

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

CENTRALSQUARE TECHNOLOGIES, LLC,
Petitioner,
v.
CARBYNE, LTD,
Patent Owner.

Case No. IPR2025-01179

U.S. Patent No. 11,689,383

SUPPLEMENTAL DECLARATION OF STUART J. LIPOFF

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I. INTRODUCTION

1. I have been retained by Petitioner CentralSquare Technologies, LLC (“Petitioner” or “CentralSquare”) as an independent expert consultant in this *inter partes* review proceeding concerning U.S. Patent No. 11,689,383 (“’383 Patent”) before the Patent Trial and Appeal Board of the United States Patent and Trademark Office.

2. I am over 18 years of age and, if I am called upon to do so, I would be willing and able to testify as to the matters set forth herein.

3. My compensation is in no way contingent on the nature of my findings, the presentation of my findings in testimony, or the outcome of this proceeding or any related matter.

4. I previously submitted a Declaration (Ex. 1003) in this proceeding in which I provided my detailed opinions on whether the claims of the ’383 Patent would have been anticipated or rendered obvious to a person of ordinary skill in the art (“POSITA”) at the time of the earliest claimed priority date of the ’383 Patent—August 13, 2017.

5. I have been asked by Petitioner to evaluate the arguments and evidence submitted by Patent Owner Carbyne, Ltd. (“Patent Owner” or “Carbyne”) in its Patent Owner Response (“Response” or “POR”) (Paper 20), as well as the opinions contained in the Declaration of Gerald Christensen (Ex. 2004) filed by

Patent Owner in support. I provide additional opinions in response to those arguments in this Supplemental Declaration.

6. Specifically, I address whether any of the opinions I offered in my opening Declaration have changed and provide my response to the various arguments of Patent Owner in (and Mr. Christensen in support of) the Patent Owner Response.

7. Throughout this Supplemental Declaration, I refer to specific pages, figures, or line numbers of various exhibits. These citations are illustrative and are not intended to suggest that they are the only support for the propositions for which they are cited.

II. SUMMARY OF OPINIONS

8. Below, I set forth the opinions I have formed, the conclusions I have reached, and the bases for these opinions and conclusions. I believe the statements contained in this Supplemental Declaration to be true and correct to the best of my knowledge.

9. Based on my experience and knowledge of the art at the time of the earliest claimed priority date of August 13, 2017, it remains my opinion that claims 1-20 of the '383 Patent are unpatentable in view of the prior art. Specifically, (i) Ramanujaiaha anticipates or renders obvious claims 1-6, 8-13, and 15-19; and

(ii) the combination of Ramanujaiaha and Krishnan renders obvious all twenty claims of the '383 Patent.

10. It is my opinion that none of the arguments presented in Patent Owner's Response (Paper 20) and Mr. Christensen's Declaration (Ex. 2004) undermines the strong *prima facie* case of unpatentability established by the Petition (Paper 1) and as explained in my original Declaration (Ex. 1003).

11. Mr. Christensen raises various arguments in his declaration (Ex. 2004)—each of which is addressed in the body of this Supplemental Declaration (*see* Sections VII and VIII below). In my opinion, each of Mr. Christensen's opinions is based on a misreading of the prior art disclosures, a mischaracterization of other evidence identified by Mr. Christensen or the Patent Owner, and/or a misrepresentation of a POSITA's knowledge or understanding of the field of the '383 Patent.

12. At times throughout this Supplemental Declaration, I may refer to only Mr. Christensen or only the Patent Owner. When I do so, it is not meant to be exclusive of the other.

III. QUALIFICATIONS AND BACKGROUND

13. I believe that I am well qualified to serve as a technical expert in this matter based upon my qualifications, which were discussed in detail in my original Declaration (Ex. 1003 at ¶¶ 9-21). I incorporate that discussion by reference here.

14. My *curriculum vitae* was already included as Exhibit 1004.

IV. MATERIALS CONSIDERED

15. In forming my opinions, I have reviewed the following documents, as well as other documents cited throughout this Supplemental Declaration or submitted in this proceeding:¹

Exhibit	Description
1001	U.S. Patent No. 11,689,383 to Dizengof (“383 Patent”)
1002	Prosecution History of U.S. Patent No. 11,689,383
1003	Declaration of Stuart J. Lipoff
1005	U.S. Patent No. 9,762,733 to Ramanujaiaha et al. (“Ramanujaiaha”)
1006	U.S. Patent No. 9,420,099 to Krishnan et al. (“Krishnan”)
1012	Deposition Transcript of Gerald Christensen (June 2, 2026)
1013	Expert Declaration of Gerald Christensen, <i>CentralSquare Techs., LLC v. Carbyne, Inc.</i> , Case No. 24-cv-01497-ADA, Dkt. 32-1 (W.D. Tex., Nov. 3, 2025)
1014	Stephen Sale & Tom Rebbeck, <i>Operators need to engage with WebRTC and the opportunities it presents</i> , ANALYSYS MASON (Oct. 2014)
1015	<i>Frost & Sullivan</i> , WIKIPEDIA (last visited June 1, 2026), https://en.wikipedia.org/w/index.php?title=Frost_%26_Sullivan&oldid=1241252384

¹ Unless otherwise noted, all emphasis herein is added.

Exhibit	Description
1016	John Honovich, <i>CEO Refuses To Pay for Frost & Sullivan Award</i> , IPVM (Apr. 19, 2018), https://ipvm.com/discussions/ceo-refuses-to-pay-for-frost-sullivan-award
1017	Sean Moolman, <i>Frost & Sullivan Awards: Recognition of Excellence or Cargo Cult?</i> , LINKEDIN (Aug. 18, 2017), https://www.linkedin.com/pulse/frost-sullivan-awards-recognition-excellence-cargo-cult-sean-moolman/
2004	Declaration of Gerald Christensen
2005	Transcript of the March 20, 2026 Deposition of Stuart J. Lipoff
2006	June 7, 2021 CentralSquare press release entitled “CentralSquare Technologies Now Offering Carbyne’s C-Live Universe”
2007	U.S. Pub. 2016/0028790 A1 to Eriksson et al.
2009	Garcia et al., <i>WebRTC Testing: Challenges and Practical Solutions</i> , IEEE (2017)
2012	2025 Product Leader Report, Frost & Sullivan
2013	Dec. 21, 2020 Memo Published by the Washoe County Communications Supervisor regarding a “Regional PSAP Funding Request” (available at https://www.washoecounty.gov/technology/board_committees/911_response/2021/Files/012121/Item%2015%20-%20WC%20Carbyne%20c-Live%20Universe.pdf)
2014	April 11, 2022 Scope of Services Document Published by Miami Dade County regarding “Carbyne c-Live Universe Video-To-911” (available at https://www.miamidade.gov/Apps/ISD/StratProc/ProcurementNAS/pdf_Files/WaiveCompetitions/Notice_to_Wave_Comp_-_Scope.pdf)

16. I have also relied on my education, experience, research, training, and knowledge in the relevant art, and my understanding of legal principles described in this Supplemental Declaration.

17. All of the opinions contained in this Supplemental Declaration are based on the documents I reviewed and my knowledge and professional judgment. My opinions have also been guided by my understanding of how a POSITA would have understood the claims of the '383 Patent at the time of the earliest claimed priority date.

18. I reserve the right to supplement and amend any of my opinions in this Supplemental Declaration based on documents, testimony, and other information that becomes available to me after the date of this Supplemental Declaration.

V. LEGAL STANDARDS

19. I am an engineer and not a lawyer. In preparing this Supplemental Declaration, I have applied the same legal standards that I applied with my original Declaration, which are set out in detail in that submission (Ex. 1003 at ¶¶ 26-46) and which I incorporate by reference here.

VI. LEVEL OF ORDINARY SKILL IN THE ART

20. In my original Declaration (Ex. 1003 at ¶ 52), I set forth my understanding of a POSITA in the field of the '383 Patent.

21. I incorporate by reference that understanding and have applied it here in my Supplemental Declaration.

VII. GROUNDS OF UNPATENTABILITY AND RESPONSES TO PATENT OWNER’S POSITIONS AND MR. CHRISTENSEN’S DECLARATION

22. This section explains why my opinions regarding unpatentability remain unchanged after reviewing Patent Owner’s Response (Paper 20) and Mr. Christensen’s Declaration (Ex. 2004). In the subsections that follow, I address Patent Owner’s and Mr. Christensen’s specific arguments and explain why I disagree with their characterizations and why they do not alter my conclusions.

A. GROUND 1: RAMANUJAIAHA ANTICIPATES AND/OR RENDERS OBVIOUS CHALLENGED CLAIMS 1-6, 8-13, 15-19

23. Here, I address the opinions of Mr. Christensen and Patent Owner as to Ground 1 (Grounds 1A/1B), under which Ramanujaiaha anticipates or renders obvious challenged claims 1-6, 8-13, 15-19 of the ’383 Patent.

24. For context, I reiterate relevant technical background regarding Web Real-Time Communication (“WebRTC”) that I previously discussed in my opening Declaration (Ex. 1003) and confirmed in my deposition testimony (Ex. 2005). WebRTC is an open-source protocol that enables real-time video communication directly within a web browser. *See, e.g.*, Ex. 1003 at ¶¶ 91-97. Notably, different from the other forms of real-time video communications, WebRTC is uniquely positioned for the emergency response setting because, as I

testified at my deposition, WebRTC does not require the installation of any plugins or dedicated applications. *See* Ex. 2005 at 42:14-16 (“WebRTC only works through a web browser. It does not work through . . . any other native application on a phone”). WebRTC’s browser-native characteristic distinguishes it from proprietary video-calling applications (such as FaceTime or Skype), which require pre-installation.

25. Ramanujaiaha itself confirms that WebRTC was a known communication mechanism by identifying “web real-time communication (e.g.,] WebRTC calls)” as a type of “communication” or “interaction” available in the contact center environment. Ex. 1005 at 9:46-53. In other words, a POSITA would have understood that WebRTC was specifically designed to operate through a native web browser—which is why Ramanujaiaha identifies it as a communication mechanism available through the “mobile web browser” path (Element 220). *Id.*, 10:38-43.

1. Ramanujaiaha Teaches or Renders Obvious Simultaneous Audio and WebRTC Real-Time Video

a. Patent Owner’s Improperly Narrow “Visual Channel” Argument Ignores Ramanujaiaha’s Clear Teachings

26. I understand that Mr. Christensen’s and Patent Owner’s central contention is that Ramanujaiaha does not teach “receipt of a WebRTC real-time video stream ‘while audio content of the emergency call is received’” as recited in

independent claims 1, 8, and 15. *See* Ex. 2004 at ¶¶ 80-84, 90; POR at 16, 25. I disagree, as Ramanujaiaha repeatedly discloses simultaneous audio and video communications.

27. In fact, simultaneous audio and WebRTC real-time video communications is a solution Ramanujaiaha was designed to provide. Ramanujaiaha states that although “many customers today regularly use two or more communication channels” (such as telephone calls and video conferencing) to interact with contact centers “simultaneously or at the same time,” operators “struggle to manage multiple related interactions as a single conversation across different channels.” Ex. 1005 at 5:6-23. Ramanujaiaha addresses this problem and discloses user and contact center communications across multiple channels (*i.e.*, different mediums) simultaneously, including voice and WebRTC real-time video. *Id.* at 5:17-23, 5:29-33, 5:45-51, 9:46-53.

28. Ramanujaiaha teaches “communication medium[s] for interacting with a customer of a contact center,” involving “a first interaction via a first medium with the customer,” and “communication mediums that are different from the first medium for a second interaction with the customer.” Ex. 1005 at [1] at (57) (Abstract), 6:13-19 (contact centers deliver “emergency response” services to users).

29. These communications mediums can include voice (first medium) and WebRTC real-time video (second medium that is different from the first medium). *Id.* at 9:46-53 (“‘interaction’ and ‘communication’ are used interchangeably and generally refer to any **real-time** and non-real time interaction that uses any **communication channel**, including, without limitation telephony calls” and “web real-time communication (e.g., WebRTC calls).”).

30. Ramanujaiaha defines “communication channels” to include “mediums or modalities.” *Id.* at 4:59-61. Mr. Christensen agreed with this express disclosure in Ramanujaiaha. Ex. 1012 at 199:5-8 (Q: “Ramanujaiaha teaches that examples of communication channels are mediums and modalities; right?” A: “Correct.”), 200:3-20 (A: “[W]hat [Ramanujaiaha is] alluding to is that a communication channel, a different channel, could be also referred to as a different type of medium or a different type of modality. Correct. That’s my read on it.”).

31. Ramanujaiaha also discloses multimodal communications (or multi-channel communications), “where two or more communication modalities (also referred to as modes of communication, communication channels, media channels, media types, or communication mediums) are **invoked concurrently** during a single communication session,” as depicted in Figures 2-4. Ex. 1005 at 5:45-51, 3:50-4:21; Pet., 35-36.

32. In my opinion, Mr. Christensen and Patent Owner ignore these disclosures.

33. Instead, Mr. Christensen and Patent Owner focus on isolated passages of Ramanujaiaha to assert that a “visual channel” would not include “video stream using WebRTC.” Mr. Christensen opines that “visual channel” can only mean “visual content” or “visual media” that is generated by a call center and rendered by a web browser or mobile application. *See* POR at 16-17; Ex. 2004 at ¶¶ 93-96. I disagree with this artificial “visual is not video” distinction.

34. In my opinion, Mr. Christensen’s artificial “visual is not video” distinction ignores the actual teachings of Ramanujaiaha, which I discussed above (*supra* ¶¶ 24-31) and in my original Declaration. Moreover, Mr. Christensen contradicted this distinction at his deposition. *See* Ex. 1012 at 225:16-226:7 (admitting “video channels typically imply visual communication channels,” “visual communication channels can include video conferencing,” and “visual communication channels can include “WebRTC” as “one means of supporting realtime video”). As Mr. Christensen’s own deposition testimony confirms, a “visual channel” as disclosed in Ramanujaiaha can include WebRTC real-time video and is not limited to only “content” or “media” generated by the call center and rendered on a web browser.

35. As an alternative, Mr. Christensen and Patent Owner argue that “visual content” must be limited to only “web pages, fillable forms, and user interfaces” “generated by the call center and sent to a user during a ‘voice’ call.” POR at 17-18; Ex. 2004 at ¶¶ 97-98. I disagree, as this again ignores other disclosures in Ramanujaiaha teaching simultaneous telephone and WebRTC communications with emergency call centers (as I noted above in ¶¶ 24-31 and in my original Declaration).

b. Patent Owner’s Attempt to Limit Ramanujaiaha’s WebRTC Disclosure Fails

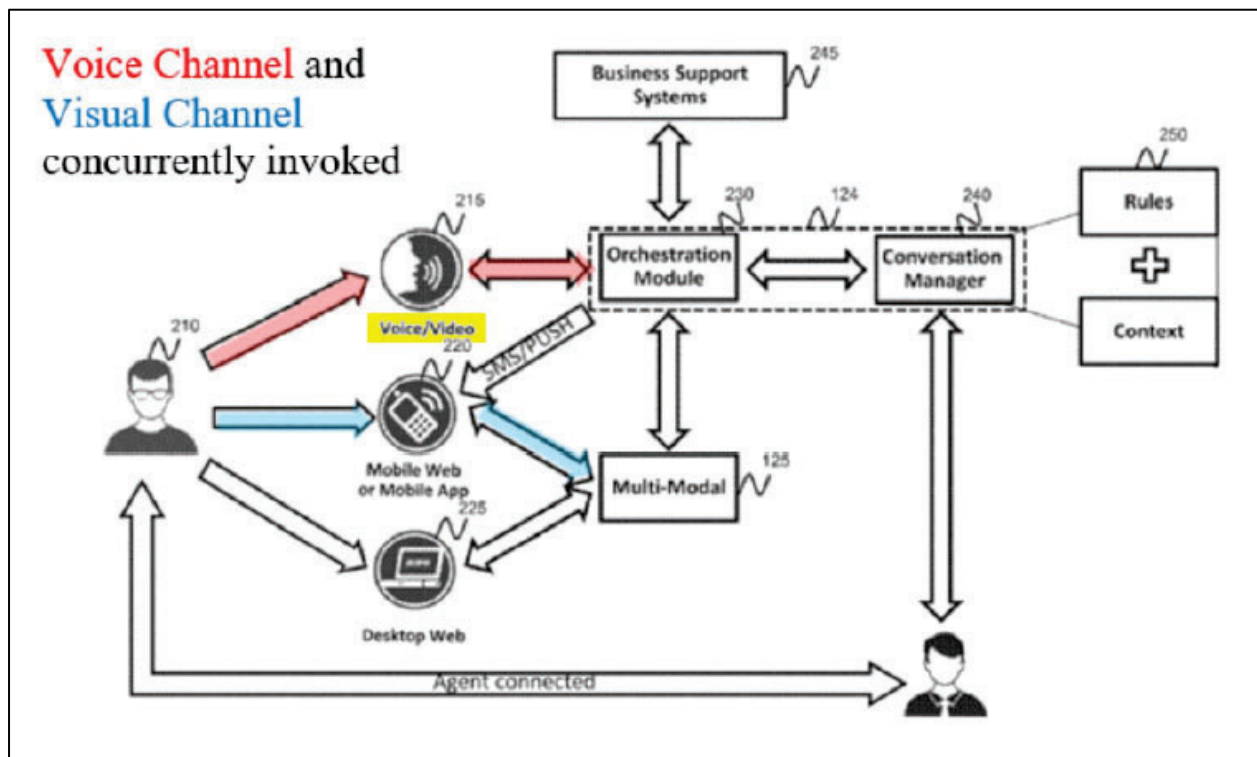
36. As I discussed above, Ramanujaiaha discloses that a communication “generally refer[s] to any real-time and non-real time interaction that uses any communication channel including, without limitation, ‘telephony calls’ and ‘web real-time communications (e.g.,] WebRTC calls).’” Ex. 1005 at 9:46-53, 10:34-42. Yet Patent Owner insists that these express disclosures in Ramanujaiaha merely refer to “generic methods for communication” available to a user “when initially contacting a call center” or “employed by a user device to initiate contact.” POR at 18 (emphasis omitted). Mr. Christensen similarly contends that Ramanujaiaha’s WebRTC is limited to instances such as “provid[ing] a mechanism for contacting the contact center . . . in the first place.” Ex. 2004 at ¶ 101, *see generally id.* at ¶¶ 99-104. I disagree.

37. Ramanujaiaha’s teachings of WebRTC as a communication channel contain ***no*** such limitation. Ex. 1005 at 9:46-53. This disclosure in Ramanujaiaha is consistent with the understanding of a POSITA—because WebRTC is a bidirectional communication channel that could be used as an initial contact and/or as a later communication channel. Ramanujaiaha describes “interactions between contact center resources (e.g., live agents and self-service systems) and outside entities (e.g., customers)” occurring over “video (e.g., video chat, video conferencing, etc.)”—communication modalities that, by their technical nature, require two-way transmission capability. Ex. 1005 at 5:9-15.

38. Mr. Christensen admitted that Ramanujaiaha’s disclosure of WebRTC is not limited to only initiating contact with a contact center. *See* Ex. 1012 at 222:5-223:8 (testifying “I don’t see that disclosed” when asked whether 9:45-53 of Ramanujaiaha described WebRTC as only for “initial communications” or “the way that we first contact a call center”). Mr. Christensen’s testimony is consistent with how a POSITA would understand Ramanujaiaha’s disclosures, and in my opinion, Ramanujaiaha’s discussion and reference to WebRTC is not just a mere “generic” method for communication or one for initially contacting the contact center.

39. Mr. Christensen and Patent Owner also assert that Figure 2 “identifies ‘video’ as transmitted over the *initial* ‘voice channel.’” POR at 19; Ex. 2004 at ¶¶ 105-106. Again, this assertion is likewise unsupported by Ramanujaiaha.

40. Patent Owner further annotated Figure 2 of Ramanujaiaha, highlighting the words “Voice/Video” in yellow. Patent Owner and Mr. Christensen argue that WebRTC is used to make “initial contact,” such that “video” is an alternative to audio, and then claims that the two forms of communication are “*never* identified as occurring” at the same time.



POR at 19-20; Ex. 2004 at ¶ 106; Ramanujaiaha, Fig. 2 (yellow annotation by Patent Owner). Mr. Christensen argues that because Figure 2 labels Element 215 (the first connection) as “voice/video” while Element 220 (the second connection)

bears no such label, video must be confined to the first channel. Ex. 2004 at ¶¶ 105-109. I disagree.

41. In my opinion, Mr. Christensen and Patent Owner again ignore Ramanujaiaha at 9:46-53, and the repeated disclosures that multi-channel communications are invoked concurrently. Ex. 1005 at 10:32-45 (explaining that the user's phone, visual interface device, and web browser may all be the "same device"). Moreover, Figure 2 discloses how the multimodal server 125 communicates with the user device(s) in *different modalities* and "dynamically generates audio *and* ... visual content" to the user. Ex. 1005 at 10:62-64, 11:4-8. So, while an initial contact may be voice (or video), Ramanujaiaha also discloses or renders obvious communications via different modalities, including audio *and* WebRTC video content.

42. I note that Patent Owner in its Response references Ex. 2007, U.S. Patent Publication No. 2016/0028790 to Eriksson (which Mr. Christensen considered) as support that audio and WebRTC communications "are not meant to occur" and can "never" occur at the same time as audio. POR at 20 (citing Ex. 2007 at [0060]-[0063] and [0073]-[0075]).

43. I do not agree with Patent Owner's conclusion. *See* Ex. 2007 at [0060]-[0063] (describing how a communication device can present icons regarding achievable communication types, including when there are "overlapping

formats for both audio and video”), [0073]-[0075] (discussing media stream created by use of a WebRTC API where user is enabled to select a communication, “e.g. video and audio or audio-only”)).

44. The Patent Owner Response (POR at 20) also references my deposition. Ex. 2005 at 42:11-22. There, I testified that it is possible to use WebRTC to engage in voice communications. But that does not mean that WebRTC cannot engage in video communications, or that such WebRTC real-time video communications cannot occur simultaneously with an audio communication.

45. Patent Owner and Mr. Christensen next argue that Ramanujaiaha’s discussion of synchronization somehow “confirms” that WebRTC is only used to “initially communicate with the contact center” and that audio and video “are not meant to occur—and are never identified as occurring—at the same time.” POR at 20-21 (emphasis in original); Ex. 2004 at ¶¶ 112-124. Mr. Christensen contends that “[t]here is no need to ‘synchronize’ or ‘maintain’ the ‘context’ of a real-time communication” because a “real-time communication is occurring at the same time the user is communicating via other means.” Ex. 2004 at ¶ 117. I disagree.

46. In the emergency-response context, real-time video and user audio must necessarily be synchronized so the call center can correlate what is spoken by the user with what is seen on real-time video. For example, if an emergency caller states that a criminal “just took off in that car,” the real-time video must be synced

to the audio so the operator can identify the car being referred to. This is precisely what Ramanujaiaha's synchronization language ensures—that the visual context the dispatcher sees corresponds to the verbal information they hear. As I explained in my deposition: “it would be important that the call center agent be able to relate what they hear by voice on the phone with the visual images that they're seeing on WebRTC knowing that they're coming from the same caller.” Ex. 2005 at 47:25-48:11.

47. Mr. Christensen also argues that synchronization means the visual content is a visual interface like “a menu, web page, or interactive form.” Ex. 2004 at ¶¶ 116-119; POR at 21. But this disregards that such non-real-time interfaces are not likely to pertain to emergency 911 contexts, where callers generally would not be browsing menus or filling out forms.

48. Even Mr. Christensen admitted that the “need to synchronize audio and video channels in the PSAP context” was known for a “long time.” Ex. 1012 at 229:7-230:10.

49. Patent Owner argues that a “multimodal session” (Figure 4) and “orchestration module” (Figure 3) *only* entail transmission of “page data” or “web” data, not WebRTC video. POR at 22-24. But Patent Owner concedes that the *multimodal session*, which can be started by the *orchestration module*, transmits “*video*” and “*voice*.” Ex. 1005 at 10:27-28 (Figure 2 is labeled “Multimodal

System”); POR at 19 (Patent Owner conceding that Figure 2 shows transmission of “video” and “voice”); Ex. 1005 at 12:3-5 (“orchestration module” can start “a multimodal session”).

50. Further, Ramanujaiaha defines “multimodal communications” as invoking “two or more communication modalities” “concurrently,” *id.* at 5:45-51, and “communication” expressly includes “*WebRTC*.” *Id.* at 9:46-53, 9:5-14 (similar), 11:59-12:12 (“a multimodal session” invoking both a phone call and a “visual communication”); Ex. 1012 at 225:16-226:7 (admitting visual communication channels include video and WebRTC). Therefore, the multimodal session and orchestration module may transmit WebRTC video.

c. Motivation to Combine Regarding Ramanujaiaha

51. I disagree with Mr. Christensen that additional motivation to combine analysis is needed with respect to Ramanujaiaha. The disclosures discussed in Ground 1 are from a single reference Ramanujaiaha, and a POSITA would naturally read and combine the teachings of Ramanujaiaha, including as a unified, coherent document that teaches emergency contact center communications, multimodal sessions, WebRTC video, and concurrent voice/visual channels. This is consistent with Ramanujaiaha’s stated purpose of addressing the well-known circumstance wherein many callers to a contact center “regularly use two or more communication channels” (such as telephone calls and video conferencing) to

interact with contact centers “simultaneously or at the same time.” Ex. 1005 at 5:5-22.

52. Patent Owner also contends that the visual content cannot be video because doing so would result in “duplicative communications.” POR at 27. Specifically, Patent Owner argues that because the first connection is “voice/video,” configuring the second connection as “video again” would mean “Petitioner is effectively proposing that Ramanujaiaha be configured such that users simultaneously engage is [sic] two identical (or at least non-distinguishable) forms of communication.” *Id.*

53. A POSITA would not configure Ramanujaiaha to contain duplicative communications, because Ramanujaiaha expressly teaches multimodal communications over *different* channels. Ex. 1005 at 5:17-21, 5:29-33, 5:45-51, 9:46-53. More specifically, as explained above, a POSITA would understand that Ramanujaiaha teaches an embodiment where the first connection is audio and the second connection is video—in which case there are no duplicative communications.

54. Mr. Christensen contends that my analysis constitutes “improper hindsight” because I analyzed Ramanujaiaha “in the context of the objectives of the ’383 Patent.” Ex. 2004 ¶¶ 89-92 (citing Ex. 2005 at 38:12-41:10, 42:11-22).

This characterization misconstrues the standard analytical methodology for prior art evaluation.

55. In any prior art analysis, the expert must first understand what the claims require. This is precisely what I did. As I explained in my deposition: “I, of course, analyzed the ’383 Patent to understand what the limitations were in the light of the specification of the ’383 Patent.” Ex. 2005 at 41:5-10. I then applied that understanding to evaluate whether certain limitations were disclosed in Ramanujaiaha. *Id.* at 39:25-40:10. Importantly, I confirmed that this process involved comparing how terms were used in both documents: “[I]n comparing those terms as they were used in the 383 Patent to the two references, I found that there was a direct alignment and correspondence to them being used in both the references as well as the [] 383 Patent . . . in the same way.” *Id.* at 22:11-18.

56. In other words, my analysis was not hindsight reconstruction—it was standard claim mapping based on the consistent use of technical concepts across documents that share “the same architecture, the same objectives.” *Id.* at 23:10-12. This approach is methodologically sound—it distinguishes between (1) understanding the claim scope as I did, which is a necessary predicate to any prior art analysis, and (2) using the claims as a “roadmap” to reconstruct the prior art, which would be impermissible hindsight and which I did not do.

d. A POSITA Would Have Used WebRTC for Real-Time Video

57. Patent Owner did not invent WebRTC, which was well-known prior to the '383 Patent. However, Mr. Christensen and Patent Owner suggest that a POSITA would not have selected WebRTC for emergency-call video transmission, alleging poor video quality, lossy encoding, and jitter. Ex. 2004 at ¶¶ 152-160; POR at 32. I disagree. To the contrary, the technical context strongly supports selecting WebRTC for emergency video transmission.

58. A POSITA would prefer WebRTC because it allows browser-based real-time video without requiring any dedicated application installation, as I noted earlier, *see supra* ¶¶ 24-25, and which was well known prior to the '383 patent. This advantage is critical in emergency scenarios because callers do not have time to locate, download, install, and configure a specialized video application to transmit live video of a fire, shooting, or other emergency event. Mr. Christensen acknowledged as much. Ex. 1012 at 246:4-8 (“WebRTC typically is browser-based, meaning that you do not have to download or use a specific app like most of us may be familiar with on our smartphones.”).

59. Because of this, I disagree with Mr. Christensen’s opinion that there are “affirmative reasons why a POSITA would not have employed WebRTC to communicate with a mobile device, particularly during an emergency call.” Ex. 2004 at ¶¶ 155-160. Mr. Christensen’s opinions conflict with his own testimony

that WebRTC is “browser-based” and would offer those in “emergency” situations the ability to connect with a dispatcher to share real-time video without going through additional steps of “download[ing] or us[ing]” a specific app.” Ex. 1012 at 245:19-246:8. It was also well known in the art that establishing a WebRTC video connection with a caller allowed PSAP operators to get additional information about the caller’s event. Ex. 1005 at 9:45-52 (disclosing WebRTC as a known mechanism for real-time communication with callers); Ex. 1006 at 1:41-47 (teaching that “[t]he PSAP can use information incoming from each of the data channels,” “e.g., a WebRTC call,” “to help determine information about the event (e.g., to build a picture of the scenario)”).

60. Mr. Christensen focuses on *potential* latency or jitter of WebRTC (Ex. 2004 at ¶¶ 156-160), but disregards the clear teaching in the art that establishing a “data channel” “compris[ing] a WebRTC” with a caller about an emergency event allows the PSAP to “use information incoming from” that data channel, including videos “to help determine information about the event.” Ex. 1006 at 7:27-35, 1:44-49. Using WebRTC addresses the “tantamount” concerns in an emergency event—helping the dispatcher collect information in real-time as new developments are unfolding.

61. Mr. Christensen alleges that doing so would “degrade the quality of communications,” Ex. 2004 at ¶156 (quoting Ex. 2009, [6]), but there is no

evidence or technical analysis supporting his opinion, and even with this supposed drawback, the prior art still taught the use of “WebRTC” in the context of emergency calls. *See* Ex. 1006 at 1:41-49 (establishing “trusted data channel (e.g., a WebRTC call) with a PSAP system,” such that the PSAP can “help determine information about the event (e.g., to build a picture of the scenario)”).

62. Mr. Christensen further alleges that use of WebRTC to transmit real-time video, “particularly at the same time other communication is occurring” would increase the demands on a user’s device, which could adversely impact the user’s ability to engage with the dispatcher. Ex. 2004 at ¶¶ 158-159. I disagree. Mr. Christensen has pointed to no other evidence that communication would be “adversely impacted.” WebRTC was designed to be bandwidth-efficient for real-time interactive video communications compared to many alternative approaches known at the time. Bandwidth efficiency would be highly advantaged because cellular networks do not have high bandwidths normally used for real-time video and bandwidth efficiency would facilitate WebRTC video transmissions from consumer cellphones.

63. Mr. Christensen’s reliance on Ex. 2009 to claim that a POSITA would not have employed WebRTC because of “packet loss,” “jitter,” and “lossy” video mischaracterizes the article. Ex. 2004 at ¶¶ 156, 160; POR at 32. Exhibit 2009 explains that “lossy” refers only to the *encoding method*, which saves space by

eliminating data indiscernible to “the human eye and ear.” Ex. 2009 at [6]. Exhibit 2009 further states that “packet loss” and “jitter” are “indicators” for assessing WebRTC’s Quality of Service, but nonetheless praises WebRTC for “simpl[ifying] the embedding of voice and video communications in all types of applications.” *Id.* Moreover, the “25%” packet loss referenced in the article’s case study was an *artificially introduced* “control variable” for testing purposes. *Id.* at [8] (“In order to introduce a control variable, we repeat the experiment introducing a packet loss of the 25% in the UDP traffic.”). Indeed, Exhibit 2009 noted WebRTC’s explosive popularity, predicting “7 billion devices compliant with WebRTC by 2020.” *Id.* at [1]; *see also* Ex. 1014 at [1] (stating WebRTC will soon be included in the “world’s most popular smartphone OS”). Mr. Christensen agrees that this “very large number” presumed “pretty much everybody has got a smartphone” that supported WebRTC. Ex. 1012 at 253:12-254:5. Even if WebRTC had some decline in video quality or jitter, a POSITA would have recognized that a technology available on “pretty much everybody[‘s] smartphone” was an obvious choice for emergency calls. This article does not state or imply that WebRTC is unsuitable for emergency response applications. Instead, Exhibit 2009 discusses *how one would measure the quality* of a WebRTC session.

64. Exhibit 2009 actually praises WebRTC as making “simple the embedding of voice and video communications in *all* types of applications.” Ex.

2009 at [6]. One such “application” would be emergency communications, as both Krishnan and Ramanujaiaha teach. Ex. 1006 at 1:41-49 (“emergency caller” establishes “a trusted data channel (e.g., a WebRTC call) with a PSAP system” to “help [PSAP] determine information about the event (e.g., to build a picture of the scenario)”); Ex. 1005 at 6:13-20 (explaining the invention in the context of “emergency response”). Indeed, Exhibit 2009 noted WebRTC’s explosive popularity, predicting “**7 billion** devices compliant with WebRTC by 2020.” Ex. 2009 at [1]; *see also* Ex. 1014 (stating WebRTC will soon be included in the “world’s most popular smartphone OS”). Mr. Christensen agreed this “very large number” presumed “pretty much *everybody has got a smartphone*” that supported WebRTC. Ex. 1012 at 253:12-254:5. Even if WebRTC had some decline in video quality or jitter, a POSITA would have recognized that a technology available on “pretty much everybody[’s] smartphone” was an obvious choice for emergency calls.

2. Ramanujaiaha Teaches or Renders Obvious Using the Phone Number of the Mobile Device as the Unique Identifier

65. The independent claims 1, 8, and 15 of the ’383 Patent recite that “the real-time video stream is associated with a unique identifier for the mobile device.” Dependent claims 4, 11, and 18 require that this “unique identifier comprises the [mobile device’s] phone number.” Mr. Christensen argues the Petition did not

explain why claims 4, 11, and 18 are satisfied because Ramanujaiaha teaches a Session ID but “does not teach, however, that this ‘Session ID’ is the user’s telephone number.” Ex. 2004 at ¶¶ 161-173; POR at 33-34. I disagree.

66. Mr. Christensen’s argument ignores the Petition’s statement that “Ramanujaiaha *also* discloses [element] [11] because the real-time video stream is associated with the caller’s telephone number (*another type of unique identifier*).”² Ex. 1003 at ¶¶ 116-118; Pet., 38. The Petition explained how “the video stream originates from (and is therefore associated with) the calling mobile device and its corresponding telephone number.” Ex. 1003 at ¶¶ 116-118. Mr. Christensen ignores this and appears to focus on what Petitioner appears to argue instead of Petitioner’s actual position.

67. Ramanujaiaha “extract[s] data about the customer interaction such as the caller’s telephone number” and sends “a link including *a unique URL or corresponding to the user’s phone number*” to the user “over SMS” when it “identif[ies] that the user is engaging via a smart phone or a mobile phone.” Ex.

² My discussion here for claim 4 incorporates the discussion of [11], which in turn incorporates the discussions of [1d] and [1h]. Ex. 1003 at ¶ 122; Pet., 41, 38. The same logic and discussion apply for claim 11 (referencing claim 8) and claim 18 (referencing claim 15). Ex. 1003 at ¶¶ 148, 167.

1003 at ¶¶ 82-85, 98-103, 116-118, 122; Pet., 20-21, 29-31, 38-39, 41 (citing Ex. 1005 at 7:4-5, 7:10-16, 10:55-59, 12:5-13, 12:23-30).

68. Mr. Christensen also ignores his (and Patent Owner's) own admission in the related district court litigation that "[a] POSITA would recognize that mapping a phone number to a message endpoint and directing a URL to that endpoint associates the phone number and the URL." Ex. 1013 at 6 (¶¶ 13-14). Mr. Christensen also testified that "[m]essage endpoint in this context could simply be a mobile phone receiving some type of communication that's nonverbal." Ex. 1012 at 75:13-19.

69. Thus, Patent Owner's and Mr. Christensen's concession that a POSITA would recognize that mapping a phone number to a phone and directing a URL to that phone is one way to create the association required by claims 4, 11, and 18 dooms their position. In my opinion, using a phone number as the claimed unique identifier is disclosed, or at a minimum rendered obvious, by Ramanujaiaha.

B. GROUND 2: RAMANUJAIAHA AND KRISHNAN RENDER OBVIOUS ALL CHALLENGED CLAIMS (I.E., CLAIMS 1-20) OF THE '383 PATENT

70. I now address the opinions of Mr. Christensen and Patent Owner as to Ground 2, which provides an alternative basis for obviousness through the combined teachings of Ramanujaiaha and Krishnan. Even if Ramanujaiaha alone was found insufficient to teach certain claim limitations (I do not agree this is the

case), the addition of Krishnan renders obvious all twenty challenged claims of the '383 Patent.

1. Ramanujaiaha and Krishnan Render Obvious All Independent Claims

a. There Is Motivation to Combine Ramanujaiaha and Krishnan to Render Obvious Simultaneous Audio and WebRTC Real-Time Video

71. Mr. Christensen and Patent Owner contend that there is no motivation to “simultaneously engage in audio and WebRTC real-time video communication between a caller and recipient during an emergency.” Ex. 2004 at ¶¶ 175-184; POR at 34-35. But my original Declaration and the Petition point to Krishnan’s express disclosure of simultaneous voice-only and video data communications. *See* Ex. 1003 at ¶¶ 61-64, 180-187, 193; Pet., 10-11, 57-60, 63. Mr. Christensen acknowledges that emergency callers can be asked to establish a WebRTC session, but incorrectly insists the purpose is “call triage” and that “in Krishnan, data (like video) is communicated *before* there is audio communication.” Ex. 2004 at ¶¶ 182, 184, 215; POR at 36. I disagree.

72. Krishnan discloses or renders obvious that an “emergency caller” (*i.e.*, one *already speaking* with the PSAP) is “*asked* to establish a trusted data channel (e.g., a WebRTC call) with a PSAP system and then provide their perspective about the event via the data channel.” Ex. 1006 at 1:41-44; Ex. 1003 at ¶¶ 180-187. A POSITA would understand (as would common sense dictate) that a caller

cannot be “asked” to establish a WebRTC session without audio communication *already* being in place.

73. Krishnan makes clear that the WebRTC connection is not used solely or exclusively for prioritization, but rather:

The PSAP can use information incoming from each of the data channels (e.g., pictures, videos, text information, etc.) *to help determine information about the event (e.g., to build a picture of the scenario)* as well as determine which caller gets through to the PSAP agent first and which callers wait.

Ex. 1006 at 1:44-49. That is, the PSAP system of Krishnan can be used for call triage to determine which caller gets through to a human agent first, but it can also be used generally to establish a trusted WebRTC session to help “build a picture” of an event, including by transmitting pictures and video.

74. In fact, Mr. Christensen concedes this because it points to Krishnan’s teaching of simultaneous transmission of audio and video. Ex. 2004 at ¶ 197; *see* Ex. 1006 at 7:27-35:

If the interaction is initiated with a *voice-only communication* channel, PSAP server 216, may prompt the user device and/or user to cause the user device to establish a data interaction connection, such as by PSAP server 216 sending a text message with a link to cause the establishment of the data channel. The establishment of a *data channel* may convey packets, such as Internet Protocol (IP) packets over communication network 104 and *may further comprise a WebRTC*, HTML5, or other data channel paradigm.

See also generally Ex. 1006 at 7:7-35. In my opinion, Mr. Christensen and Patent Owner are incorrect to argue that Krishnan does not disclose or render obvious the

challenged claims. Krishnan at 7:27-35 discloses that when an interaction begins with a voice-only channel, the PSAP can prompt the user (through a text message with a link) to establish a separate WebRTC data channel in parallel to the existing voice connection. Krishnan contains no teaching that the initial voice connection must terminate before or when WebRTC is established. Even if the established WebRTC data channel is sometimes used for triage or to manage multiple callers, that does not negate Krishnan's teachings that WebRTC over the data channel nonetheless helps to "build a picture" of an emergency scenario, including by collecting real-time video as well as maintaining audio with the caller.

b. Mr. Christensen and Patent Owner Mischaracterize Krishnan's Teachings

75. Mr. Christensen and Patent Owner try to recast Krishnan's disclosure that "[w]hile audio communications may be provided via the data channel and/or a voice-only channel, other content is exchanged via the data channel, content such as messages 412, 416, 420; video; images; and/or position data," Ex. 1006 at 10:62-66, asserting "while" "does not imply or teach simultaneous communication (or anything about communication timing at all)." Ex. 2004 at ¶¶ 192-195; POR at 38. I disagree, and this ignores the express language in Krishnan.

76. Krishnan discloses that "first user device 206 has established a data channel . . . with PSAP server 216." Ex. 1006 at 10:53-54. Krishnan also states "[w]hile audio communications may be provided via the data channel and/or a

voice-only channel, other content is exchanged via the data channel, content such as . . . video[,] images[,] and/or position data.” *Id.* at 10:62-66. That is, real-time video, messages, photographs, or GPS position data can be transmitted over the data channel. Voice can also be provided over the data channel—***or by a voice-only channel***. A POSITA reading this disclosure would understand that Krishnan’s system transmits video, images, and position data over the data channel, and at the same time, audio communications can be carried over the voice-only channel. Importantly, a POSITA would not read this sentence in Krishnan in isolation but rather in conjunction with Krishnan’s other disclosures of simultaneous audio and video communications, including those discussed in my opening Declaration and herein. A POSITA would not interpret Krishnan to have “no teaching” of simultaneous audio and real-time video.

77. Thus, Krishnan discloses or renders obvious the challenged claims by teaching two separate channels—a “voice only” channel and a data channel for exchanging video, images, position data.

78. Krishnan further discloses or renders obvious the ’383 Patent claims, especially when read with the other concurrent audio/video disclosures in Krishnan and Ramanujaiaha. As Krishnan’s goal is facilitating communication over different mediums, limiting a system capable of delivering multiple mediums simultaneously to one at a time is illogical, especially in emergencies where every

piece of information matters. Pet., 58-60. Moreover, a POSITA would not want to terminate audio over the voice-only channel because maintaining audio contact with the caller is critical while receiving video and other content over the data channel.

79. Mr. Christensen and Patent Owner allege that Krishnan's Figure 3 only discloses "a sequential, ordered process," and that step 316 "is [not] even a voice call at all," which therefore means no simultaneous voice and video communications. Ex. 2004 at ¶¶ 199-206; POR at 39-40. I disagree. *Supra* ¶¶ 75-78.

80. Krishnan discloses that step 316 may have a "content type," and that "[c]ontent type may differ in terms of *audio*, video, text, position information, etc."—meaning step 316 can be *voice*. Ex. 1006 at 9:49-53, 9:60-64 ("caller 204 *may receive audio* instructions" to perform CPR).

81. In my opinion, Krishnan teaches (or renders obvious) the order as claimed in the '383 Patent: first, a voice-only channel; second, a data channel that may comprise WebRTC. *See, e.g.*, Ex. 1006 at 7:27-35 ("***If the interaction is initiated with a voice-only communication channel***, PSAP server 216, may ***prompt*** the user device and/or user to cause the user device ***to establish a data interaction connection***, [which] may further comprise a WebRTC, HTML5, or other data channel paradigm."). Mr. Christensen ignores this disclosure.

82. This disclosure corroborates Ramanujaiaha's express teaching of concurrent voice and visual channel operation and further confirms that a POSITA would have understood the prior art to teach simultaneous audio and WebRTC video transmission.

c. There Is Motivation to Combine Ramanujaiaha and Krishnan

83. Mr. Christensen and Patent Owner argue that there is no motivation to combine Krishnan and Ramanujaiaha for "the real-time video stream is received through the WebRTC session while audio content of the emergency call is received" claim element. Ex. 2004 at ¶¶ 209-215; POR at 41 (arguing that "simply using 'WebRTC' and 'video' does not separately motivate use of this simultaneously with audio communication."). I disagree.

84. As I noted in my original Declaration, a POSITA would have been motivated to utilize Ramanujaiaha's link to the web browser to establish a **WebRTC session**, as taught by Krishnan, because it would have comported with Ramanujaiaha's express goal of facilitating "real-time" interactions between the contact center resources (e.g., live agents) and outside entities (e.g., customers). Ex. 1003 at ¶¶ 95-97, 184-187; *see also* Pet., 58-60.

85. Moreover, Ramanujaiaha and Krishnan each use similar components (e.g., a smart phone adapted to **simultaneously** communicate with an emergency call center over **voice-only and data channels**), to achieve a common purpose

(providing *voice and visual communication* to improve customer service). Ex. 1003 at ¶ 186; *see also id.* at ¶ 64 (“Ramanujaiaha and Krishnan are directed to the same problem as the ’383 patent: improving call center response services (such as emergency response services) by allowing a user to provide *visual and audio communications*.”).

86. As I previously explained, a POSITA would have recognized the value of combining Ramanujaiaha and Krishnan and would have had a reasonable expectation of success. *See* Ex. 1003 at ¶ 184 (“A POSITA would have been motivated to utilize Ramanujaiaha’s link to the web browser to establish a WebRTC session, as taught by Krishnan, because it would have comported with Ramanujaiaha’s express goal of facilitating ‘real-time’ interactions between the ‘contact center resources (e.g., live agents)’ and ‘outside entities (e.g., customers).”); *id.* at ¶ 185 (“A POSITA would have also appreciated the advantages of utilizing such real-time communication in emergency situations, as taught by Krishnan.”); *id.* (“For example, a POSITA would have recognized that real-time communication via WebRTC would have allowed the user to quickly and accurately convey the nature of their emergency (e.g., through video communication); thus enabling the contact center to provide more timely emergency services.”). Both references address the same technical domain as the ’383 Patent—real-time data streaming from mobile devices to centralized

emergency systems. Both references solve the same engineering problem: enabling concurrent visual and audio communications using smartphones that maintain parallel voice and data connections. *Compare* Ex. 1005 at Abstract, 5:6-21, 10:34-38, FIG. 2, *with* Ex. 1006 at Abstract, 2:4-21, 10:56-66. The references themselves confirm that the underlying protocols (PSTN/VoIP for voice, WebRTC for data) were well-established, and integrating them into a unified multimodal system required only routine skill. *See* Ex. 1005 at 9:46-52, 10:34-42; Ex. 1006 at 7:27-35. Mr. Christensen’s analysis does not adequately address these disclosures.

87. Mr. Christensen’s opinions on obviousness and motivation to combine also do not address, and cannot be squared with, the disclosures of Ramanujaiaha and Krishnan. Each reference discloses systems designed to address enabling emergency callers to transmit real-time video alongside their voice calls. *See* Ex. 1005 at 5:9-15 (describing “interactions between contact center resources (e.g., live agents[])” and “outside entities” conducted over “video (e.g., video chat, video conferencing, etc.)”); Ex. 1006 at 1:41-49 (describing caller establishment of “a trusted data channel (e.g., a WebRTC call) with a PSAP system” to “provide their perspective about the event via the data channel.”). Therefore, adapting Ramanujaiaha’s SMS-triggered browser link to initiate a WebRTC data channel—as Krishnan expressly teaches—represents a straightforward combination of elements each reference already discloses: a mobile device, a URL delivery

mechanism, and a WebRTC session, as I previously explained. *See* Ex. 1003 at ¶ 186 (“A POSITA would have reasonably expected to succeed in configuring Ramanujaiaha to establish the WebRTC session because it is expressly envisioned by Ramanujaiaha and would have only required routine skill to implement.”); *id.* (“As I explain above, Ramanujaiaha and Krishnan each use similar components (e.g., a smart phone adapted to simultaneously communicate with an emergency call center over voice-only and data channels), to achieve a common purpose (providing voice and visual communication to improve customer service”); *id.* (“Thus, configuring Ramanujaiaha’s mobile web browser link to establish WebRTC data, as taught by Krishnan, would have been a straightforward application of known elements (a mobile device, link and WebRTC session) used according to their known functions (real-time video) to yield predictable results (communicating with an emergency center using distinct voice and data communication channels)”). This combination yields the predictable outcome of enabling parallel voice and data communication with an emergency response center—the very result both references describe. *Id.* at ¶¶ 184-187.

88. Mr. Christensen does not address these arguments, effectively conceding the required motivation to combine exists and has been met for Ramanujaiaha and Krishnan.

2. Ramanujaiaha and Krishnan Render Obvious Dependent Claims 7 and 14

a. New Claim Construction

89. Patent Owner states dependent claims 7 and 14 do not require construction. POR at 42. However, Mr. Christensen appears to introduce a new construction with respect to claims 7 and 14. Ex. 2004 at ¶ 220 (“claims 7 and 14 require that the same ‘recipient’ engaging in an ‘audio’ ‘emergency call’ with a ‘mobile device user’ also simultaneously receive both (1) a ‘real-time video stream’ and (2) either ‘GPS location data’ or ‘one or more photographs’ via the same ‘WebRTC session’ with the ‘user.’”); *see generally id.* ¶¶ 218-231.

90. In my opinion, Mr. Christensen is alleging a new construction that the “simultaneous” transmission of audio, WebRTC video, *and* GPS or photographs is required.

91. Unlike the independent claims, claims 7 and 14 do not contain the “while” language that Patent Owner relied on to obtain a Notice of Allowance during prosecution, i.e., “wherein the real-time video stream is received through the WebRTC session while audio content of the emergency call is received through the first connection.” *See* Ex. 1001 at cls. 7, 14; Ex. 1002 at [18]-[19].

92. Moreover, a POSITA would have understood that a WebRTC session can remain open to transmit additional data *after* an initial video stream.

93. Therefore, a POSITA would not have understood claims 7 and 14 in the way Mr. Christensen suggests.

b. Ground 2 Nevertheless Renders Claims 7 and 14 Obvious

94. In my opinion, even if Mr. Christensen’s new claim construction is applied, Ramanujaiaha and Krishnan still disclose or render obvious claims 7 and 14. In fact, a passage of Krishnan that Mr. Christensen relied on confirms Krishnan’s teaching of simultaneous transmission of GPS data or photographs while also transmitting audio and video. Ex. 2004 at ¶ 221 (citing Ex. 1006 at 1:41-49) (“An emergency caller is asked to establish a trusted *data channel (e.g., a WebRTC call)* with a PSAP system and then provide their perspective about the event via the data channel. The PSAP can use information incoming from each of the data channels (e.g., *pictures*, videos, text information, etc.) to help determine information about the event (e.g., *to build a picture of the scenario*)”). Carbyne cites to Figure 2, arguing it does not show how a “screen for display” available to an “agent.” POR at 43. But as I previously explained, “Figure 2 illustrates inter alia a ‘caller 204’ placing an emergency voice call using a ‘[customer] communication device 206’ such as a ‘cellular phone’ or ‘smart phone ... adapted to support video, audio, text, and/or data communications.’” Ex. 1003 at ¶ 181.

95. A POSITA would understand that a 911 operator would receive the video, picture, and GPS over the WebRTC data channel, and would do so during

the same WebRTC session, in order to “build a picture of the scenario.” Ex. 1006 at 1:47. This is because, as I mentioned above, a POSITA would understand that a WebRTC session, once established, can transport video, audio, and data.

96. Further, a POSITA would know that a 911 operator working to understand an emergency scenario would want to simultaneously receive pictures and video (to know what the emergency is) as well as the GPS location of the caller (to know precisely where to send the first responders). Ending a first WebRTC session after a video is sent and then opening a second one to receive pictures and/or GPS would unnecessarily delay help. It would further run the risk of a technical obstacle interfering with the second WebRTC session, where crucial GPS or pictures would be transmitted.

97. Krishnan further confirms that its data channel transmits multiple data types, including “photos” and “GPS,” disclosing or rendering obvious the claim requirements. Ex. 1006 at 11:28-31 (“[t]he multimedia content provided over the data channel may comprise *audio*, *video*, datafiles, URLs, *GPS coordinates*.”); *id.* at 6:61-67 (user devices “take *photos*, take *video*, capture *audio*, [and] receive *GPS* data.”); *id.* at 7:36-47 (communication to the call center “includes, but is not limited to voice-based *audio* communications and may comprise *video*, *images*, text, data, *and/or other content*.”); POR at 44 (Patent Owner acknowledging Krishnan’s disclosures of “*GPS coordinates*” and “*images*”). Based on basic

principles of data conservation and system efficiency, a POSITA would know to leverage the same opened WebRTC session to transmit GPS, photos, and videos during emergent events rather than opening a new connection. There would be no reason (and there is no teaching in Krishnan) to open a separate data channel for GPS and photos when an existing WebRTC channel can carry all of this content.

98. Patent Owner argues certain Krishnan passages are “inapt.” POR at 44; Ex. 2004 at ¶¶ 216-234. Mr. Christensen claims GPS coordinates and pictures come from a “third-party 220.” Ex. 2004 at ¶ 229 (citing Ex. 1006 at 11:6-31). But Mr. Christensen ignores that the cited passage does not involve any third party. Ex. 1006 at 11:20-31 (multimedia data “may be captured *by first user device* 206 and *sent to PSAP server 216*.”).

99. Mr. Christensen also argues “images” and “position data” at Krishnan 10:62-66 refer to messages sent *to* the user. Ex. 2004 at ¶ 230. But Krishnan 10:62-66 describes “images” and “position data” as “*exchanged* via the data channel”—*i.e.*, that the exchanges are bidirectional.

100. Mr. Christensen additionally argues Krishnan 7:43-58 “does not explain when [GPS] is sent to the PSAP.” Ex. 2004 at ¶ 231. But Krishnan expressly teaches that “GPS coordinates” are among “[t]he multimedia content provided over the *data channel*.” Ex. 1006 at 11:28-31. And Krishnan identifies this data channel can be WebRTC. *Id.* at 1:41-43 (“An emergency caller is asked

to establish a trusted data channel (e.g., a *WebRTC call*) with a PSAP system.”). Krishnan further teaches that the PSAP uses “information incoming from each of the data channels (e.g., pictures, videos, text information, etc.) *to help determine information about the event.*” *Id.* at 1:44-47. A POSITA would understand this to mean that video, GPS, and pictures are all transmitted over the same WebRTC data channel during the same session—not over separate channels or in separate sessions. There would be no reason to close one WebRTC session after sending video and then open a new one to send GPS or pictures; doing so would introduce unnecessary delay and risk technical failure during an emergency. In my opinion, Ramanujaiaha and Krishnan render obvious claims 7 and 14, including under Mr. Christensen’s construction that claims 7 and 14 require audio *and simultaneous* real-time video *and* either GPS or photographs.

c. Motivation to Combine with Respect to Claims 7 and 14

101. I disagree that the Petition and my original Declaration failed to provide motivation to combine with respect to claims 7 and 14. The Motivation to Combine section of my original Declaration states “a POSITA would have recognized that real-time communication via WebRTC would have allowed the user to *quickly and accurately convey the nature of their emergency* (e.g., through video communication), thus enabling the contact center to provide *more timely emergency services.*” Ex. 1003 at ¶ 185. The Petition also cited Krishnan’s

teaching that a PSAP “can use information incoming from each of the data channels (e.g., pictures, videos, text information, etc.) to *help determine information about the event.*” Pet., 11, 58 (citing Ex. 1006 at 1:45-49); Ex. 1003 at ¶¶ 95-96, 184-185.

102. Mr. Christensen overlooks my prior opinion that a POSITA would have been motivated to combine Krishnan with Ramanujaiaha to allow the end user to quickly and accurately convey the full nature of the emergency—enabling more timely and effective emergency services. As I explained previously, a POSITA would understand that Krishnan’s system helps the contact center “obtain a *more complete knowledge of the emergent situation*” and “better coordinate mitigation activities for the emergent event” to “build a picture of the scenario” in real time. Ex. 1006 at 1:47; 2:1-4; Ex. 1003 at ¶ 184 (“A POSITA would have been motivated to utilize Ramanujaiaha’s link to the web browser to establish a WebRTC session, as taught by Krishnan, because it would have comported with Ramanujaiaha’s *express goal of facilitating ‘real-time’ interactions* between the ‘contact center resources (e.g., live agents)’ and ‘outside entities (e.g., customers).’”); *id.* at ¶ 185 (“A POSITA would have also appreciated the advantages of utilizing such real-time communication *in emergency situations*, as taught by Krishnan.”); *id.* (“For example, a POSITA would have recognized that real-time communication via WebRTC would have allowed the user to quickly and

accurately convey the nature of their emergency (e.g., through video communication); thus enabling the contact center to *provide more timely emergency services.*”). Doing so over one open session of WebRTC would be optimal rather than sending real-time video over one WebRTC session, then waiting to send GPS or photographs over another WebRTC session. In emergent events, a POSITA would recognize that minimizing the steps between a user calling a call center and the transmission of as much information as possible to the dispatcher is ideal.

103. A POSITA would further understand that, in an emergency, a 911 operator should receive pictures, GPS, and videos in real-time as the event unfolds, not after the fact. It would make no sense to receive GPS or photographs after and separate from real-time video transmitted via WebRTC, especially if, for example, the caller had moved locations or the emergency event had become exacerbated. And for the same reason a POSITA would use WebRTC for video calls, a POSITA would use WebRTC for GPS and photographs—requiring callers to download a separate application or start a new WebRTC session would introduce unacceptable delay. Ex. 2005 at 42:14-22.

VIII. SECONDARY CONSIDERATIONS LACK NEXUS AND ARE “PAY-TO-PLAY”

104. Finally, I address Mr. Christensen’s objective indicia arguments. I explained in my opening Declaration that I was unaware of any secondary

considerations evidence that would alter my obviousness analysis. *See* Ex. 1003 at ¶ 45. After reviewing Patent Owner’s Response and Mr. Christensen’s declaration (POR at 46-52; Ex. 2004 ¶¶ 235-267), my opinion remains unchanged. Patent Owner’s purported secondary considerations lack nexus to Claim 1.

105. Patent Owner has repeatedly alleged that the “fundamental feature” of Claim 1 is the simultaneous transmission of both audio and WebRTC real-time video to a dispatcher via two different connections. POR at 2, 14-16; POPR at 7-9, 21; Ex. 1002 at [59]. But in rendering his opinion, Mr. Christensen made no effort to research, test, or use the Universe product to tie it to Claim 1. *See* Ex. 1012 at 18:4-17 (admitting he relied on only two documents, “no” other sources, and spoke to no one at Patent Owner about how the system operates). When pressed on the technical details of how Universe actually works, Mr. Christensen admitted he would be speculating. Ex. 1012 at 40:8-9 (“I’m not going to speculate on the specific nature or engineering behind exactly how it works.”), 42:18-22, 133:17-20 (“I can’t comment on things I haven’t seen. Because, again, I have not seen how this is actually done from an engineering perspective in practice.”).

106. Given that Mr. Christensen admitted he had not tested the Universe product, or spoken with anyone at Patent Owner about how Universe works, Mr. Christensen has failed to establish that all of the elements of Claim 1 are met. At deposition, Mr. Christensen insisted that to meet the “unique identifier” limitation

of element [11], the URL being transmitted to the user “encapsulates a unique identifier that could be a telephone number” (Ex. 1012 at 77:13-22), but there is no evidence Patent Owner’s products do so. Ex. 2004 at ¶¶ 256-262. Mr. Christensen admitted he had not seen any either. Ex. 1012 at 82:8-14 (“I don’t know if I have seen a specific example in commercial practice.”).

107. Further, Patent Owner’s evidence does not show that its customers *chose* Universe *because* of this allegedly “fundamental feature.” Rather, the evidence identifies unclaimed features were much more important:

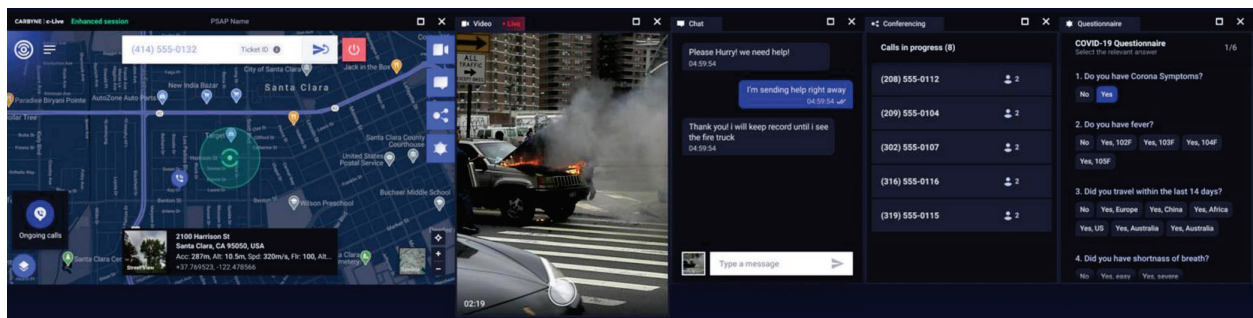
- Ex. 2013 at [1] (“The technology ... *most importantly* gives your location with an accuracy of nearly 10 feet based on cell tower and WiFi locations”);
- *id.* at [7] (showing “Events History,” “c-Records,” “Heatmap according to predefined parameters”);
- *id.* at [11] (“Distinguishing Features” include SaaS that can be “minimized [and] deployed quickly and remotely,” “silent-instant chat,” “Domain Awareness via a user interface” with “customizable reports” where “incidents can be filtered to see concentrated areas of geography per incident type”);
- *id.* at [14]-[16] (“Next Gen Features” include AML, “Silent Instant Chat” with non-verbal callers, “Citizen Data Protection,” “Audit and Tracking”).

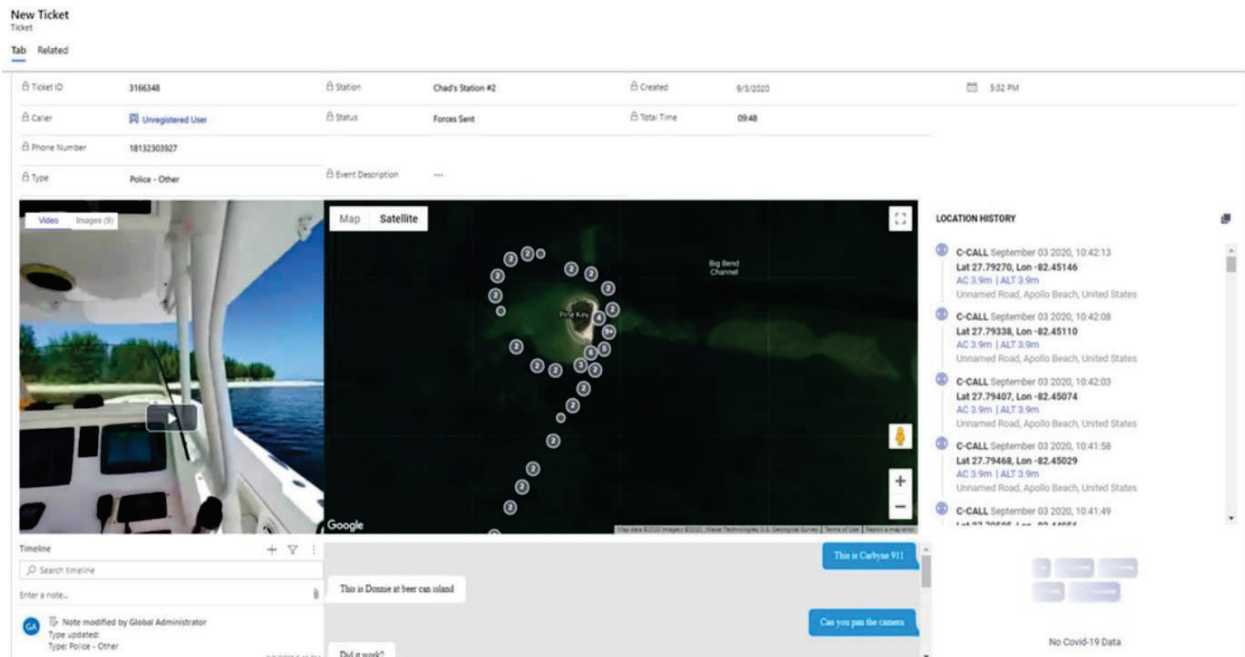
108. Similarly, the only other document considered by Mr. Christensen concerning Universe evidences the same—that the features considered important by customers were unrelated to Claim 1:

- Ex. 2014 at 13-14 (services include ELS-integration, dynamic device location for all calls, pinpoint location for SMS/WhatsApp, two-way chat-silent chat overlay, wallboard to enable RTCC detectives to view multiple videos, “Live 24/7/365” support team).

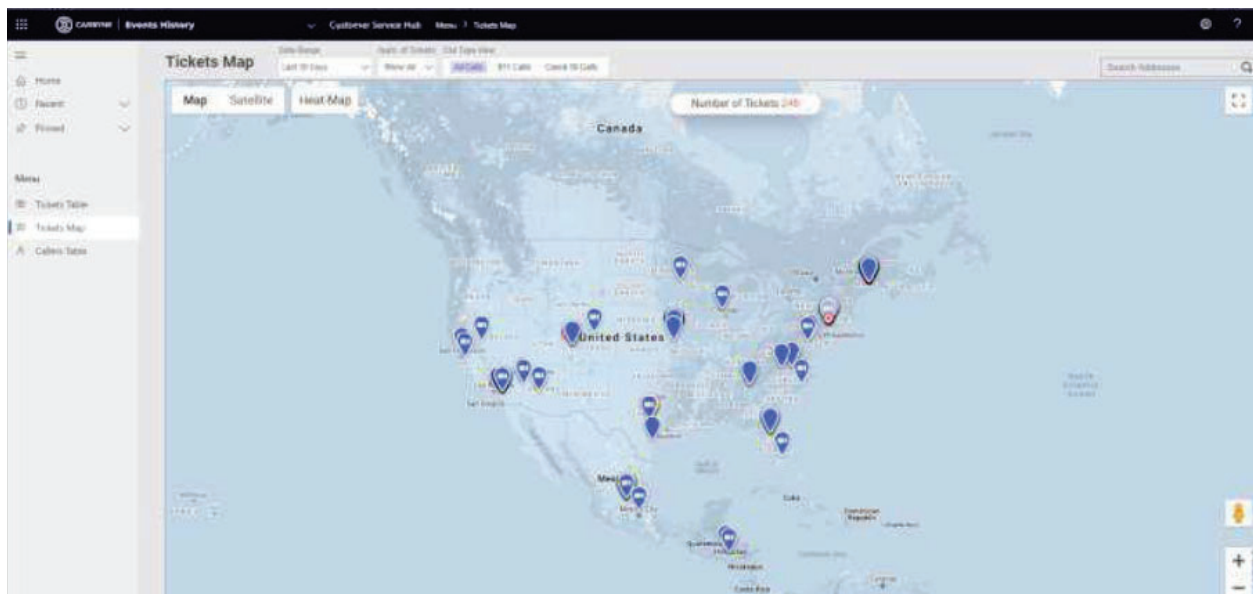
109. Mr. Christensen agreed that the very features Patent Owner touts—location accuracy, silent chat, resizable video windows—are unclaimed, such that Universe is not coextensive with Claim 1 and does not embody it. Ex. 1012 at 152:18-20 (Q: “Is locating a calling party something that's claimed in the '383 patent?” A: “Not that I recall explicitly.”); 151:8-12 (admitting “chat” is not “explicitly captured” by the claims); 156:8-12 (Q: “Is the ability to ‘easily view and resize video windows’ . . . a feature that is claimed in the '383 patent?” A: “No, not explicitly.”).

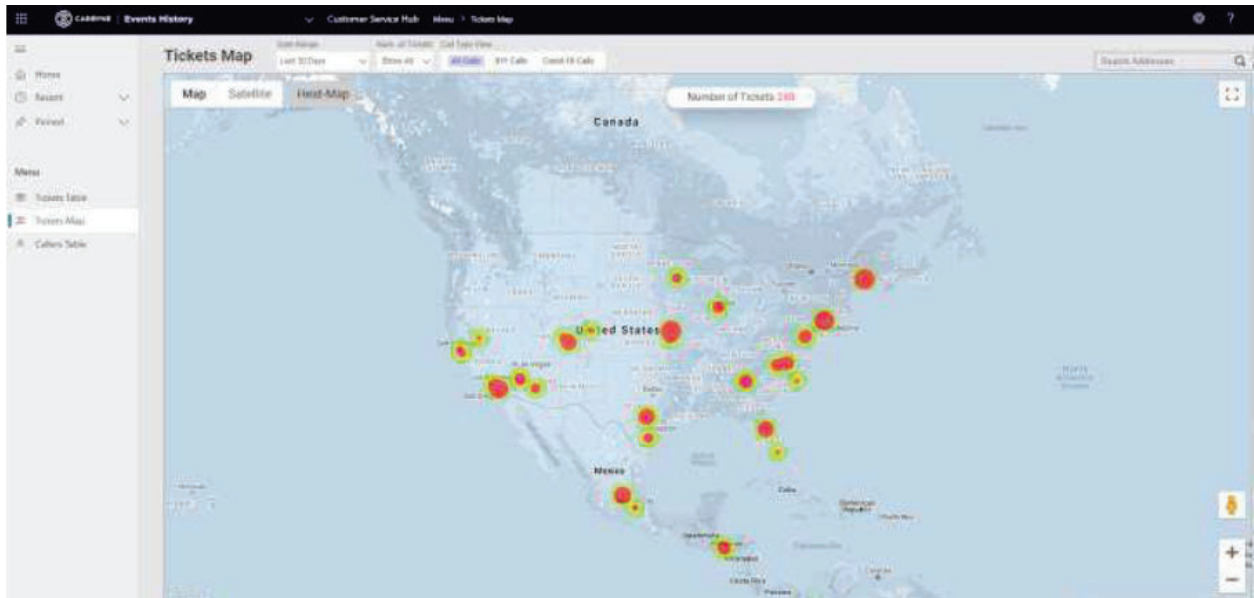
110. Even images of Universe highlight aspects unrelated to the allegedly “fundamental feature” of simultaneous audio and WebRTC video:





Ex. 2013 at [4]-[6] (showing map views, chat, conferencing, questionnaire, events history, and “Breadcrumb (if mobile)”).





Ex. 2014 at 9-10 (showing Tickets Map and Tickets Map Heat View).

111. Further, in my opinion, Mr. Christensen made no effort to identify which features are the key innovative features that drive any success of the product. *See* Ex. 1012 at 32:8-14 (“Q: But you didn’t try to establish which features were most important or innovative in the Universe products; is that fair?”

A: “For purposes of evaluating this document, I did not go through an exercise of determining what is the most innovative.”). In addition, the “live video stream” feature that is mentioned in Patent Owner’s marketing material (e.g., Ex. 2013 at [11]) was undoubtedly in the prior art, including in Ramanujaiah (Ex. 1005 at 4:63-5:3, 9:46-52, 10:32-45) and Krishnan (Ex. 1006 at 1:41-49, 5:46-56, 7:7-12, 7:36-43). Thus, in my opinion, there is no nexus between the Universe product and the alleged praise, and Patent Owner has failed to demonstrate that any supposed evidence of non-obviousness for Universe is tied to Claim 1.

112. I disagree with Patent Owner’s claim that the Universe product “has received a variety of industry accolades evincing the non-obviousness of the claimed subject matter.” POR at 51; Ex. 2004 at ¶¶ 263-267. Again, Patent Owner and Mr. Christensen rely on only two documents. The first example is a 2021 press release where Petitioner “announced the availability” of the Universe product “*alongside* [Petitioner’s own] Enterprise CAD solution.” Ex. 2006 at [1]. While Universe is described as “provid[ing] dynamic, real-time caller-generated live video, GPS, and chat,” notably, the “fundamental feature” of simultaneous audio and WebRTC real-time video is not mentioned. *Id.* Mr. Christensen admitted that the press release references a number of features that are not covered by Claim 1. *See* Ex. 1012 at 194:21-195:4 (Q: “There are a number of other features in this press release referenced here that are not covered by the claims of the ’383 patent; is that fair?” A: “Correct, I would agree.”).

113. Patent Owner also points to a 2025 award it received from Frost & Sullivan for “North American Product Leadership Recognition in the emergency cloud call handling industry.” Ex. 2012 at [8]. But that award pertains to Patent Owner’s *APEX platform* (i.e., *not* Universe, the product that allegedly practices claim 1). *Id.* at [4]. And even then, APEX includes myriad features that have nothing to do with Claim 1, including AI-driven event assistance, language

identification, virtual agents that can pay parking tickets, detecting clusters of calls in a geofenced area, and notifying bus drivers of school shootings. *Id.* at [4]-[6].

114. Moreover, far from being organic evidence of industry praise, recipients of these awards must pay for Frost & Sullivan’s publicity and recognition. Ex. 1015 at [1] (“Organizations that receive a Frost & Sullivan award must pay a fee to communicate the outcome to the public”); Ex. 1016 at [1] (“paying for an award creates a perverse incentive for all parties involved”); Ex. 1017 at [3] (payment for award “not an insignificant amount, but in the order of [about] US\$15 000 [sic]”). Even Mr. Christensen admitted that “you could call it a *pay-to-play* model when it comes to the promotion of an award or even being able to say that you have the award.” Ex. 1012 at 175:16-19. Mr. Christensen also admitted that he had no idea how Patent Owner came to be selected for the award, including whether Patent Owner had paid anything or shaped the context of Exhibit 2012. Ex. 1012 at 161:22-162:10, 167:11-168:8.

115. Patent Owner has offered no evidence tying the supposed industry praise to the ’383 Patent claims. Common sense confirms this point. In the 911 context, capabilities such as pinpointing a caller’s precise location on a map provide standalone value entirely apart from simultaneous audio and WebRTC video streaming. None of the cited materials attributes recognition specifically to the claimed invention.

IX. CONCLUSION

116. For the foregoing reasons, it is still my opinion that claims 1-20 of the '383 Patent would have been anticipated or obvious to a POSITA as of August 13, 2017.

117. I understand that my Supplemental Declaration will be filed as evidence in this case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I acknowledge that I may be subject to cross-examination in this case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

118. I declare that all statements made herein of my knowledge are true, and that all statements made on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

IPR2025-01179
U.S. Patent No. 11,689,383

Supplemental Declaration of Stuart J. Lipoff

Date: June 9, 2026

Respectfully submitted,



A handwritten signature in cursive script, reading "Stuart J. Lipoff", is positioned above a solid horizontal line.

Stuart J. Lipoff