

In the Matter Of:

MICROCHIP TECHNOLOGY INC. v

APTIV TECHNOLOGIES AG

HENRY HOUH

December 18, 2024



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MICROCHIP TECHNOLOGY INC.,
Petitioner,

V.

APTIV TECHNOLOGIES AG AND APTIV TECHNOLOGIES LIMITED,
Patent Owner.

Case No. IPR2024-00228
U.S. Patent No. 9,619,420

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1 2 ORAL VIDEOTAPED DEPOSITION 3 HENRY H. HOUH 4 DECEMBER 18, 2024 5 VOLUME 1 6 7 ORAL VIDEOTAPED DEPOSITION OF HENRY H. HOUH, via 8 Zoom, produced as a witness at the instance of the 9 Petitioner and duly sworn, was taken in the above-styled 10 and numbered cause on the 18th day of December, 2024, 11 from 9:01 a.m. to 5:04 p.m., before Melinda Barre, 12 Certified Shorthand Reporter in and for the State of 13 Texas, reported by computerized stenotype machine, all 14 parties appearing remotely via web videoconference, 15 pursuant to the rules of procedure and the provisions 16 stated on the record or attached hereto. 17 18 19 20 21 22 23 24 25	1 2 INDEX 3 PAGE 4 Examination by Mr. Jensen 6 5 Signature Page 218 6 Court Reporter's Certificate 220 7 8 EXHIBITS 9 DESCRIPTION PAGE 10 Exhibit 0001 Screenshot of Figure 4, USB Hub 129 Module 11 12 Exhibit 1082 Document Entitled "Independent 132 13 Claims" 14 15 16 17 18 19 20 21 22 23 24 25
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1 APPEARANCES 2 (ALL APPEARED VIA ZOOM VIDEO CONFERENCE.) 3 FOR PETITIONER: 4 Mr. Travis Jensen 5 ORRICK, HERRINGTON & SUTCLIFFE, LLP 6 1000 Marsh Road 7 Menlo Park, California 94025 8 9 Telephone: 650.614.7400 10 E-mail: tjensen@orrick.com 11 12 FOR PATENT OWNER: 13 Mr. Bryan Blumenkopf 14 MORRISON & FOERSTER LLP 15 13521 High Bluff Drive, Suite 100 16 San Diego, California 92130 17 18 Telephone: 858.720.5100 19 E-mail: bblumen@mofo.com 20 21 ALSO PRESENT: Caylob Suarez, Videographer 22 23 24 25	1 THE VIDEOGRAPHER: We are on the record on 2 December 18, 2024 at approximately 9:01 a.m. Eastern 3 Time for the remote deposition of Dr. Henry Houh in the 4 matter of Microchip Technology Inc. versus Aptiv 5 Technologies AG and Aptiv Technologies Limited. 6 My name is Caylob Suarez, and I'm the 7 videographer on behalf of Lexitas. Will counsel please 8 introduce themselves and the party they represent, 9 beginning with the party noticing this proceeding. 10 MR. JENSEN: This is Travis Jensen from 11 the law firm Orrick, Herrington & Sutcliffe; and I 12 represent the petitioner, Microchip Technology Inc. 13 MR. BLUMENKOPF: This is Bryan Blumenkopf 14 from Morrison & Foerster. I'm here on behalf of the 15 patent owner, Aptiv Technologies. 16 Before we begin I'd like to state for the 17 record that we made Dr. Houh available in person. 18 Petitioner has elected to take his deposition remotely 19 via videoconference. 20 THE VIDEOGRAPHER: Thank you. Will the 21 court reporter please swear or affirm the witness. 22 23 24 25

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1 HENRY H. HOUH, 2 having been first duly sworn, testified as follows: 3 EXAMINATION 4 QUESTIONS BY MR. JENSEN: 5 Q. Good morning, Dr. Houh. My name is Travis 6 Jensen and I represent the petitioner in the five IPR 7 proceedings at issue today and I will be taking your 8 deposition. 9 A. Good morning. 10 Q. And for the record, let me just identify the 11 five IPR proceedings that we're talking about today. 12 Those are IPR2024-00228, IPR2024-00229, IPR2024-00230, 13 IPR2024-00495, and PGR2024-00011. 14 Do you understand, Dr. Houh, that you're 15 here today to be deposed in connection with each of 16 those proceedings? 17 A. Yes. 18 Q. Could you state and spell your name, please. 19 A. My name is Henry Houh. That's spelled 20 H-e-n-r-y. The last name is spelled H-o-u-h. 21 Q. And, Dr. Houh, where do you normally reside? 22 A. I live in Lexington, Massachusetts. 23 Q. Where are you located today? 24 A. I am at the Morrison Foerster office in 25 downtown Boston in the Hancock building.	1 BY MR. JENSEN: 2 Q. Dr. Houh, approximately how many times have you 3 been deposed as an expert witness? 4 A. I've lost count long ago; but it's close to, 5 you know, 200 times, give or take a bit. 6 Q. Were those primarily patent cases? 7 A. Yes. 8 Q. Can you give me an approximate -- well, let me 9 ask this question. Strike that. 10 Of the roughly, you know, 200 depositions 11 that you've done, approximately how many of those have 12 been in connection with IPR proceedings? 13 A. My best estimate is about three-quarters of 14 them, maybe two -- two-thirds to three-quarters, around 15 there. 16 Q. And of the depositions that you've done in IPR 17 proceedings, roughly what percentage of those have been 18 for the petitioner versus the patent owner? 19 A. Probably -- of the IPR proceedings I've done, I 20 probably am for petitioner about 90 percent of the time 21 and patent owner the rest. 22 Q. Given the number of depositions that you've 23 done, I think we can probably summarize what I call some 24 of the ground rules because it sounds like you're 25 familiar with the deposition format; but let me just ask
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1 Q. Is anyone else physically with you? 2 A. Yes. 3 Q. Who is that? 4 A. It's Mr. Blumenkopf. 5 Q. Anyone else? 6 A. No. 7 Q. And I'm not physically present with you, 8 correct? 9 A. You're not. That's right. 10 Q. Have you and I ever met before, Dr. Houh? 11 A. I don't think so. I don't recall. 12 MR. BLUMENKOPF: Counsel, if you don't 13 mind, before we begin in substance, I just want to 14 confirm our understanding of the parameters today. Our 15 understanding is you're limited to 10 1/2 hours for the 16 cross-examination, followed by up to 2 hours of redirect 17 and then up to 1.5 of re-cross across all five 18 proceedings. Is that your understanding? 19 MR. JENSEN: I'd have to double-check. 20 That generally sounds right. I know it could spill over 21 into two days but I don't -- hopefully we don't have to 22 use all that time for any party. 23 MR. BLUMENKOPF: Sure. 24 MR. JENSEN: We'll see. 25 MR. BLUMENKOPF: Thank you.	1 a few questions in that regard. 2 Do you understand today that you're giving 3 testimony for five IPR proceedings? 4 A. I understand one of them is PGR. I'm not a 5 lawyer. I don't really understand the difference 6 between an IPR and -- I know there's some differences, 7 but I think there's four IPRs and one PGR. 8 Q. Thank you for that clarification. That's 9 right. Would it be okay if I generically refer to those 10 as the five IPR proceedings today? 11 A. Sure. 12 Q. Is there any reason you cannot give truthful 13 testimony today, Dr. Houh? 14 A. No. 15 Q. And I take it you've done a number of virtual 16 depositions before as well. Is that correct? 17 A. Yes. 18 Q. Let me know if you have any technical 19 difficulties. You may have experienced some if you've 20 done a number of these depositions before, but we want 21 to make sure that we can both hear and see what we need 22 to. So will you let me know if you experience any 23 technical difficulties today? 24 A. I'll try; but if we get connected [sic], you 25 might not hear from me that we've gotten disconnected

Page 10 1 somehow. 2 Q. You provided in advance a zip file with a 3 number of exhibits in it. Were you provided a copy of 4 that file with the exhibits? 5 A. Yes. 6 Q. Do you have that, like, locally on your 7 computer there? 8 A. Yes. 9 Q. Okay. I don't anticipate we'll use most of 10 those, but we wanted to make sure you had the set of 11 materials available locally. I expect that we'll be 12 using the screen share feature of Zoom for much of the 13 deposition, but we wanted to ensure that you had a local 14 electronic copy of the files as well. 15 If we have any additional exhibits, we'll 16 use the Chat feature and just drop them in the Chat. 17 Are you familiar with how to access the Chat feature and 18 to click on a link? 19 A. Yes. I have that open, the Chat window, that 20 is. 21 Q. Okay, great. If you find any of my questions 22 unclear, will you let me know so I can try to clarify or 23 rephrase? 24 A. Sure. I'll try. 25 Q. Throughout the course of the deposition,	Page 12 1 number of directories and more than 27 files there. 2 MR. JENSEN: Let's go off the record for 3 just a moment. 4 THE VIDEOGRAPHER: The time is 9:11 a.m. 5 We're now going off the record. 6 (Recess taken) 7 THE VIDEOGRAPHER: The time is 9:14 a.m. 8 We're now back on the record. 9 BY MR. JENSEN: 10 Q. All right. So during the break we confirmed 11 that there are some files that still need to be -- by 12 "files" I mean the exhibits that we provided that need 13 to be copied onto the laptop. But my understanding is 14 that Dr. Houh has some hard copies, and we should be 15 able to proceed at least in the interim while they get 16 the rest of the files. 17 So let's start -- Dr. Houh, let me ask. 18 What hard copy materials do you have with you? 19 A. I have in front of me four hard copies of each 20 of the patents, the four patents; and then I have copies 21 of my supplemental declaration for each of the five 22 cases we talked about earlier. 23 Q. Okay. And so there are -- even though there 24 are -- I'm sorry. Go ahead. It looks like you weren't 25 done.
Page 11 1 counsel for patent owner may object. If he does so, 2 he's objecting to my question, not your answer. 3 However, unless you're instructed by your counsel not to 4 answer on the basis of privilege, you must still answer 5 my question. Do you understand that? 6 A. Yes. 7 Q. Perhaps most importantly, we'll be taking 8 periodic breaks today. If at any time you'd like a 9 break, just let me know; and we'll try to accommodate as 10 long as there is not a question pending. Is that all 11 right? 12 A. Sure. Thank you. 13 Q. Apart from the Zoom application what programs, 14 if any, do you have open on your computer? 15 A. There is a window to some of the documents from 16 that zip file. 17 Q. Any other programs? 18 A. No. Although I just noticed I think the 19 document folder is not complete here, but we can deal 20 with that as it arises. 21 Q. Well, what do you mean by "not complete"? 22 A. I thought I remembered seeing different folders 23 for every different proceeding, but this document folder 24 only appears to have 27 files in it and no directories. 25 Q. And you're right. There should be, I think, a	Page 13 1 A. I'm sorry. I forgot. There's some huge boxes 2 on the corner of the table with, I think, more printed 3 materials in them; but I'm not sure what's in them. 4 Q. Okay. This is additional hard copy materials; 5 but the ones that you have sort of at the ready are the 6 four patents and your five supplemental declarations, 7 one for each of the IPRs? 8 A. Yes, that's right. 9 Q. Okay. And even though there's five IPRs, you 10 understand that there are four Aptiv patents, correct? 11 A. Yes. 12 Q. And let me just identify those, and you can 13 confirm these are what you have. And these have all 14 been premarked in the proceedings. 15 Exhibit 1003 is U.S. patent 9,619,420. Is 16 that right? 17 A. Yes. 18 Q. And Exhibit 1005 is U.S. patent 9,645,962? 19 A. I have that patent; but, unlike the '420, which 20 is marked in the lower right-hand corner as 21 Exhibit 1003, this version of the '962 I have doesn't 22 appear to be marked with an exhibit number in the lower 23 right. So I won't really know if you refer to it as 24 1005. I'll have to think about it. 25 Q. Okay. I'll represent to you that that is

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1 Exhibit 1005 in the proceedings, and the copy that we 2 provided should have that marking on it. 3 Is Exhibit 1009 U.S. patent 11,176,072? 4 A. Well, I have that; but I don't have the marking 5 in the lower right. So I'm not sure what exhibit this 6 is. 7 Q. I'll represent to you that that's Exhibit 1009. 8 And Exhibit 1011 is U.S. patent 11,681,643? 9 A. Same issue there. This one doesn't appear to 10 be marked with the exhibit number, the copy that I have. 11 Q. Okay. I'll represent to you that that's the 12 Exhibit 1011. 13 In view of the fact that some of the paper 14 copies you have don't have the exhibit numbers on them, 15 would it be okay if I refer to the patents by the last 16 three digits of their patent number? 17 A. Yes. That would make it much easier. 18 Q. Okay. 19 A. Thank you. 20 Q. And do you recognize these four patents as the 21 Aptiv patents that are being challenged in the IPRs? 22 A. Yes, I do. 23 Q. Before being contacted about this case, had you 24 ever heard of a company called Unwired Technology? 25 A. I mean, I can't be sure about that.	1 Andrews? 2 A. I don't think I know -- I can't recall anyone 3 that I know by the name of Scott Andrews. 4 Q. Do you know who Robert Dezmelyk is? The last 5 name is spelled D-e-z-m-e-l-y-k. 6 A. No, I don't think so. 7 Q. If you look on -- you can pick any of the 8 patents. If you look on the cover sheet of one of the 9 patents, do you see the named inventors listed? 10 A. Yes. 11 Q. And those are Robert Voto; Craig Petku, 12 P-e-t-k-u; and Shyam Babuyeda, S-h-y-a-m, 13 B-a-b-u-y-e-d-a? 14 A. I'm sorry. What was the question? 15 Q. Did you see those inventors listed on the 16 patent? 17 A. Yes, I do. 18 Q. Do you know any of them? 19 A. No, I don't think so. 20 Q. And I think last name for now. Do you know 21 Michael Dreon, D-r-e-o-n? 22 A. No, I don't. I've not met him personally. 23 Q. Do you know who he is? 24 A. I believe I reviewed some documents and maybe 25 some testimony on something related to -- I think
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1 Q. But sitting here today, you don't recall having 2 heard of them before this case? 3 A. I mean, I don't have a memory of hearing about 4 it before this case; but it could be possible still. I 5 just don't remember. 6 Q. Before being contacted about this case, had you 7 heard of Aptiv Technologies? 8 MR. BLUMENKOPF: Objection, form. 9 A. I don't recall having heard of them before this 10 case. 11 BY MR. JENSEN: 12 Q. Before being contacted about this case, had you 13 heard of a company called Aptiv Services US? 14 MR. BLUMENKOPF: Objection, form. 15 A. I don't have a memory of hearing about them 16 before this case. 17 BY MR. JENSEN: 18 Q. Before being contacted about this case, had you 19 ever heard of the four Aptiv patents that are being 20 challenged? 21 A. I don't think so. 22 Q. Do you know who Eric Welch is? 23 A. I mean, I don't think I do; but it's possible. 24 I know someone named Welch. 25 Q. Do you know anyone by the name of Scott	1 they're listed in my declarations. 2 Q. Apart from coming across his name in connection 3 with this case, do you know Michael Dreon? 4 A. No. I've not met him personally. 5 Q. Have you ever spoken with him? 6 A. No. 7 Q. Are you aware that there is a related district 8 court case on the same patents at issue in the IPR? 9 A. I'm vaguely aware. 10 Q. Have you submitted any expert reports in the 11 district court case? 12 A. No. 13 Q. Have you done any work on the district court 14 case? 15 A. No. 16 Q. So your involvement has been limited to the IPR 17 proceedings? 18 A. Yes. 19 Q. You mentioned that you have a copy, a hard 20 copy, of some of your declarations with you, correct? 21 A. Yes. 22 Q. And how many declarations do you have? 23 A. I have five. 24 Q. And that's one for each of the IPR proceedings, 25 correct?

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1 A. Yes. 2 Q. You also prepared another declaration in 3 connection with the -- well, strike that. Let me ask 4 this. 5 Do you know what a patent owner 6 preliminary response is in an IPR proceeding? 7 A. Yes. 8 Q. Did you prepare a declaration in connection 9 with the patent owner preliminary responses filed in the 10 five IPRs? 11 A. Yeah. I think that I did, to the best of my 12 recollection right now. 13 Q. Do you have a copy of those declarations with 14 you? 15 A. They're not in front of me. I don't know if 16 they're in those boxes over there. 17 Q. Okay. Are there any notes or markings on any 18 of the hard copy documents you have, Dr. Houh? 19 A. No. 20 Q. Yeah. Let me just ask counsel. 21 MR. JENSEN: Do you know, is there a hard 22 copy of the POPR declaration available for Dr. Houh? 23 MR. BLUMENKOPF: No, counsel does not. We 24 can pull one during a break if needed. 25 MR. JENSEN: Yeah. I wanted to start with	1 Q. Okay. And is this a copy of the declaration 2 that you prepared for the PGR proceeding? 3 A. It appears to be. 4 Q. Okay. And rather than introduce every one of 5 these POPR declarations, I think we'll use this one 6 for -- I'll call it a representative declaration because 7 I think four of them are identical to one another. They 8 were just filed in the different proceedings. And one 9 of them, I think, is slightly different; but I'm not 10 sure that we'll need to use that at all today. 11 I'll refer to this Exhibit 2001 today as 12 your patent owner preliminary response or POPR 13 declaration. Is that okay? 14 A. Sure. 15 Q. And let me introduce the other five 16 declarations that you had prepared, which are all 17 numbered Exhibit 2019 in their respective IPR 18 proceedings and are titled Supplemental Declaration of 19 Henry Houh. Are those the five hard copy declarations 20 that you have with you, Dr. Houh? 21 A. Yes. 22 Q. And I'll just do the screen share again here. 23 I think I'm still sharing the screen. Okay. 24 So I just want to walk through each one of 25 these very briefly and confirm that these are the same
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1 that. So I'm happy to maybe just do the screen share 2 for now just to introduce the exhibits. So let me go 3 ahead and do that. 4 BY MR. JENSEN: 5 Q. Dr. Houh, did you prepare a declaration for 6 each of the patent owner preliminary responses for the 7 five IPRs? 8 A. I mean, it was a while ago. Maybe. I just 9 can't remember which ones or if it was all or some of 10 them. I don't remember at this point. 11 Q. Well, let me go ahead. Let's try the screen 12 share feature here. 13 Dr. Houh, are you able to see my screen? 14 A. Yes, except part of it's obscured because I 15 have this -- oh, there. Okay. Sorry. I've gotten rid 16 of that pop-up box. Yes, I can see. 17 Q. And this is an exhibit that has been premarked 18 as Exhibit 2001 in PGR2024-00011. 19 Do you recognize this document? And I'm 20 happy to flip to whatever page you would like and show 21 you your signature at the end of the declaration on 22 page 57. 23 A. I mean, yeah. What you showed me looks kind 24 of -- makes it look like it, yes. And I can see the 25 exhibit number now as well.	1 declarations that you have hard copies of with you 2 starting with the declaration in the PGR20240-00011. Is 3 this a copy of your supplemental declaration in that 4 proceeding? 5 A. Well, from the first two pages it looks the 6 same as my first two pages. 7 Q. And that's a 90-page document with your 8 signature on the last page? 9 A. Yes, I see that. 10 Q. Okay. And the next one is Exhibit 2019 in the 11 '230 proceeding. Is this a copy of your declaration in 12 the '230 proceeding? 13 A. Yes, looks like it. 14 Q. And that's an 84-page document? 15 A. Yes. 16 Q. All right. Next is Exhibit 2019 in the '229 17 proceeding. Is that a copy of your declaration in the 18 '229 proceeding? 19 A. Yes, looks like it. 20 Q. And that's a 135-page document? 21 A. Yes. 22 Q. And next we have a copy of your declaration in 23 the '228 proceeding. Is that right? 24 A. Yes, looks like it. 25 Q. And that's a 142-page document?

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1 A. Yes. 2 Q. Last we have a copy of your declaration in the 3 '495 proceeding. Is that right? 4 A. Yes. 5 Q. And that's a 111-page document? 6 A. Yes. 7 Q. And is that your signature on the last page of 8 each of the five declarations? 9 A. Yes, it is. 10 Q. And as with the patent numbers, where needed 11 I'll refer to these declarations by the patent to which 12 they pertain, the three-digit patent number. Is that 13 okay? 14 A. Sure. Well, there are two for the '420 patent. 15 I'm not sure how you want to refer to those. 16 Q. Thank you for mentioning that. If we need to 17 distinguish between those, I can give you the IPR number 18 as well on the front page. If you ever have a question, 19 though, about which declaration we're discussing, will 20 you let me know? 21 A. Yes. 22 Q. And you'd agree that there's a lot of material 23 that is common among the various declarations? 24 A. Sure. 25 Q. Okay. And what are the dates on the	1 A. I mean, my newer declarations are supplemental 2 declarations. They're not intended to replace anything. 3 I think I stand by all my opinions that I've submitted 4 in this case. 5 BY MR. JENSEN: 6 Q. When you submitted your respective 7 declarations, Dr. Houh, did each of them contain a 8 complete and accurate statement of your opinions 9 regarding the validity of the challenged claims for the 10 patent at issue? 11 MR. BLUMENKOPF: Objection, form. 12 A. I mean, they contained all my written opinions 13 with respect to the case they were submitted for. 14 BY MR. JENSEN: 15 Q. Did each of them contain a complete and 16 accurate statement of your opinions? 17 MR. BLUMENKOPF: Objection, form. 18 A. I mean, I think they're a complete and accurate 19 statement of my written opinions I submitted for each 20 respective case. 21 BY MR. JENSEN: 22 Q. You qualified that with the phrase "written 23 opinions." Do you have some unwritten opinions about 24 the patents in these cases that are not in your report? 25 MR. BLUMENKOPF: Objection, form.
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1 declarations that you have, Dr. Houh? 2 A. Four of them are dated October 23rd of this 3 year. The '420 '495 case -- what I mean by that is the 4 '420 patent with the IPR number ending in 495, that's 5 dated November 20th of this year. 6 Q. And what is the date of Exhibit 2001, which is 7 your POPR declaration? 8 A. That one's dated April 18th, 2024. 9 Q. So the POPR declaration was prepared and 10 submitted before the other five declarations? 11 A. Yes. That's my understanding, although I -- 12 that's this one for the PGR '11 case. I don't recall 13 offhand the dates of the other ones, but I'm pretty 14 sure -- 15 Q. And I'll represent to you that the dates of the 16 other ones are before October 23rd, 2024. Four of them 17 are all dated April 18th, and they're identical to one 18 another except for the cover page. 19 So the question I wanted to ask is were 20 your supplemental declarations -- and those are the five 21 that you have the hard copies of with you. Were your 22 supplemental declarations intended to supersede or 23 replace your POPR declaration or to supplement your POPR 24 declaration? 25 MR. BLUMENKOPF: Objection, form.	1 A. I mean, I don't have anything else written down 2 that is not submitted -- unsubmitted with respect to 3 what I submitted. I mean, there are -- these are my 4 written opinions that are submitted with respect to this 5 case, with the respective cases. 6 BY MR. JENSEN: 7 Q. Yeah. And I'm trying to drill down if there's 8 some significance on that qualifier "written opinions." 9 Did you have some unstated opinions about the patents in 10 these cases? Strike that. 11 Do you have any unwritten opinions about 12 the validity of the patents in these cases? 13 MR. BLUMENKOPF: Objection, form. 14 A. I mean, I think the opinions with respect to 15 each respective case are what I've submitted in the 16 declarations. 17 BY MR. JENSEN: 18 Q. Okay. That's what I was asking. Thank you. 19 Have any of your opinions regarding the 20 validity of the challenged claims changed since 21 submitting your declarations? 22 A. No. 23 Q. When was the last time that you reviewed your 24 declarations? 25 A. I'm sorry. By the way, I think you're asking

Page 26 1 about validity; but I think I'm -- I don't know if 2 there's a distinction here, but my declarations are 3 directed at the patentability. 4 Q. With that clarification, I'm happy to use those 5 terms interchangeably or use whichever term you would 6 prefer. 7 A. I mean, I'll understand it if you say that; but 8 my understanding is IPR challenges are directed to 9 patentability of patents as opposed to validity. Again, 10 I'm not a lawyer, so that's my understanding. 11 Q. If that's your understanding, I'm happy to use 12 the word "patentability." So let me just ask the 13 question again. 14 Have any of your opinions regarding the 15 patentability of the challenged claims changed since 16 submitting your declarations? 17 A. No. 18 Q. And when you submitted your respective 19 declarations, did each contain a complete and accurate 20 statement of your opinions regarding the patentability 21 of the challenged claims for the patent at issue? 22 MR. BLUMENKOPF: Objection, form. 23 A. I mean, in at least some of the cases I think I 24 have two declarations. So they're -- I don't know if -- 25 so those are my opinions. I mean, it may be that	Page 28 1 Q. Were there any materials you would like to have 2 reviewed when forming your patentability opinion but did 3 not have access to? 4 MR. BLUMENKOPF: Objection, form. 5 A. I mean, I can't think of anything at the 6 moment. 7 BY MR. JENSEN: 8 Q. What did you do to prepare your declarations? 9 A. I think I probably reviewed the patents, the 10 prosecution history, the list of materials I've 11 considered that I have in each declaration. 12 Q. Do you have a normal process that you follow 13 when preparing an expert declaration? 14 MR. BLUMENKOPF: Objection, form. 15 A. I mean, I don't think of it as my own normal 16 process; but I think I typically start with reviewing 17 the patents and the prosecution histories. And that's 18 where I typically always start. 19 BY MR. JENSEN: 20 Q. Did your review of the patents include 21 reviewing the claims of the patents? 22 A. Yes. Even claims that are not, you know, 23 necessarily part of the case. I reviewed the full set 24 of claims. 25 Q. And is that true regardless of whether you're
Page 27 1 they're not entirely overlapping, if that's your 2 question. But, you know, the declarations I submitted 3 in the case would be what my opinions are for each 4 respective case. 5 BY MR. JENSEN: 6 Q. At the outset I always like to ask the witness 7 if they have identified any errors, apart from typos, 8 that they would like to correct. Is there anything that 9 you would like to correct in your declarations, 10 Dr. Houh? 11 MR. BLUMENKOPF: Objection, form. 12 A. I didn't see anything in my review. 13 BY MR. JENSEN: 14 Q. And I may have already forgotten if you 15 answered this. When was the last time that you reviewed 16 your declarations? 17 A. Within the last week. 18 Q. Have you submitted any errata sheets to your 19 declarations? 20 A. No, I don't think so. 21 Q. And I may sometimes refer to the declaration as 22 a report just out of habit. Will you understand that if 23 I refer to your report, that it's synonymous for your 24 declaration? 25 A. Yes. And I might do the same thing as well.	Page 29 1 preparing an expert report for a petitioner or a patent 2 owner? 3 A. Yes, generally. I don't do anything 4 differently, I don't think. 5 Q. And then after you have looked at the claims in 6 the patent, do you review the prior art? 7 MR. BLUMENKOPF: Objection, form. 8 A. Perhaps at some point I'll look at what, you 9 know, the prior art is either for -- well, I mean, in 10 some of the cases there's potential prior art maybe, 11 right? But in a case where the prior art's been 12 presented already and a petition has been written up and 13 I'm reviewing it, then I'll look at the prior art that 14 was in each of the challenges. 15 BY MR. JENSEN: 16 Q. And you mentioned that you started with the 17 patent; and I assume that means the patent that is, you 18 know, being challenged or the patent at issue. Is that 19 right? 20 A. Yes. 21 Q. Why do you (transmission interference)? 22 A. Well, so I know the area of the patent. Are 23 you talking about what the case is about to start with? 24 Q. Who prepared the first draft of your 25 declarations?

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1 MR. BLUMENKOPF: Objection, form. 2 A. I mean, I don't remember in this case. I think 3 sometimes I do. Sometimes the attorneys do. 4 BY MR. JENSEN: 5 Q. Who assisted in preparing your declarations? 6 MR. BLUMENKOPF: Objection, form. 7 A. Aside from me and the attorneys, I -- they're 8 my opinions. I stand by them in the end. That's what I 9 signed as the submitted declarations. But there is -- 10 it can be a collaborative process. So there are edits 11 made back and forth with the attorneys and myself. 12 BY MR. JENSEN: 13 Q. So putting aside the attorneys, were there any 14 nonlawyers that assisted in preparing your report? 15 MR. BLUMENKOPF: Objection, form. 16 A. I mean, sometimes I understand that paralegals 17 may do cite checking. I'm not an attorney. 18 BY MR. JENSEN: 19 Q. Apart from anybody related to the law firm, 20 were there any nonattorneys that helped you in preparing 21 your declarations? 22 A. No. 23 Q. You don't have like an assistant or somebody 24 like that that you use? 25 A. I do not, no.	1 were talking about errors. Are you still doing that? 2 BY MR. JENSEN: 3 Q. Yeah. With that clarification. 4 A. Well, I mean, these are my opinions. I don't 5 think they contain errors. These are my opinions that 6 I've submitted in these declarations. 7 Q. If there are any errors, though, would those be 8 your errors or the lawyers' errors? 9 MR. BLUMENKOPF: Objection, form. 10 A. I mean, I don't think that there are errors 11 that I saw, as I mentioned earlier. But it's my 12 declaration ultimately and my opinions. 13 BY MR. JENSEN: 14 Q. Apart from the legal standards section of your 15 declarations, did you rely on anything the patent 16 owner's lawyers told you for your declarations? 17 MR. BLUMENKOPF: Objection, form. Again, 18 I'd caution Dr. Houh not to reveal any privileged 19 communications. 20 A. I mean, I think I tried to cite the documents 21 and exhibits that I did rely on in support of various 22 statements. I mean, there may be in some cases things 23 that you might think needed to be supported; but I think 24 all my statements are based on typically a review of the 25 materials that I've listed that I've considered.
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1 Q. Okay. Did you rely on any lawyers in preparing 2 your declarations? 3 MR. BLUMENKOPF: Objection, form. I'd 4 caution Dr. Houh not to reveal any privileged 5 communications with counsel. 6 A. Well, sometimes there's a legal understanding 7 section typically in my declarations. I'm not a lawyer. 8 So, you know, that's my understanding of the law as 9 provided by, I think, typically the -- how I understand 10 it from the attorneys. 11 BY MR. JENSEN: 12 Q. Apart from the legal standards section of your 13 declarations, did you rely on any lawyers in preparing 14 your declarations? 15 MR. BLUMENKOPF: Objection, form. 16 A. Well, I rely on the evidence and other 17 exhibits. So I don't think so unless I say that 18 somewhere. But no, aside from the legal section I try 19 to rely on the documents and exhibits and things I've 20 reviewed. 21 BY MR. JENSEN: 22 Q. If there are any errors or mistakes in your 23 declarations, are those attributable to you? 24 MR. BLUMENKOPF: Objection, form. 25 A. You seemed to exclude typos earlier when you	1 BY MR. JENSEN: 2 Q. When were you first contacted about working on 3 these IPRs? 4 A. I mean, I don't remember exactly. It was 5 certainly before the date of the earliest declaration I 6 submitted. 7 Q. Well, that's telling me exactly nothing. How 8 long have you been working on these IPRs, Dr. Houh? 9 A. I think I started sometime this year. 10 Q. 2024? 11 A. Yes. 12 Q. Like in the springtime? 13 A. It could have been earlier. It could have been 14 in the winter sometime. I just don't have a memory of 15 an exact date off the top of my head. 16 Q. Roughly how much time have you spent working on 17 these IPRs up to and including today? 18 A. I don't have that from memory. It's hard. I 19 wouldn't know exactly. 20 Q. Can you give me a range. 21 A. I mean, it would be hard to. It's probably 22 around 100 hours or more; but, again, I can't really 23 give you even a -- I can't give you a -- I don't know 24 how accurate that would be, but it's probably around 25 there or more.

Page 34 1 Q. And that would be including your work on all of 2 the IPRs? 3 A. Yes, all these matters in front of us today. 4 Q. What did you do to prepare for today's 5 deposition? 6 MR. BLUMENKOPF: I'd caution Dr. Houh not 7 to reveal any privileged communications with counsel. 8 A. Well, I reviewed my declarations, the patents 9 and other materials in the case; and I met with 10 attorneys. 11 BY MR. JENSEN: 12 Q. What attorneys did you meet with? 13 A. I met with Bryan, Andrew, Clint, and Michael. 14 I don't remember his name at the moment. 15 Q. How many attorneys were there that you met 16 with? 17 A. I think it's around four at different times. 18 Q. Since you mentioned the different times, how 19 many meetings did you have with counsel to prepare for 20 the deposition today? 21 A. I think three. 22 Q. And when did those meetings start? 23 A. I think they started last week. 24 Q. In aggregate, approximately how many hours did 25 you spend with the attorneys preparing for your	Page 36 1 forth your understanding of the relevant legal 2 standards, correct? 3 A. Yes. I think that's right. 4 Q. Who informed you of the legal standards that 5 you used in this case? 6 MR. BLUMENKOPF: Objection, form. And I 7 would caution Dr. Houh not to reveal any privileged 8 communications. 9 A. I mean, I think the understanding is based on 10 what the attorneys have outlined here. 11 BY MR. JENSEN: 12 Q. And are those the attorneys at Morrison & 13 Foerster that you're referring to? 14 A. Yes, although I'm not sure which one of them 15 but generally. 16 Q. Did you apply the legal standards in 17 paragraphs 20 to 25 when forming your opinions? 18 MR. BLUMENKOPF: Objection, form. 19 A. I mean, to the extent I needed to for the 20 different parts of my declarations, I would have applied 21 these when needed. 22 BY MR. JENSEN: 23 Q. When forming your opinions, did you apply any 24 other legal standard not listed in your report? 25 MR. BLUMENKOPF: Objection, form.
Page 35 1 deposition? 2 A. I'd say around 15-ish. 3 Q. Did you speak with any nonlawyers to prepare 4 for your deposition? 5 A. No. 6 Q. Did you review any deposition transcripts to 7 prepare for your deposition today? 8 A. Yes, yes, yes. 9 Q. What deposition transcripts were those? 10 A. I reviewed at least some of the ones that I've 11 cited to and provided excerpts of in my declarations. 12 Q. Let's turn to your '643 declaration at 13 paragraphs 20 to 25. 14 MR. BLUMENKOPF: Just to clarify, Counsel, 15 you're referring to the supplemental declaration? 16 MR. JENSEN: Yeah. 17 BY MR. JENSEN: 18 Q. If I want to refer to the POPR declaration, 19 I'll call it the POPR declaration. Everything else 20 refers to the -- I call it the main declarations. 21 A. You said paragraphs 20 to 25? 22 Q. Yes. 23 A. That looks like, if I have this right, kind of 24 the understanding of the law sections, A, B and C. 25 Q. Yeah. So paragraphs 20 to 25 is where you set	Page 37 1 A. I mean, I think they should all be listed. If 2 there's an individual case that you think is not, we can 3 look at those. 4 BY MR. JENSEN: 5 Q. So if we look at paragraphs 20 to 24, that's 6 where you set forth your understanding of the 7 obviousness test to be used. Is that right? 8 A. I mean, I think those paragraphs include the 9 obviousness section paragraphs that are in my '643 10 supplemental declaration. 11 Q. And paragraphs 20 to 24 represent a complete 12 statement of your understanding of the obviousness 13 standard? 14 MR. BLUMENKOPF: Objection, form. 15 A. I think for the purposes I needed them for this 16 declaration, I think they should be. 17 Well, there's also a secondary 18 considerations section somewhere else. Maybe it would 19 include that because if it's directed to obviousness, 20 there are secondary considerations of nonobviousness, as 21 I understand them. 22 BY MR. JENSEN: 23 Q. And you reference secondary considerations of 24 nonobviousness at the end of paragraph 23, correct? 25 A. Yes. But I think I outlined specifically some

Page 38 1 of the secondary -- more details elsewhere is what I'm 2 saying. 3 Q. Yeah. Are you referring to the section 4 starting in paragraph 139? 5 A. Yes. That was what I was thinking of. 6 Q. So going back to paragraph 23, you identify 7 four factors that may be taken into account when 8 analyzing obviousness, correct? 9 A. I do see four enumerated items in paragraph 23. 10 Q. And the fourth one is the secondary 11 considerations factor, correct? 12 A. Yes. 13 Q. What weight did you give the secondary 14 considerations factor in your obviousness analysis? 15 MR. BLUMENKOPF: Objection, form. 16 A. Well, I mean, they're secondary. So the 17 primary things to consider are these -- the other issues 18 of obviousness with respect to the prior art, but these 19 are secondary considerations. 20 BY MR. JENSEN: 21 Q. Did you give the secondary considerations less 22 weight than the other three factors listed in 23 paragraph 23? 24 MR. BLUMENKOPF: Objection, form. 25 A. I mean, my opinions are in my declaration. So	Page 40 1 meant the first sentence. So thank you for reading 2 that. 3 Did you apply that same understanding when 4 forming your opinions of the challenged patents in the 5 Aptiv IPRs? 6 MR. BLUMENKOPF: Objection, form. 7 A. I mean, the respective sections on secondary 8 considerations lay out all of my -- my opinions directed 9 towards secondary considerations in these cases at issue 10 in this matter. 11 BY MR. JENSEN: 12 Q. Yeah. And I'm asking a slightly different 13 question, which is did you apply the same legal standard 14 that you stated you understood in paragraph 82 of your 15 declaration in IPR2024 No. 43 when forming your opinions 16 in the Aptiv IPRs? 17 MR. BLUMENKOPF: Objection, form. 18 A. I mean, that paragraph that I read doesn't say 19 that you can never establish nonobviousness based on -- 20 even if a nexus is established; otherwise, what would be 21 the point of secondary considerations? 22 So I think I appropriately applied what I 23 did, and I've laid out my reasons why I think there are 24 the case for secondary considerations of nonobviousness 25 in these respective cases that we're talking about today
Page 39 1 I'm not -- I don't see -- there are certainly fewer 2 pages of analysis directed to the secondary 3 considerations in my report. So, you know, there are a 4 lot more pages directed to other factors besides 5 secondary considerations in my report. 6 BY MR. JENSEN: 7 Q. I'm showing another exhibit on the screen here. 8 And this is titled Supplemental Declaration of Henry 9 Houh, Ph.D. in Support of Petitioners' Reply in 10 IPR2024-00043. Do you see that? 11 A. Yes. 12 Q. And this, I think, was Exhibit 1028 in that 13 proceeding as shown in the lower right-hand corner. Do 14 you see that? 15 A. Yes. 16 Q. And is that your signature on the last 17 page dated October 7th, 2024? 18 A. Yes. 19 Q. I want to direct your attention to paragraph 82 20 of this declaration. Can I just have you read that 21 paragraph aloud, please. 22 A. It says, "I understand that even if a nexus is 23 established, secondary considerations cannot overcome a 24 strong prima facie case of obviousness." 25 Q. That's fine just to there. That's okay. I	Page 41 1 in this deposition. 2 BY MR. JENSEN: 3 Q. Do you agree with me, Dr. Houh, that even if a 4 nexus is established, the secondary considerations 5 cannot overcome a strong prima facie case of 6 obviousness? 7 MR. BLUMENKOPF: Objection, form. 8 A. I mean, I stand by all my opinions in cases 9 I've submitted. 10 BY MR. JENSEN: 11 Q. Respectfully, that's not answering my question 12 at all, Dr. Houh. 13 Do you agree and understand in the Aptiv 14 IPRs that even if a nexus is established, secondary 15 considerations cannot overcome a strong prima facie case 16 of obviousness? 17 MR. BLUMENKOPF: Objection, form. 18 A. I've laid out the reasons why I think there is 19 a case for secondary considerations of nonobviousness 20 that I stand by in this case. 21 I understand maybe it's someone else that 22 may ultimately decide, the PTAB panel or whatever, 23 whether that's the case. But I've laid out the case 24 that I think is for secondary considerations in my 25 respective declarations.

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1 MR. JENSEN: Move to be strike. 2 BY MR. JENSEN: 3 Q. That's totally nonresponsive, Dr. Houh. You're 4 answering a question I'm not asking. All right? 5 In your declarations in the Aptiv IPRs you 6 do not include a statement like the one you have in 7 paragraph 82 in the document we're looking at, correct? 8 MR. BLUMENKOPF: Objection, form. 9 A. Well, you know, I can look at that section. 10 BY MR. JENSEN: 11 Q. Go ahead and take a look at the legal standards 12 section in paragraphs 20 to 25; and if you want to look 13 at the secondary considerations section in that 14 paragraph 139, go ahead and take a moment to review 15 those sections. 16 A. I have looked at some of those paragraphs, and 17 I don't see this statement from the FuboTV/Aylo case. I 18 don't see that exact statement. 19 Q. What date was your declaration submitted in the 20 Fubo case? 21 A. October 7th this year. 22 Q. That was like two or three weeks before you 23 submitted the declarations in the Aptiv cases, correct? 24 A. Four of them, I think. 25 Q. For four of them, right? And so what I'm	1 expressed in paragraph 82, the first sentence of the 2 Fubo declaration? 3 MR. BLUMENKOPF: Objection, form. 4 A. So with these cases I did lay out my 5 understanding, and I laid out a case for why -- not only 6 why the patents -- what the combinations set forth in 7 the various petitions we're talking about today are not 8 operable combinations and why, furthermore, there are 9 these secondary considerations that would have supported 10 why the combinations in the obviousness case is not 11 obvious, in fact. 12 MR. JENSEN: Move to strike that as 13 totally nonresponsive. 14 BY MR. JENSEN: 15 Q. It's a yes or no question, Dr. Houh. Did you 16 apply the same understanding in the Aptiv IPRs that you 17 set forth in the first sentence of paragraph 82 of your 18 Fubo declaration, or did you apply a different 19 understanding? 20 MR. BLUMENKOPF: Objection, form. 21 A. I don't think there's -- I'm not sure what the 22 issue is, but I laid out the secondary considerations. 23 I think maybe it's up to the PTAB to decide whether or 24 not they would overcome obviousness, and I laid out the 25 reasons why I think they should with respect to the
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1 trying to understand is if you had a -- the same or a 2 different understanding in the Aptiv declarations that 3 you had in the Fubo declaration in paragraph 82. So 4 I'll just ask a clean question. 5 When you submitted your declarations in 6 the Aptiv case, did you understand that even if a nexus 7 is established, secondary considerations cannot overcome 8 a strong prima facie case of obviousness? 9 MR. BLUMENKOPF: Objection, form. 10 A. So I understand that's not saying that can 11 never happen; otherwise, what would be the point of 12 secondary considerations? 13 BY MR. JENSEN: 14 Q. Is it your opinion, Dr. Houh -- strike that. 15 Is it your understanding that secondary 16 considerations can overcome a strong prima facie case of 17 obviousness? 18 A. Well, I'm not familiar with all the case law 19 and cases that have ever been put forth in front of the 20 PTAB. So I think ... 21 Q. Which is why I'm asking the question, right? 22 I'm asking about your understanding, not what the cases 23 say. I want to know what understanding did you apply. 24 And I want to know did you apply in the 25 Aptiv declarations the same understanding that you	1 cases that we're talking about today. 2 MR. JENSEN: Move to strike as 3 nonresponsive. 4 BY MR. JENSEN: 5 Q. We can call the board on this, Dr. Houh, to get 6 you to answer a simple yes or no question. This 7 shouldn't be controversial. This shouldn't be a hard 8 question to answer. 9 MR. BLUMENKOPF: Counsel, Dr. Houh has 10 testified repeatedly to the standards he applied in his 11 declarations in the Aptiv matter. 12 MR. JENSEN: He hasn't answered the 13 question. 14 BY MR. JENSEN: 15 Q. Well, let me ask this. Okay? Let me ask this. 16 If we go back to your Aptiv declaration 17 and look at paragraphs 20 to 25 and paragraph 139, you 18 do not express any understanding regarding whether 19 secondary considerations can overcome a strong prima 20 facie case of obviousness, correct? 21 A. I think there's only a mention in one paragraph 22 of secondary considerations. I want to point out that 23 even in this Fubo case, the declarations in that, this 24 is not within the -- I don't think that's within the 25 legal understandings section. I'm just looking at this

Page 46 1 one page. But I think it's -- the legal understandings 2 section is typically much more in the front. 3 Q. Yeah. So in the Aptiv declaration in the legal 4 standards section and in the secondary considerations 5 section, you do not set forth any understanding that 6 even if a nexus is established, secondary considerations 7 cannot overcome a strong prima facie case of 8 obviousness, correct? 9 A. Well, as I was saying, I don't think this 10 section that we're looking at from the Fubo case, I 11 don't believe that's in the legal understandings 12 section. But, again, I don't have this statement in 13 either of the cases, the Fubo case or these cases, in 14 the legal understandings section. 15 Q. Well, putting aside where you put it, right, 16 you stated in the Fubo case, "I understand that even if 17 a nexus is established, secondary considerations cannot 18 overcome a strong prima facie case of obviousness," 19 correct? 20 A. Well, I mean, that's just part of the overall 21 declaration in the Fubo case based on what I laid out as 22 whatever the challenges were. 23 Q. Where did your understanding come from that you 24 set forth in paragraph 82? 25 MR. BLUMENKOPF: Objection, form.	Page 48 1 Q. Do you think the legal standard is different 2 between the cases? 3 A. Just to clarify, the facts of what the 4 challenges are, what they were and that -- between what 5 the various patents were. And, again, this is a 6 statement; but I don't believe -- in the FuboTV case 7 that statement is not within the legal understandings 8 section. It's just an understanding that I listed 9 there. That's based on what's laid out in the Fubo 10 petition in my declaration in that case. 11 Q. Does the same understanding that you set forth 12 in paragraph 82 of your Fubo declaration apply to your 13 Aptiv declarations, or is the legal section that is in 14 your Aptiv declarations complete and accurate on its 15 own? 16 MR. BLUMENKOPF: Objection, form. 17 A. So I laid out in these matters the legal 18 understanding and I've laid out issues with the 19 secondary considerations in each of the matters in these 20 cases and I stand by those. I do stand by my opinions 21 in this case. 22 BY MR. JENSEN: 23 Q. In the Aptiv cases do you know whether 24 secondary considerations can overcome a strong prima 25 facie case of obviousness?
Page 47 1 A. I mean, it would have probably been based on 2 the facts of that particular case with respect to 3 working with the attorneys for that particular case. 4 BY MR. JENSEN: 5 Q. And the attorneys in this case, in the Aptiv 6 case, did not instruct you regarding whether secondary 7 considerations can overcome a strong prima facie case of 8 obviousness, did they? 9 MR. BLUMENKOPF: Objection, form. 10 Counsel, you're asking for communications with counsel 11 here. You need to ask a different question. 12 BY MR. JENSEN: 13 Q. Did you set forth any such understanding in 14 your Aptiv declarations? 15 MR. BLUMENKOPF: Objection, form. 16 A. I laid out in the legal section my 17 understanding of the legal section, and then I provided 18 more details with respect to the secondary 19 considerations as to what they were in the respective 20 sections in my supplemental declarations in this case. 21 And they are a different set of -- none of the patents 22 between this case overlaps with this other case you're 23 talking about. The challenges are different. The facts 24 of each of the cases are different. 25 BY MR. JENSEN:	Page 49 1 A. Well, I've laid out my opinions; and I think 2 it's up to the PTAB to determine what applies and 3 whether there is a strong prima facie case and whether 4 or not the secondary considerations laid out, if the 5 PTAB believes they can overcome that. But I think 6 that's something for the PTAB to decide. 7 Q. In your opinion, can secondary considerations 8 in the Aptiv case overcome a strong prima facie case of 9 obviousness? 10 MR. BLUMENKOPF: Objection, form. 11 A. Well, I've laid out the case why I think in 12 this case they are nonobviousness. So I don't think 13 that the combinations laid out by petitioner in these 14 cases are not obvious. So I think this is different 15 than the facts of the Fubo petition. 16 BY MR. JENSEN: 17 Q. Putting the Fubo petition aside, would you 18 agree with me that if there were a strong prima facie 19 case of obviousness in the Aptiv IPRs, that the strong 20 prima facie case of obviousness could not be overcome by 21 secondary considerations? 22 MR. BLUMENKOPF: Objection, form. 23 A. I mean, as I said, I don't think that's the 24 case here. I don't think there is a strong case -- I 25 think there's the case for nonobviousness, as I've laid

Page 50 1 out. The combinations I -- I have a whole section with 2 enumerated points underneath that section why the 3 petitioner's combinations are nonobviousness. 4 So I don't believe that there is a 5 strong -- the facts of this case are very different 6 because I have opinions that lay out why the 7 combinations proposed by petitioner in each of the cases 8 are not obvious. 9 BY MR. JENSEN: 10 Q. And this is the exact point I'm trying to get 11 at, right? 12 Is it your opinion that there is not a 13 strong prima facie case of obviousness in the Aptiv 14 IPRs? 15 MR. BLUMENKOPF: Objection, form. 16 A. I have laid out why I think these combinations 17 are not obvious in the declarations for the Aptiv IPRs. 18 BY MR. JENSEN: 19 Q. Do you think there is a strong prima facie case 20 of obviousness in the Aptiv IPRs? 21 MR. BLUMENKOPF: Objection, form. 22 A. Well, my opinion is that they're not obvious. 23 So I think the facts of this case are very different 24 than the facts of the Fubo petition. 25 BY MR. JENSEN:	Page 52 1 A. I've laid out my reasons why in the Aptiv case 2 the combinations set forth in the challenges are not 3 obvious. So that's my opinion. You know, maybe 4 petitioner and petitioner's expert believes that; but my 5 opinion is that they're not obvious. 6 BY MR. JENSEN: 7 Q. I'm asking a slightly different question, and I 8 apologize for interrupting there, right? 9 Do you have an opinion in the Aptiv IPRs 10 whether the IPR petitions make out a prima facie case of 11 obviousness? 12 MR. BLUMENKOPF: Objection, form. 13 A. I don't know what the -- I'm not a lawyer, and 14 I don't know what the PTAB -- how the PTAB views that 15 standard. 16 But what I'm saying in this case is that I 17 don't -- in each of the petitions I have -- sorry. In 18 each of the supplemental declarations I've submitted I 19 do have a section on why I think the -- what's wrong 20 with the obviousness case set forth by petitioners, and 21 I stand by those opinions. So clearly I don't think the 22 obviousness case is correct as set forth by petitioners; 23 and, furthermore, I have a secondary considerations 24 section. 25 Again, the facts of the Fubo case are
Page 51 1 Q. Yeah. And I'm not asking you about the Fubo 2 petition at all, right? I'm asking only about the Aptiv 3 IPRs. 4 I'm trying to figure out, Dr. Houh, if you 5 have rendered an opinion in your report that 6 notwithstanding -- and it could be an alternative 7 opinion, right? But do you have any opinion in the 8 Aptiv IPRs as to whether the secondary considerations 9 would overcome a strong prima facie case of obviousness? 10 A. I've laid out my case for why I think the 11 challenged combinations are not obvious, the art laid 12 out by petitioner are not -- why they're incorrect about 13 why there's obviousness. And I've laid out my reasons 14 and my opinions for why there are secondary 15 considerations. 16 I'm not the PTAB judges. So I think the 17 PTAB judges get to decide how strong the case -- 18 Q. Yeah. The PTAB judges will decide. I'm just 19 asking about your opinions, and I can't tell whether you 20 have an opinion on this issue or not. I'm just trying 21 to ferret it out. 22 Do you have an opinion whether in the 23 Aptiv IPRs there is a strong prima facie case of 24 obviousness? 25 MR. BLUMENKOPF: Objection, form.	Page 53 1 different, the Fubo petition are different than what are 2 laid out here. But I don't have opinions -- my opinions 3 in this case are that for the reasons I've laid out it 4 would not have been obvious to make the combinations set 5 forth in the petitions as I've laid out in the 6 respective declarations. 7 BY MR. JENSEN: 8 Q. Yeah. Let's look at your declaration 9 paragraph 106, the last line and a half there. Can you 10 read that aloud, please, just this highlighted section. 11 A. Well, I'll read the whole sentence. "This 12 hindsight analysis improperly fails to consider evidence 13 of how the POSITA would not have been motivated to make 14 the proposed combination; the petition fails to make a 15 prima facie case of obviousness for at least these 16 reasons." 17 Q. What did you mean when you said "the petition 18 fails to make a prima facie case of obviousness"? 19 A. It's the reasons. For example, the petition 20 uses hindsight analysis. So I think these are the 21 reasons why I disagree that there is even a case for 22 obviousness. 23 Q. So you would agree with me that the petition 24 fails to make a strong prima facie case of obviousness 25 because, in your opinion, it doesn't even make a prima

Page 54 1 facie case of obviousness, correct? 2 MR. BLUMENKOPF: Objection, form. 3 A. I guess I wouldn't disagree with the logic that 4 you used in that sentence, in that question. 5 BY MR. JENSEN: 6 Q. Well, is it your opinion, Dr. Houh, that the 7 petition fails to make a prima facie case of 8 obviousness? 9 A. For the reasons I've outlined in my 10 declaration, yes. 11 Q. And because your opinion is that the petition 12 does not make a prima facie case of obviousness, you 13 didn't have to determine whether the secondary 14 considerations could overcome a prima facie case of 15 obviousness? 16 MR. BLUMENKOPF: Objection, form. 17 A. I mean, these are my opinions as I've laid out 18 here. So I don't believe there is. 19 I think there are all sorts of errors in 20 the obviousness case that I've laid out in my 21 declaration. One of them is hindsight analysis. And I 22 stand by what I've said in these cases. I stand by 23 these declarations. They're my opinions. 24 BY MR. JENSEN: 25 Q. Yeah. And what I'm trying to ask is do you	Page 56 1 prima facie case of obviousness, it would be overcome by 2 secondary considerations, correct? 3 MR. BLUMENKOPF: Objection, form. 4 A. Well, I don't remember every word in my 5 declarations; but I don't recall that offhand. 6 BY MR. JENSEN: 7 Q. Okay. All right. As part of forming your 8 opinions, Dr. Houh, did you perform any testing? 9 MR. BLUMENKOPF: Objection, form. 10 A. I don't believe I said anything about that in 11 my declarations, but they are what they are. I just 12 don't remember every word. 13 BY MR. JENSEN: 14 Q. And you don't recall doing any product testing, 15 correct? 16 MR. BLUMENKOPF: Objection, form. 17 A. I mean, I don't recall that for the purposes of 18 this case. 19 BY MR. JENSEN: 20 Q. And maybe I can ask sort of a threshold 21 question. Were you provided any Microchip or Aptiv 22 products? 23 MR. BLUMENKOPF: Objection, form. 24 A. No. 25 BY MR. JENSEN:
Page 55 1 have an opinion, Dr. Houh, that even if there were a 2 prima facie case of obviousness in the Aptiv IPRs, that 3 it would be overcome by the evidence of secondary 4 considerations? 5 MR. BLUMENKOPF: Objection, form. 6 A. I don't believe there is a -- I don't believe 7 the petition made a prima facie case of obviousness for 8 the reasons I've outlined in my section. 9 BY MR. JENSEN: 10 Q. And my question is slightly different. 11 Did you render an alternative opinion that 12 even if there were a strong prima facie case of 13 obviousness, that it would be overcome by the secondary 14 considerations? 15 MR. BLUMENKOPF: Objection, form. 16 A. I mean, I don't think I address that because I 17 don't believe -- you know, my opinions in this case are 18 that there's -- the combinations are not obvious for the 19 reasons I've laid out here, including using hindsight 20 analysis. So I don't believe there is a case -- I don't 21 believe the petition has made a prima facie case of 22 obviousness for the reasons I've outlined here. 23 BY MR. JENSEN: 24 Q. And because of that you did not render an 25 alternative opinion that even if there were a strong	Page 57 1 Q. Did you ask for any such products? 2 MR. BLUMENKOPF: Objection, form. 3 A. I don't think so. 4 BY MR. JENSEN: 5 Q. Why not? 6 A. Well, this is -- this petition is directed 7 towards -- sorry. 8 I was focused on responding to the 9 petition. The petition is about the prior art, not 10 about the -- not mainly about the products. But there I 11 think are some sections with respect to Aptiv's in the 12 nexus section, I believe, that I relied on evidence 13 that's in the record. And I don't think any of those 14 refer to actual products; but they refer to descriptions 15 and things to the extent necessary for, I think, the 16 nexus analysis. 17 Q. And is that the Aptiv dual-role hub product 18 that you're referring to in the secondary considerations 19 section? 20 MR. BLUMENKOPF: Objection, form. 21 BY MR. JENSEN: 22 Q. And I can direct you if it's helpful, Dr. Houh, 23 to paragraph 156 in the '643 declaration. 24 A. It does refer to Aptiv's dual-role hub; but 25 it's also referring to the Boston 2 chip, which I think

Page 58 1 I discuss throughout this section as well. 2 Q. What's the relationship between the Boston 2 3 chip and the Aptiv dual-role hub? 4 MR. BLUMENKOPF: Objection, form. 5 A. Well, I say in this section with respect to the 6 preamble of claim 1 in the table in paragraph 156 of the 7 '643 supplemental declaration that the -- to the extent 8 the preamble is limiting, the Boston 2 chip in Aptiv's 9 dual-role hub and it goes on. But that outlines at 10 least some of the relationship. 11 BY MR. JENSEN: 12 Q. So the Boston 2 chip is included as part of the 13 Aptiv dual-role hub? 14 MR. BLUMENKOPF: Objection, form. 15 A. What it says there, yeah. It's outlining the 16 relationship of the Boston 2 chip in the Aptiv dual-role 17 hub. That's what it says there. 18 BY MR. JENSEN: 19 Q. Have you ever personally seen an Aptiv 20 dual-role hub, Dr. Houh? 21 A. I don't think I've seen it outside of a car, if 22 that's what you mean. 23 Q. Have you seen an Aptiv dual-role hub in a car? 24 A. Well, to the extent it might not actually be 25 visible, I probably couldn't see it if it was not	Page 60 1 A. Generally, yes. 2 Q. And what is your understanding of what the 3 priority date refers to? 4 A. I think the priority date refers to the -- so 5 I'm not a lawyer; but, you know, there's some chain of 6 events leading up to the issuance of a patent. And 7 there are rules, as I understand, to go back to a 8 particular date where you could -- the invention was 9 actually laid out. 10 That would be the date, I think, I would 11 use in various cases to define prior art before that 12 date. And I understand that date can be challenged or 13 moved earlier for various reasons or moved later for 14 various reasons due to, you know, the documents in the 15 prior art not supporting the claims at issue or things 16 like that. 17 So I'm not a lawyer, but that's typically 18 what I understand a priority date would be. I would 19 consider prior art before that date in -- if a 20 petitioner were challenging it, prior art after a 21 priority date wouldn't be applicable for the use in any 22 challenges. 23 Q. Would you agree with me, Dr. Houh, that the 24 priority date is the date that you use to evaluate the 25 knowledge of a POSITA?
Page 59 1 visible. I don't know the electronic components to 2 every car that I've ever seen or sat inside. 3 Q. In connection with these proceedings, did you 4 look at an actual Aptiv dual-role hub product? 5 MR. BLUMENKOPF: Objection, form. 6 A. I mean, I can't remember if any of the data 7 sheets or anything I looked at might have had 8 photographs or anything. So I just can't remember 9 what's in all the materials I considered every page. 10 BY MR. JENSEN: 11 Q. Putting aside like photographs or pictures, I'm 12 asking about the actual, physical product. Did you look 13 at one of those in connection with this case? 14 MR. BLUMENKOPF: Objection, form. 15 A. I don't think I did. 16 BY MR. JENSEN: 17 Q. Why not? 18 MR. BLUMENKOPF: Objection, form. 19 A. Because what I relied on were the materials 20 that I listed; and I think I was able to show why, for 21 example, there's a nexus based on the exhibits that I 22 cited in my supplemental declarations. 23 BY MR. JENSEN: 24 Q. Are you familiar, Dr. Houh, with the term 25 "priority date"?	Page 61 1 MR. BLUMENKOPF: Objection, form. 2 A. So I would -- in my analysis I would use a 3 priority date as the date to consider certain things for 4 the purposes of determining obviousness or understanding 5 the plain and ordinary meaning of claim terms and things 6 like that. 7 So I understand that would be as of -- 8 like, for example, claim interpretation. In plain and 9 ordinary meaning my understanding is that it would be 10 based on the specification and the prosecution history 11 as of the priority date, and that's typically what I 12 apply. 13 MR. BLUMENKOPF: Counsel, if there's a 14 window for a break, we've been going for about an hour 15 and a half. 16 MR. JENSEN: Yeah. Let me just finish a 17 couple more questions. 18 BY MR. JENSEN: 19 Q. Would you agree with me, Dr. Houh, that it's 20 important to evaluate the knowledge and understanding of 21 a POSITA as of the priority date for a given patent? 22 MR. BLUMENKOPF: Objection, form. 23 A. I think it's important for various issues that 24 may arise in a particular case. 25 BY MR. JENSEN:

Page 62 1 Q. What priority date did you use for the patents 2 in this case? 3 MR. BLUMENKOPF: Objection, form. 4 BY MR. JENSEN: 5 Q. And I can direct you to paragraph 27 of your 6 report. 7 A. So with respect to the '643 patent, this 8 paragraph says that the -- "I understand that for the 9 claims of the '643 patent, a priority date of 10 September 6, 2016 should apply." 11 And I know there might be slight 12 differences in some of them, but I think we need to look 13 at each case separately to show what the priority dates 14 I applied for each case were. 15 Q. And the one you just read, that was for the 16 '643 patent, correct? 17 A. Yes. 18 Q. And for the '072 patent we can look at your 19 report in that case and go to paragraph 27. 20 A. Okay. 21 Q. And what is the priority date that you used for 22 the '072 patent? 23 A. Yeah. So I understand that for the claims of 24 the '072 patent a priority date of September 6, 2016 25 should apply.	Page 64 1 the '420 patent? 2 A. Paragraph 27 in the '228 case for the '420 3 patent, because there are two different cases, 4 paragraph 27 says that "I understand that for the claims 5 of the '420 patent a priority date of September 6, 2016 6 should apply." 7 Q. Is that correct? 8 MR. BLUMENKOPF: Objection, form. 9 A. I don't think I have an opinion about that. I 10 think I have an opinion somewhere about, you know, if 11 the priority date might be different. And we can go 12 look at that. My declarations say what they say. 13 So there might be a statement where 14 somewhere in one or more of my declarations about a 15 hypothetical -- well, a situation that may arise if the 16 priority date were not that. I just don't remember word 17 for word. 18 BY MR. JENSEN: 19 Q. Yeah. I didn't see that in your declarations. 20 If you can point me to that, that would be great. But I 21 would submit to you, Dr. Houh, that this is the wrong 22 date; and it can be readily verified by looking at the 23 patent itself. And maybe we can take a look at that. 24 You can pick whatever patent you would 25 like. Which patent should we look at?
Page 63 1 Q. Where did that understanding come from? 2 MR. BLUMENKOPF: Objection, form. 3 A. I'm often informed of that. And also I may 4 just confirm that looking at the patent, absent any 5 other issues challenging party dates in a case. 6 BY MR. JENSEN: 7 Q. Yeah. And in this case where did the 8 understanding that you recite in paragraph 27 come from? 9 MR. BLUMENKOPF: Objection, form. 10 BY MR. JENSEN: 11 Q. And I'm trying to get at, is that something 12 that you came up with on your own, that was your own 13 understanding, or was that understanding provided to you 14 by the lawyers? 15 MR. BLUMENKOPF: Objection, form. 16 A. I mean, I don't know. I don't remember exactly 17 where. It may have come from what the petitioners said; 18 or it could have, you know, been based on what I 19 understood from the lawyers. I don't remember. 20 BY MR. JENSEN: 21 Q. All right. Let's look at your declaration in 22 the '228 proceeding. So this is the '420 patent, '228 23 proceeding, paragraph 27. 24 A. Okay. 25 Q. And what is the priority date that you used for	Page 65 1 A. Since we have the '420, maybe we can look at 2 the '420. 3 Q. That would be Exhibit 1003. But if it's not 4 marked, that's fine. We go to the '420 patent. 5 And what is the priority date of the '420 6 patent? And you can look on the cover sheet. It 7 extends onto another page as well. What is the priority 8 filing date for the '420 patent? 9 A. Well, it doesn't say priority date on the face; 10 but it says that there's a filing date of September 19, 11 2016. 12 Q. And that's the day that this application was 13 filed, correct? 14 A. The application that led to the '420 patent, 15 that's the date the application was filed. 16 Q. Correct? 17 A. For the '420 patent application. 18 Q. And does the '420 patent claim priority to an 19 earlier filing date? 20 A. Well, it says that it's a continuation of 21 another application filed on September 16th, 2014; and 22 it continues that there's a provisional application 23 filed on September 26, 2013. 24 Q. Do you know which of those dates is considered 25 the priority date?

Page 66 1 A. Well, absent any challenges that may occur, if 2 it were a straight continuation of the September 16th 3 one, September 16, 2014 one, then perhaps that could be 4 the priority date in cases. 5 And then to the extent the provisional 6 application supports -- provides support for parts of 7 the invention, I understand in some cases it could be 8 viewed as September 26, 2013. And to the extent there's 9 other material set forth about earlier an invention 10 date, I understand that could cause the date to be 11 earlier. 12 So I'm not a lawyer but I -- so I hope I 13 got that stuff right. 14 Q. Yeah. So the question I have is, you know, we 15 looked at your various declarations where you stated 16 that, you know, you used a priority date of September 6, 17 2016 in your reports. What I want to know is, is that, 18 in fact, what you used or was that just a typo and it's 19 incorrect and, in fact, you used a different earlier 20 priority date? 21 A. Again, I can't recall like exactly where this 22 understanding came from; but I don't think my opinions 23 would change based on whether it would be a date in 2013 24 or 2016 or in between. 25 Q. So, for example -- well, let's just take a	Page 68 1 of 2016, would it make a difference what the priority 2 date was, whether it was, you know, September 2016 or 3 September of 2013? 4 MR. BLUMENKOPF: Objection, form. 5 A. So if you look at the '962, the cover there, 6 this patent was filed on -- the application that led to 7 this patent was filed on September 6, 2016. And it says 8 it's a continuation in part of another application filed 9 on September 16, 2014. And it goes on to have a 10 provisional application filed on September 26, 2013. 11 But I understand -- that's what it says 12 under Related U.S. Application Data. But I understand 13 -- again, I'm not a lawyer -- that the continuation in 14 part -- there's some cases where you would -- you could 15 add specifications and figures in a continuation in 16 part. And to the extent that certain claims are 17 directed to the newly added material, you wouldn't get 18 an earlier priority date -- the patentee wouldn't be 19 entitled to an earlier priority date if the materials 20 that support the claim were added later. 21 So, I mean, this is -- the cover of the 22 '962 is different than -- I don't remember if we're 23 looking at the '072 or the '420, but the dates are 24 slightly different. This one's a continuation in part 25 as opposed to a straight continuation.
Page 67 1 specific example. Are you familiar with the USB Power 2 Delivery standard? 3 A. I mean, I don't recall specifically talking 4 about that in my declarations. 5 Q. You don't? 6 A. I mean, I don't remember every word in my 7 declarations; but if I have, we can take a look at it. 8 Well, I do. I do see it now right here in 9 paragraph 28. 10 Q. Okay. Do you know what year the Power Delivery 11 Specifications came out? 12 MR. BLUMENKOPF: Objection, form. 13 BY MR. JENSEN: 14 Q. And let me just direct your attention, 15 Dr. Houh, to the '962 patent which discusses the Power 16 Delivery Specification in column 10 starting around 17 line 36. 18 A. Yes, I see that. 19 Q. And it references the Power Delivery 20 Specification revision 3.0, version 1.0 published 21 March 25, 2016 when corrected for the typo? 22 A. Yeah. I think that's pretty clearly a typo. I 23 do recall seeing the typo before. I remember that typo. 24 Q. So accepting the '962 patent's statement that 25 this particular power delivery spec published in March	Page 69 1 BY MR. JENSEN: 2 Q. Yeah. And my question is simply, would you 3 agree with me that the knowledge of a POSITA would be 4 different in 2016 versus 2013 because there were USB 5 specifications that published in the interim? 6 MR. BLUMENKOPF: Objection, form. 7 Counsel, it's unclear if you're asking about the '420 8 patent or the '962 patent. 9 MR. JENSEN: I'm not asking about any 10 patent in particular. 11 BY MR. JENSEN: 12 Q. So would you agree with me, Dr. Houh, that the 13 knowledge of a POSITA would be different in 2016 versus 14 2013? 15 MR. BLUMENKOPF: Same objection. 16 A. I mean, it may not be materially different for 17 the purposes of my analysis for this case; but I will 18 point out that in the '962 patent it's referring to a 19 revision 3, version 1.0 published in 2016. It doesn't 20 say when earlier versions or even draft versions were -- 21 would have been known to POSITAS. 22 BY MR. JENSEN: 23 Q. Would you agree with me that a POSITA in 24 September of 2016 would have the benefit of knowing 25 about the Power Delivery Specification referenced in the

Page 70 1 '962 patent? 2 MR. BLUMENKOPF: Objection, form. 3 A. Well, there's a very specific revision that 4 indicates that -- even before that date in 2016 there 5 were earlier revisions, and oftentimes there are earlier 6 drafts that are -- that would have been available to 7 POSITAS. 8 So I don't think there's any -- I mean, if 9 you want to go through each of my opinions, I don't 10 think they would change based on slightly different 11 priority dates. 12 BY MR. JENSEN: 13 Q. Yeah. So my question is slightly different 14 than that, right? It's simply would a POSITA in 2016 15 have the benefit of knowing about the Power Delivery 16 Specification mentioned in '962 patent? 17 A. Well, the '962 patent does call upon it 18 explicitly. But that doesn't mean POSITAS in earlier 19 times didn't know about, you know, materially the same, 20 you know, materials that were in an earlier version that 21 were also in the later versions. 22 Q. So let me follow up on that. 23 Would you agree with me then that in 2013, 24 to the extent that there was material that had been 25 previously published by the USB standards organization,	Page 72 1 THE VIDEOGRAPHER: The time is 11:13 a.m. 2 We're now back on the record. 3 BY MR. JENSEN: 4 Q. Welcome back, Dr. Houh. 5 A. Thank you. 6 Q. During the break did you talk with your 7 counsel? 8 A. Just about how to get the files on this 9 computer. 10 Q. Oh, thank you for reminding me of that. Were 11 we able to get that issue resolved? 12 A. No, not yet. Still working on it. 13 Q. All right. Well, we'll continue; and hopefully 14 by the next break that will be tied up. 15 Dr. Houh, have you ever designed a USB 16 hub? 17 MR. BLUMENKOPF: Objection, form. 18 A. No, I have not. But I've designed a lot of 19 networking and switching equipment. 20 BY MR. JENSEN: 21 Q. Have you ever designed a USB host-to-host 22 bridge? 23 MR. BLUMENKOPF: Objection, form. 24 A. No. 25 BY MR. JENSEN:
Page 71 1 that a POSITA would be familiar with that information? 2 MR. BLUMENKOPF: Objection, form. 3 A. I'm sorry. Could you repeat the question, 4 please? 5 BY MR. JENSEN: 6 Q. Yeah. I understand you to be saying, Hey look, 7 this is revision 3.0. There could be a 2.0 or a 1.0 8 that was published in 2013. Is that the point you're 9 trying to get at? 10 MR. BLUMENKOPF: Objection, form. 11 A. I mean, that may be part of the -- that may be 12 true. This doesn't say. But a POSITA would have been 13 knowledgeable about the things that POSITAS -- POSITA is 14 a hypothetical person that supposedly knows about the 15 body of publicly available information before certain 16 dates. It's not a real person. 17 But to the extent there were earlier 18 versions that could have been found by a POSITA, they 19 would know about these earlier versions as well. 20 BY MR. JENSEN: 21 Q. Okay. 22 MR. JENSEN: Let's take a break. 23 THE VIDEOGRAPHER: The time is 10:54 a.m. 24 We're now going off the record. 25 (Recess taken)	Page 73 1 Q. Prior -- well, let me just ask this question. 2 Have you read the USB 2.0 standard? 3 MR. BLUMENKOPF: Objection, form. 4 A. I've reviewed portions of it. I've flipped 5 through it. 6 BY MR. JENSEN: 7 Q. Had you read the USB 2.0 standard prior to 8 working on this case? 9 MR. BLUMENKOPF: Objection, form. 10 A. I think probably I did, yes. 11 BY MR. JENSEN: 12 Q. Had you read the USB 2.0 standard in 2013? 13 MR. BLUMENKOPF: Objection, form. 14 A. I don't think so. 15 BY MR. JENSEN: 16 Q. Have you read the USB 3.0 standard? 17 MR. BLUMENKOPF: Objection, form. 18 A. I may have read parts of it. I don't know 19 offhand. 20 BY MR. JENSEN: 21 Q. Have you read the USB 1.0 standard? 22 MR. BLUMENKOPF: Objection, form. 23 A. I probably have seen that before. 24 BY MR. JENSEN: 25 Q. Have you read it?

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1 A. I've probably read portions of it before. 2 Q. Had you read it in 2013? 3 MR. BLUMENKOPF: Objection, form. 4 A. I don't think so. 5 BY MR. JENSEN: 6 Q. Had you read the USB 3.0 standard in 2013? 7 MR. BLUMENKOPF: Objection, form. 8 A. I mean, if I had, I -- at the time later, 9 probably not in 2013. 10 BY MR. JENSEN: 11 Q. Have you read the USB OTG standard? 12 MR. BLUMENKOPF: Objection, form. 13 A. I may have read parts of it. 14 BY MR. JENSEN: 15 Q. Would you have read any parts of it in 2013? 16 MR. BLUMENKOPF: Objection, form. 17 A. Probably not. 18 BY MR. JENSEN: 19 Q. Do you know what the acronym OTG stands for? 20 A. It might be "on-the-go." I don't know if I 21 remember that correctly or not. 22 Q. Let me direct your attention to paragraph 26 of 23 your declaration. 24 A. Which declaration do you mean? 25 Q. Any of them. They're all the same. We can go	1 the date of the invention (September 26, 2013) 2 ('POSITA')" -- by the way, this is the declaration for 3 the '643 supplemental declaration case -- "would have 4 had a bachelor's degree in computer science, electrical 5 engineering, or an equivalent and two years of 6 professional experience working with computer network 7 protocols such as USB. Lack of work experience can be 8 remedied by additional education and vice versa." 9 Q. Did you apply that definition when rendering 10 the opinions in your declarations? 11 A. Just for the issues that require analysis from 12 the point of view of a POSITA, this is what I applied. 13 Q. Did you render any opinions in your 14 declarations under a different definition of a POSITA? 15 A. I mean, for the issues that the analysis, if I 16 understand, would be taken from that person of ordinary 17 skill, that's the level of skill that I applied. 18 I understand the petition is taking a 19 different view of the level of ordinary skill, but I 20 applied -- which I think is wrong for -- that does not 21 reflect -- I think petition's proposed level of ordinary 22 skill does not reflect the true ordinary level of skill 23 applicable to the challenged patents, but I applied what 24 I've laid out as a POSITA. 25 Q. And you didn't render any opinions under
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1 with the '643; but it will be the same in all of them, I 2 think. 3 A. Okay. 4 Q. And this is under the heading Level of Skill in 5 the Art. Is that right? 6 A. Yes. 7 MR. BLUMENKOPF: I'm sorry. Just for 8 clarity, Dr. Houh, are you looking at the '643 9 declaration? 10 THE WITNESS: I am looking at the '643 11 declaration, yes. 12 BY MR. JENSEN: 13 Q. And let me just ask this. Is your level of 14 skill in the art different depending on which patent 15 you're analyzing? 16 A. Just for the record, the '420 '495 case, that 17 is not the same paragraph number. It's a different 18 paragraph number. But for that paragraph describing 19 what my opinion is, the person of ordinary skill in the 20 art in the field is the same across all five of my IPR 21 declarations. 22 Q. Could you read your definition aloud of the 23 level of skill in the art. 24 A. "In my opinion, a person of ordinary skill in 25 the art in the field of the challenged patents, as of	1 someone else's definition of a POSITA in your reports, 2 did you? 3 A. In this section I don't see that I said I did 4 that. 5 Q. In forming your definition of a POSITA, did you 6 consider the education and experience level of the 7 inventors on the Aptiv patents? 8 A. I don't recall looking at that information. 9 Q. Do you know what the education level of the 10 inventors on the Aptiv patents is? 11 A. I don't believe I do. 12 Q. Do you know the experience level of the 13 inventors on the Aptiv patents? 14 A. So I'm not an attorney here; but I understand 15 that the inventors of a patent are presumed to be at the 16 level they are for, you know, making the invention. So 17 no, I don't believe I looked at that specifically. 18 Q. Let me direct your attention to paragraph 47 of 19 the petitioners' expert reports, and that's 20 Exhibit 1013. I'm not sure if you have a hard copy of 21 that or not, but I'm happy to just share it on the 22 screen here. 23 MR. BLUMENKOPF: Which proceeding are you 24 referring to, Counsel? 25 MR. JENSEN: This one happens to be the

Page 78 1 '643, but it doesn't matter. It's the same. 2 MR. BLUMENKOPF: I want to be clear on the 3 record which document you're referring to, but it 4 appears to be the '643. 5 MR. JENSEN: Yeah. I mean, I can refer 6 collectively to all of them. It even says at the 7 beginning that they're identical in this section. 8 MR. BLUMENKOPF: I understand that; but 9 given the number of proceedings and the number of 10 documents, I'd just like the record to be clear as to 11 which specific document we're talking about. 12 MR. JENSEN: Well, and I want to be clear. 13 If you're going to raise an issue, I can pull up every 14 one of them and we can look at it but that seems like a 15 tremendous waste of time and resources. 16 So we'll proceed in looking at the one 17 that we've got here, which is the '643; but they're 18 expressly the same in terms of the paragraph that we're 19 looking at. 20 BY MR. JENSEN: 21 Q. And let me ask this, Dr. Houh. Did you review 22 the expert declarations of the petitioner when forming 23 your opinions? 24 A. I mean, I'm pretty sure the declaration of 25 Mr. Welch was part of materials I considered. I'm not	Page 80 1 of those, not specifically a host-to-host bridge but 2 certainly components of network and communication 3 architectures that I personally designed myself. 4 I've worked in computer hardware and 5 peripherals. I've done computer programming. I have 6 written drivers for Unix operating systems, and I've 7 done embedded systems work. And I have a four-year 8 degree in electrical engineering and computer science. 9 I do not specifically have four years of 10 experience designing USB systems, including USB hosts 11 and hubs and USB devices; but I have a relevant advanced 12 degree all the way up to a Ph.D. that Mr. Welch says 13 could substitute -- may substitute for some work 14 experience. 15 And then I have not specifically -- I 16 don't have specific professional experience in working 17 with USB, but I think my Ph.D. in networking -- this is 18 really a networking -- that's what I did for my Ph.D. -- 19 may substitute for this work experience. 20 BY MR. JENSEN: 21 Q. So let me ask this. Are you able to answer the 22 question with a "yes" or a "no," Dr. Houh? Did you 23 qualify as a POSITA under Mr. Welch's definition? 24 A. I mean, I think if you consider Mr. Welch's 25 statements about relevant advanced degrees substituting
Page 79 1 sure if it's doctor. I'm sorry. I think it's doctor. 2 I don't remember. 3 Q. It's Mr. Welch. 4 A. Okay. I think I've listed those as part of the 5 materials considered. And a lot of these are rebuttal 6 response positions to both Mr. Welch's and the 7 petition's points. 8 Q. And this is -- the paragraph 47 that we're 9 looking at falls under the heading in Mr. Welch's report 10 of Level of Skill in the Art, correct? 11 A. Yes. And I think I did cite or include 12 excerpts of this portion in my own section below where 13 we were just looking in the '643 declaration. 14 Q. And I want to give you just a moment to review 15 paragraph 47 of the Welch declaration where he sets 16 forth his definition of a POSITA. So I'll let you just 17 read that. Let me know when you're done reviewing that. 18 A. Okay. I've reviewed it. 19 Q. Dr. Houh, did you qualify as a POSITA under 20 Mr. Welch's definition? 21 MR. BLUMENKOPF: Objection, form. 22 A. Well, if you consider -- if you consider his 23 statements, certainly there's the middle part where I -- 24 I did work in network communication architectures. I've 25 designed systems like that, worked on components of such	Page 81 1 for work experience, I would say I -- even with what he 2 says -- 3 Q. So let's walk through -- 4 A. Again, I disagree with what Mr. Welch says is 5 the level here of the person of ordinary skill for the 6 reasons I laid out in my declaration for the '643 right 7 after the paragraphs we're looking at earlier. 8 Q. So let's walk through this kind of just 9 piece-wise one piece at a time. 10 Starting toward the beginning -- first, 11 let me ask. So Mr. Welch says, "The challenged patents 12 pertain generally to the field of USB connectivity 13 (e.g., USB systems/architectures/communications), though 14 other technical fields may be relevant." 15 Do you see that sentence? 16 A. Yes. 17 Q. Do you agree that the challenged patents 18 pertain generally to what the first sentence says? 19 MR. BLUMENKOPF: Objection, form. 20 A. Well, I mean, I have a different statement in 21 my declaration. So they're not the same. 22 If you look at my '643 supplemental 23 declaration, in paragraph 31 I talk about what the 24 patented technology relates to; and it's slightly 25 different, although I do mention that it -- I do mention

Page 82 1 USB in what I lay out. 2 BY MR. JENSEN: 3 Q. Yeah. And because they do use slightly 4 different words, that's why I'm asking the question, 5 which is do you agree with the statement that "The 6 challenged patents pertain generally to the field of USB 7 connectivity, e.g., USB systems/architectures/ 8 communications, though other technical fields may be 9 relevant"? 10 MR. BLUMENKOPF: Objection, form. 11 A. I mean, I don't think that I have a specific 12 opinion in my declarations with respect to this 13 statement. I just don't remember every word, but I 14 don't recall that I specifically addressed this as part 15 of my analysis. 16 BY MR. JENSEN: 17 Q. Do you disagree with this statement? 18 MR. BLUMENKOPF: Objection, form. 19 A. I don't think I have an opinion right now about 20 that. 21 BY MR. JENSEN: 22 Q. Okay. So let's kind of come back to the 23 qualifications that Mr. Welch lays out. The first thing 24 he says is that, "A POSITA at the time of the alleged 25 invention would have been well-versed in USB standards	Page 84 1 So while I don't have specific experience 2 with the specific USB specifications laid out here, I 3 had an education level that allowed me then to review 4 these types of specifications and understand them 5 because I had work experience designing and building 6 these kinds of networking equipment pertaining to 7 different standards. 8 BY MR. JENSEN: 9 Q. Sitting here today, would you say that you are 10 well-versed in the USB 2.0, 3.0 and OTG standards? 11 MR. BLUMENKOPF: Objection, form. 12 A. I can pretty much read most networking 13 protocols and understand them to the extent necessary. 14 BY MR. JENSEN: 15 Q. Would you agree with me that that ability is 16 something a POSITA would have? 17 MR. BLUMENKOPF: Objection, form. 18 A. Well, I think the POSITA that I've laid out 19 certainly would have the capability to pick up a 20 specification such as a USB specification and review and 21 understand that and then be able to implement and make 22 devices based on the level of education and skill that 23 I've laid out in what my opinion is. I think they could 24 review and read these types of specifications and 25 understand them.
Page 83 1 (including the USB 2.0 and 3.0 specifications and the 2 OTG supplement)." 3 My question for you, Dr. Houh, is were you 4 well-versed in USB standards, including the USB 2.0 and 5 3.0 specifications and the OTG supplement, in 2013? 6 MR. BLUMENKOPF: Objection, form. 7 A. So I did not specifically have work experience 8 with those standards, but I had designed prior to that 9 point a high-speed serial optical link. So I -- and I 10 was very familiar with networking protocols and read 11 many specs and certainly had the ability to read 12 whatever spec and understand the issues in them. 13 BY MR. JENSEN: 14 Q. Dr. Houh, in 2013 were you well-versed in the 15 design and deployment of USB hosts, including embedded 16 hosts, USB devices and USB hubs? 17 MR. BLUMENKOPF: Objection, form. 18 A. So I did not specifically work with USB; but as 19 of 2013, I had designed networking switches which had 20 many similarities to the functions within hub devices 21 generally. I had designed a host interface for a 22 communications system. I had written the software for 23 the driver for that host interface, which was software 24 on the host that enabled communications with the 25 network.	Page 85 1 BY MR. JENSEN: 2 Q. And my question is a little bit different. 3 It's not what a POSITA -- well, let me ask this. We'll 4 let the previous question and answer stand. 5 Putting aside what a POSITA could do, 6 right, or what you could have done in the past or even 7 could do today, right, were you well-versed in the 8 USB 2.0, 3.0 and OTG standards? 9 MR. BLUMENKOPF: Objection, form. 10 A. You're asking in 2013? 11 BY MR. JENSEN: 12 Q. In 2013 were you well-versed with the substance 13 of the USB 2.0 and 3.0 specifications and the OTG 14 supplement? 15 MR. BLUMENKOPF: Same objection. 16 A. So as I said earlier, I don't recall 17 specifically having reviewed those in 2013. But I 18 certainly did a lot of networking work and understood a 19 lot of -- I've actually designed my own protocols 20 before. And I have the capability of relating things in 21 these specs to all the common concepts that I 22 understood. 23 So they're just very specific about 24 certain things, but they all relate to concepts that I 25 was well-versed in. Those are the kinds of things found

Page 86 1 in, you know, various networking/communications-type 2 specifications. 3 BY MR. JENSEN: 4 Q. Were you well-versed in the USB-C connector 5 specification and the USB-PD power delivery 6 specification in 2013? 7 MR. BLUMENKOPF: Objection, form. 8 BY MR. JENSEN: 9 Q. Strike that. Let me ask that question again. 10 Were you well-versed in the USB-C 11 connector specification and the USB-PD power delivery 12 specification in 2016? 13 MR. BLUMENKOPF: Objection, form. 14 A. So I did not work professionally in the -- 15 working with USB devices as of 2016. But prior to 2016, 16 actually in the late '90s, I did work on communications 17 systems where I studied actually the power-over-ethernet 18 specification because we were designing a telephone 19 system and I was the technical research person and we 20 wanted to do power over ethernet. And also I had to 21 study the technical specifications for ethernet with 22 respect to the signals and where power may be delivered 23 as part of the standard. 24 So I'm familiar with many of the concepts, 25 while I was not familiar specifically in 2016 with the	Page 88 1 BY MR. JENSEN: 2 Q. And I think you've already talked about your 3 educational experience. In 2013 did you have four years 4 of experience designing USB systems, including USB 5 hosts, USB hubs and USB devices? 6 MR. BLUMENKOPF: Objection, form. 7 A. As I said earlier, I didn't work professionally 8 and design those type of specific systems; but I 9 designed other types of network components and 10 networking systems. And I had a relevant advanced 11 degree that Mr. Welch says may substitute for some work 12 experience. 13 BY MR. JENSEN: 14 Q. Did you render any opinions in your declaration 15 regarding the qualifications of Eric Welch as a POSITA? 16 MR. BLUMENKOPF: Objection, form. 17 A. I mean, I don't recall doing so; but my 18 declarations are what they are. 19 BY MR. JENSEN: 20 Q. Did you render an opinion in your declarations 21 under the definition of a POSITA set forth by Mr. Welch? 22 MR. BLUMENKOPF: Objection, form. 23 A. As I said earlier, I don't think I recall 24 providing any alternative analyses under different 25 POSITAS; but I will let the declarations stand for
Page 87 1 power delivery or USB-C connector specifications. But, 2 again, I certainly -- with my education level and 3 experience certainly had the capability to relate 4 specific things that turn up in these types of 5 specifications to existing concepts that I had studied 6 previously. 7 BY MR. JENSEN: 8 Q. In 2013 did you have a working understanding of 9 network communication architectures such as client 10 server and components such as host-to-host bridges? 11 MR. BLUMENKOPF: Objection, form. 12 A. I mean, generally, yes. I mean, maybe not 13 specifically a host-to-host bridge; but that's simply an 14 example of a component of a network communication -- or 15 architectural network or communications. 16 So I would say I definitely had a working 17 understanding of what's listed in what you asked. 18 BY MR. JENSEN: 19 Q. In 2013 did you have a working understanding of 20 computer hardware and peripherals, computer programming 21 and the design and implementation of communications 22 software, firmware and drivers in standard operating 23 systems like Windows, MacOS and Linux? 24 MR. BLUMENKOPF: Objection, form. 25 A. Yes.	Page 89 1 themselves. I just don't remember every word, but I 2 don't recall that. 3 BY MR. JENSEN: 4 Q. You referenced something that I want to go back 5 to in your declaration. We can look at the '643 6 declaration at paragraph 28. 7 Let me know when you have that in front of 8 you. 9 A. We're looking at the '643? 10 Q. Sure. 11 A. I mean, as I mentioned earlier, the paragraph 12 numbering is slightly different in at least one of 13 the -- even in this section in at least one of the other 14 declarations. So I just want to make sure I understand, 15 you know, which paragraph 28. 16 Q. It's the one I'm sharing on the screen. You 17 can always reference the screen share if you have a 18 question. 19 A. Yeah. The problem is I don't see 20 identification on the screen of which -- okay. 21 Q. It's always in the lower right-hand corner. 22 A. It was obscured earlier, but now I see it. 23 MR. BLUMENKOPF: Just to be clear for the 24 written record, this is the '643 declaration, right? 25 THE WITNESS: Yes.

Page 90 1 BY MR. JENSEN: 2 Q. And this is the same in all your declarations, 3 correct, the substance of the paragraph? 4 A. Yeah. I mean, I believe the substance is 5 essentially the same; but the paragraph numbers are 6 slightly different in at least one of them. 7 Q. Yep. So the substance is the same, and anybody 8 who would like can run a redline and see that. 9 So in the first sentence of paragraph 28 10 you say, "I understand that the petitioner contends that 11 a heightened level of ordinary skill applies." 12 Do you see that? 13 A. Yes. 14 Q. And you use this word "heightened" that I 15 wanted to ask about. What do you mean by "a heightened 16 level of ordinary skill"? 17 A. Well, in comparison to what I've laid out as a 18 person of ordinary skill, the petitioner has a lot more 19 specific requirements to a POSITA; and I've outlined 20 that if you continue reading. 21 Q. Yeah. And that's what I want to kind of drill 22 down on, right? What I'm trying to understand is if 23 there's really any daylight or difference between the 24 two definitions or if the definition you provide is 25 simply a more generic statement and Mr. Welch's is a	Page 92 1 is that the level of skill allows that person to look at 2 these standards and understand them but may not 3 necessarily have been already knowledgeable and 4 well-versed in them because the level of skill, you 5 know, provides the background and underpinnings for a 6 person to review a number of different standards and 7 apply them. 8 So I think that is different, presupposing 9 the knowledge of a very specific specification versus 10 pre -- well, what I'm saying is that the level of that 11 skill allows that POSITA to be able to look at many 12 different specifications related to networking and USB 13 and understand them; and I think those are two different 14 things. 15 BY MR. JENSEN: 16 Q. Is it your testimony, Dr. Houh, that an 17 individual could qualify as a POSITA if he or she had 18 never once looked at any of the USB standards or 19 specifications? 20 MR. BLUMENKOPF: Objection, form. 21 A. I mean, my point is that the person of -- level 22 of skill as I've laid out could pick up one of these 23 specifications and, based on their knowledge and level 24 of skill that I've outlined, understand what's going on, 25 certainly with respect to the way that the inventions
Page 91 1 more granular statement but they're really saying sort 2 of the same thing. So that's what I'm going to try to 3 understand as we look at this paragraph 28. 4 The first thing that you talk about there 5 is the USB standards. Do you see that in the first few 6 lines of paragraph 28? 7 A. Yes, I see that. 8 Q. Okay. Is it your opinion that a POSITA would 9 not have been well-versed in the USB 2.0, 3.0 and OTG 10 standards? 11 MR. BLUMENKOPF: Objection, form. 12 A. I mean, that's not exactly what I'm saying. 13 What I'm saying is that my level of POSITA would have 14 been perfectly capable of reviewing these standards and 15 specifications and understanding them sufficient to 16 understand the patented inventions and to even perhaps 17 make use of them. 18 BY MR. JENSEN: 19 Q. How is that different than being well-versed 20 with the USB standards? 21 MR. BLUMENKOPF: Objection, form. 22 A. Well, I think the petitioner's contention is 23 that the POSITA is already well-versed and has that 24 knowledge. 25 My position is a little different, which	Page 93 1 are -- what the inventions are and what the 2 specifications are and what points are relevant and be 3 able to making use of the invention. 4 And that's what I've laid out is that 5 level of skill allows the POSITA to do it even if they 6 haven't seen it before because they don't have to have 7 seen it before. They simply have to understand how to 8 understand what they're reading. And I think that's 9 part of what my level of ordinary skill lays out 10 includes. 11 BY MR. JENSEN: 12 Q. And let me just sort of play that back to see 13 if I understand that correctly. 14 Are you saying that someone could qualify 15 as a POSITA as long as they had the capability to review 16 the USB standards and understand them, but they need not 17 have any previous understanding or knowledge of the 18 substance of the standards? 19 MR. BLUMENKOPF: Objection, form. 20 A. What I'm saying is that the level I've laid 21 out, which their education and professional experience 22 working with networking protocols, computer networking 23 protocols, that person of ordinary skill could be 24 looking at the patents and making use of the invention; 25 and they would understand, you know, what's being laid

Page 94 1 out in the spec. 2 What's different in the levels of ordinary 3 skill is that a petitioner's contention is higher 4 because it builds into the POSITA that they already are 5 well-versed in USB standards, including USB 2.0 and 3.0, 6 the OTG supplement, and the USB Power Delivery 7 Specification. 8 I'm saying that is a heightened level of 9 ordinary skill that I think is not reflective of the 10 true level of ordinary skill of the challenged patents 11 because I think my level of ordinary skill allows a 12 person, you know, because they already understand -- 13 they have the requisite professional and work experience 14 to be able to understand the concepts in these 15 specifications relevant to the inventions of the 16 challenged patents. 17 BY MR. JENSEN: 18 Q. And is it correct then that under your 19 definition a POSITA need not have ever looked at the USB 20 2.0, 3.0 or OTG standards to qualify as a POSITA as long 21 as they had the ability to read and understand those 22 standards? 23 MR. BLUMENKOPF: Objection, form. 24 A. That's not quite what I'm saying. The level of 25 skill I've laid out allows them to be able to, you know,	Page 96 1 example. 2 I'm saying that the level of ordinary 3 skill that I've laid out is what I think is more 4 reflective of the true level of ordinary skill 5 applicable to these claims and that these additional 6 requirements are a heightened level of ordinary skill -- 7 additional requirements level of set forth by a 8 petitioner are a heightened level of skill that need not 9 apply and that are not reflective of the true level of 10 ordinary skill required for -- applicable to these 11 patents. 12 BY MR. JENSEN: 13 Q. Under your definition of a POSITA, Dr. Houh, 14 does a POSITA need to have any experience in the design 15 and deployment of USB hosts, USB devices and USB hubs? 16 MR. BLUMENKOPF: Objection, form. 17 A. So, again, that's another additional 18 requirement that the petitioner's set forth for what's 19 required in a POSITA that I think is heightened and not 20 reflective of the true level of ordinary skill because I 21 don't think the -- I haven't laid out in my person of 22 ordinary skill that they have a priority work experience 23 in these very specific devices. 24 Given the level that I've laid out, I 25 think they can work in these areas; and it's more
Page 95 1 work in the field of these patents and making use of 2 what's laid out. 3 It doesn't require them to a priority have 4 reviewed all of these standards and be well-versed at it 5 because with the adequate educational and professional 6 experience, as I've laid out in my level of ordinary 7 skill, I think that's more reflective of the true level 8 of ordinary skill applicable to these patents. 9 BY MR. JENSEN: 10 Q. Would you agree with me that a POSITA would at 11 least be aware of the standards and know that they 12 exist? 13 MR. BLUMENKOPF: Objection, form. 14 A. You know, many people join the workplace; and 15 they haven't had prior knowledge of the things they're 16 working on. But after they've worked on something for 17 two years, you know -- these POSITAs as I've laid out, 18 they don't have to know about anything before working on 19 a new project necessarily because their education and 20 professional background allows them to do new things. 21 I think plenty of people are able to make 22 moves and still be productive and be able to, you know, 23 implement a, say, Bluetooth device even though they've 24 never read the Bluetooth spec given that they already 25 have a level of experience working in -- that's just an	Page 97 1 reflective of the true level of ordinary skill in the 2 art applicable to the challenged patents, my definition, 3 not adding all these heightened and additional 4 requirements to a POSITA that the petitioner does. I 5 think that's not reflective of the true level of 6 ordinary skill applicable to the patents. 7 BY MR. JENSEN: 8 Q. In your view would a POSITA have had a working 9 understanding of network communication architectures, 10 for example, master/slave architecture and components 11 like host-to-host bridges? 12 MR. BLUMENKOPF: Objection, form. 13 A. So my opinion of the true level of ordinary 14 skill doesn't enumerate specific concepts. But I have 15 that the POSITA has working professional experience with 16 computer network protocols and whatnot, and some of 17 these may be acquired readily through that. 18 But I don't specifically enumerate these 19 types of additional requirements, and I don't think 20 it's -- I think my -- what I've laid out without 21 specific enumeration of a laundry list of things, I 22 think my level of ordinary skill is more reflective of 23 the true level of skill applicable to the patents at 24 issue here. 25 BY MR. JENSEN:

Page 98 1 Q. Under your definition of a POSITA would a 2 POSITA have a working understanding of computer hardware 3 and peripherals, computer programming and the design and 4 implementation of communications software, firmware and 5 drivers? 6 MR. BLUMENKOPF: Objection, form. 7 A. Again, I don't specifically enumerate those 8 things; but many of these skills would easily have been 9 acquired through education and the professional 10 experience that I've laid out. But I don't require 11 these specific things, and I think these are what makes 12 the petitioner's definition of a POSITA to be more 13 heightened than what I've laid out. 14 And I don't think what petitioner has laid 15 out is reflective of the true level of ordinary skill 16 applicable to the patents. I think what I've laid out 17 is reflective of the true level of ordinary skill with 18 respect to the patents at issue here. 19 BY MR. JENSEN: 20 Q. In paragraph 26 of your report you say that a 21 POSITA would have two years of professional experience 22 working with computer network protocols such as USB, 23 correct? 24 A. That's what I say. 25 Q. Is any amount of experience specifically with	Page 100 1 MR. BLUMENKOPF: Objection, form. 2 A. I mean, I haven't considered specific -- we 3 could play this game and list all sorts of things. But, 4 you know, the level of ordinary skill is what I've laid 5 out here. I didn't consider specific instances. This 6 is just a general layout of what the person of ordinary 7 skill which I've laid out are, which I think are more 8 reflective of the true level of ordinary skill 9 applicable to these patents than the heightened level 10 laid out and set forth by petitioner. 11 BY MR. JENSEN: 12 Q. And what I'm trying to understand, Dr. Houh, is 13 whether any amount of USB experience is required under 14 your definition to qualify as a POSITA. Because you 15 give USB as an exemplary -- such as an exemplary network 16 protocol. So let me just ask the clean question. 17 Could an individual qualify as a POSITA 18 under your definition if they had no USB experience? 19 MR. BLUMENKOPF: Objection to form. 20 A. Well, I mean, you're presupposing that lack of 21 any USB experience is total lack of all concepts in USB, 22 which is simply not true. I mean, if you've done 23 communications -- you know, USB is about serial 24 communications; and that's part of a lot of the core 25 curricula for networking courses.
Page 99 1 USB required under your definition of a POSITA? 2 MR. BLUMENKOPF: Objection to form. 3 A. Well, USB lays out a very specific way of doing 4 things. That's what protocols are. But they're based 5 on the same fundamental concepts common in any similar 6 protocol. 7 And so while I do give an example of a 8 network protocol such as USB that professional 9 experience would be good in, I also say that the lack of 10 work experience can be remedied by additional education, 11 which gives people the capability to understand new 12 things and relate them to additional concepts that they 13 already know, which I still think the base level of 14 ordinary skill provides. 15 BY MR. JENSEN: 16 Q. Is ethernet an example of one type of a network 17 protocol? 18 MR. BLUMENKOPF: Objection, form. 19 A. I haven't specifically listed it, but I'm sure 20 it could be. 21 BY MR. JENSEN: 22 Q. If someone in 2013 had a bachelor's degree in 23 computer science and two years of professional 24 experience working with ethernet, would such a person 25 qualify as a POSITA under your definition?	Page 101 1 So it's not so black and white that you 2 have to know about a very specific protocol to know 3 anything about the protocol. You can know things about 4 a protocol and have experience even though you haven't 5 worked with a specific protocol. 6 So it's not -- you really can't say you 7 know nothing about USB that's not -- USB protocol 8 concepts are -- there's a high overlap with other 9 communications concepts and other protocols. So if you 10 know something about and work with network protocols, 11 you know a lot about what most protocols are designed to 12 do. 13 BY MR. JENSEN: 14 Q. So is it your testimony that if someone knows 15 about the ethernet protocol, that they would know most 16 of what's in the USB protocol as well? 17 MR. BLUMENKOPF: Objection, form. 18 A. There may be very specific different ways, like 19 different like voltage levels, different networking 20 speeds, different ways to access the physical media. 21 But fundamentally a lot of the networking protocols 22 share a lot of common concepts. That's my point. 23 BY MR. JENSEN: 24 Q. And just to maybe kind of wrap this up, is it 25 correct that under your definition a POSITA could

Page 102 1 qualify -- let me strike that. Let me ask a cleaner 2 question. 3 Could someone qualify as a POSITA under 4 your definition in paragraph 26 if they had two years of 5 professional experience working with a network protocol 6 other than USB? 7 A. I mean, they would have worked with similar 8 concepts that are also present in USB. So it's hard -- 9 Q. Well, what are those concepts? What are the 10 similar concepts that you think are consistent across 11 the network protocols? 12 MR. BLUMENKOPF: Objection, form. 13 A. Well, there are serial data protocols and 14 serial data communication methods and sometimes there's 15 parallel communication methods. But aside from those 16 two, those two are the two -- different networking 17 protocols will do it one way or the other typically. 18 So if you know -- if you've worked with 19 the serial communication protocols, you understand many 20 of the issues relevant to -- in USB as it is also a 21 serial communication protocol. 22 So what I'm saying is that simply if you 23 say that person hasn't had specific work experience in a 24 specific protocol, it doesn't mean they know nothing 25 about the protocol. What I'm saying is that the	Page 104 1 thing is very common -- you know, a very common concept 2 in computers and networking. 3 So I don't think you have to enumerate it, 4 but it's part of -- there are like a bunch of things. 5 You don't have to enumerate every single class a POSITA 6 has taken, right? I've not really seen that done really 7 much or at all that I can recall. 8 It's the level of skill that gives people 9 and POSITAs the skills and tools they need to work -- to 10 be applicable to the level of skill relevant to the 11 patents at issue here. 12 BY MR. JENSEN: 13 Q. Okay. 14 A. And I think what I've laid out is more 15 reflective of the true level of skill required for the 16 level of the challenged patents than all these extra 17 things thrown in, which -- in the petitioner's view 18 which I don't think are reflective of the true level of 19 skill. It's not necessary. They're heightened. 20 So I'm saying that these are extra things 21 I don't think are truly reflective of the true level of 22 skill required for a POSITA in the context of these 23 patents. 24 Q. Under your definition of a POSITA, would a 25 POSITA have an understanding of the concept of bridging?
Page 103 1 experience and education level gives them the tools 2 necessary to be able to work with many or, you know, any 3 protocols in some capacity without having to have 4 already had specific work experience or knowledge of the 5 details of the specification prior to working on some of 6 these because that level of education and work 7 experience in network protocols, for example, give that 8 POSITA the tools to be able to work in an environment 9 such as USB and implement products and devices using a 10 different standard that they may not have pre-known 11 about before starting to work on a particular project 12 because that level of education and professional 13 experience gives them the tools to understand -- apply 14 their knowledge to new areas. 15 And I think that's part of why the level 16 of skill I've outlined is more reflective of the true 17 level of skill that applies to these challenged patents 18 than the heightened level provided and set forth by 19 petitioner. 20 BY MR. JENSEN: 21 Q. So, for example, would a POSITA under your 22 definition be familiar with the concept of a master/ 23 slave network architecture? 24 MR. BLUMENKOPF: Objection, form. 25 A. I mean, that level of education, that specific	Page 105 1 MR. BLUMENKOPF: Objection, form. 2 A. I mean, bridging is a very basic, common 3 networking concept that can be applied to a variety of 4 different specific protocol areas, yes. 5 BY MR. JENSEN: 6 Q. Under your definition would a POSITA have an 7 understanding of the concept of a hub? 8 MR. BLUMENKOPF: Objection, form. 9 A. So I haven't -- I mean, I haven't any specific 10 opinions about what these POSITAs specifically have 11 to -- I've laid out more of a general, broad level of 12 skill, which is that it's a certain education level in 13 certain specific fields alternatively and a few years of 14 professional experience in computer networking protocols 15 with an example being USB. 16 I don't have an opinion about -- you know, 17 that they have to know how to multiply or add or do 18 calculus or do anything. It's just a broad -- it's a 19 general level of skill I've laid out, which I think are 20 more reflective of the true level of skill applicable to 21 the patents than I think what the petitioner has laid 22 out, which require a number of things I don't think are 23 necessary. 24 There's too many requirements laid out in 25 the petitioner's proposal that are not truly reflective

Page 106 1 of the actual level of skill necessary in the area of 2 the challenged patents. 3 BY MR. JENSEN: 4 Q. In paragraph 19 you include a table that lists 5 the materials you considered when preparing your 6 declaration, correct? 7 A. I mean, at least in the declaration for the 8 '643 patent, I see that in paragraph 19. 9 Q. Yeah. And in all of your declarations you have 10 a similar table called Materials Considered where you 11 list a number of exhibits? 12 A. I think that's right. 13 Q. Okay. Is the table -- does the table in 14 paragraph 19 contain a complete list of the materials 15 you considered when forming your opinions? 16 MR. BLUMENKOPF: Objection, form. 17 A. I mean, it should be to the extent there are 18 not other documents I cited in the body of the 19 declaration that just somehow didn't make its way onto 20 the list; but I would have cited to those. 21 Like this table in my citation should be 22 what I relied on for the basis of my opinions, that 23 information, yeah. Sorry. 24 BY MR. JENSEN: 25 Q. Were all of the exhibits in paragraph 19	Page 108 1 transcripts. Do you see that? 2 A. Yes. 3 Q. Did you read the entire trial transcript? 4 MR. BLUMENKOPF: Objection, form. 5 A. I read portions of it, and I might have flipped 6 through other portions. But no, I didn't read cover to 7 cover the trial transcripts; but I certainly reviewed 8 and read portions. 9 BY MR. JENSEN: 10 Q. How did you decide what portions to read? 11 MR. BLUMENKOPF: Objection, form. 12 A. Well, in some cases I searched for words; and 13 then I reviewed context around -- I read the transcript 14 around those areas backing up to where I think the 15 beginning of a particular line of questioning would have 16 been. In other cases I may have been directed to 17 certain areas. 18 BY MR. JENSEN: 19 Q. What is the trial to which the trial 20 transcripts pertain? 21 MR. BLUMENKOPF: Objection, form. 22 A. I believe they relate to a trial and the two 23 parties where I think Microchip may have been the 24 plaintiff. That's what I recall right now. 25 BY MR. JENSEN:
Page 107 1 provided to you by counsel, or did you locate any of 2 them in the first instance on your own? 3 MR. BLUMENKOPF: Objection, form. 4 A. I mean, sometimes I'm not actually provided 5 with all the things. For example, the patents, I might 6 have a list that I might actually download my own copy; 7 but I would have been informed of what the patent 8 numbers were, you know, as opposed to -- but with 9 respect to other documents, I don't think I -- like the 10 2000 series, for example, I think those would have been 11 provided to me. Yeah. 12 To the extent there -- I might have asked 13 for something in some area but not a specific document. 14 I don't recall about how every document came to be on 15 this list. 16 BY MR. JENSEN: 17 Q. Did you read all of the materials listed in 18 paragraph 19 in their entirety? 19 MR. BLUMENKOPF: Objection, form. 20 A. I think there were some documents I would have 21 looked at the specific portions as opposed to reading 22 the whole thing. 23 BY MR. JENSEN: 24 Q. And you list toward the end of the table three 25 exhibits numbered 2040, 2041 and 2042, which are trial	Page 109 1 Q. Do you know what patents were asserted in that 2 trial? 3 MR. BLUMENKOPF: Objection, form. 4 A. I'm not sure I know that from memory or -- I 5 may have seen it. I just don't know. 6 BY MR. JENSEN: 7 Q. Whose idea was it to review the trial 8 transcripts? 9 MR. BLUMENKOPF: Objection, form. 10 A. I mean, it was probably -- probably it was 11 supportive of some of my opinions, typically relating to 12 the secondary considerations. And so I -- those 13 transcripts I probably didn't ask for myself. 14 BY MR. JENSEN: 15 Q. Are you familiar with the concept of a USB 16 host-to-host bridge? 17 MR. BLUMENKOPF: Objection, form. 18 A. I mean, I think I've heard or read the term 19 before. 20 BY MR. JENSEN: 21 Q. Does a USB host-to-host bridge comply with the 22 USB standard? 23 MR. BLUMENKOPF: Objection, form. 24 A. I don't know that that was part of my analysis; 25 but if you want to point me to somewhere in any of my

Page 110 1 declarations, I'd be happy to take a look. But I don't 2 recall that as -- that that was a part of my analysis 3 for my declarations. 4 BY MR. JENSEN: 5 Q. Let's switch gears a little bit and talk about 6 the Aptiv patents. Did you read the four Aptiv patents 7 at issue in these IPRs? 8 A. Yes. 9 Q. Did you understand the Aptiv patents? 10 MR. BLUMENKOPF: Objection, form. 11 A. I mean, yeah. I mean, I read them; but, you 12 know, I don't know if you're going to ask me about 13 specific things. But yeah, when I read them and review 14 them, I try to form an understanding of what they're 15 about as part of what I do. 16 By the way, you know, if we could take a 17 break within 10 or 20 minutes for lunch, I'm actually 18 getting a little hungry as long as we have food. 19 BY MR. JENSEN: 20 Q. Yeah. We'll definitely break for lunch. 21 So just to make sure I've got a clean 22 answer to this, do you understand the Aptiv patents? 23 A. Yeah. I form an understanding of the patents 24 that I review for cases. 25 Q. Is there anything that you didn't understand in	Page 112 1 of one of the things that was already around prior to 2 the invention, just giving some context for the 3 invention. 4 BY MR. JENSEN: 5 Q. And is the same true for figure 2? 6 A. Yeah. I mean, figure 2 differs in that there's 7 also an SD card connector; and that's what it points out 8 in column 5. But it's also being discussed in the 9 Background section. So it would be understood that 10 that's describing what's already out there. This is a 11 variation where now there's an SD card. 12 I remember seeing that in private 13 vehicles. You could plug in a memory stick so you could 14 play music or something off of it, for example. But I 15 am just telling you what the patent is saying. It's in 16 the Background section. 17 Q. And would your answer be similar for figure 3? 18 A. Yeah. Figure 3 is also described in the 19 Background section. It's directed to this tiered -- 20 multiple USB hubs can be tiered, and it's describing 21 that. So I think it is describing what people have 22 known to do already. It's not describing it as an 23 embodiment of the invention. 24 And there's a similar short description in 25 column 5 at line 21, starting there. But this is being
Page 111 1 the Aptiv patents? 2 MR. BLUMENKOPF: Objection, form. 3 A. I mean, I don't recall that, no. I tried to 4 form an understanding of what the patents are about and 5 specifically with respect to what the claims claim. 6 BY MR. JENSEN: 7 Q. Let's take a look at the -- we can go to the 8 '643 patent. Let me know if you've -- I'm sharing 9 figure 1 of the '643 patent, but you're welcome to look 10 at the hard copy as well. 11 Is figure 1 of the '643 patent an 12 embodiment of the alleged invention, or is it showing 13 the prior art? 14 MR. BLUMENKOPF: Objection, form. 15 A. So figure 1 is being discussed in the 16 Background section of the '643 patent specification. 17 If you look around column 2, actually 18 maybe the bottom of column 1, it's talking about vehicle 19 systems and what's kind of there already. And then 20 there's a short description of figure 1 on the next 21 page -- or column 5 rather that says, "Figure 1 22 illustrates a system where a multiple port self-powered 23 USB Hub functions to connect a single USB Host to a 24 plurality of USB ports." 25 So I think that is really discussing kind	Page 113 1 discussed in the background. So it's what people were 2 doing at the time and what was known. 3 Q. And when we get to figure 4, things change a 4 little bit. Would you agree with me that figure 4 is an 5 embodiment of the alleged invention in the Aptiv 6 patents? 7 A. Well, yes. Figure 4 is accompanied by a more 8 detailed explanation of the specification that, you 9 know, goes -- it's kind of -- they start off talking 10 about it in the detailed illustration of the embodiment 11 section in column 5 starting around line 50. But the 12 description goes on. So the figure is described as a 13 system which is in accordance with an embodiment of the 14 present invention. 15 So it's just one example of an embodiment, 16 and it is described in more detail in the specification 17 itself. 18 Q. And, in fact, figure 4 is the embodiment that 19 you used to describe the patent in your declarations, 20 correct? 21 A. Can you point me to where you're looking at 22 here. 23 Q. So, for example, in section VII of your 24 declaration titled "The Claimed Inventions" you have an 25 annotated version of figure 4.

Page 114 1 A. Well, I'm looking at the '643 declaration. I 2 do see that, both on the screen and in my declaration. 3 I do highlight figure 4; but there's more discussion in 4 there, too, figure 4 of the '643 patent. 5 Q. Yeah. So let's take a look at figure 4. Near 6 the top just underneath the label figure 4 do you see 7 the text "USB Hub Module"? 8 A. I do see that text in figure 4 of the '643 9 patent. 10 Q. What is a USB hub module? 11 A. Well, I'm looking at the '962 patent claim 1; 12 and if you look at it, there's a claimed USB hub module, 13 which it comprises a number of different elements. 14 So with respect to that claim, the claimed 15 USB hub module would have to have all the elements 16 listed in claim 1 to be the claimed USB hub module. 17 Q. In figure 4 of the Aptiv patent what is the USB 18 hub module? 19 MR. BLUMENKOPF: Objection, form. 20 A. Well, in figure 4 there's an example of -- this 21 is one example of an embodiment discussed. So there is 22 a label that says "USB Hub Module" on figure 4, and then 23 it's discussed in more detail in the specification. 24 But in order to be the claimed USB hub 25 module of the '962 -- and I note that the '420 patent	Page 116 1 hub." 2 There were a few other statements about 3 the USB hub module that we saw. But there is a further 4 description in the specification with respect to the 5 figure 4 in the label of the USB hub module. 6 But in order to be a claimed USB hub 7 module would require something to have all the elements 8 as laid out in the respective claims that recite that a 9 USB hub module comprises and listing elements, for 10 example, in the '420 patent claim 1, in the '962 patent 11 claim 12. 12 BY MR. JENSEN: 13 Q. Let me ask the question this way. In figure 4 14 is everything inside of the box that I've highlighted 15 part of the USB hub module? 16 MR. BLUMENKOPF: Objection, form. And, 17 Counsel, it looks like our lunch is here. So if you 18 reach a good stopping point, we'd appreciate a break. 19 A. Well, also within five minutes I would 20 appreciate that because I think I mentioned -- 21 BY MR. JENSEN: 22 Q. I'd appreciate it if you could answer my 23 question, and we can take a break. 24 Is everything inside the box part of the 25 hub module in figure 4?
Page 115 1 claim 1 also recites the USB hub module. To be those 2 claimed USB hub modules would require those elements be 3 cited in each of the respective claims to be present. 4 BY MR. JENSEN: 5 Q. Yeah. I'm just asking about figure 4. Can you 6 answer my question? With respect to figure 4, in 7 figure 4 what is the USB hub module? 8 MR. BLUMENKOPF: Objection, form. 9 A. Well, it's a label at the top of a box in 10 figure 4 where figure 4 is described in more detail in 11 the specification. And that's with respect to just 12 figure 4 and not as used in the claim -- as a claimed 13 USB hub module. 14 BY MR. JENSEN: 15 Q. Yeah. And my question is specific to figure 4, 16 what in figure 4 comprises the USB hub module? 17 MR. BLUMENKOPF: Objection, form. 18 A. Well, with respect to this example embodiment 19 that's shown in figure 4 and described in the spec, the 20 spec does talk about -- for example, column 6, line 5, 21 it talks about how the USB hub module of the -- sorry, 22 the '643 patent. "The USB hub module is configured such 23 that signals received from at least one USB port are 24 received by the switching device, and the switching 25 device routes the signals to the USB bridge or the USB	Page 117 1 A. Yeah. I mean, I'll answer your question. I 2 wanted to supplement that with I would really like to 3 take a break in five minutes at the most. 4 Q. Let me just ask the question again. In 5 figure 4 of the Aptiv patent is everything inside of the 6 box part of the USB hub module? 7 MR. BLUMENKOPF: Objection to form. 8 Counsel, it's not clear in the written record what 9 you're referring to by "highlighting inside the box," if 10 you can describe it for the record. 11 MR. JENSEN: I'll do a screenshot, and we 12 can make it an exhibit. It's the outer box. 13 BY MR. JENSEN: 14 Q. I'll ask a clean question. In figure 4 of the 15 Aptiv patent is everything located inside of the 16 external box part of the USB hub module? 17 MR. BLUMENKOPF: Objection, form. 18 A. So if you look at the description of figure 4, 19 you know -- for example, while figure 4 includes down 1, 20 I think FI the box, that stands for downstream 1. The 21 first downstream FI or physical interface is what FI is 22 short for. I don't see a specific description of it. 23 I don't know if I saw the digital logic 24 part of that specifically described, but there's also a 25 statement here that there could be other conventional --

Page 118 1 this is column 6, line 19 of the '643, "other 2 conventional structure not specifically shown in 3 figure 4 which would be readily assumed to be present by 4 one having ordinary skill in the art." 5 And I want to point out that this is -- 6 figure 4 is saying that it illustrates a system, which 7 is in accordance with an embodiment of the present 8 invention. Sorry. That's column 5, lines 49 and 50. 9 And I think this part of the -- this spec is the same 10 in, for example, the '420 and '962, which actually 11 claims in claim 1 a USB hub module that is -- that lists 12 a bunch of elements that describe what the claimed USB 13 hub module would have to include and how they would be 14 arranged. 15 MR. JENSEN: Move to strike as 16 nonresponsive. 17 BY MR. JENSEN: 18 Q. Let me ask the question this way, Dr. Houh. 19 What in figure 4 forms part of the USB hub module? 20 MR. BLUMENKOPF: Objection, form. 21 A. Well, figure 4 has a label at the top that says 22 "USB Hub Module." And there is a box around which -- 23 within which there are various labeled components. And 24 some of those components are described in more detail in 25 the specifications. Some I didn't see described some of Page 119 1 the labels and boxes within the outer box of figure 4 of 2 the '643. 3 But the specification does talk about this 4 as figure 4 illustrating a system which is in accordance 5 with an embodiment of the present invention. And there 6 are some embodiments claimed, specific embodiments 7 claimed in the '420 and '962 patents that claim a USB 8 hub module that comprises a number of elements. 9 So with respect to any claimed USB hub 10 modules in the challenged patents, they would have to 11 include all the elements as arranged in -- as elements 12 of the respective claims. 13 BY MR. JENSEN: 14 Q. Let me ask the question this way. Is there 15 anything shown in figure 4 that is not part of the USB 16 hub module? 17 MR. BLUMENKOPF: Objection, form. 18 A. Well, I mean, I think at the left there's a USB 19 cable at the head unit. I think that's outside the big 20 box. 21 BY MR. JENSEN: 22 Q. Is there anything else in figure 4 that is not 23 part of the USB hub module? 24 MR. BLUMENKOPF: Objection, form. 25 A. I mean, in this example illustration I think	Page 120 1 the only physical thing I -- explicitly physical thing I 2 see outside the big box that's highlighted in blue here 3 is the USB cable. 4 I mean, it's implying that there's 5 something out to the right with the consumer-facing 6 ports; but there's nothing -- that's really describing 7 these -- the ports that are -- it's just describing the 8 ports. 9 BY MR. JENSEN: 10 Q. Apart from the cable to the head unit and any 11 potential cables going to a consumer device, is there 12 anything else in figure 4 that is not part of the USB 13 hub module? 14 MR. BLUMENKOPF: Objection, form. 15 A. Well, in this example figure of an example 16 embodiment the figure itself doesn't have any other 17 additional things. But to be a claimed hub module you 18 have to look at the elements of the claims -- for 19 example, claim 1 -- 20 BY MR. JENSEN: 21 Q. Yeah. And let me just stop you. I'm not 22 asking about the claims. You keep trying to go there. 23 I'm just asking about figure 4. I understand you -- let 24 me ask you -- 25 A. Can I finish, please? I know -- just because Page 121 1 hub module is a claim term -- 2 Q. I'm trying to get you to your lunch break, 3 Dr. Houh. 4 A. I want to get to lunch, too. 5 Q. Let me just ask a clean question. 6 A. I understand that part of the ground rules in 7 every deposition is that you'll let me finish my answer. 8 I'll let you finish your question. I think it's common 9 courtesy to let me finish my question [sic]. 10 Q. I think it's common courtesy, Dr. Houh, to 11 answer the question you've been asked. 12 A. I'm trying to answer, but you're using a -- 13 Q. Let me ask the question. 14 A. -- I want to be sure my answer reflects that. 15 Could I please continue my answer? 16 Q. In figure 4 is there anything else -- 17 A. Could I please finish my previous answer? 18 Q. Not if you're going to talk about the claims 19 because my question has nothing to do with the claims. 20 I'm asking about a -- 21 A. You're asking about a term that is used in 22 the claims, so I want to be sure -- 23 Q. I'm asking about figure 4. You're being very 24 express. I'm being very explicit in my question. 25 In figure 4 outside the context of the
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1 claims is there anything inside of the box labeled "USB 2 Hub Module" that is not part of the USB hub module in 3 figure 4? 4 MR. BLUMENKOPF: Objection, form. 5 A. I mean, the problem with that is that the USB 6 hub module is used in the claims. So it's difficult to 7 divorce how you would use it in the claims from 8 outside the -- I get that it's used here. 9 But my point is that it is a claim term in 10 at least some of the challenged claims, and I have to 11 provide the context around that because it is a claim 12 term. It's a hypothetical situation where USB hub 13 module is not in any of the claims; and you're asking 14 about USB hub module in figure 4, which is still a claim 15 term. 16 BY MR. JENSEN: 17 Q. In figure 4 is there anything inside of the box 18 labeled "USB Hub Module" that is not part of the USB hub 19 module? 20 MR. BLUMENKOPF: Objection, form. 21 A. If you're just talking about figure 4 and not 22 about claims that claim certain elements be comprised -- 23 that comprise the USB hub module and the arrangements, 24 even with respect to other things that might not appear 25 on the figure 4, the big box with the label of "USB Hub	1 I'll accept any three of those answers. 2 MR. BLUMENKOPF: Objection, form. 3 BY MR. JENSEN: 4 Q. So let me just ask the question one more time, 5 Mr. Houh. Would you agree with me that in figure 4 the 6 components that are inside of the box labeled "USB Hub 7 Module" are intended to illustrate the components of a 8 USB hub module in figure 4? 9 MR. BLUMENKOPF: Objection, form. 10 A. Well, figure 4 is described as a system which 11 is in accordance with an embodiment of the present 12 invention. And some of those embodiments are 13 specifically claimed in some of the challenged patents, 14 for example, '420 claim 1 and '962 claim 1 and the 15 dependent claims that are dependent from that and 16 potentially other independent claims but at least those 17 two. 18 As an embodiment of the claimed invention, 19 you look to the claimed USB hub module and what they 20 comprise, but figure 4 is just an example illustration. 21 And yes, there are things inside the box in this example 22 illustration; but there are specifically claimed 23 embodiments of the USB hub module and what it comprises. 24 In order to meet those claimed USB hub 25 modules, something would have to have at least the
Page 123	Page 125
1 Module" in figure 4 is there are elements inside that 2 box. And there are some elements outside the box, as we 3 discussed, like USB cable is not inside the box. 4 So with respect to figure 4, USB cable is 5 one of the things that's not in the box. And the things 6 that are in the box are illustrated in this example of 7 an embodiment in figure 4. Those things are in the box 8 of figure 4. But with respect to the claim term, the 9 things that would represent the claimed USB hub module 10 are laid out in respective claims that recite USB hub 11 module and what it comprises. 12 BY MR. JENSEN: 13 Q. Would you agree with me then that in figure 4, 14 everything inside of the box is part of the USB hub 15 module? 16 MR. BLUMENKOPF: Objection, form. 17 A. So I'll try to answer this question, but after 18 I answer I would like to take a lunch break. 19 BY MR. JENSEN: 20 Q. Okay. 21 A. So could you repeat this question, please. 22 Q. You can say "yes" or "no." You keep talking 23 around the question. 24 Is everything in the box part of the hub 25 module or not; or you can say "I don't know," right?	1 elements that are claimed in those respective claims and 2 the dependent claims. So with that, that's the end of 3 my answer; but I would like to take lunch now. 4 MR. JENSEN: I move to strike that as 5 nonresponsive, and we'll reserve the right to leave this 6 deposition open at the end of tomorrow on that basis. 7 But we can go off the record. 8 THE VIDEOGRAPHER: The time is 12:49 p.m. 9 We're now going off the record. 10 (Luncheon recess) 11 THE VIDEOGRAPHER: The time is 1:29 p.m. 12 We're now back on the record. 13 BY MR. JENSEN: 14 Q. Welcome back, Dr. Houh. 15 A. Thank you. 16 Q. Let me ask you to turn to your '643 declaration 17 to paragraph 38, and I'll share that on the screen as 18 well. Are you there? 19 A. Yes. 20 Q. Paragraph 38 is in a section titled State of 21 the Art, Universal Serial Bus, correct? 22 A. Yes. 23 Q. And can you just read the highlighted sentence 24 in paragraph 38, and just read it aloud. Sorry. 25 A. "A hub is a device that routes multiple

Page 126 1 downstream ports into a single upstream port." 2 And that's paragraph 38 from my '643 3 supplemental declaration. 4 Q. Is that definition of hub that you gave 5 consistent with how the term is used in the USB 6 standards? 7 MR. BLUMENKOPF: Objection, form. 8 A. Well, I don't recall from memory what that 9 would say; but I think it's at least part of the 10 functionality of a hub. 11 BY MR. JENSEN: 12 Q. Were you intending to provide a definition of a 13 hub that is different from the USB standard? 14 MR. BLUMENKOPF: Objection, form. 15 A. I mean, I don't think that this is inconsistent 16 with anything that I recall from the standard. 17 BY MR. JENSEN: 18 Q. Okay. 19 A. This is simply just a statement of one of the 20 functions. It might not be recited exactly word for 21 word from any standards document. 22 Q. Using the statement that you gave in 23 paragraph 38, I want to ask you if figure 4 of the Aptiv 24 patent includes a hub? 25 MR. BLUMENKOPF: Objection, form.	Page 128 1 Q. What is the USB hub in figure 4? 2 MR. BLUMENKOPF: Objection, form. 3 A. So if you look at column 5, also line 53, 4 describing figure 4, it says, "The system is in the form 5 of a self-powered USB hub module having a USB bridge and 6 a switching device implemented as discrete devices. The 7 USB hub is preferably provided in the form of an 8 integrated circuit and is configured (via an upstream 9 USB port) connected to a vehicle's embedded USB host 10 (such as a USB host in a head unit) via vehicle internal 11 wiring such as in one embodiment, via a single USB data 12 cable between the head unit and USB hub." 13 So what it's describing here is that there 14 are -- of figure 4 is that there's a cable that connects 15 between the head end and the USB hub in this example. 16 So I think in this example, as described here, the -- 17 one example is -- what that would include is what this 18 cable is connected to, which indicates in figure 4 it's 19 connected to the big box. And that's one example 20 provided in the specification. 21 BY MR. JENSEN: 22 Q. And when you say "the big box," are you 23 referring to the largest box with the label "USB Hub 24 Module" above it? 25 MR. BLUMENKOPF: Objection, form.
Page 127 1 BY MR. JENSEN: 2 Q. I'll just ask the clean question. 3 Does figure 4 illustrate a hub as you have 4 used that term in paragraph 38 of your declaration? 5 MR. BLUMENKOPF: Objection, form. 6 A. So if you look at the '643 patent in column 5, 7 line 65, it talks about figure 4. This is in the 8 description of figure 4. And it says, "At least one 9 downstream USB port of the USB hub is connected to a 10 switching device such as USB analog multiplexing 11 switches, for example. This switching device is 12 configured to be connected to at least one USB port in 13 the vehicle connecting to a consumer device." 14 And then it goes on, but it also describes 15 the -- in the figure there's a cable to the head unit. 16 So I think this is certainly consistent with my 17 description in that there are multiple downstream ports. 18 So those are the consumer-facing. I think somewhere I 19 describe what the meaning of upstream versus downstream 20 is in my declaration, but there are certainly a couple 21 of downstream consumer-facing ports illustrated here. 22 Figure 4 might not use those exact same 23 words, but my description that we were just looking at 24 is consistent with what's shown here in figure 4. 25 BY MR. JENSEN:	Page 129 1 A. I am referring to that box that I think you 2 highlighted earlier, and I think you indicated that you 3 made a screenshot and would provide it as an exhibit. 4 I'm not sure if that was done. 5 BY MR. JENSEN: 6 Q. Let me just do that right now. 7 MR. JENSEN: I am dropping into the Chat 8 window right now what has been labeled as Houh 9 Exhibit 0001, which is a highlighted version of 10 figure 4. 11 (Exhibit 0001 was marked for 12 identification.) 13 BY MR. JENSEN: 14 Q. And can you confirm, Dr. Houh, that you 15 received that; and it's the highlighted image that you 16 were referring to? 17 A. Yeah. I think I do see it. It appears to be. 18 But just for the record, I don't know -- this is from 19 the '643, figure 4, patent figure 4. And I understand 20 someone is going to archive this, but I'm just going to 21 save that on my desktop somewhere. 22 Q. So the question I have for you, Dr. Houh, is in 23 figure 4 what is the difference between a USB hub module 24 and a USB hub? 25 MR. BLUMENKOPF: Objection, form.

Page 130 1 A. Well, in the description of figure 4 it 2 specifically says at line 56, it says, "The USB hub is 3 preferably provided in the form of an integrated 4 circuit," and it goes on. 5 But figure 4 doesn't specifically say what 6 form this might take, but in the example it says the 7 form of a USB hub is that it's in an integrated circuit. 8 BY MR. JENSEN: 9 Q. In your view is a USB hub module and a USB hub 10 the same thing? 11 MR. BLUMENKOPF: Objection, form. 12 A. I mean, in one of the examples listed here in 13 the specification it talks about how the cable is 14 interconnected between the head unit and the USB hub. 15 And I think one could see that there is a separately 16 labeled US -- sorry. 17 The figure doesn't say what form that USB 18 hub module takes, but it does talk about USB hub 19 integrated circuit here in figure 4. And there is a 20 description of the IC, which is interconnected to the 21 head unit. 22 But, again, the hub module, as claimed in 23 the '420 and '962 at least, requires very specific 24 things; and I think we can go look at those claims to 25 see if they require -- if the USB hub is part of that.	Page 132 1 for example, in the '962 patent claim 1 what is claimed 2 as a "USB hub module comprises" is that one of the 3 elements in -- I'd say it's the third element, but I 4 don't remember how I labeled them in my declaration. 5 What I'm looking at on line 24 of the '962 6 patent -- and this is one of the elements that the USB 7 hub module comprises. It comprises a USB hub 8 integrated -- sorry, interconnected to the upstream USB 9 port, and it goes on. 10 So at least one of the claims -- in one of 11 the claims the claimed USB hub module comprises a USB 12 hub. 13 BY MR. JENSEN: 14 Q. And that's consistent with what's shown in 15 figure 4, correct? 16 MR. BLUMENKOPF: Objection, form. 17 A. So the USB hub IC, being a USB hub in 18 integrated circuit form, is shown in this example 19 figure 4, example embodiment, is within the larger box 20 USB Hub Module. 21 MR. JENSEN: Let me introduce another 22 exhibit into the Chat, and this will be Exhibit 1082. 23 (Exhibit 1082 was marked for 24 identification.) 25 BY MR. JENSEN:
Page 131 1 I know that there are other elements that are USB 2 elements that those claims require, but we can look at 3 those. The USB hub I see is what's shown here in 4 figure 4 that the head unit is attached to. 5 BY MR. JENSEN: 6 Q. Is the USB hub IC in figure 4 a USB hub as 7 you've used that term in paragraph 38 of your 8 declaration? 9 MR. BLUMENKOPF: Objection, form. 10 A. Well, as the -- in figure 4 it does show a box 11 labeled "USB Hub IC" with down 1 FI, down 2 FI and 3 FI; 12 and those are downstream physical interfaces. FI is 13 typically short for physical interface. 14 So I think there are multiple of them, and 15 there's only one port in connection with to the head 16 end. So this USB hub IC is consistent with how I use 17 that in my report, as we saw earlier. 18 BY MR. JENSEN: 19 Q. And the USB hub IC in figure 4 is located 20 inside of what is labeled the "USB Hub Module," correct? 21 MR. BLUMENKOPF: Objection, form. 22 A. So in this example embodiment shown in figure 4 23 it does talk about -- it does show that there's a USB 24 hub IC within the box labeled "USB Hub Module." 25 But specifically with respect to claims,	Page 133 1 Q. Let me know when you've got that. 2 A. It's 1082 to which matter? 3 Q. It's a new Exhibit 1082. 4 A. Okay. 5 Q. Do you have a copy of that? 6 A. Would they be in those boxes? I see what's on 7 your screen. I don't have a copy in front of me. 8 Q. I dropped it into the Chat window. 9 A. I see it. I have it open now. 10 Q. I'll represent to you this is simply a listing 11 of the independent claims from the four patents with the 12 identifiers added since you were trying to reference a 13 particular claim element in the '962, and these are 14 intended to correspond with what the parties have used 15 in the proceedings. 16 So if we look at the '962 patent claim 1, 17 I think you were referring to what's labeled as claim 18 element 1[c][i], a USB hub interconnected to the 19 upstream USB port? 20 A. Yes. That was what I was referencing, that 21 element in the '962 that is in this chart for the '962 22 claim 1, 1[c][i]. 23 Q. Dr. Houh, did you analyze whether figure 4 of 24 the Aptiv patents reads on any of the challenged claims? 25 MR. BLUMENKOPF: Objection, form.

Page 134 1 A. I was mostly responding to the actual 2 combinations set forth by petitioner. So I don't think 3 that was part of my analysis. 4 BY MR. JENSEN: 5 Q. Do you have an opinion on whether figure 4 6 reads on any of the challenged claims? 7 A. I don't think I have an opinion in my 8 declarations about that. I mean, claim 4 was not the 9 prior art challenge combination or whatever. So I don't 10 think it was part of my analysis. 11 I mean, if you think I did, we can look at 12 it. I'll let the declarations stand for themselves. 13 But I don't think I include that as part of my analysis. 14 Q. Let's go back to figure 4, and let me ask a 15 high-level question here. 16 Do you have an understanding, Dr. Houh, of 17 how figure 4 operates? 18 MR. BLUMENKOPF: Objection, form. 19 A. Well, I reviewed the specification for this 20 example figure 4. 21 BY MR. JENSEN: 22 Q. Yeah. So how does the USB hub module in 23 figure 4 work? 24 MR. BLUMENKOPF: Objection, form. 25 A. So if you look at the pin specification for	Page 136 1 the specification. 2 BY MR. JENSEN: 3 Q. And the idea is that the USB hub module would 4 be able to route a connected USB product through the 5 bridge IC if it's in host mode and around the bridge IC 6 if the connected USB product is in device mode? 7 MR. BLUMENKOPF: Objection, form. 8 A. Well, I think we can just look at the 9 specification because I think it -- I might not take 10 issue with what you said there. But the specification 11 is saying, if you look at column 6, line 25, "The HU" -- 12 and that stands for head unit -- "software application 13 may choose to enable, for example, a phone on any one of 14 the consumer USB ports by requesting, commanding or 15 otherwise knowing the phone is required to be in the USB 16 host mode and commanding the routing of the specific USB 17 port the phone is attached to to the USB bridge." 18 And that is how the host mode is routed -- 19 devices are routed. Devices are routed to the USB 20 bridge. And then it says, "Once routed to the USB 21 bridge, the phone will detect the USB device is 22 connected and the phone will begin the standard USB 23 enumeration sequence." 24 It goes on. That details more of the 25 operation. Let me see if I can find the device mode
Page 135 1 this specific example given in figure 4, if you look at 2 column 6, line 23, it talks about how in use the head 3 unit controls the switching device via the USB bridge 4 hardware or any other convenient means of control. 5 If you look at figure 4, in this example 6 shown in figure 4, it shows that there is the switch 7 control arrow from the bridge to the USB routing 8 multiplexing switches. That's the one. And that's part 9 of -- that's within in the hub module. 10 But the specification goes really beyond 11 just this particular example in that it says that there 12 could be any other convenient means of control. But for 13 here it does talk about how the head unit is controlling 14 the switching device via the USB bridge hardware. 15 So I think figure 4 is just an 16 illustration. So it's not going to show all the 17 details. But the description here says that the head 18 unit is controlling the switching device but via the USB 19 bridge. And I think that's why in figure 4 it's showing 20 switch control from the bridge to the USB routing 21 multiplexing switches. 22 The specification goes a little further in 23 that even in this example it's saying that the head unit 24 is still the one controlling the switching device. So 25 that's at least part of how it's operating as taught by	Page 137 1 description. I think it's in here. 2 BY MR. JENSEN: 3 Q. Well, let me direct you to your declaration, if 4 I could, to paragraph 48. I think you're getting sort 5 of more in the weeds, and I'm just trying to understand 6 big picture thing here. 7 So if we look at paragraph 48 of your 8 declaration, you include an annotated version of 9 figure 4. 10 MR. BLUMENKOPF: This is the '643 11 declaration, right? 12 MR. JENSEN: Sure. But you can look at 13 any of them because they're all the same. 14 A. Well, I know that's not true. There are 15 variations in the declarations. 16 BY MR. JENSEN: 17 Q. Well, they're all the same with respect to this 18 image that we're talking about. 19 A. Well, okay. I don't know if you're making a 20 representation or you want me to look. 21 Q. I'm just pointing that out. So my question is 22 about the annotated version of figure 4 that you have in 23 your declarations. 24 MR. BLUMENKOPF: Just to be clear, 25 Counsel, it's not true that this is the same across all

Page 138 1 five declarations. For example, if you look at the 2 supplemental declaration for the '495 proceeding, it's a 3 different paragraph 48. So I do think we need to 4 clarify which declaration -- 5 MR. JENSEN: Yeah. I'm just saying 6 figure 4 is the same and the annotations are the same, 7 right? I don't think there's an issue here. 8 BY MR. JENSEN: 9 Q. Pick whatever declaration you would like, 10 Dr. Houh, to look at and find the annotated version of 11 figure 4 that you used to describe the patent. 12 A. While the figure looks the same in all three, 13 the paragraph numbering is different in the '420 '495 14 case; and so it's actually a different paragraph number. 15 But the figure here looks the same in all five. 16 BY MR. JENSEN: 17 Q. In the figure you show an orange path that 18 you've labeled "device mode path" and a blue path that 19 you've labeled "host mode path," correct? 20 MR. BLUMENKOPF: Objection, form. 21 A. Yes. 22 BY MR. JENSEN: 23 Q. Okay. And what did you intend to convey by 24 highlighting and annotating those two different paths? 25 MR. BLUMENKOPF: Objection, form.	Page 140 1 communications between the head unit and the host 2 device, let's say phone, are going through the bridge. 3 BY MR. JENSEN: 4 Q. And the idea is that depending on the mode of 5 the connected downstream product, it can be routed 6 through the bridge or around the bridge? 7 MR. BLUMENKOPF: Objection, form. 8 A. Well, I mean, if the device -- sorry. If the 9 phone is in device mode or if it's just another type of 10 device, then the communication path does not go through 11 the bridge IC. That's part of what's being illustrated 12 here in figure 4. 13 BY MR. JENSEN: 14 Q. And that's the orange line path? 15 A. Yes. The orange line path represents device 16 mode path. 17 Q. And if the downstream product is in host mode, 18 the USB hub module will route it through the bridge to 19 the upstream port to create a host-to-host connection. 20 Is that correct? 21 MR. BLUMENKOPF: Objection, form. 22 A. I think if you look at the specification of the 23 '643 -- you know, we were looking at this earlier around 24 lines 26 through 30 -- it talks about "commanding or 25 otherwise knowing the phone is required to be in USB
Page 139 1 A. Well, I'm indicating that it's -- the involved 2 use of the bridge structure allows two separate hosts to 3 send data back and forth so that both the head unit 4 acting as a host and a user's connected device when it's 5 connected to, for example, the connector 1 and it's in 6 host mode, then it's the bridge that allows the host to 7 communicate. So the communications path is through the 8 bridge in that case. 9 I don't see it in this paragraph; but it's 10 also when the device is acting as just a device and it 11 turns into device mode, then the communication path is 12 not going through the bridge IC. And that allows the 13 head unit to control the device as a device. 14 BY MR. JENSEN: 15 Q. Is that your understanding that there is a host 16 connected on the upstream port side of figure 4? 17 MR. BLUMENKOPF: Objection, form. 18 A. Yes. I mean, I think if you look at the 19 specification, it makes that clear that it's -- you 20 know, we were just looking at it then. It did talk 21 about the port the phone was attached to. That's 22 column 6 in the '643 patent, line 29. 23 So yes, I mean, figure 4 doesn't 24 illustrate an actual phone connected to the port. But 25 in operation when there is and it's in host mode, the	Page 141 1 host mode in commanding the routing of the specific USB 2 port the phone is attached to to a USB bridge. And once 3 routed to the USB bridge, the phone will detect the USB 4 device is connected to the phone. The phone will detect 5 a USB device is connected, and the phone will begin 6 standard USB enumeration sequence." 7 BY MR. JENSEN: 8 Q. Yeah. And so if you've got a downstream USB 9 product in host mode, the system is designed so that it 10 will establish a host-to-host connection with the 11 upstream host by routing the signals through what's 12 labeled the bridge IC? 13 MR. BLUMENKOPF: Objection, form. 14 A. Yeah. And a little more detail is that the 15 phone host is detecting there's a USB device connected 16 to it now, and it starts enumerating -- it begins a 17 standard USB enumeration sequence. 18 There's just a little more detail in this 19 specification that's clearly like not shown in the 20 figure because the figure itself doesn't show all the 21 details of the operation. 22 BY MR. JENSEN: 23 Q. But the idea is that you can establish either a 24 device mode path or a host mode path depending on the 25 mode of the downstream phone?

Page 142 1 MR. BLUMENKOPF: Objection, form. 2 A. That's part of what's being illustrated here in 3 the figure, yeah. 4 BY MR. JENSEN: 5 Q. And the figure includes a box that's labeled 6 "USB routing multiplexing switches." Do you see that? 7 A. Yes. 8 Q. What function does that component perform? 9 MR. BLUMENKOPF: Objection, form. 10 A. Well, one example from the specification, it 11 says -- if you look at the bottom of column 5, line 65 12 in the '643 patent, it says that "At least one 13 downstream USB port of the USB hub is connected to a 14 switching device (such as USB analog multiplexing 15 switches, for example.)" 16 And it says that, "The switching device is 17 configured to be connected to at least one USB port in 18 the vehicle for connection to a consumer device." 19 So part of the functionality of the 20 switching device, which one example is a USB analog 21 multiplexing switch, is that it can be configured to be 22 connected to at least one USB port in the vehicle so 23 that a consumer device can be connected to it. 24 BY MR. JENSEN: 25 Q. Yeah. But what does it do in figure 4?	Page 144 1 ways. 2 A. Yeah. So one example is that the host units 3 controlling the switching device via the USB bridge so 4 that there would be a control signal that goes through 5 the bridge -- in this example, figure 4, through the 6 bridge IC, which you can see there's a switch control 7 label and a line to the USB routing multiplexing 8 switches. So that's one of the examples from the 9 specification. 10 Q. Yeah. And my question is different, right, 11 because the specification -- I think you're looking at 12 column 6, lines 23 to 25? 13 A. Yes. I was looking there in the '643 patent. 14 Q. Yeah. And I'll just read that. It says, "In 15 use, the head unit controls the switching device via the 16 USB bridge hardware or any other convenient means of 17 control." 18 So my question is can you give me an 19 example of any other convenient means of control. 20 A. It could be that the head unit is not going 21 through the bridge, but there could be a line directly 22 from the appropriate place going to the head unit that 23 does not go through the bridge. 24 Q. Can you think of any other examples? 25 A. I mean, it could go -- it could simply go
Page 143 1 MR. BLUMENKOPF: Objection, form. 2 A. Well, one thing the spec is describing is that 3 it can be configured to connect a port. And as I show, 4 there are multiple paths that the device can be 5 configured to support. 6 BY MR. JENSEN: 7 Q. How is the USB routing multiplexing switch 8 configured to connect, as you described it? 9 MR. BLUMENKOPF: Objection, form. 10 A. Well, one thing, we were looking at column 6, 11 line 23. It says that "The head unit controls the 12 switching device via the USB bridge hardware or any 13 other convenient means of control. " 14 So one example given as shown in the spec 15 is that the -- there's a switch control label on a line 16 that goes from the bridge IC to the switch, and that's 17 how the switch is controlled. But ultimately what the 18 spec says is that the head unit is controlling the 19 switching device but via the USB bridge hardware. I 20 might add or any other convenient means of control. 21 So there are lots of ways that the 22 switch -- that the patent is disclosing about how the 23 switch can be controlled. 24 BY MR. JENSEN: 25 Q. Can you give me an example of one of those	Page 145 1 through the hub IC at some point. There could be a path 2 for control. 3 I mean, I think a person of ordinary 4 skill -- I mean, that's just what it's saying, other 5 means of control. So I think -- that's what it's 6 saying, and I've given at least one or two. 7 Q. Does the patent disclose any means of 8 controlling the USB routing multiplexing switch that do 9 not involve receiving a host device command from the 10 head unit? 11 MR. BLUMENKOPF: Objection, form. 12 A. Well, I think it says, for example, in 13 column 6 -- it starts at line 25; but what I'm looking 14 at is a little farther down but a part of that sentence 15 which is, "The HU software application may choose to 16 enable, for example, a phone on any one of the consumer 17 USB ports by requesting, commanding or otherwise knowing 18 the phone is required to be in USB host mode and 19 commanding the routing of a specific USB port the phone 20 is attached to to the USB bridge. Once routed to the 21 USB bridge, the phone will detect a USB device is 22 connected and the phone will begin the standard USB 23 enumeration sequence." 24 So it doesn't specifically say that it's 25 done by a USB host mode command. I think it's a

Page 146 1 little -- it says "commanding the routing of the 2 specific USB port the phone is attached to to the USB 3 bridge." 4 So I think what a person of ordinary skill 5 would understand from that is a USB host mode command is 6 not the only way to command the routing of a specific 7 USB port the phone is attached to. 8 BY MR. JENSEN: 9 Q. What are all the ways that a POSITA would know 10 to do that? 11 A. Well, I can give you an example. One might be 12 there is a separate command that's not a host mode 13 command that's simply a different command that can be 14 sent to that control. 15 Q. What would send that command? 16 MR. BLUMENKOPF: Objection, form. 17 A. Well, in this particular example the head unit 18 is controlling the switching. And in some cases the 19 command is sent via other portions of the USB hub 20 module, but it doesn't have to be through those same 21 portions or via those same elements. 22 So the command doesn't necessarily have to 23 be a USB host mode command. It doesn't have to -- the 24 specification talks about it sending -- commanding 25 generally. It doesn't give the form of the command to	Page 148 1 Q. Any other examples you can think of? 2 A. Sometimes commands are -- or data bits are sent 3 through latches that are on a global clock so that they 4 can be held and stored for a cycle of -- a switching 5 cycle, for example. 6 I'm certainly not going to be able to tell 7 you all of them in the time we have. If you want, I can 8 try to think of more examples. 9 Q. Well, let me ask this. Are all of the examples 10 that you just gave things that are within the knowledge 11 of a POSITA? 12 MR. BLUMENKOPF: Objection, form. 13 A. I mean, I really haven't discussed the world of 14 how to command in my declaration, you know. I'm just 15 trying to be helpful here. This kind of analysis about 16 all possible forms of doing something was certainly not 17 something I included in my analysis. That wasn't really 18 what was at issue. 19 BY MR. JENSEN: 20 Q. Would you agree with me, though, that there are 21 many ways that a system could determine whether a 22 connected downstream USB product was in host or device 23 mode? 24 MR. BLUMENKOPF: Objection, form. 25 A. That sounds like a very different topic than we
Page 147 1 necessarily be a USB host mode command. 2 BY MR. JENSEN: 3 Q. And because of that my question is what are all 4 the commands that a POSITA would know of that could be 5 used to send a host or device selection? 6 MR. BLUMENKOPF: Objection, form. 7 A. Well, I certainly can give examples. You would 8 need to give me a lot of time to come up with the world 9 of all of them. 10 For example, in one of the switches I 11 helped design we would have direct control lines 12 pointing from the control -- switching control unit 13 directly to the switch fabric itself. 14 BY MR. JENSEN: 15 Q. What do you mean by a direct control line? 16 A. I mean traces on a circuit board that go from 17 the command -- I believe it might have been a -- I don't 18 remember the form, but it was from part of the circuit 19 going to the switching part of the circuit as copper 20 traces on a circuit board substrate. 21 Q. Any other examples you can think of? 22 A. Yeah. Sometimes those circuit board traces are 23 laid out in a very specific way, so they act as a wave 24 guide as opposed to more of a wire. Sometimes people 25 use optical interconnections for some signals like that.	Page 149 1 were just talking about. I thought we were talking 2 about controlling the USB routing multiplexing switches. 3 I mean, I haven't really talked about -- 4 your question is -- it wasn't really part of my analysis 5 because I didn't understand the petition to raise an 6 issue like that. 7 I mean, the petition was very specific 8 about a detection unit within the bridge of Chang II and 9 relied on that. There's really only one way that I 10 understood -- at least that was the primary way 11 petitioner relied on for that kind of detection. 12 BY MR. JENSEN: 13 Q. We'll come back to that topic. 14 MR. JENSEN: Could the reporter read back 15 my original question. 16 (The record was read as requested.) 17 MR. BLUMENKOPF: Same objection. 18 A. I mean, that wasn't part of my analysis with 19 respect to the petition because my understanding is the 20 petition only raised really one way and relied on the 21 detection circuit in Chang II as the way the device -- 22 that relied on that detection unit in Chang II inside 23 the bridge of Chang II to perform the device detection. 24 So this hypothetical wasn't part of my 25 analysis because the petition was focused on the

Page 150 1 detection unit in Chang II, and that's all that I 2 believe it set forth is for all the independent claims. 3 BY MR. JENSEN: 4 Q. And because of that you didn't analyze the 5 question that I had just posed? 6 MR. BLUMENKOPF: Objection, form. 7 A. Well, I was responding to what was raised in 8 the petition and that was the only detection unit 9 configured to detect whether the downstream device was 10 in host or device mode and that was within the bridge of 11 Chang II. That's the configuration that was raised, and 12 other hypothetical configurations that were not raised 13 were not part of my analysis. 14 BY MR. JENSEN: 15 Q. I'm not asking about Chang II. I haven't 16 mentioned Chang II. I'm just asking now in the context 17 of the Aptiv patents themselves, is it your opinion that 18 a POSITA would know many ways to perform host device 19 detection? 20 MR. BLUMENKOPF: Objection, form. 21 A. I have not discussed that point. That's not an 22 issue I provide an opinion about in my report. 23 Mainly the detection unit that was 24 discussed in the petition was the detection unit in 25 Chang II, and that's what I was responding to. These	Page 152 1 did consider, which is the Chang reference in 2 Exhibit 1014. Do you recognize Exhibit 1014 as the 3 Chang reference? 4 A. Well, from these first pages you're showing me, 5 sure. It looks about right. 6 Q. And what is shown in Chang figure 1? 7 MR. BLUMENKOPF: Objection, form. 8 THE WITNESS: Can I get a copy of that 9 from -- it must be in those boxes somewhere. 10 MR. BLUMENKOPF: Yes. We have a printed 11 copy of this. 12 A. I think there must be a copy -- can I open up 13 an electronic copy that's part of the exhibits that were 14 provided? 15 BY MR. JENSEN: 16 Q. Yeah, that's fine. And I'm sharing it on the 17 screen as well. You're welcome to use an electronic 18 local copy if you'd like. 19 A. I'm sorry. I have it open now; but could you 20 repeat the pending question, please? 21 Q. Yeah. What is shown in Chang figure 1? 22 MR. BLUMENKOPF: Same objection. 23 A. So the description of figure 1 in the Chang 24 specification in paragraph 12 says that "Figure 1 is a 25 schematic view of a personal computer linked to various
Page 151 1 other hypotheticals weren't part of my analysis. 2 BY MR. JENSEN: 3 Q. Did you review the Castleberry reference as 4 part of your analysis? And that's Exhibit 1025. 5 A. I don't see Exhibit 1025 listed in my list of 6 my materials considered in any of my supplemental 7 declarations. 8 Q. And I think you testified earlier that you did 9 review both the petition -- or all of the five IPR 10 petitions and expert declarations of Mr. Welch when 11 preparing your report. Is that correct? 12 MR. BLUMENKOPF: Objection, form. 13 A. I mean, I certainly have Mr. Welch's respective 14 declarations in each case listed among the materials 15 considered in each of my respective cases. 16 BY MR. JENSEN: 17 Q. Is there a reason that you didn't review the 18 Castleberry reference cited by Mr. Welch in the 19 petitions when forming your opinions? 20 MR. BLUMENKOPF: Objection, form. 21 A. I simply said that I -- Exhibit 1025 does not 22 appear in my list of the materials considered. That's 23 not part of my materials considered. 24 BY MR. JENSEN: 25 Q. Okay. Let's look at something that I think you	Page 153 1 devices via a conventional USB hub," and the figure 2 itself calls figure 1 the prior art. 3 BY MR. JENSEN: 4 Q. So figure 1 is a conventional USB hub, correct? 5 MR. BLUMENKOPF: Objection, form. 6 A. That's one thing this is described as in the 7 specification of Chang. 8 BY MR. JENSEN: 9 Q. And you don't have any reason to doubt the 10 accuracy of that statement, do you? 11 MR. BLUMENKOPF: Objection, form. 12 A. No. It's a high-level diagram, though. I 13 mean, I personally wouldn't have called this a 14 schematic; but that's what Chang calls it. 15 BY MR. JENSEN: 16 Q. And it's got an upstream host connected on 17 port 12, correct? 18 MR. BLUMENKOPF: Objection, form. 19 A. So if you look at the further description of 20 figure 1 in paragraph 17 of Chang, it talks about, 21 "Referring to figure 1, a USB hub 10 has an uplink port 22 12 for being linked to a personal computer (PC) 20." So 23 I think that's what it's describing. 24 BY MR. JENSEN: 25 Q. So port 12 is a host port, right?

Page 154 1 MR. BLUMENKOPF: Objection, form. 2 A. I mean, the spec doesn't say that; but I think 3 we recognize that it's the host, that the PC is the host 4 device on this hub. 5 BY MR. JENSEN: 6 Q. And there's four downlink ports all labeled 14, 7 correct? 8 MR. BLUMENKOPF: Objection, form. 9 A. Yeah. I mean, paragraph 17 says "several 10 downlink ports 14 for being linked devices." 11 BY MR. JENSEN: 12 Q. And figure 1 shows four devices, one each 13 connected to a downstream port 14? 14 MR. BLUMENKOPF: Objection, form. 15 A. So Chang uses the phrase "downlink," but I 16 wouldn't dispute your characterization. 17 BY MR. JENSEN: 18 Q. And the four devices that are connected on the 19 downlink ports are labeled flash disk, MP3 player, 20 digital camera and PDA, correct? 21 MR. BLUMENKOPF: Objection, form. 22 A. In figure 1 of Chang that's how they're 23 labeled. 24 BY MR. JENSEN: 25 Q. What would happen if the downstream PDA device	Page 156 1 Q. Do you have an understanding as a POSITA and an 2 expert what would happen to the connections of the flash 3 disk, MP3 player and digital camera in Chang figure 1 if 4 the PDA were unplugged? 5 MR. BLUMENKOPF: Objection, form. 6 A. I mean, generally speaking, in a -- like, for 7 example, on my PC when I unplug a device from one port, 8 it generally -- sometimes it does because I've had 9 things crash and drivers act badly before. It generally 10 doesn't disconnect other devices. 11 But in the combination I analyze in the 12 petition the combination is a combination of Chang, 13 Chang II and the person of ordinary skill's knowledge. 14 That does break the basic principles of operation of USB 15 and of Chang II. It basically eliminates the main 16 features, you know, for example, provided in Chang II. 17 And I outline those reasons why no one 18 would make the combination -- no POSITA would make the 19 combination that is set forth in the petitions for the 20 reasons I lay out in the respective declarations because 21 they -- you know, that combination is not a standard USB 22 hub. 23 It's Chang I modified with Chang II to 24 break many of these capabilities that would be present 25 and break some of the features such as hot swapability.
Page 155 1 was unplugged? 2 MR. BLUMENKOPF: Objection, form. 3 A. Well, there would cease to be any 4 communications between the PC and the device that was 5 unplugged. 6 BY MR. JENSEN: 7 Q. Would the other devices lose their connections 8 to the upstream host? 9 MR. BLUMENKOPF: Objection, form. 10 A. Well, I mean, it depends on -- this shows 11 nothing of the internal of the hub. So I do understand 12 that the -- that there are instances in a challenged 13 combination where, depending on what's done and what's 14 plugged in on various ports in the combination, other 15 downstream ports would lose their connection, at least 16 in the combinations set forth in the petition. 17 But Chang doesn't talk about what happens 18 in that case here in paragraph 17, and I haven't 19 provided -- it wasn't part of my analysis with respect 20 to Chang in my declarations, I don't believe, because I 21 was responding to the petition's specific combinations 22 in cases where connectivity would be lost to downstream 23 devices in the proposed combinations, in the situations 24 I describe in my supplemental declarations. 25 BY MR. JENSEN:	Page 157 1 And I outline those in my declaration. 2 BY MR. JENSEN: 3 Q. Yeah. So my question is just about Chang right 4 now. I'm not asking about a combination or a 5 modification. I'm not asking any of that stuff. I'm 6 just asking only about what's labeled prior art, a 7 conventional USB hub in Chang I. 8 I would like to know, do you have an 9 understanding as a POSITA and an expert in this field 10 whether unplugging the PDA in figure 1 of Chang would 11 disrupt the connections of the other three downstream 12 devices? 13 A. So I don't think that the operation of Chang 14 individually was part of my analysis in that way you 15 propose because it was a combination of Chang, Chang II 16 and the knowledge of a person of ordinary skill. That 17 was the combination that I analyzed with respect to some 18 of these points about why there's a lack of motivation 19 to combine. And I've outlined those in the respective 20 supplemental declarations. 21 Chang itself I don't see in paragraph 17 22 or 18 discussing that particular situation. 23 Q. Is it fair to say then that you don't have an 24 opinion one way or the other whether unplugging the PDA 25 in Chang figure 1 would disrupt the connections of the

Page 158 1 other three downstream devices? 2 MR. BLUMENKOPF: Objection, form. 3 A. I don't think that was part of my analysis with 4 respect to what was set forth in the petition, which 5 wasn't the challenge based on Chang alone. So I 6 didn't -- I don't think I include in my analysis the 7 hypothetical other things that were not in the petition 8 with respect to how that would work. 9 I analyzed how the proposed combination 10 would work, and I provided opinions mostly in the 11 sections -- or partly in the sections about motivation 12 to combine or lack thereof in my respective supplemental 13 declarations. 14 BY MR. JENSEN: 15 Q. Does the USB standard specify how a hub should 16 operate with respect to connecting or disconnecting 17 downstream devices in a hub? 18 MR. BLUMENKOPF: Objection, form. 19 A. Sorry. Could you repeat the question, please. 20 BY MR. JENSEN: 21 Q. Does the USB standard specify what should 22 happen in a USB hub if you unplug one of the downstream 23 devices? 24 MR. BLUMENKOPF: Same objection. 25 A. I mean, I don't think I -- I don't think that	Page 160 1 figure 3 in the specification. 2 BY MR. JENSEN: 3 Q. Would you agree with me that Chang figure 3 4 shows four downstream ports? 5 MR. BLUMENKOPF: Objection, form. 6 A. Well, again, Chang doesn't use the term 7 "downstream ports." It uses two terms referring to 8 those rectangles at the bottom. One is downlink port 9 44, and the other is host port 50. 10 BY MR. JENSEN: 11 Q. And those are all, as you use the term in your 12 declaration, downstream ports as opposed to upstream 13 ports, correct? 14 MR. BLUMENKOPF: Objection, form. 15 A. I don't think I'd agree with that. 16 BY MR. JENSEN: 17 Q. Why not? 18 A. Can you point me to or allow me to search my 19 declaration so I can find where I talk about downstream 20 ports? 21 Q. Yeah. You can look at whatever you'd like. 22 A. So -- 23 Q. And I might be able to help you out if you look 24 at paragraph 99 of your report. 25 A. You're referring to the '643 supplemental
Page 159 1 was part of my analysis with respect to a standard USB 2 because a standard USB was not the basis of any -- 3 standard USB alone was not the basis of a challenge, I 4 don't believe. 5 Most of the challenges were based on the 6 combination of Chang, Chang II and a person of ordinary 7 skill's knowledge. Maybe there are other grounds based 8 on Chang II in some other documents, along with I think 9 also person of ordinary skill. 10 So my analysis was with respect to the 11 actual challenges set forth in the petitions, and I 12 respond to them in the respective declarations. 13 BY MR. JENSEN: 14 Q. Let's look at Chang figure 3. Do you recognize 15 Chang figure 3? 16 A. Yes. 17 Q. What's shown in Chang figure 3? 18 MR. BLUMENKOPF: Objection, form. 19 A. In paragraph 14 Chang describes figure 3 as "a 20 schematic view of a hub according to the present 21 invention" and lists further details about figure 3 22 starting at paragraph 19 in Chang and maybe even going 23 as far as -- at least as far as paragraph 22. And there 24 may be further discussion relevant to figure 3, but 25 there is a section that looks like it's directed towards	Page 161 1 declaration? 2 Q. Sure. 3 A. I'm not seeing what you're seeing in 99, but I 4 was looking at paragraph 37 of my '643 supplemental 5 declaration. And what I say here is that "The direction 6 of data flow in a USB network is described relative to 7 the USB host. Upstream means the direction of data flow 8 towards the host. Downstream means the direction of 9 data flow away from the host." 10 Q. Yeah. So using that in -- sorry. Go ahead. 11 A. Well, it continues. I don't know if this is as 12 relevant. In our example, the PC would be described as 13 upstream of the mouse and printer; and, conversely, one 14 could refer to the mouse and printer as downstream 15 devices. 16 But if you look at Chang, what it's 17 describing are the ports. And it doesn't use the term 18 "downstream" as I pointed out earlier. It uses 19 "downlink" and "host port." And the host port is one 20 that the host -- a host would plug into. 21 You were asking if all four of those are 22 downstream ports. And I disagree with that 23 characterization because with respect to port 50, that's 24 designed for a host to plug into; and that's unlike the 25 ports 44 labeled in Chang.

Page 162 1 Q. Is it your opinion that any port that can 2 connect to a host is not a downstream port? 3 MR. BLUMENKOPF: Objection, form. 4 A. Well, I'm saying that downstream refers to the 5 direction, as I've said here, of data flow away from the 6 host. And so it's -- the downlink ports 44 I would 7 characterize as downstream ports because those are 8 designed to take data from the host plugged into 42 down 9 to the devices such as the MP3 player, the PDA, the -- I 10 don't remember what the devices were, the memory device, 11 whatever. 12 And that's why I disagreed with the 13 characterization because 50 is a different kind of port 14 as Chang discusses. 15 BY MR. JENSEN: 16 Q. Are you saying that the port 50 is an upstream 17 port in Chang figure 3? 18 MR. BLUMENKOPF: Objection, form. 19 A. I don't think I've said that specifically with 20 respect to Chang as part of my analysis. I think this 21 issue isn't really about what to call it but the 22 functionality of the petitioner's proposed combination, 23 which is not a combination that a POSITA would make for 24 many reasons, and also doesn't satisfy -- for the 25 reasons I lay out, it does not render obvious the	Page 164 1 BY MR. JENSEN: 2 Q. Will you agree with me that port 42 in Chang 3 figure 3 is an uplink port? 4 MR. BLUMENKOPF: Objection, form. 5 A. Well, paragraph 19 uses the term "uplink port" 6 for 42. 7 BY MR. JENSEN: 8 Q. Is there a distinction in your mind between an 9 uplink port and an upstream port? 10 MR. BLUMENKOPF: Objection, form. 11 A. Well, I'm referring to the direction of data 12 flow as opposed to the type that a port is labeled. I 13 mean, each of -- like a device doesn't only send data 14 upstream. That's not the point of labeling downstream/ 15 upstream. The point of it is to be able to have a 16 reference in which to talk about which direction the 17 data is flowing. 18 So the point here is that upstream is the 19 direction of data flow towards the host. But a device 20 connected into the, you know, port 44, it can receive 21 data from the host; and it can send data to the host. 22 Downstream and upstream are referring to 23 what I'm -- what I've laid out in 37, it's referring to 24 the direction of data flow using the host as a reference 25 as opposed to the type or label of a particular port.
Page 163 1 challenged claims, as I lay out in respective 2 declarations. 3 BY MR. JENSEN: 4 Q. Yeah. And that's not my question, right? I'm 5 not asking that. 6 So the question I have is do you know one 7 way or the other as an expert and a POSITA in this 8 field, Dr. Houh, looking at figure 3, what ports are 9 upstream ports and what ports are downstream ports? 10 MR. BLUMENKOPF: Objection, form. 11 A. I mean, these are simply labels. If you just 12 look at the functionality as I've laid out and why the 13 functionality of the petitioner's proposed combinations 14 are broken, I've laid all those reasons out. 15 I don't know that a particular label 16 attaching anything would add any clarity to what I've 17 already laid out, but I don't think I -- I talk about 18 this specific. We're not going around to say, Is that a 19 bird; is that a cat; is that a dog? 20 That's not the analysis that I was looking 21 at in that part of the analysis because the petition 22 didn't -- to the extent the petitioner and Mr. Welch 23 didn't use terms that I disagreed with, I analyzed the 24 actual combinations that were being set forth in the 25 petition.	Page 165 1 You're using these terms that I'm talking 2 about, a direction of data flow, and you're applying 3 them to the port. I'm telling you Chang does not 4 discuss the ports using that label you're asking about. 5 Chang uses different labels distinguishing -- it uses 6 "uplink port," "downlink port" or "host port." 7 Upstream and downstream refer to a 8 direction of data flow in relation to a host, and that's 9 what I'm saying in paragraph 37. 10 BY MR. JENSEN: 11 Q. Do you use that definition in paragraph 37 that 12 you applied when analyzing the claims that require 13 upstream and downstream USB ports? 14 MR. BLUMENKOPF: Objection, form. 15 A. So I assume it's okay to search documents that 16 I have? 17 BY MR. JENSEN: 18 Q. Yeah. I mean, I can direct you to '962 patent 19 claim 1, for example. And that's also shown at 20 Exhibit 1082. Element 1[a] recites an upstream USB 21 port. 22 A. Yeah. I mean, if 1082 is correct, which I have 23 no reason to believe it's not, I do see the term 24 "downstream" used; but I only see it in the '962 patent. 25 Q. Yeah. So the '962 patent claim element 1[a]

Page 166 1 recites "an upstream USB port," correct? 2 A. Yes. 3 Q. Element 1[b] recites "a plurality of downstream 4 USB ports," correct? 5 A. I see that. 6 Q. When analyzing the '962 patent claim 1, did you 7 use the definition of upstream and downstream ports from 8 paragraph 37 of your declaration? 9 MR. BLUMENKOPF: Objection, form. 10 A. I wouldn't say I'm describing it. I applied 11 the plain and ordinary meaning as would have been 12 understood by a POSITA. 13 BY MR. JENSEN: 14 Q. Okay, perfect. What is the plain and ordinary 15 meaning to a POSITA of upstream USB port? 16 MR. BLUMENKOPF: Objection, form. 17 A. I think that would include something that 18 there's a host, like on a regular hub that a host was 19 designed to be plugged into. 20 BY MR. JENSEN: 21 Q. And what is the plain and ordinary meaning of a 22 downstream USB port to a POSITA? 23 MR. BLUMENKOPF: Objection, form. 24 A. I think one example would be on a standard hub 25 something that a device would be ordinarily plugged	Page 168 1 that port 42 is mapping it, I believe, to the upstream 2 port. 3 Q. Do you agree? 4 A. I don't think I have an opinion about Chang 5 alone, what the petition's claim there. My opinions are 6 with respect to -- mainly directed to the combinations 7 set forth in the petition as to why they don't meet or 8 render obvious the claim elements and, furthermore, why 9 the combinations would not have been -- there would have 10 been no motivation to combine them to start with by a 11 POSITA. 12 Q. Did the combination change anything about 13 port 42? 14 MR. BLUMENKOPF: Objection, form. 15 A. I think the combinations as proposed really 16 modified Chang from the bridge down, at least down with 17 respect to the actual figure itself. But I don't 18 believe the combination changed anything from the hub 19 control -- well, at least in the figures that I recall 20 in the petitions, I don't believe those parts were 21 modified. 22 I mean, the figures in the petition 23 weren't the prior art -- I want to make that clear -- 24 but they were combinations of different portions from 25 different prior art and from the knowledge of a person
Page 167 1 into; and it would include that, for example. 2 BY MR. JENSEN: 3 Q. And if we look at Chang figure 3 using the 4 descriptions that you just provided, Dr. Houh, can you 5 identify what, if any, ports are upstream USB ports. 6 MR. BLUMENKOPF: Objection, form. 7 A. I think what the petition is calling the 8 upstream port in its mappings and in the petition I 9 think is referring to port 42 as the upstream port -- 10 and I think that's what the petition is saying -- in the 11 combination of the various references that it's setting 12 forth. 13 BY MR. JENSEN: 14 Q. Yeah. And I'm not asking about what the 15 petition says. I'm asking about what your opinion is, 16 Dr. Houh. 17 In your opinion, is port 42 in Chang 18 figure 3 an upstream port as you have explained and 19 described what that term means? 20 A. I mean, my analysis was about the combination 21 and not about Chang alone. So I don't have a -- I 22 didn't provide analysis about this question because my 23 analysis is with respect to what the petition is setting 24 forth. 25 In the petition, the petition is saying	Page 169 1 of ordinary skill. 2 BY MR. JENSEN: 3 Q. Yeah. And from the perspective of an expert 4 and a POSITA, can you tell me in Chang figure 3 whether 5 port 42 is or is not an upstream port? 6 MR. BLUMENKOPF: Objection, form. 7 A. Well, I certainly understand that the 8 petitioner has been calling it and mapping it, I 9 believe, where required to be upstream port. 10 BY MR. JENSEN: 11 Q. Yeah. And what is your position? Is the 12 petition correct in that regard? 13 MR. BLUMENKOPF: Objection, form. 14 A. I don't think that specific question was part 15 of my analysis. My analysis was generally directed to 16 the broader combination as opposed to this specific 17 question. 18 BY MR. JENSEN: 19 Q. So you don't have an opinion one way or the 20 other whether port 42 is an upstream port? 21 MR. BLUMENKOPF: Objection, form. 22 A. I'm really merely responding to issues raised 23 in the petition with respect to the combination 24 elements, not with respect to Chang alone. I don't 25 believe I have an opinion about this particular question

Page 170 1 because it wasn't part of my analysis. 2 BY MR. JENSEN: 3 Q. All right. Let's take a break. 4 THE VIDEOGRAPHER: The time is 3:03 p.m. 5 We're now going off the record. 6 (Recess taken) 7 THE VIDEOGRAPHER: The time is 3:20 p.m. 8 We're now back on the record. 9 BY MR. JENSEN: 10 Q. Dr. Houh, let me direct you to your '643 11 declaration at paragraph 67. 12 A. Okay. 13 Q. And in that section you discuss what's called 14 the hub 40 mux implementation, correct? 15 A. Partly here, yes. 16 Q. And in the hub 40 mux implementation the 17 petitioner maps what's labeled in Chang as hub 40 to the 18 claimed USB hub, correct? 19 MR. BLUMENKOPF: Objection, form. 20 A. So I just want to point out that this is a 21 made-up figure, the figure that I've got. It's not 22 prior art from any of the separate Chang or Chang II. 23 This comes from the petition. 24 And in it there is a label that the 25 petitioner has applied to 42 that -- they call that a	Page 172 1 Q. Do you have an opinion one way or the other 2 whether the box 40 in the petitioner's figure is a USB 3 hub? 4 MR. BLUMENKOPF: Objection, form. 5 A. I mean, my analysis in this section isn't 6 directed to that specific question. But I am of the 7 opinion that -- well, I'm just laying out what according 8 to the petition the petitioner is mapping. It wasn't 9 part of my analysis in this section in any way what you 10 asked. 11 BY MR. JENSEN: 12 Q. Is it part of your analysis in any section that 13 the box 40 is not a USB hub? 14 MR. BLUMENKOPF: Objection, form. 15 A. Well, I mean, I'll let my declaration stand for 16 itself here; but I don't recall that was part of my 17 analysis in my supplemental declarations. 18 BY MR. JENSEN: 19 Q. Okay. Let me point you to a few paragraphs 20 earlier, to paragraph 62 in your '643 declaration. 21 A. Okay. 22 Q. And that paragraph is under the heading "The 23 Hub 46 Mux Implementation," correct? 24 A. Yes. 25 Q. And if we go to paragraph 64, you have pasted
Page 171 1 first USB port. 2 BY MR. JENSEN: 3 Q. I'm not asking about 42. I'm asking about 4 hub 40. 5 A. Hub 40. 6 Q. Yeah. In the hub 40 mux implementation the 7 petitioner is mapping the claimed hub to the box hub 40, 8 correct? 9 MR. BLUMENKOPF: Objection, form. 10 A. Yeah. If you look at the next page, I believe 11 that that's still part of the hub 40 mux implementation. 12 There that figure from the petition is mapping the Chang 13 hub 40 in this matchup and created figure to the USB 14 hub. 15 BY MR. JENSEN: 16 Q. And this is a better figure to look at. You're 17 talking about the figure you pasted into paragraph 69 of 18 your report? 19 A. I'm talking about this figure, yes, which comes 20 from the petition at page 68 of the '643 petition. 21 Q. And in that figure the petitioner has mapped 22 the box 40 to the claimed USB hub, correct? 23 MR. BLUMENKOPF: Objection, form. 24 A. I would agree with that characterization. 25 BY MR. JENSEN:	Page 173 1 in an image from the petition, correct? 2 A. Yes. 3 Q. And in that image petitioner is mapping what's 4 labeled as the "hub control unit 46" to the claimed USB 5 hub, correct? 6 MR. BLUMENKOPF: Objection, form. 7 A. That's my understanding what the petition's 8 mapping is. 9 BY MR. JENSEN: 10 Q. Do you render an opinion anywhere in your 11 report that the hub control unit 46 is not a USB hub? 12 MR. BLUMENKOPF: Objection, form. 13 A. I mean, I don't know all my declarations from 14 memory; but I'll let them stand for themselves if they 15 do or don't. But I don't recall that being part of my 16 analysis as I'm sitting here. 17 BY MR. JENSEN: 18 Q. Okay. 19 A. Your specific question, that is. 20 Q. Let's turn to the Chang II reference, which is 21 Exhibit 1015. 22 A. Okay. 23 Q. And you've read the Chang II reference, 24 correct? 25 A. Yes.

Page 174 1 Q. And you understood it? 2 MR. BLUMENKOPF: Objection, form. 3 A. Yeah. I understood what I reviewed, and I also 4 understood the petitioner's claims about the 5 combinations that involve Chang II. 6 BY MR. JENSEN: 7 Q. What is shown in Chang II figure 1? 8 MR. BLUMENKOPF: Objection, form. 9 A. So if you look at paragraph 15 of Chang II, 10 what Chang II says about it is that "Figure 1 shows an 11 embodiment of a schematic diagram for a data 12 transmission bridge device and control chip thereof for 13 transmitting data according to the present invention." 14 So this is an example embodiment. And I 15 think the specification talks more about figure 1 16 starting around paragraph 22 and going on for at least 17 several paragraphs. 18 BY MR. JENSEN: 19 Q. What is Chang figure 2? 20 MR. BLUMENKOPF: Objection, form. 21 A. So Chang II describes figure 2 as it shows -- 22 this is from paragraph 16. "Figure 2 shows an 23 embodiment of a circuit diagram for a data transmission 24 bridge device and control chip thereof for transmitting 25 data according to the present invention."	Page 176 1 invention." 2 I think, you know, figure 3 in the 3 previous paragraph is talking about a first embodiment 4 of a structural representation. This is simply another 5 example of an embodiment of a structural representation. 6 And then if you look at paragraph 31 and 32, those 7 paragraphs also discuss figure 4. 8 BY MR. JENSEN: 9 Q. What's showing in Chang II figure 5? 10 MR. BLUMENKOPF: Objection, form. 11 A. If you look at Chang II at paragraph 19, it 12 says that "Figure 5 shows an embodiment of a schematic 13 diagram for a control chip for a data transmission 14 bridge device for transmitting data according to the 15 present invention." 16 And then paragraphs -- at least 17 paragraphs 34 and a few paragraphs thereafter are also 18 discussing figure 5. 19 BY MR. JENSEN: 20 Q. Well, what is a schematic diagram, Dr. Houh? 21 A. Well, this type of diagram is one that Chang II 22 happens to be calling a schematic diagram, as is 23 figure 1. I guess that's -- yeah, figure 1. 24 So at least in the context of Chang II, 25 this type of diagram -- this diagram is described as a
Page 175 1 So this is just an example embodiment. 2 And I think also if you look at the same paragraph 22, 3 for at least several paragraphs thereafter it's also 4 describing figure 2 in the Chang II specification. 5 BY MR. JENSEN: 6 Q. What's shown in Chang figure 3? 7 MR. BLUMENKOPF: Objection, form. Just to 8 be clear on the record, Counsel, I assume you meant to 9 say Chang II? 10 BY MR. JENSEN: 11 Q. Yes. What is shown in Chang II figure 3? 12 A. If you look in the specification of Chang II at 13 paragraph 17, it says that "Figure 3 shows a first 14 embodiment of a structural representation for a data 15 transmission bridge device and control chip thereof for 16 transmitting data according to the present invention." 17 And if you look at paragraph 29 of 18 Chang II, it discusses figure 3, at least there and in 19 the following several paragraphs. 20 Q. What is shown in Chang II figure 4? 21 MR. BLUMENKOPF: Objection, form. 22 A. So if you look at paragraph 18 of Chang II, it 23 says that "Figure 4 shows a second embodiment of a 24 structural representation for a data transmission bridge 25 device for transmitting data according to the present	Page 177 1 schematic diagram. 2 Q. Yeah. So what is a schematic diagram? 3 A. Well, it's showing here things that are labeled 4 like blocks and some relationships between elements. So 5 that's what you can see in figure 5 at least. 6 Q. Are the blocks in the schematic diagram of 7 figure 5 in Chang II intended to depict structural 8 components or functional components? 9 MR. BLUMENKOPF: Objection, form. 10 A. So if you look at paragraph 34 describing this 11 figure 5 example that it calls a schematic diagram, it 12 talks about how it's an embodiment of a schematic 13 diagram for a control chip of a data transmission bridge 14 device. 15 So I think it's understood that the 16 control chip is a physical thing. And then it talks 17 about things like having a bypass circuit unit 133. 18 That's kind of towards the middle. And I think that a 19 circuit has structure, and it's a physical thing that 20 has structure. And there's a CPU, and I think a CPU is 21 a thing. 22 So at least in part this is describing 23 some structure in this example and in paragraph 34. 24 BY MR. JENSEN: 25 Q. And the device in Chang II has two connection

Page 178 1 interfaces, correct? 2 MR. BLUMENKOPF: Objection, form. 3 A. Figure 5 is using slightly different words to 4 describe what it's showing. It's showing that it's an 5 embodiment of a schematic diagram for a control chip. 6 And then it goes on to say in 7 paragraph 35, it says how "the first USB controller 131 8 connects to the first connection interface 11 of the 9 data transmission bridge device 1." 10 And then with respect to the other 11 connection -- or later in the paragraph it says how the 12 first connection interface 11, there's a -- there's a 13 connection at some point that's completed. You know, 14 there's a situation that would cause that described in 15 paragraph 35; but eventually potentially there's a 16 connection between the first connection interface 11 and 17 the first host device 2. 18 Then the next paragraph 36 talks more 19 about the second connection interface 12 and how -- 20 "when a second connection interface 12 is connected with 21 a second host device 3, an inquire signal is produced 22 for the second host device 3. Then the second USB 23 controller 132 complete the connection between the 24 second connection interface 12 and the second host 25 device 3."	Page 180 1 MR. BLUMENKOPF: Objection, form. 2 A. Yeah. In figure 1, which is described as an 3 embodiment of a schematic diagram for a data 4 transmission bridge device and control chip thereof -- 5 it goes on, but I won't read it. But in this example 6 embodiment in what's shown in figure 1 does show a first 7 host device 2 connected to a first connection 8 interface 1. 9 BY MR. JENSEN: 10 Q. And figure 1 shows that the second connection 11 interface 12 can connect to either a second host device 12 3 or a slave device 4, correct? 13 MR. BLUMENKOPF: Objection, form. 14 A. If you look at paragraphs 26 and 27 of 15 Chang II, it discusses the situation where there can be 16 a host device connected but then a user can connect a 17 slave device to the same second connection interface. 18 BY MR. JENSEN: 19 Q. But only one of those can be connected at a 20 time, right? 21 A. I think that only -- it's one of those or it 22 could be the device -- I think somewhere in Chang II I 23 recall that it could be just switching modes for a 24 single device or something like that somewhere. 25 Q. Do you have an understanding as to what USB
Page 179 1 BY MR. JENSEN: 2 Q. Yeah. So my question is really simple. In 3 figure 5 how many connection interfaces are identified? 4 A. Well, the figure shows two boxes that have -- 5 labeled "first connection interface" and "second 6 connection interface," and the spec does talk about 7 those two and what devices they connect to respectively. 8 Q. And so there's two connection interfaces shown 9 in figure 5, right? 10 A. This example embodiment figure 5 does have -- 11 the figure does have two connection interfaces. 12 Q. And the embodiment shown in figure 1 also 13 illustrates two connection interfaces, correct? 14 MR. BLUMENKOPF: Objection, form. 15 A. Did you say figure 1? I thought I heard some 16 different number, but you're showing figure 1 right now? 17 BY MR. JENSEN: 18 Q. Yeah. Figure 1 shows two connection interfaces 19 as well, right? 20 A. It has the same labels, 11 and 12, on the first 21 connection interface and second connection interface 22 respectively as the previous figure we were looking at. 23 Q. And the first connection interface 11 connects 24 to what's labeled in figure 1 as a "first host device 25 2," correct?	Page 181 1 ports are defined in the USB standard? 2 MR. BLUMENKOPF: Objection, form. 3 A. It doesn't sound like something I addressed 4 specifically in my supplemental declarations, I mean, 5 unless you're thinking of something I can take a look 6 at. 7 BY MR. JENSEN: 8 Q. I'm just asking with your understanding of a 9 POSITA. I don't have a particular paragraph in mind 10 here. Let me just ask a clean question. 11 Are you aware that the USB standard 12 defines a number of connectors? 13 MR. BLUMENKOPF: Objection, form. 14 A. That may be the case. I understand that 15 there's some standardized connector types that are 16 different, but I don't recall from memory what the spec 17 says about those. 18 BY MR. JENSEN: 19 Q. And let me use just the terminology from the 20 USB standard itself. Are you aware that the USB 21 standard defines both receptacles and plugs? 22 MR. BLUMENKOPF: Objection, form. 23 A. That wouldn't surprise me. I don't know these 24 specs from memory. 25 BY MR. JENSEN:

Page 182 1 Q. Do you know what a standard A receptacle is in 2 the USB context? 3 MR. BLUMENKOPF: Objection, form. 4 A. I believe so. 5 BY MR. JENSEN: 6 Q. What is it? 7 A. I think an A receptacle is roughly maybe a half 8 inch wide by maybe around a quarter inch high with an 9 internal -- I don't know what you call it. I think of 10 it as a little circuit board device with contacts on it. 11 I don't know what dimensions exactly are in the spec, 12 but I think that's what a type A receptacle looks like. 13 Q. Do you recognize what's shown in Chang II 14 figure 3 with the labels 11 and 12 to be standard A USB 15 connectors or plugs? 16 MR. BLUMENKOPF: Objection, form. 17 A. Well, I think the receptacle for type A is 18 illustrated in 121; and the plug would be 12. I mean, I 19 hope I got that right, you know. That's what I would 20 recall offhand, but I think that hopefully matches the 21 spec. 22 BY MR. JENSEN: 23 Q. And if we look at Chang II, figure 4, do you 24 see that there are two cables shown there labeled 122 25 and 122 prime?	Page 184 1 connectors that have such a mechanism. 2 Q. Is a USB standard A female receptacle able to 3 accept a USB device that's inserted into it? 4 MR. BLUMENKOPF: Objection, form. 5 BY MR. JENSEN: 6 Q. Let me ask a better question. 7 Under the USB standard can a type A 8 receptacle accept a connection that is coming from a USB 9 device? And by that I mean in device mode. 10 MR. BLUMENKOPF: Objection, form. 11 A. I believe there are many such things such as 12 a -- like a memory stick, USB memory stick, that simply 13 has a USB type A connector on the end that can be 14 plugged into a USB receptacle. And so -- 15 BY MR. JENSEN: 16 Q. I'm sorry. Go ahead. 17 A. So I think I'm aware of at least some examples 18 of those. 19 Q. Can the same USB type A female receptacle 20 accept a connection coming from a USB host? 21 MR. BLUMENKOPF: Objection, form. 22 A. I mean, do you mean whether it can physically 23 accept such a cable if you plugged it in or that it 24 would have to behave in a certain way? 25 BY MR. JENSEN:
Page 183 1 A. Yes. 2 Q. Do you recognize the left end of those cables 3 in the figure as a standard A USB plug or connector? 4 MR. BLUMENKOPF: Objection, form. 5 A. They look like it to me. 6 BY MR. JENSEN: 7 Q. And those would plug into the receptacle that's 8 labeled 12 in Chang II figure 4? 9 MR. BLUMENKOPF: Objection, form. 10 A. Sure. That's what it looks like to me, just 11 looking at the figure alone. 12 BY MR. JENSEN: 13 Q. Is there anything about the receptacle 12 14 itself that changes depending on whether a host or a 15 device is plugged into it? 16 MR. BLUMENKOPF: Objection, form. 17 A. Physically? 18 BY MR. JENSEN: 19 Q. Yes. 20 A. I'm not aware, thinking about this, of a 21 physical transformation of either the plug or receptacle 22 as they're mated. I mean, maybe there's some 23 spring-type brushes or something on one side that do get 24 a little deformed when they're mated together just to 25 ensure proper contact. But there are types of	Page 185 1 Q. Let's start with physically. 2 A. Well, I mean, figure 4 here in Chang II does 3 show a cable 122 prime with two A-type connectors at 4 each end. So I think physically you could take the same 5 host device 2 which has the same A receptacles and 6 simply take that cable and plug it into each host. That 7 would physically work, I think, as illustrated here in 8 figure 4. What I'm saying is that's physically 9 possible. 10 Q. And whether or not that would work from an 11 electrical perspective would depend on other things in 12 the system. Is that right? 13 MR. BLUMENKOPF: Objection, form. 14 A. I don't know that I've -- no. I don't know 15 that I know what specifically would occur in this 16 particular case, but it looks physically possible given 17 this illustration in figure 4. 18 BY MR. JENSEN: 19 Q. Would it be electrically possible as well? 20 MR. BLUMENKOPF: Objection, form. 21 A. Well, I'm not sure what you mean by 22 "electrically possible." 23 BY MR. JENSEN: 24 Q. Well, Chang II is talking about a device that 25 allows a user to plug in a host USB product or a device

Page 186 1 USB product into the second connection interface 12, 2 correct? 3 MR. BLUMENKOPF: Objection, form. 4 A. Sorry. You're talking about Chang II? 5 BY MR. JENSEN: 6 Q. Yes. 7 A. You're able to plug in what to what, please 8 again? 9 Q. You're able to plug in either a host or a 10 device into the second connection interface 12. 11 A. Yeah. So the specific type of cable like shown 12 in figure 3 with this control chip embedded in it, I 13 think Chang II is talking about how either end, the 14 first shown in -- as shown in figure 1. 15 The second connection interface could go 16 either to a slave or host given that the control chip 13 17 and all requisite components are part of -- if it were 18 part of this cable, such as illustrated in figure 3, I 19 think that's what Chang II is designed to be able to 20 support, plugging in host-to-host or host-to-slave -- 21 or, sorry, host-to-device. 22 Q. And that's the second connection interface 12 23 you're talking about, right? 24 A. So I think one of -- so if you look at 25 paragraph 21 in Chang II, it talks about how "The	Page 188 1 the main feature of the way Chang II operates. 2 Q. The challenged patents in this case talk about 3 smartphones, correct? 4 MR. BLUMENKOPF: Objection, form. 5 BY MR. JENSEN: 6 Q. If you want to check the patent, just tell me 7 what patent you're looking at, Dr. Houh, and I can point 8 you to the column and line. 9 A. Well, I have the '962 here in paper in front of 10 me. So maybe we could start with that one. 11 Q. Okay. So why don't you look at column 2 12 starting at line 42. 13 A. Yes, I see that. 14 Q. And the first sentence there says, "Recently 15 mobile phones such as smartphones have gained in 16 popularity." 17 Is that the paragraph you're looking at? 18 MR. BLUMENKOPF: Objection, form. 19 A. In the '962 patent I see that in column 2 20 starting at line 42. 21 BY MR. JENSEN: 22 Q. And toward the bottom of that paragraph around 23 line 60 it describes how smartphones can be configured 24 to operate as either a USB host or a USB device, 25 correct?
Page 187 1 present invention designed a data transmission bridge 2 device for transmitting data between two devices 3 (host-to-host or host-to-slave) through simple hardware 4 structure. The main feature is the provision of two 5 different transmission paths so that by automatically 6 detecting the type of device connected (host or slave) 7 the present invention can switch to the proper 8 transmission path, thus not only can host-to-slave 9 operation between the host device and the slave device 10 be supported, but direct bridging between two host 11 device for data transfer is also possible." 12 So I think that's what this invention is 13 directed to, and this is one of the main features is 14 that you can -- it's designed to support both and be 15 able to, you know, change the configuration and have it 16 still continue to work. 17 It goes on to say, "Furthermore, the 18 present invention adheres to USB specification by design 19 so that 'plug and play' works properly. Thus, the goal 20 of allowing users to conveniently bridge between a host 21 device and any other device (host or slave) for data 22 transfer is achieved." And that hot swapability is -- 23 sorry, plug and play is you can unplug and plug in a 24 different device, and it just works." 25 So all this is what's being described as	Page 189 1 MR. BLUMENKOPF: Objection, form. 2 A. I mean, I see starting at line 60 and down to 3 line 63 that it says that, "Therefore, leading mobile 4 device manufacturers and system designers have begun 5 designing their mobile device products (i.e., 6 smartphones, tablets, et cetera) to support both USB 7 host and USB device roles." 8 BY MR. JENSEN: 9 Q. Do you understand that to mean that a 10 smartphone can operate in a host mode or a device mode? 11 MR. BLUMENKOPF: Objection, form. 12 A. I think what it's saying is that the people are 13 starting to design products like phones that support 14 both host mode and -- or host roles and USB device 15 roles. 16 BY MR. JENSEN: 17 Q. Do you have an understanding as to whether it's 18 saying that it can simultaneously support both host and 19 device roles or that those roles are mutually exclusive? 20 MR. BLUMENKOPF: Objection, form. 21 A. I don't think the description here in the 22 bottom of column 2 and the top of column 3 is directed 23 to what you're asking. I think it doesn't say 24 specifically. 25 BY MR. JENSEN:

Page 190 1 Q. Do you have an understanding as a POSITA 2 whether a smartphone can at a given point in time act as 3 both a host and a device? 4 MR. BLUMENKOPF: Objection, form. 5 A. I don't think that was part of my analysis that 6 I've laid out in my supplemental declarations. 7 BY MR. JENSEN: 8 Q. Do you know whether plugging a smartphone such 9 as is described in the Aptiv patents into the device 10 shown in Chang II figure 5 would work? 11 MR. BLUMENKOPF: Objection, form. 12 A. I mean, I don't think that was part of my 13 analysis for my supplemental declarations, this 14 particular issue. 15 BY MR. JENSEN: 16 Q. Okay. 17 A. I mean, I do analyze how Chang II's bridge, in 18 conjunction with Chang and the devices that are added to 19 even that combination by a person of ordinary skill, I 20 analyze how that whole combination works. 21 Q. How does Chang -- sorry. Go ahead. 22 A. That's what I did analyze. 23 Q. Yeah. How does Chang II determine whether a 24 host or a device is connected on the second connection 25 interface?	Page 192 1 in maybe one of my declarations if you'll allow me to 2 kind of open them and search through them. So I'll go 3 ahead and do that. 4 BY MR. JENSEN: 5 Q. Rather than take the time to look through all 6 your reports to track that down, let me ask maybe a more 7 basic or fundamental question. 8 Would the detection unit in Chang II 9 figure 5 be able to detect a role change by a smartphone 10 connected to the second connection interface 12 at all? 11 MR. BLUMENKOPF: Objection, form. 12 A. Yeah. So if you look at my '643 declaration, 13 in paragraph 135 I say, "As I noted in my previous 14 declaration, the USB specification requires certain 15 configurations of pull-up and pull-down resistors on the 16 USB data lines to indicate whether a device is operating 17 as a USB host or a USB device. I agree with Mr. Welch 18 that pull-up and pull-down resistors creates signals." 19 So I think that the presence of these 20 resistors in the proper configuration would be what's 21 used to determine what the device -- what mode the 22 device is in. 23 BY MR. JENSEN: 24 Q. And that would include determining whether it's 25 in device mode or host mode?
Page 191 1 MR. BLUMENKOPF: Objection, form. 2 A. If you look at paragraph 38 of Chang II, it 3 discusses this detection unit 134 and it says it's also 4 connected to the second connection interface 12 and 5 detection unit 134 will automatically operate to switch 6 between a virtual host state and a virtual slave state, 7 wherein the states are used to determine the type of 8 device currently connected with a second connection 9 interface 12 and a detection signal (bridging detection 10 signal or slave detection signal) is produced 11 accordingly. On the other hand, the CPU 135 is for 12 receiving the detection signal," and then it goes on. 13 But I think part of how Chang describes 14 this is that these states are used to determine the 15 device, but the detection signal is produced 16 accordingly. And I think there's more detail in further 17 paragraphs as well. 18 BY MR. JENSEN: 19 Q. Assuming you had a smartphone connected on the 20 second connection interface 12 in device mode and the 21 smartphone switched to host mode, how would the 22 detection unit in Chang figure 5 determine that there 23 had been a role change? 24 MR. BLUMENKOPF: Objection, form. 25 A. I mean, I may have some discussion about this	Page 193 1 MR. BLUMENKOPF: Objection, form. 2 A. So yeah. The specification requires certain 3 configurations of pull-up and pull-down resistors on the 4 USB data lines to indicate whether a device is operating 5 in USB host -- or as a USB host or a USB device, so ... 6 BY MR. JENSEN: 7 Q. And would the detection unit in Chang II 8 figure 5 be able to detect a switch from host mode to 9 device mode by a smartphone? 10 MR. BLUMENKOPF: Objection, form. 11 A. I mean, I don't think that -- I don't recall 12 seeing it in Chang II anywhere where it's talking about 13 a phone. 14 BY MR. JENSEN: 15 Q. Well, let's put aside whether it's a phone or 16 some other kind of product that can switch roles between 17 host and device and vice versa. Let me ask the question 18 more broadly. 19 Would the detection unit in Chang II 20 figure 5 be able to detect a role switch from host to 21 device of a connected USB product? 22 MR. BLUMENKOPF: Objection, form. 23 A. I don't think I address this -- this is an 24 issue I analyzed in my supplemental declarations. 25 What I did analyze was what was set forth

Page 194 1 in the petition, which is when this combination -- in 2 the combinations set forth by petition of Chang, 3 Chang II and the knowledge of a person of ordinary 4 skill, and maybe even perhaps the other challenges as 5 well that involve Chang II, that once the -- and I'll 6 just refer to my declaration as to where I address this 7 point. 8 But once in the combination the overall 9 device bypasses the bridging unit of Chang II, no 10 further detections can be performed because the 11 detection unit is in the bridge of Chang II in the 12 combinations. And so the device effectively is broken 13 and doesn't behave in the proper way. It doesn't behave 14 according to the main feature of what Chang II was 15 designed to do, so essentially removing features that 16 are already existing in Chang II. 17 Admittedly, now there are additional 18 ports; but then it doesn't work and a person wouldn't 19 make that combination. 20 BY MR. JENSEN: 21 Q. And I'm just asking about Chang II here. I'm 22 not asking about a combination. We're just looking at 23 the Chang II reference. 24 My question to you is is the device shown 25 in Chang II figure 5 broken as you just described?	Page 196 1 MR. BLUMENKOPF: Objection, form. 2 A. There's a little more detail about the 3 operation of Chang II if you look at paragraph 43 with 4 respect to figure 6 of Chang II that is -- it's kind of 5 in the middle of the description of figure 6. 6 But in paragraph 43, it talks about, 7 "Next, switch to a virtual slave state in order to 8 produce an inquire signal to the external device," which 9 is step S603 in figure 6," and then determine if there 10 is a response from the external device (S605). If at 11 step S605 the answer is yes regarding receiving of the 12 external device response, then it is determined that the 13 external device is a second host device 3 (S607) and at 14 this time switch to a bridged transmission path." 15 It goes on. And I think there's an 16 equivalent description in paragraph 44 of step S17. But 17 if you look at paragraph 44, it talks about, "However, 18 if at S605 the answer is no regarding the receiving of 19 the external device response and it is determined that 20 the external device is not a host type device. 21 Therefore, an automatic switch to virtual host state 22 will occur (S615), and then further determine if there 23 is an inquire signal from the external device (S617)." 24 At this time if the answer is yes regarding receiving of 25 the external device inquire signal, then it is
Page 195 1 A. Well, I think Chang II works as it's described 2 in Chang II. What I'm saying is broken is the 3 combination of Chang II, Chang and the person -- a 4 POSITA's knowledge as outlined in the obviousness 5 combinations in the petitions. 6 Q. So you're not rendering an opinion that 7 Chang II itself is somehow broken, correct? 8 MR. BLUMENKOPF: Objection, form. 9 A. I don't think that's what I said, that Chang II 10 alone was broken. Chang II has a main feature which is 11 now changed and the principle of operation has changed 12 really when the petitioner took the bridge of Chang II 13 and put it in this combination with Chang I and the 14 knowledge of a person of ordinary skill. I think that 15 combination is broken. 16 BY MR. JENSEN: 17 Q. So sticking with Chang II now -- we'll talk 18 about that, I think, tomorrow given the time. I just 19 want to focus exclusively on the Chang II reference and 20 what the Chang II reference itself teaches to a POSITA. 21 The question I have is does the Chang II 22 reference teach to a POSITA reading it that the 23 detection unit 134 in figure 5 could detect a role 24 change for a connected USB product on the second 25 connection interface 12?	Page 197 1 determined that the external device is a slave device." 2 So it says all that. So it doesn't say 3 anything about specifically to a phone. But if a phone 4 replied in the manner then in my -- it could detect in 5 an example where the phone replied in this similar 6 manner, according to figure 6. But it's not directed 7 specifically saying anything about a smartphone here. 8 BY MR. JENSEN: 9 Q. I want to put aside the smartphone term because 10 I don't really care about that so much. Regardless of 11 what type of USB product is plugged in, is it the case 12 that the Chang II detection unit 134 can determine 13 whether the connected product is in device mode or host 14 mode? 15 MR. BLUMENKOPF: Objection, form. 16 A. I think in Chang II figure 6 in the description 17 tells you how it makes that determination, as long as 18 the detection circuitry is receiving signals from what's 19 connected. 20 The issue with the combination that I've 21 analyzed is that in the proposed combination by the 22 petitioner, once it's determined the first time that a 23 device type has been connected to the appropriate port 24 that is initially going into the bridge, then subsequent 25 to that, the -- that device is set up to bypass the

Page 198 1 bridge, and there can be no subsequent detections of any 2 change in what's plugged into that port after that time 3 of the switch. 4 And I lay that out in my various 5 declarations. That's what's wrong with the combination 6 because the bridge of Chang II has been bypassed in the 7 combination, and that's how I analyze the combination. 8 But then in Chang II there is a bypass circuit, but the 9 detection unit is still present in the bridge chip that 10 the second connection interface device -- or whatever is 11 connected to it is still connected in Chang II. 12 BY MR. JENSEN: 13 Q. And because -- I'm sorry. Go ahead. 14 A. In Chang II alone. And that's one of what 15 Chang II calls its main features. 16 Q. And because Chang II's detection unit 134 can 17 always detect what is connected on the second connection 18 interface, it's able to detect if there was a switch 19 between a host and device mode for a connected product, 20 right? 21 MR. BLUMENKOPF: Objection, form. 22 A. Well, there is a detection unit that's in the 23 bridge in Chang II. And the problem with the 24 combination is that -- 25 BY MR. JENSEN:	Page 200 1 MR. BLUMENKOPF: Objection, form. 2 A. So the detection unit being connected to the 3 second connection interface does allow it to detect 4 what's connected at the second connection interface. 5 BY MR. JENSEN: 6 Q. And that would include detecting whether the 7 USB product on the second connection interface switched 8 modes from host to device or vice versa? 9 MR. BLUMENKOPF: Objection, form. 10 A. In Chang II alone, if you look at figure 6, it 11 tells you -- talks about how -- the flow chart indicates 12 how -- like if you look at steps S613 and S625, it talks 13 about how it's checking whether the user has exchanged 14 for another external device, both those steps. 15 And if no, it's looping through and 16 continuing to check through the loop back to S611 and 17 S623 respectively for the two different branches. So 18 there is this continuous checking that Chang II is 19 disclosing that Chang II alone, you know, as its own 20 stand-alone reference discloses. 21 Then if it detects there's a change, it 22 goes all the way back up to the top or to step S603 23 which says "switch to a virtual state." This kind of 24 starts the process of detecting which state it's in. 25 So Chang II alone, that's how it works. I
Page 199 1 Q. Yeah. And I'm not talking about the 2 combination. We'll talk about that tomorrow, I promise. 3 I want to ask just about Chang II here. 4 I guess the first thing I'd like to know 5 is does Chang II by itself have the same alleged problem 6 that you identify for the combination? 7 MR. BLUMENKOPF: Objection to form. 8 A. If you look at paragraph 38, there's a 9 statement there that the detection unit 134 is also 10 connected to the second connection interface 12. So as 11 long as the device is present at the second connection 12 interface, the detection unit is connected to what's at 13 the second connection interface. 14 So Chang II doesn't have the problem 15 because the bypass is internal. It goes around -- the 16 bypass unit 133 of Chang II simply is bypassing the 17 second USB controller and the buffer unit to connect the 18 device in device mode using the bypass circuit unit to 19 the first USB controller; but the detection unit is 20 still connected to the second connection interface, as 21 Chang II describes. 22 BY MR. JENSEN: 23 Q. And that allows the detection unit to always be 24 able to determine whether a host or a device is 25 connected on the second connection interface, correct?	Page 201 1 know we'll talk about it tomorrow; but if you bypass the 2 input so that there's no input to the bridge, the 3 Chang II bridge, the detection circuit, the detection 4 unit inside the Chang II bridge won't receive anything. 5 BY MR. JENSEN: 6 Q. Could the Chang II system detect whether there 7 was a role switch between host and device mode or vice 8 versa without being physically disconnected? 9 MR. BLUMENKOPF: Objection, form. 10 A. Well, figure 6 does have this loop, as I 11 discussed; and it is checking whether the user has 12 exchanged for other external device. Let me see what it 13 says about those. 14 I mean, Chang II is simply saying, "At the 15 same time that bridged transmission is occurring, a 16 further step of checking whether the user has exchanged 17 for other external device would occur instantly (S613). 18 If it is determined that there are no exchange for other 19 external device, the bridged transmission of data 20 between the first host device 2 and the second host 21 device 3 will continue; however, if the user has 22 exchanged for other external device, then return to 23 step S603." 24 And I think it describes S625, is it, 25 yeah, in a similar manner. In fact, I think it even

Page 202 1 references to the previous step described as S613. 2 That's in paragraph 44. 3 So that's what Chang is saying. It's not 4 specifically addressing the question you asked, but it's 5 simply detecting if the user has exchanged for other 6 external device. 7 BY MR. JENSEN: 8 Q. Are you familiar with the single end in 0, SE0, 9 command in the USB standard? 10 MR. BLUMENKOPF: Objection, form. 11 A. I don't think I've talked about that as part of 12 my analysis unless you -- if you can point me somewhere. 13 BY MR. JENSEN: 14 Q. Let's suppose you have an existing connection 15 between a host on the first connection interface 11 and 16 a device on the second interface connection 12 of Chang 17 figure 5. In that circumstance which of those two 18 devices, or both of them, would be able to break the 19 connection? 20 MR. BLUMENKOPF: Objection, form. 21 A. I'm sorry. 22 BY MR. JENSEN: 23 Q. And by "break" I don't mean physically break. 24 I mean just close the connection. 25 MR. BLUMENKOPF: Same objection.	Page 204 1 A. Well, the operating system still knows 2 something's there. But like for a drive it can still -- 3 it may still show that there's something -- it knows 4 that there's something connected; but it may not be 5 operable as a full drive as before I initiated the 6 disconnection from the USB panel in Windows, for 7 example. 8 BY MR. JENSEN: 9 Q. Do you know if it's possible to close a 10 connection between a USB host and device without 11 physically disconnecting them from one another? 12 MR. BLUMENKOPF: Objection, form. 13 A. I don't think that's an issue that I had to 14 look at specifically in my analysis. 15 BY MR. JENSEN: 16 Q. Okay. Let's look at Chang II figure 5, bypass 17 circuit unit 133. Do you see that? 18 A. Yes. 19 Q. Do you have an understanding as a POSITA as to 20 what would be inside of the bypass circuit unit 133? 21 MR. BLUMENKOPF: Objection, form. 22 A. Well, I think a person of ordinary skill would 23 understand that. It's a circuit. So a circuit is a 24 physical thing with a structure, and there would be a 25 class of circuits that would perform the bypass as
Page 203 1 A. I don't think I addressed that specifically as 2 part of my analysis. I don't think petitioner raised 3 any issue that was directed this specifically to this 4 kind of signal. 5 BY MR. JENSEN: 6 Q. Do you know as a POSITA whether the host can 7 terminate the connection it has with a device? 8 MR. BLUMENKOPF: Objection, form. 9 A. So, for example, in Windows I know that I can 10 disconnect a USB device from the USB interface using 11 software. And then it may tell me that the device is 12 still busy or that it's safe to unplug the device. 13 BY MR. JENSEN: 14 Q. And in that case that you just mentioned when 15 you have, using software, disconnected the USB device, 16 could the USB device still physically be plugged into 17 the computer? 18 MR. BLUMENKOPF: Objection, form. 19 A. It may still be plugged in, yes, in my personal 20 experience. 21 BY MR. JENSEN: 22 Q. So even though it's physically connected, there 23 may not be a USB connection that's operational between 24 the host and the device? 25 MR. BLUMENKOPF: Objection, form.	Page 205 1 required here. 2 BY MR. JENSEN: 3 Q. Does that class of circuits include a switch? 4 MR. BLUMENKOPF: Objection, form. 5 A. I mean, Chang II is already discussing how 6 there can be a switching between the bypass circuit and 7 the -- I forget what they call the other path. I mean, 8 yeah, so the switch between the bypass path or the path 9 through the section controller. 10 So Chang II is already referencing that 11 there's a switch. So adding another switch inside the 12 bypass circuit unit would seem a little wasteful because 13 you don't necessarily need to have two switches if you 14 can already switch between the path going through the 15 second USB controller and the path going through the 16 bypass circuit unit. That would be redundant and 17 wasteful. 18 BY MR. JENSEN: 19 Q. Where is the first switch that you mentioned in 20 Chang figure 5? 21 A. So there's not a box labeled switch in figure 5 22 inside the control chip. But it's clear if you review 23 the specification and actually look right in -- I think 24 it's in the abstract, for one. It says -- near the 25 lower middle of the abstract in Chang II it says, "The

Page 206 1 control chip detects which device is connecting to the 2 second connecting interface and switch to select one of 3 the two transmission paths for transmitting data between 4 the first connecting interface and the second connecting 5 interface." 6 So I think if you look at figure 5, the 7 two paths are directly through the middle like from the 8 second controller to the USB controller to the buffer 9 unit to the first USB controller to the first connection 10 interface and then the lower path, the bypass path, 11 which goes from the second connection interface to the 12 bypass circuit unit to the first USB controller to the 13 first connection interface. 14 So it's talking about switching between 15 those paths. So it's clear that there's a switch that 16 switches between those paths. And I think there's other 17 mentions of that, that switching the paths. 18 For example, in the summary of invention, 19 the very first paragraph, paragraph 11 of Chang II, it 20 talks about -- starting about the fourth line at the 21 end, "wherein the device would automatically detect the 22 connecting device type and accordingly switch between 23 different transmission paths, which would not only allow 24 for support of data transfer between a host device and a 25 slave device, but also can directly support data	Page 208 1 A. I don't think that I did that I can recall, but 2 I'll let the declarations stand for themselves. But I 3 don't think that I issued an opinion about that one way 4 or the other. 5 Q. Did you construe any claim terms as part of 6 your analysis? 7 MR. BLUMENKOPF: Objection, form. 8 A. I mean, again, I'll let my supplemental 9 declarations stand for themselves. I don't think that I 10 expressly construed -- provide express construction for 11 terms. I analyzed plain and ordinary meaning. 12 Now, I understand that in or more -- I 13 think at least one petitioner proposed a construction, I 14 believe, if I remember correctly, that the PTAB declined 15 to provide an express construction for it. 16 So I think my analysis was done under what 17 the PTAB instructed, which I think was everything was 18 plain and ordinary meaning. I'll let the declarations 19 stand for themselves. That's just from memory. 20 BY MR. JENSEN: 21 Q. Are the first and second connection interfaces 22 in Chang II figure 5 limited to any particular type of 23 USB standard connector? 24 MR. BLUMENKOPF: Objection, form. 25 A. I don't think I provide any -- that analysis as
Page 207 1 transferred between two host devices." 2 So that's where it talks about switching 3 between the different transmission paths. So it's clear 4 that there's a switch already. So it would seem 5 wasteful and redundant to include -- that the bypass 6 circuit also include a switch. 7 Q. Would you agree with me that Chang II figure 5 8 does not disclose a multiplexer? 9 MR. BLUMENKOPF: Objection, form. 10 A. I don't think or recall that Chang II used the 11 term "multiplexer" in the specification. 12 BY MR. JENSEN: 13 Q. Would a POSITA understand that Chang II could 14 use a multiplexer to perform the switching function you 15 described? 16 MR. BLUMENKOPF: Objection, form. 17 A. I didn't consider that in my analysis for 18 Chang II alone. I understand that petition has set 19 forth that a POSITA would know how to use a multiplexer 20 in this combination of Chang, Chang II and the knowledge 21 of a person of ordinary skill at least. But I didn't 22 include that as my analysis for Chang II alone. 23 BY MR. JENSEN: 24 Q. Did you render any opinions as to whether the 25 preambles of the challenged claims are limiting?	Page 209 1 part of my opinions in my supplemental declarations. I 2 mean, if you think that's not correct, if you point me 3 somewhere, I'll be happy to take a look at it. 4 BY MR. JENSEN: 5 Q. Let me ask this question. Are the first and 6 second connection interfaces in Chang II figure 5 -- 7 well, strike that. 8 Does Chang II figure 5 require any 9 particular type of USB receptacle defined in the USB 10 standard for the first and second connection interfaces 11 11 and 12? 12 MR. BLUMENKOPF: Objection, form. 13 A. I don't think that was part of my analysis. 14 BY MR. JENSEN: 15 Q. Let me direct your attention to '643 patent 16 claim 1. And I've got that on the screen, but you can 17 also look at the patent as well if you'd like. 18 A. I see it. 19 Q. So claim element 1[c] recites "providing a 20 signal detection circuit for receiving USB signals from 21 the consumer USB device via the second USB port," 22 correct? 23 MR. BLUMENKOPF: Objection. 24 A. Were you reading 1[c]? I wasn't looking there 25 when you started reading it, but at the end I think you

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1 were reading -- 2 BY MR. JENSEN: 3 Q. Yeah. Claim element 1[c] provides in part 4 "providing a signal detection circuit," correct? 5 A. Yes. 6 Q. What is a signal detection circuit? 7 A. It's a circuit. So that's a physical thing. 8 And that would refer to a class of signals that can do 9 signal detection. 10 Q. Do any of the claims of the '072, '420 or '962 11 patents require a signal detection circuit? 12 MR. BLUMENKOPF: Objection, form. 13 A. Are you asking about the challenged claims or 14 any of the claims? 15 BY MR. JENSEN: 16 Q. Well, I think all of the claims are challenged. 17 So it would be the same set of claims. 18 A. I mean, just searching through the 1082 exhibit 19 that you provided, I see signal detection circuit only 20 used in '643 claim 1 and in claim 5 and the dependent 21 claims that it would depend therefrom based on the fact 22 that they're in the independent case. 23 And I noticed that your chart doesn't 24 provide a listing of the dependent claims, I see. 25 Q. Yeah. This is just the independent claims.	1 isolated from the consumer USB device, I don't see how 2 you could practice the method of receiving a signal from 3 the consumer device, for example. 4 So I think there may be some limitations 5 implied of a physical arrangement or location based on 6 some of these claim steps that are listed. 7 BY MR. JENSEN: 8 Q. Do any of the other independent claims in the 9 '072, '420 or '962 patents require detecting whether a 10 connected device is in host or device mode? 11 MR. BLUMENKOPF: Objection, form. 12 Counsel, your question is directed to the patents 13 themselves, not to just Exhibit 1082, right? 14 MR. JENSEN: Well, they're the same. It's 15 just the claims from the patent. 16 MR. BLUMENKOPF: We haven't had an 17 opportunity to verify any of the information in 18 Exhibit 1082. 19 Dr. Houh, please feel free to consult the 20 actual patents themselves. 21 BY MR. JENSEN: 22 Q. Yeah. You're free to reference the patents 23 themselves if you like. 24 Let me break this up into smaller segments 25 for you, Dr. Houh. Rather than asking you about all the
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1 A. Yeah. So I searched 1082. I can go look 2 through the other ones for the dependent claims as well, 3 but I don't remember that offhand. 4 Q. Does claim 1 of the '643 patent provide any 5 restriction on the location of the signal detection 6 circuit? 7 A. I'm sorry. Did you say claim 5? 8 Q. Claim 1 or 5. I'll just ask a clean question. 9 Do either claims 1 or 5 in the '643 patent 10 require a particular location for the signal detection 11 circuit? 12 MR. BLUMENKOPF: Objection to form. 13 A. Well, I see that claims 1 and 5 of the '643 14 patent are directed to methods; but I think by nature of 15 the way things are arranged -- so, for example, 16 providing a signal detection circuit for receiving USB 17 signals from the consumer USB device via the second USB 18 port, you have to be able to receive it, a USB signal 19 from the device. 20 So I think that would say that there is 21 some specific arrangement of where the circuit is in 22 relation to the consumer device via the second port. So 23 I think some part of the claim limitations are directed 24 to the fact that, you know, you have to be able to 25 receive a signal. If you just have a detection circuit	1 claims in one question, let me direct your attention to 2 the '072 patent claim 1. Does the '072 patent claim 1 3 require detecting whether a connected USB product is in 4 host or device mode? 5 MR. BLUMENKOPF: Objection, form. 6 A. Well, there is a limitation in claim 1, which 7 is a method claim. I think it's labeled 1[b] here, but 8 I'll read it from the patent. 9 "Receiving a first USB signal from the USB 10 device via the USB port while the USB device is 11 operating in the USB host mode." 12 So that's the requirement of the method. 13 So it doesn't say the word detecting, but the method 14 requires receiving a first USB signal from the USB 15 device via the USB port while the device -- while the 16 USB device is operating in the USB host mode. 17 So if that's not done, the times when the 18 device is operating in USB host mode, then that would 19 not meet the limitation. 20 BY MR. JENSEN: 21 Q. Are you construing claim 1 of the '072 patent 22 to require detecting or making a determination that a 23 connected USB product is in host or device mode? 24 MR. BLUMENKOPF: Objection, form. 25 A. That's not exactly what I said. I'm

Page 214 1 interpreting all of these in their plain and ordinary 2 meaning, which is that "This claim element requires 3 receiving a first USB signal" -- let's just skip over 4 the "from" and "via" -- "while the USB device is 5 operating in the USB host mode." 6 So if you're not receiving a USB signal 7 from a device while it's operating in USB host mode, 8 subject to the -- via the USB port, then this method is 9 not being practiced. 10 BY MR. JENSEN: 11 Q. Does the system need to know that it has 12 received a signal from a device that is operating in 13 host mode, or is it enough that it simply receives the 14 host mode signal? 15 MR. BLUMENKOPF: Objection, form. 16 A. Well, I mean, the claim requires what it says 17 it requires, which is it requires that receiving a first 18 USB signal from the USB device via the USB port while 19 the USB device is operating in the USB host mode. And 20 if a device doesn't do that, it wouldn't meet this 21 element for a proposed -- and for the reasons I say, 22 because the combination is broken. In my analysis the 23 broken combination that is set forth by petitioner, this 24 is one of the things it doesn't do because when you plug 25 in a host on a bypass port, it's not going to receive a	Page 216 1 it's easier to understand. I'm not trying to change the 2 meaning, by the way, by doing this. 3 But while the USB device is operating in 4 the USB host mode, receiving a first USB signal from the 5 USB device via the USB port. So if you don't do that, 6 if you don't receive a signal while the device is 7 operating in the host mode at all, you couldn't have 8 received it from a device or via the USB port. So if 9 you don't receive any signal while the USB device is 10 operating in the host mode, you can't meet this element. 11 If you do receive a first USB signal, it 12 will additionally have to be from the USB device via the 13 USB port. So I think that's what this element requires. 14 BY MR. JENSEN: 15 Q. Suppose the system receives a first USB signal 16 from a USB device that is operating in host mode but it 17 doesn't know that that is a host. Would that situation 18 meet the claim? 19 MR. BLUMENKOPF: Objection, form. 20 A. Well, I don't know if that specific case was 21 what I analyzed because I don't think the petitioner 22 brought some hypothetical case like that up. So I don't 23 know if this specific case is part of what I've analyzed 24 in part of my analysis. 25 MR. JENSEN: Let's go off the record.
Page 215 1 signal. 2 So that doesn't meet the claim element, 3 for example. I mean, the exact reasons why are in my 4 declaration. I'm paraphrasing a little bit. 5 BY MR. JENSEN: 6 Q. Yeah. I'm just asking about the claim here. 7 I'm not asking about the prior art or the combination or 8 anything. I'm just asking what your understanding is of 9 what the claim requires. 10 Is it your understanding that the claim 11 requires the system to make a determination that a 12 connected USB product is in host or device mode? 13 MR. BLUMENKOPF: Objection, form. 14 A. I mean, those exact words aren't in this 15 element. But the element simply requires what it says 16 it requires, which is receiving a first USB signal from 17 the USB device via the USB port while the USB device is 18 operating in the USB host mode. 19 BY MR. JENSEN: 20 Q. And that doesn't say the system has to detect 21 or determine that the signal that it is receiving is a 22 host mode signal, correct? 23 MR. BLUMENKOPF: Objection, form. 24 A. Well, it could be part of it; but what is 25 required is that while -- and I'll flip this. Maybe	Page 217 1 THE VIDEOGRAPHER: The time is 5:02 p.m. 2 We're now going off the record. 3 (Recess taken) 4 THE VIDEOGRAPHER: The time is 5:03 p.m. 5 We're now back on the record. 6 MR. JENSEN: Given that we are getting 7 close to the seven-hour mark and in view of some 8 commitments, Dr. Houh, that you and others may have, 9 we've agreed to recess this deposition for today and 10 reconvene tomorrow morning at 9:00 a.m. Eastern. Thank 11 you. 12 THE VIDEOGRAPHER: The time is 5:04 p.m. 13 We're now going off the record. 14 (Proceedings concluded at 5:04 p.m.) 15 16 17 18 19 20 21 22 23 24 25

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1 CHANGES AND SIGNATURE 2 WITNESS NAME: HENRY H. HOUH 3 DATE OF DEPOSITION: December 19, 2024 4 PAGE LINE CHANGE REASON 5 _____ 6 _____ 7 _____ 8 _____ 9 _____ 10 _____ 11 _____ 12 _____ 13 _____ 14 _____ 15 _____ 16 _____ 17 _____ 18 _____ 19 _____ 20 _____ 21 _____ 22 _____ 23 _____ 24 _____ 25 _____	1 IN THE UNITED STATES PATENT AND TRADEMARK OFFICE 2 _____ 3 BEFORE THE PATENT TRIAL AND APPEAL BOARD 4 _____ 5 MICROCHIP TECHNOLOGY INC., 6 Petitioner, 7 8 V. 9 APTIV TECHNOLOGIES AG AND APTIV TECHNOLOGIES LIMITED, 10 Patent Owner. 11 12 Case No. IPR2024-00228 13 U.S. Patent No. 9,619,420 14 15 REPORTER'S CERTIFICATE 16 ORAL DEPOSITION OF HENRY H. HOUH 17 December 19, 2024 18 I, Melinda Barre, Certified Shorthand Reporter in 19 and for the State of Texas, hereby certify to the 20 following: 21 That the witness, HENRY H. HOUH, was duly sworn by 22 the officer and that the transcript of the oral 23 deposition is a true record of the testimony given by 24 the witness; 25 That the original deposition was delivered to
Page 219 1 I, HENRY H. HOUH, have read the foregoing deposition 2 and hereby affix my signature that same is true and 3 correct, except as noted above. 4 5 _____ 6 HENRY H. HOUH 7 THE STATE OF _____) 8 COUNTY OF _____) 9 Before me, _____, on this day 10 personally appeared HENRY H. HOUH, known to me or proved 11 to me on the oath of _____ or through 12 _____ (description of identity card 13 or other document) to be the person whose name is 14 subscribed to the foregoing instrument and acknowledged 15 to me that he/she executed the same for the purpose and 16 consideration therein expressed. 17 Given under my hand and seal of office on this _____ 18 day of _____, _____. 19 20 _____ 21 NOTARY PUBLIC IN AND FOR 22 THE STATE OF _____ 23 My Commission Expires: _____ 24 _____No Changes Made _____ Amendment Sheet(s) Attached 25	Page 221 1 Travis Jensen. 2 That a copy of this certificate was served on all 3 parties and/or the witness shown herein 4 on _____. 5 I further certify that pursuant to FRCP Rule 6 30(f)(1), that the signature of the deponent: 7 _____ was requested by the deponent or a party before 8 the completion of the deposition and that the signature is 9 to be before any notary public and returned within 30 days 10 from date of receipt of the transcript. If returned, 11 the attached Changes and Signature Page contains any 12 changes and the reasons therefor: 13 _____ was not requested by the deponent or a 14 party before the completion of the deposition. 15 I further certify that I am neither counsel for, 16 related to, nor employed by any of the parties or 17 attorneys in the action in which this proceeding was 18 taken, and further that I am not financially or 19 otherwise interested in the outcome of the action. 20 Certified to by me on this, the _____ day 21 of _____, 2025. 22 23  24 Melinda Barre 25 Texas CSR 2192 Expiration: 12/31/25

Page 222 1 COUNTY OF HARRIS) 2 STATE OF TEXAS) 3 I hereby certify that the witness was notified on 4 _____ that the witness has 30 days or (____ 5 days per agreement of counsel) after being notified by 6 the officer that the transcript is available for review 7 by the witness and if there are changes in the form or 8 substance to be made, then the witness shall sign a 9 statement reciting such changes and the reasons given by 10 the witness for making them; 11 That the witness' signature was/was not returned as 12 of _____. 13 Subscribed and sworn to on this, the ____ day of 14 _____, 2025. 15 16 17 18 19 20 21 22 23 24 25	



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