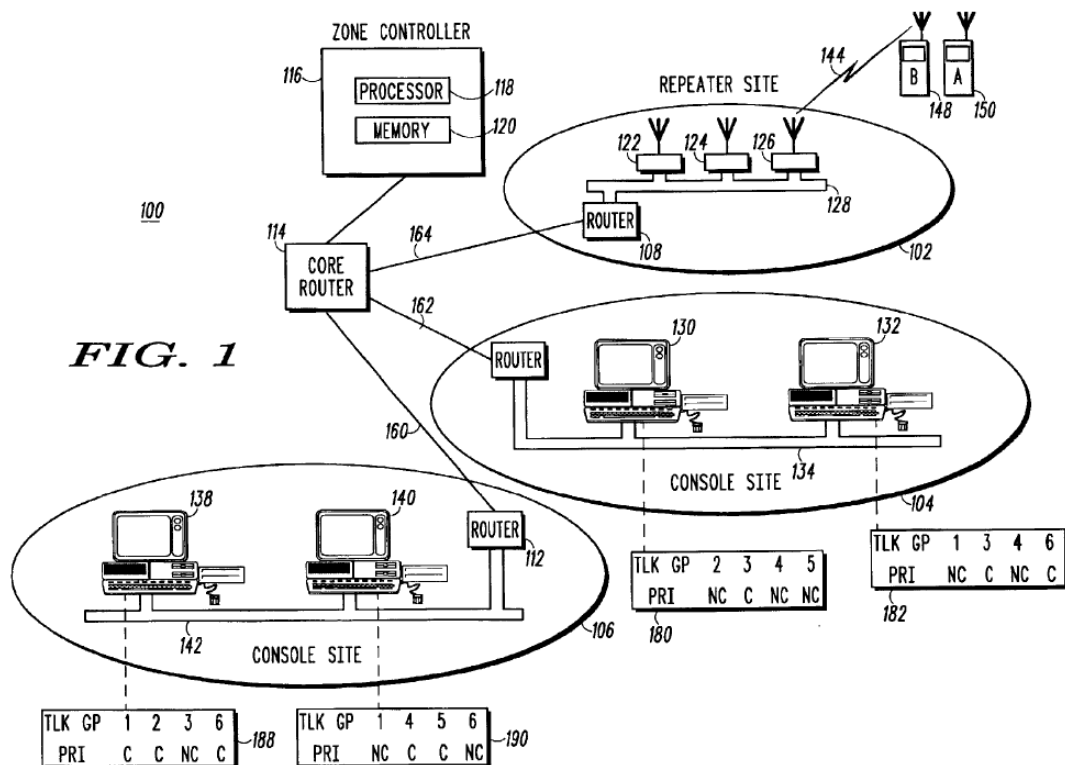
EX1007, ¶[0002]; EX1002, ¶146.

McDonald does not explicitly disclose that the mobile radios 148, 150 are push-to-talk devices, but a POSITA would have recognized them as such in view of the descriptions in McDonald of consoles as SMARTZONE™ consoles and of activating a PTT (push-to-talk) switch at such a console to indicate a desire to source payload (i.e., speak) on a talkgroup call. EX1007, ¶¶[0004], [0013]; EX1002, ¶147. The Motorola SMARTZONE™ system is a trunked radio push-to-talk multi-site communication system have the ability to accomplish site hand-offs without needing the fixed end equipment to notify them when to switch to another site. EX1009, 11.

2. [1a], [13a], [25a]

The Mixed-McDonald System includes and/or renders obvious these limitations. McDonald expressly discloses the transmission of a push-to-talk

communication stream corresponding to a plurality of radios 148, 150 in a talk group having a talk group identifier from a router 108 at radio system site 102 to a core router 114. EX1007, ¶[0015] as shown in Fig. 1. The PTT radios 148 and 150 in communication with the repeaters are connected via a high-bandwidth ethernet connection to the router 108 and core router 114. EX1007, ¶[0015]. A POSITA would have understood that the ethernet connection to the router is a high-bandwidth connection. EX1002, ¶148.



The router 108, the core router 114 and the consoles 132-140 and router 112 at sites 104, 106 are all IP host devices capable of sending IP datagrams/packets over the network. EX1007, ¶[0018]; EX1002, ¶148.

The console sites 130, 132, 138 and 140 are connected with “talkgroups” to receive the payloads which can be from the PTT radios 148, 150 via the routers 108 and 114.

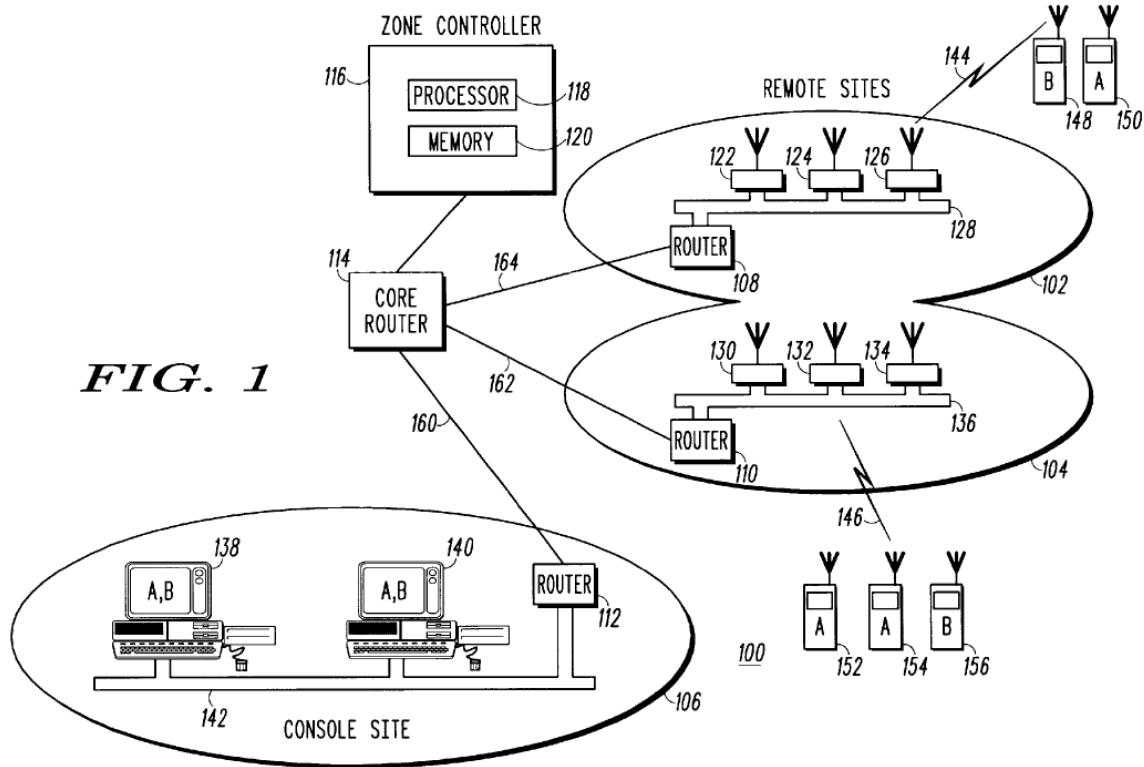
Console positions 130, 132, 138, 140 can affiliate with various talkgroups for monitoring purposes, that is to receive payload (e.g., audio, video, data) being communicated on the talkgroups, or to source payload for the talkgroups.

EX1007, ¶[0016]

The present disclosure has thus identified methods for establishing priority or critical talkgroups at console Sites, and for establishing calls based on the designated priority levels in a manner that allows for the limited bandwidth of console site links to be allocated on a priority basis for the talkgroups identified as critical. In this manner, console operators will be more likely to receive audio for high priority or critical calls.

EX1007, ¶[0035]; EX1002, ¶149.

The description of the embodiment of Fig. 1 discloses the receipt of multiple audio streams from multiple talkgroups at router 114, but to the extent that Patent Owner argues that it does not, U.S. Patent No. 6,647,020 (which is incorporated by reference in its entirety in McDonald; EX1007, ¶[0003]) discloses the receipt of multiple streams on links 162, 164 from multiple talkgroups, each talkgroup including multiple radios 148-150 and 152-156, from multiple sites 102, 104:



EX1008, 6:21-47 and Fig. 1. A POSITA would have found it obvious to include multiple radio sites 102, 104 as taught in Fig. 1 of EX1008 and as shown in the notional block diagram of the Mixed McDonald System in the Introduction to Ground 2 above, and would further have found it obvious to include additional radio system sites that generate additional talkgroup streams connected to the router in the Mixed McDonald System in order to allow consoles in the Mixed McDonald System to monitor a larger number of radio talkgroups such as the four talkgroups at a single console as illustrated in boxes 180-190 of Fig. 1 of McDonald or more talkgroups. EX1002, ¶150.

With respect to limitation [25a], a POSITA would have recognized or found obvious that the core router 114 would include a network interface card (“NIC”) because NICs were ubiquitous at the time of the 249 patent and were known to a POSITA as being suitable for connecting a device such as a router to a network. See, e.g., discussion of NICs in EX1014, ¶[0045]. Such a NIC performs the identical function recited in this limitation and is at least equivalent structure to the interface 51 of the 249 patent. EX1002, ¶151.

3. [1b], [13b], [25b]

The Mixed McDonald System includes these limitations. As discussed in the Introduction to Ground 2, the core router in the Mixed McDonald system includes a mixer, e.g. the mixer 304 of Fig. 3 in Radenkovic. When the core router detects (e.g., via congestion monitor 308) that the bandwidth is not sufficient to transmit audio streams from all selected talkgroups from the core router to a console, the mixer in the core router of the Mixed McDonald System is configured to mix two or more non-critical streams into a combined stream for passive monitoring at the console so that audio from all selected streams is transmitted from the core router to the console using the available bandwidth. EX1002, ¶152.

With respect to limitation [25b], a POSITA would have recognized Radenkovic’s mixing as described at EX1005, ¶[0050] (“audio mixer component is arranged to average selected audio data streams to create a single combined audio

stream comprising the same number of bits as each unmixed data stream”) as performing the identical function of the “means for mixing” of this limitation, and as being at least equivalent structure (i.e., algorithm) to the class of known structures recognized by a POSITA as corresponding to the mixer 223 of the 249 patent because such averaging is a type of linear mixing that is equivalent to summation. EX1002, ¶153.

4. [1c], [13c], [25c]

The Mixed McDonald System includes these limitations. As discussed above for limitation [1b], [13b], [25b], the mixed audio stream generated by the mixer in the core router is transmitted from the core router to a console via a link. As discussed in McDonald at ¶[0004], these links to the consoles in the Mixed McDonald system are T1 links in some embodiments, which are low bandwidth connections as that term is used in the 249 patent. EX1013, 7:2-14 and 2:19-27 (discussing bandwidths of various connection technologies including DSL and T1); EX1002, ¶154.

With respect to limitation [25c], the NIC discussed above for limitation [25a] would also perform the identical function recited in limitation [25c] for the “means for transmitting” and is at least equivalent structure to the interface 51 of the 249 patent. EX1002, ¶155.

A. Claims 7 and 19

The Mixed McDonald System includes the limitations of these claims. *See* claims 1 and 13 in Ground 2 above. McDonald discloses that a console can select up to 64 talkgroups for monitoring. EX1007, ¶[0004]. It would have been obvious to a POSITA to configure a console to select eight non-critical talkgroups and to configure the mixer to mix those eight non-critical talkgroups on a single channel when required due to limited bandwidth as taught by Radenkovic. Radenkovic gives an example of mixing six simultaneous streams with certain bandwidth and audio stream encoding parameters, and from this example a POSITA would have recognized and found obvious that mixing eight streams was also possible using different bandwidth and/or encoding parameters. EX1007, ¶¶[0069]-[0080]; EX1002, ¶156.

B. Claims 8 and 20

1. [8pre], [20pre]

To the extent the preambles are limiting, the Mixed McDonald System includes them. *See supra* §VII.B (Claim 1); EX1002, ¶157.

2. [8a], [20a]

The Mixed McDonald System renders these limitations obvious. Radenkovic discloses that a mix of audio streams can be tailored to a user's taste, including "allowing the volume of particular speakers to be raised or lowered according to their relative importance, for example." EX1005, ¶[0007]. Similarly, D'Avello

discloses providing a user at an endpoint with the ability to control the volumes of other user. EX1011, ¶¶[0030, [0055]. It would have been obvious to provide console operators with this same capability in the Mixed McDonald System by configuring the consoles in that system with a user-operable volume control for each selected talkgroup audio stream selected by the operator at that console, and to transmit the operator's volume setting for each stream to the core router, and to configure the mixer in the core router to perform the mixing in accordance with those volume control settings. EX1002, ¶158. A POSITA would have been motivated to do so in view of the teaching in Radenkovic at ¶[0007] of giving users the ability to control particular speaker volume in a mixed stream and in view of the similar disclosure in D'Avello. A POSITA would have had a reasonable expectation of success because adjusting volumes when mixing audio streams was well-known in the art and involved only routine skill. EX1002, ¶158.

3. [8b], [20b]

The Mixed McDonald System renders these limitations obvious. *See* limitations [8a] and [20a] above. EX1002, ¶159.

C. Claims 9 and 21

1. [9pre]

To the extent the preambles are limiting, the Mixed McDonald System includes them. *See supra* §VII.B (Claim 1); EX1002, ¶160.

2. [9a], [21a]

The Mixed McDonald System includes or renders obvious these limitations. As discussed in the Introduction, McDonald discloses that the console (the claimed user endpoint of claims 1 and 13) transmits its selection of talkgroups and their priorities as either critical or non-critical to the zone controller, and a POSITA would have found it obvious to configure the zone controller to pass the selections and priorities to the core router, or to configure the console to transmit the selections and priorities to the core router. EX1007, ¶[0021]; EX1002, ¶161.

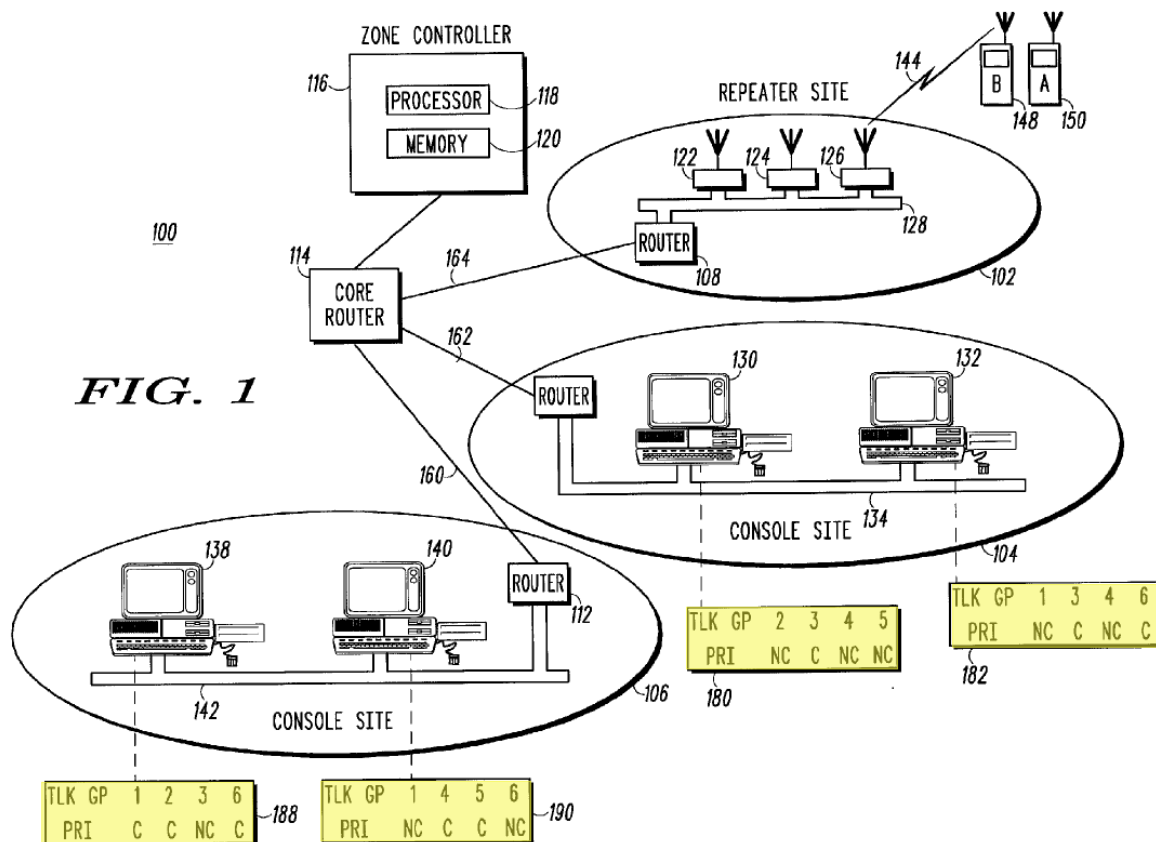
3. [9b], [21b]

The Mixed McDonald System includes or renders obvious these limitations. As discussed in the Introduction, it would have been obvious to a POSITA to configure the core router in the Mixed McDonald system to mix audio streams of selected non-critical talkgroups into a single stream for transmission to the console that selected them when available bandwidth does not permit all of the selected talkgroup streams to be transmitted to the console individually. EX1002, ¶162.

D. Claims 12 and 24

The Mixed McDonald System includes or renders obvious these claims. See claims 1 and 13 above. McDonald discloses consoles 130-140 with indicators for, e.g., selected talkgroups and priorities. EX1007, ¶[0021] and Fig. 1, reference numerals 180-190 (annotations added). McDonald further discloses that these consoles are connected to the core router via low bandwidth T1 connections in

some embodiments. EX1007, ¶[0004]; *see also* Ground 2 Introduction. It would have been obvious to a POSITA to configure the Mixed McDonald System to provide the same functionality indicators at the consoles 130-140. EX1002, ¶163. A POSITA would have been motivated to do so by (a) the above-discussed disclosure in McDonald, (b) the disclosure of providing controls at an endpoint for assigning priorities in D’Avello (EX1011, ¶¶[0048], [0055] and Figs. 5 and 8); and (c) the discussion in Slaninka of allowing a console user to control the volumes of the talkgroups in locally mixed streams output to a speaker (EX1010, 2:42-66). EX1002, ¶163.



**VIII. GROUND 3: CLAIMS 2-6, 10-11, 14-18 AND 22-23 ARE OBVIOUS
OVER RADENKOVIC, MCDONALD AND KOREN**

A. Introduction

Independent claims 1 and 13 are obvious over the combination of Radenkovic and McDonald and the Mixed McDonald System made obvious thereby for the reasons discussed in Ground 2. Claims 2 and 14, which depend from claims 1 and 13, and the other claims of Ground 3 that depend therefrom, are obvious over Radenkovic and McDonald and the Mixed McDonald System made obvious thereby, in view of Koren for the reasons explained below. EX1002, ¶164.

In the Mixed McDonald System, there are multiple radio sites, each generating at one communication stream corresponding to a talk group in which a plurality of mobile radio endpoints 148-156 participate. The mobile radios in these talk groups are all part of the same communication network. Claims 2 and 14 require that each of the communication streams for a virtual talk group include a plurality of endpoints from different communications networks. Koren discloses an interoperability server that allows the formation of virtual talk groups between different communications systems. EX1006, 3:26-51. An example is shown in such as between a conventional two-way radio system 30/220 and a trunked radio system 20/230 as shown in Figs. 1 and 2 of Koren reproduced below (annotations added). EX1006, 3:52-4:7, 5:41-6:30; EX1002, ¶165.

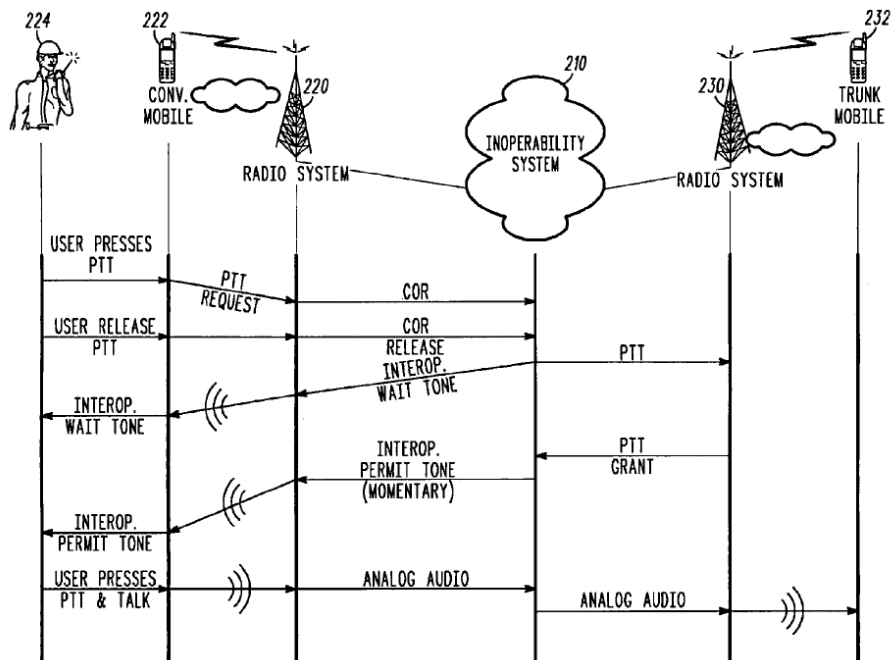
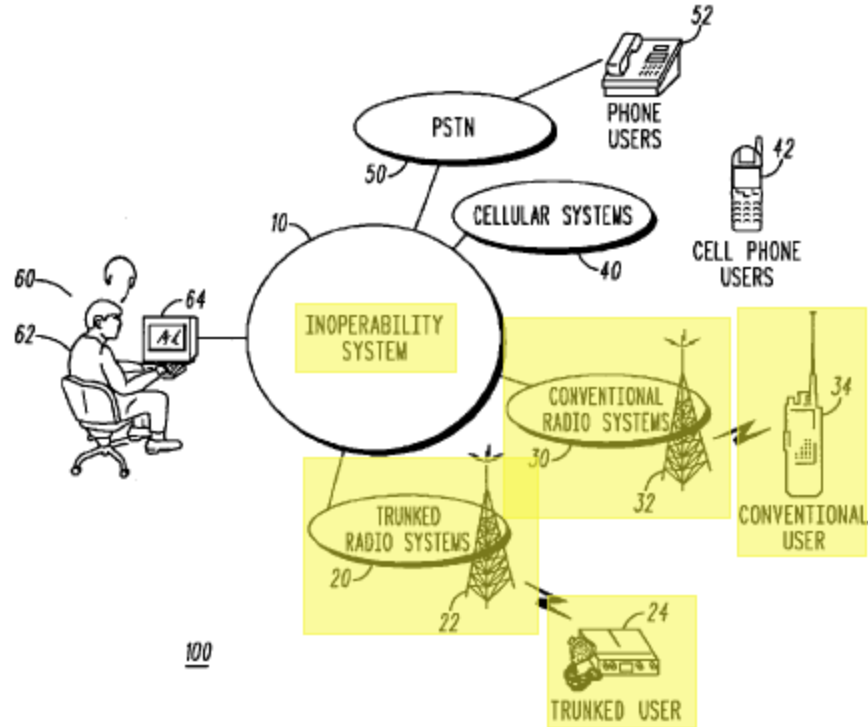


FIG. 2

A POSITA would have found it obvious to configure the operability system 10/110 to output an aggregated or mixed audio stream with the audio from both

radio system to the core router of the Mixed McDonald System for, e.g., transmission to monitoring consoles (e.g., multiple monitoring consoles as disclosed in the Mixed McDonald System, where multiple consoles are shown monitoring streams such as stream 4). A POSITA would have been motivated to do so because a POSITA would have understood that one of the disparate radio systems in the virtual talk group described above may not have any other connection to console in the Mixed McDonald system. EX1002, ¶166. Such an aggregated audio stream from the virtual talkgroup formed by the operability system 10/110 in the figures above constitutes “communications from a respective talk group comprising a plurality of endpoints of different communications networks” as recited in claims 2 and 14. EX1002, ¶166.

To the extent an interoperability dispatcher at console 64 of Fig. 1 in Koren is necessary for operation of the talkgroup in Fig. 2, a POSITA would have understood that such an operator console would be in addition to an operator console that selects, e.g., for passive monitoring, the mixed/aggregated audio stream output by the interoperability system 10. This is because, for example, Koren teaches that the operator at console 64 of Koren’s Fig. 1 above requires special training as an interoperability dispatcher. EX1006, 4:22-24; EX1002, ¶167.

B. Claims 2 and 14

The Mixed McDonald System as modified to include virtual talkgroups between disparate radio systems as taught by Koren includes the limitations of these claims. As discussed above, a mixed/aggregated audio stream for the virtual talkgroup as illustrated in Fig. 2 of Koren input to the core router of the Mixed McDonald System constitutes “communications from a respective talk group comprising a plurality of endpoints of different communications networks” as recited in claims 2 and 14. EX1002, ¶168. A POSITA would have found it obvious to allow for a plurality of such streams in the Mixed McDonald System to allow a console therein to monitor the plurality of such talkgroup streams. EX1002, ¶168.

C. Claims 3 and 15

1. [3pre], [15pre]

See Claims 2 and 14 above. EX1002, ¶169.

2. [3a], [15a]

The Mixed McDonald System as modified to include virtual talkgroups between disparate radio systems as taught by Koren includes these limitations. As discussed in the Ground 3 Introduction, the communication session between a conventional two-way radio system 30/220 and a trunked radio system 20/230 as shown in Figs. 1 and 2 of Koren is a virtual talkgroup, and the mixed/aggregated communication stream including communications from two such virtual talkgroups sent from the core router to a monitoring console as discussed in connection with

Claims 2 and 14 includes a communication from a first virtual talk group. EX1002, ¶170.

3. [3b], [15b]

The Mixed McDonald System as modified to include virtual talkgroups between disparate radio systems as taught by Koren renders obvious these limitations. As discussed in McDonald, each talkgroup includes a talkgroup ID. EX1007, ¶[0023]. It would have been obvious to a POSITA to include a talkgroup IDs for each talkgroup corresponding to the mixed/aggregated stream sent by the core router in order to allow that information to be displayed at the operator console. Doing so would allow an operator who is passively monitoring such streams to designate one of them as a critical stream for active monitoring as discussed in McDonald at ¶[0032]. EX1002, ¶171.

D. Claims 4 and 16

The Mixed McDonald System as modified to include virtual talkgroups between disparate radio systems as taught by Koren renders obvious the limitations of these claims. See claims 2 and 14 above. As discussed in the Ground 3 Introduction, it would have been obvious to a POSITA to configure Koren's interoperability system 10 to transmit a mixed/aggregated audio stream including audio from both endpoints of both radio systems 30/220 and 20/230a of that virtual talkgroup to the core router in the Mixed McDonald System. A POSITA would

further have found it obvious to configure the same interoperability system 10 to support a second virtual talkgroup, including audio communications from different channels of the same two radio systems or two different radio systems, and to transmit a second mixed/aggregated audio stream for the second virtual talkgroup, to the core router as discussed above for claims 2 and 14. A POSITA would further have found it obvious to transmit both mixed/aggregated audio streams from the interoperability system to the core router over the high bandwidth connection between the interoperability system and core router. EX1002, ¶172.

E. Claims 5 and 17

The Mixed McDonald System as modified to include virtual talkgroups between disparate radio systems as taught by Koren includes or renders obvious these limitations. See claims 2 and 14 above. The endpoints of virtual talkgroups formed by the interoperability server as taught by Koren are in different communications networks. EX1002, ¶173, *see also* Ground 3 Introduction.

McDonald discloses the use of multicast addressing on streams sent to console sites. EX1007, ¶¶[0019], [0031]. To the extent not explicitly disclosed in McDonald, a POSITA would have found it obvious to use multicast addresses for audio streams sent from the core router to the consoles because those streams are sent to multiple consoles at multiple console sites 104, 106, and using multicast addressing conserves bandwidth because it avoids the need of sending multiple

unicast streams to those multiple consoles. EX1002, ¶173. As a result of the use of multicast addressing on streams from the core router to the consoles, the communications from the endpoints of the virtual talkgroups are mapped to the multicast addresses used by the core router as required by these claims.

F. Claims 6 and 18

The Mixed McDonald System as modified to include virtual talkgroups between disparate radio systems as taught by Koren includes or renders obvious these limitations. *See* Introduction to Ground 3 and claims 2 and 14 above. Koren's interoperability system 10/110 bridges communications between the endpoints 34/222 and 24/232 of the different radio systems 22/230 and 32/220. EX1002, ¶174.

G. Claims 10 and 22

1. [10pre], [22pre], [22a]

See supra §VIII.B (Claim 2) ; *see also* §VII.B.4 (limitations [1c] and [13c]). EX1002, ¶175.

2. [10a], [22b]

The Mixed McDonald System as modified to include virtual talkgroups between disparate radio systems as taught by Koren includes or renders obvious these limitations. McDonald discloses that the consoles 130-140 can source payload (i.e., speak) on a call. EX1007, ¶¶[0004], [0013]. The communication

would be transmitted to and received at the core router via the low bandwidth PSTN connection in the Mixed McDonald System. EX1002, ¶176.

3. [10b], [22c]

The Mixed McDonald System as modified to include virtual talkgroups between disparate radio systems as taught by Koren includes or renders obvious these limitations. See above § VII.C.2 (limitations [9a], [21a]) (discussing transmitting selections of talkgroups to the core router). Alternatively, the console may be configured to allow the console operator to select one or multiple talkgroups to which the communication is intended and to transmit those selections to the core router. EX1002, ¶177.

4. [10c], [22d]

The Mixed McDonald System as modified to include virtual talkgroups between disparate radio systems as taught by Koren renders obvious these limitations. It would have been obvious to a POSITA to configure the core router to transmit an audio stream received from a console to talkgroups corresponding to the talkgroups selected by the console for monitoring. Alternatively, if the console were configured to transmit a selection of one or more talkgroups for which a communication from the console operator is intended, it would have been obvious to a POSITA to configure the core router to transmit that communication to the selected talkgroups. One reason that this broadcast of the console operator's

communication to the multiple talkgroups would be done is to allow a console operator to inform those multiple talkgroups of an event of common interest, such as a general emergency, or that the console operator is going off duty and will no longer be monitoring those talkgroups. EX1002, ¶178.

H. Claims 11 and 23

See above § VIII.G (Claims 10 and 22). The Mixed McDonald System as modified to include virtual talkgroups between disparate radio systems as taught by Koren renders obvious these limitations. It would have been obvious to a POSITA to configure the core router to transmit an acknowledgement message including the identifications of the selected channels back to the console in response to receipt of the selection of the plurality of talkgroups from the console. Such acknowledgement messages are well-known in the art. EX1012, 4:10-29; EX1002, ¶179.

IX. DISCRETIONARY DENIAL IS NOT WARRANTED

A. 35 U.S.C. § 314(a) Analysis

Petitioner hereby stipulates that, if IPR of the 249 patent is instituted based on this Petition, Petitioner will not assert invalidity of the Challenged Claims based on any ground that was raised or that reasonably could have been raised in this Petition in the Parallel Litigation (as defined below). In light of this stipulation, this Petition should not be discretionarily denied pursuant to *Fintiv*. See USPTO

Memorandum, Interim Procedure for Discretionary Denials in AIA Post-Grant

Proceedings with Parallel District Court Litigation, 2 (June 21, 2022) at 3.

B. 35 U.S.C. § 325(b) Analysis

Applying the two-part framework discussed in *Advanced Bionics, LLC v. Med-El Elektromedizinische Gerate GMBH*, IPR2019-01469, Pap. 6, *8-9, the Board should not exercise its §325(d) discretion to deny institution. Neither of the challenges are substantially the same as those considered during prosecution and none of the references on which the challenges in this Petition are based were considered during prosecution. If any of the challenges herein are found to be based on prior art that is the same as or cumulative to prior art considered by the examiner during prosecution, the examiner has made a clear error in allowing the claims over such prior art. This is at least because the challenges in this Petition satisfy the compelling merits standard, and allowing the claims over such prior art is therefore clear error.

X. COMPLIANCE WITH FORMAL REQUIREMENTS

A. Mandatory Notices Under 37 C.F.R. §§ 42.8(b)(1)-(4)

1. Real Party-In-Interest

Motorola Solutions, Inc. (“Petitioner”) is the real party-in-interest.

2. Related Matters

The 249 patent is subject to the following actions: *STA Group LLC v. Motorola Solutions, Inc.*, No. 2:23-CV-00030 (E.D. Tex., Jan. 26, 2023) (the “Parallel Litigation”).

3. Lead and Backup Counsel

Lead Counsel	Backup Counsel
James Heintz Reg. No. 41828 DLA Piper LLP 11911 Freedom Drive, Suite 300 Reston, VA 20190-5602 Phone: + 1 703 773 4000 Fax: + 1 703 773 5000 Jim.Heintz@us.dlapiper.com	Peter Nelson Reg. No. 77478 DLA Piper LLP (US) 500 Eighth Street, NW Washington, DC 20004 Phone: +1 202 799 4000 Fax: +1 202 799 5000 Peter.Nelson@us.dlapiper.com

4. Service Information

Petitioner consents to electronic service at dla_msi_sta_iprs@us.dlapiper.com with copies to the email addresses for lead and backup counsel designated above.

B. Proof of Service on the Patent Owner

As identified in the attached Certificate of Service, a copy of this Petition in its entirety is being served pursuant to a written agreement on Patent Owner’s attorneys as indicated on the attached certificate of service.

C. Power of Attorney

Powers of attorney are being filed with designation of counsel in accordance with 37 C.F.R. § 41.10(b).

D. Standing

In accordance with 37 C.F.R. §42.104(a), Petitioner certifies that the 249 patent is available for *inter partes* review and that Petitioner is not barred or estopped from requesting an *inter partes* review challenging the patent claims on the grounds identified in this Petition.

E. Fees

The undersigned authorizes the Director to charge the fee specified by 37 C.F.R. § 42.15(a) and any additional fees that might be due in connection with this Petition to Deposit Account No. [50-3266].

XI. CONCLUSION

All claims of the 249 patent should be found unpatentable for the reasons discussed in this Petition.

Dated: January 24, 2024	Respectfully submitted, /s/ James Heintz James M. Heintz Reg. No. 41828 DLA Piper LLP 11911 Freedom Drive, Suite 300 Reston, VA 20190-5602 Phone: + 1 703 773 4000 Fax: + 1 703 773 5000 Jim.Heintz@us.dlapiper.com
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U.S. Patent No. 8,145,249
Petition for *Inter Partes* Review

	Peter Nelson Reg. No. 77478 DLA Piper LLP (US) 500 Eighth Street, NW Washington, DC 20004 Phone: +1 202 799 4000 Fax: +1 202 799 5000 Peter.Nelson@us.dlapiper.com
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CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), Petitioner certifies that this petition includes 13,531 words, as measured by Microsoft Word, exclusive of the table of contents, mandatory notices under § 42.8, certificates of service, word count, claim listing, and exhibits.

CERTIFICATE OF SERVICE

The undersigned certifies pursuant to 37 C.F.R. §§ 42.6(e) and 42.105 that on January 24, 2024, a true and correct copy of the Petition for *Inter Partes* Review of U.S. Patent No. 8,145,249 and all Exhibits was served by emailing a copy of same (by agreement) to the following attorneys for the Patent Owner:

KLG-STA-Motorola@klgates.com

A courtesy copy was sent to the below counsel via electronic mail:

Brenna.Legaard@klgates.com

Respectfully submitted,

/s/ James Heintz