

In the Matter Of:

MICROCHIP TECHNOLOGY INC. v

APTIV TECHNOLOGIES AG

HENRY HOUH

December 19, 2024



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 V.

8 APTIV TECHNOLOGIES AG AND APTIV TECHNOLOGIES LIMITED,
9 Patent Owner.

10 Case No. IPR2024-00228
11 U.S. Patent No. 9,619,420
12

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1 2 ORAL VIDEOTAPED DEPOSITION 3 HENRY H. HOUH 4 DECEMBER 19, 2024 5 VOLUME 2 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 19th day of December, 2024, 11 from 9:00 a.m. to 2:59 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 228 5 Examination by Mr. Blumenkopf 324 6 Re-Examination by Mr. Jensen 333 7 Signature Page 357 8 Court Reporter's Certificate 359 9 10 11 12 13 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 Telephone: 650.614.7400 9 E-mail: tjensen@orrick.com 10 11 FOR PATENT OWNER: 12 Mr. Bryan Blumenkopf 13 MORRISON & FOERSTER LLP 14 13521 High Bluff Drive, Suite 100 15 San Diego, California 92130 16 Telephone: 858.720.5100 17 E-mail: bblumen@mofo.com 18 19 ALSO PRESENT: Robert Suarez, Videographer 20 21 22 23 24 25	1 THE VIDEOGRAPHER: The time is 9:00 a.m. 2 Eastern Time on December 19th, 2024. We are going on 3 the record for the remote video deposition of Dr. Henry 4 H. Houh in the matter of Microchip Technology Inc. 5 versus Aptiv Technologies AG and Aptiv Technologies 6 Limited. My name is Robert Suarez, and I'm the legal 7 videographer on behalf of Lexitas. Will counsel please 8 introduce themselves and state their firm and who they 9 represent beginning with the party noticing this 10 proceeding. 11 MR. JENSEN: Yeah. This is Travis Jensen 12 from Orrick, Herrington & Sutcliffe on behalf of 13 petitioner, Microchip Technology Inc. 14 MR. BLUMENKOPF: This is Bryan Blumenkopf 15 from Morrison & Foerster on behalf of the patent owner, 16 Aptiv Technologies. 17 THE VIDEOGRAPHER: Will the court reporter 18 please swear or affirm in the witness. 19 THE REPORTER: He's still under oath from 20 yesterday, Robert. 21 THE VIDEOGRAPHER: Go ahead. Proceed. 22 23 24 25

Page 228 1 CONTINUED EXAMINATION 2 QUESTIONS BY MR. JENSEN: 3 Q. Welcome back, Dr. Houh. You understand that 4 we're continuing the deposition today from yesterday? 5 A. Thank you. Yes, I do. 6 Q. After we recessed yesterday did you discuss 7 your deposition with counsel? 8 A. No. 9 Q. Let me ask you to turn to your '643 — — 10 declaration. I can give you the paragraph number in 11 just a moment. 12 This is paragraph 156 towards the end of 13 the declaration. 14 A. Okay. I'm there. 15 Q. And in this section you provide a claim chart 16 showing how Aptiv's dual-role hub embodies each 17 limitation of claim 1 in the '643 patent, correct? 18 A. That's what I say here, yes. 19 Q. So I'd like to turn your attention to the claim 20 limitation on page 84 that recites "providing a signal 21 detection circuit." 22 A. Okay. 23 Q. Do you see that claim element? 24 A. Yes. 25 Q. Is it your opinion that the Boston 2 chip in	Page 230 1 A. Yes, I see it. 2 Q. Is there a signal detection circuit shown in 3 that diagram? 4 MR. BLUMENKOPF: Objection, form. 5 A. If you read the descriptions in conjunction 6 with these figures on pages 90 to 93 of Exhibit 2023 of 7 the '643 matter, it's describing the port switch 8 sequence whereby the dual-role hub is able to detect 9 whether a consumer USB device is operating in host or 10 device mode. 11 BY MR. JENSEN: 12 Q. Yeah. So where is the signal detection 13 circuit? That's my question. 14 A. If you review what's described, it's clear that 15 there is a -- it is detecting that the dual-role hub is 16 able to detect whether a consumer USB device is 17 operating in host or device mode if you read it. 18 Q. I'll accept that. My question is where is the 19 circuit? 20 A. Well, it's within the dual-role hub. 21 Q. Where? 22 A. I mean, it's clear that it's describing that 23 it's there so that -- because the dual-role hub is able 24 to detect whether a consumer USB device is operating in 25 host or device mode.
Page 229 1 Aptiv's dual-role hub contains a signal detection 2 circuit? 3 MR. BLUMENKOPF: Objection, form. 4 A. I do say that in this chart. 5 BY MR. JENSEN: 6 Q. And then the only thing that you cite in 7 support of that is Exhibit 2023, pages 90 to 93, 8 correct? 9 A. In that box, sure. 10 Q. So let's take a look at Exhibit 2023 at 11 pages 90 to 93, and I've got on the screen share 12 Exhibit 2023 at page 90. Are you able to see that? 13 A. Yes. 14 Q. And just to maybe give you some context, let me 15 go to the first page of the document for you. What is 16 the document Exhibit 2023? 17 A. This is a product specification related to the 18 Boston USB hub with SD card port ASIC. 19 Q. And is this the document that you rely on in 20 your report for providing a signal detection circuit 21 limitation claim mapping? 22 A. Yes. 23 Q. So let's turn to pages 90 to 93 of 24 Exhibit 2023. And on page 90 there's a diagram on the 25 top half of the page.	Page 231 1 Q. Where does it say that? 2 A. So if you look at the text at the bottom of 3 page 90, it's describing part of this process. And it 4 says that -- I'm looking in the middle there -- "The end 5 user will later plug in a device to one of the three 6 remaining external ports (PRT2 in this example), which 7 will connect to the upstream host through the hub in the 8 usual manner, placing the system in the (a) 9 configuration. The upstream host will examine the user 10 device's descriptors and determine that this device is 11 compatible with the H2H function." 12 And then it goes on to say that "The 13 upstream host and the user's device may negotiate 14 between themselves over the USB network to arrange for 15 the H2H function to activate. The H2H" -- 16 Q. In your opinion, does that disclose a signal 17 detection circuit? 18 MR. BLUMENKOPF: Objection, form. 19 A. This is describing the process whereby the -- 20 it's describing this port switch sequence in which the 21 dual-role hub is able to detect whether the consumer USB 22 device is operating in host or device mode. 23 And that's what this is saying, which 24 is -- it continues to say that "The H2H device driver is 25 running on the upstream host will then communicate with

Page 232 1 the Boston firmware using UDCUS control inputs out 0 and 2 N0 to arrange for the port to change and inform the 3 Boston firmware which hub port number is involved." 4 Then, "Having previously negotiated the 5 H2H function with upstream host, the user's device will 6 perform a USB disconnect and this places the system in 7 the (b) configuration." 8 Then it goes on to talk about the (c) 9 configuration, and that's part of the port switch— 10 sequence. 11 BY MR. JENSEN: 12 Q. Yeah. So where is the signal detection 13 circuit? 14 MR. BLUMENKOPF: Objection, form. 15 A. I mean, this is describing this as part of the 16 process of the port switch sequence within the dual-role 17 hub. 18 BY MR. JENSEN: 19 Q. Does any system that can perform a host device 20 port switch sequence necessarily have a signal detection 21 circuit? 22 MR. BLUMENKOPF: Objection, form. 23 A. I mean, in this chart I'm only considering the 24 Boston 2 chip really, this dual-role hub. I mean, 25 that's a hypothetical for any other system except the	Page 234 1 descriptions of what's going on in pages 90 to 93 of 2 this document. 3 BY MR. JENSEN: 4 Q. Is it your testimony, Dr. Houh, that firmware 5 in a head end that negotiates a host device role 6 reversal is a signal detection circuit? 7 MR. BLUMENKOPF: Objection, form. 8 A. You used the word "firmware in the host 9 device," but this is also talking about the Boston 10 firmware. So it's the Boston firmware which is -- if 11 you look, for example, on page 92, it's talking about 12 the Boston firmware setting appropriate value to the H2H 13 port switch to route the user to the device. 14 BY MR. JENSEN: 15 Q. Is it the Boston firmware on page 92 that you 16 are identifying as the signal detection circuit? 17 MR. BLUMENKOPF: Objection, form. 18 A. Well, typically firmware can be used to control 19 circuit elements; and that's what firmware -- you know, 20 working in conjunction provides the control for elements 21 that perform functions that are specified by the 22 firmware. So firmware certainly works in conjunction 23 with underlying circuitry to perform certain functions. 24 BY MR. JENSEN: 25 Q. Is firmware a circuit, Dr. Houh?
Page 233 1 one I proposed -- or analyzed as what the petitioner 2 proposed. And while there is a detection unit inside 3 the bridge of Chang II, it doesn't work to -- 4 BY MR. JENSEN: 5 Q. Respectfully, Dr. Houh, I didn't ask anything 6 about Chang II. We're looking at the Aptiv product. 7 A. You asked about any other thing, and I'm 8 talking about any other thing. While it has a 9 detection unit -- 10 Q. It's nonresponsive. It's nonresponsive. 11 MR. BLUMENKOPF: Counsel, if you could 12 please let Dr. Houh finish his response before 13 interrupting. 14 MR. JENSEN: This is obstructionist. 15 We're moving on. 16 BY MR. JENSEN: 17 Q. Dr. Houh, can you identify -- 18 A. I just want to state for the record you didn't 19 allow me to finish my answer. 20 Q. You can say whatever you want. 21 Dr. Houh, can you identify anything in the 22 diagram on page 90 of the document you cite that is a 23 signal detection circuit? 24 MR. BLUMENKOPF: Objection, form. 25 A. It's described in the -- it's described in the	Page 235 1 MR. BLUMENKOPF: Objection, form. 2 A. Well, firmware is typically loaded onto some 3 sort of memory device that is part of a circuit that 4 also would be used to control other circuitry on a chip 5 to control the functions of the way the circuit works. 6 That includes pathways and sequential instructions that 7 control various elements of circuitry. 8 BY MR. JENSEN: 9 Q. Is it your testimony that the Boston firmware 10 can meet the signal detection circuit requirement of 11 claim 1 of the '643 patent? 12 MR. BLUMENKOPF: Objection, form. 13 A. What I'm saying is that this description of the 14 port switch sequence whereby the dual-role hub is able 15 to detect whether a consumer USB device is operating in 16 host or device mode is evidence that shows that there is 17 a circuit, signal detection circuit for receiving USB 18 signals from the consumer USB device via the second USB 19 port in the Boston 2 chip. 20 Q. Where does it say that the Boston 2 chip 21 performs signal detection? 22 MR. BLUMENKOPF: Objection, form. 23 A. The port switch sequence is describing whereby 24 the dual-role hub is able to detect whether a consumer 25 USB device is operating in host or device mode. It

Page 236 1 doesn't have to use the words that you seem to insist it 2 has to use. 3 BY MR. JENSEN: 4 Q. Where are you reading from? Is there something 5 you're reading from? 6 A. A person of ordinary skill looking at this 7 would recognize that there is such a signal detection 8 unit because the dual-role hub is able to detect whether 9 a consumer USB device is operating in host or device 10 mode. 11 Q. Let's turn to the '643 patent. 12 Where does the '643 patent disclose a 13 signal detection circuit? 14 MR. BLUMENKOPF: Objection, form. 15 A. So one place the specification is describing 16 the process of detecting whether the device is -- what 17 mode the device is in is around column 6 around line 23. 18 And it talks here about how "In use, the 19 head unit controls the switching device via the USB 20 bridge hardware or any other convenient means of 21 control. The HU software application may choose to 22 enable, for example, a phone on any one of the consumer 23 USB ports by requesting, commanding or otherwise knowing 24 the phone is required to be in USB host mode and 25 commanding the routing of the specific USB port phone is	Page 238 1 the head unit drivers and -- to the head unit drivers 2 and returning the responses from the head unit drivers 3 back to the consumer device, the bridge appears as a 4 transparent component in the USB system architecture. 5 "The system capabilities are controlled by 6 the head unit and the system remains flexible without 7 need for changes to the bridge firmware or hardware when 8 the system designer requires changes to the descriptor 9 responses. 10 "Once the consumer device completes the 11 enumeration process, the USB head unit's USB functional 12 capabilities are known to the consumer device and the 13 consumer device may enable use of those functions over 14 USB communication. At this point, the consumer device 15 or head unit may begin activating any number of 16 supported services such as data connections, streaming 17 audio and streaming video to and from the vehicle via 18 the USB bridge." 19 So this is discussing -- while it's 20 discussing this enumeration process from the host's 21 point of view, partly, it is describing that there's the 22 detection going on in conjunction with the bridge 23 hardware and that the -- I mean, it says that the -- the 24 control of the switching can be done via the bridge 25 hardware or any other means of control.
Page 237 1 attached to the USB bridge. Once routed to the USB 2 bridge, the phone will detect a USB device is connected 3 and the phone will begin the standard USB enumeration 4 sequence." 5 Actually, let me skip down. So if you 6 skip down to line 36, it talks about -- it says that 7 "The enumeration process follows a strict sequence of 8 USB descriptor requests from the USB host and USB 9 descriptor responses from the USB device that allow the 10 host to determine the capabilities and functions of the 11 device and configure the USB device for operation. Once 12 the complete set of device descriptors are known to the 13 USB host" -- sorry. "Once the complete set of device 14 descriptors are known, the USB host will load the 15 appropriate USB drivers and applications to support in 16 the functionality that the USB device provides. 17 "In the scope of this invention, it is 18 envisioned that the responses to the descriptor requests 19 made by the phone (USB host) are either answered locally 20 by the bridge or preferably the requests are forwarded 21 through the bridge to the head unit where its device 22 drivers process the request and return the response. 23 The descriptor responses from the device driver are 24 conveyed to the USB bridge which then, in turn, passes 25 them to the phone. By passing this descriptor request	Page 239 1 And that's part of what in the 2 specification is talking about the process of being able 3 to detect what mode devices might be in. That's part of 4 what describes what happens in a signal detection unit. 5 BY MR. JENSEN: 6 Q. In your opinion, does the passage that you just 7 read disclose a signal detection circuit? 8 MR. BLUMENKOPF: Objection, form. 9 A. Well, the process it's describing involves the 10 use of hardware and circuitry in the process of what's 11 going on here. 12 BY MR. JENSEN: 13 Q. Is that a "yes" or a "no" to my question? 14 A. I mean, I don't -- give me one second, please. 15 I mean, there are embodiments within the 16 specification that talk about -- and figures that talk 17 about how the USB routing and switching logic in a USB 18 bridge are integrated with a USB hub in combination -- 19 in a combination integrated circuit. 20 So one of the embodiments is certainly a 21 circuit that is -- that embodies the invention. And so 22 if you look at the specification as a whole, it 23 certainly discloses there's a circuit. And the 24 functions described here support that there is the 25 capability of the system on the circuit to provide the

Page 240 1 detection and enumeration process described for 2 detecting the mode of USB devices or things that are 3 connected to the USB ports. 4 Q. The passage you read is describing figure 4 of 5 the patent, correct? 6 A. It's in the section describing figure 4, but 7 the description is more broad than what's shown in 8 figure 4 because it talks about how there can be any 9 other convenient means and that things are done via the 10 USB bridge hardware and things like that. 11 So it is talking about figure 4, but the 12 description isn't limited only to what's shown in— 13 figure 4. 14 Q. Does figure 4 of the Aptiv patent show a signal 15 detection circuit? 16 MR. BLUMENKOPF: Objection, form. 17 A. I mean, if you read the description of what's 18 happening in figure 4, it's apparent to a person of 19 ordinary skill that it has the capability to detect what 20 mode the connected devices are. 21 BY MR. JENSEN: 22 Q. That's not my question. My question is does 23 figure 4 illustrate a signal detection circuit? 24 MR. BLUMENKOPF: Objection, form. 25 A. Well, while there's no explicit box that I see	Page 242 1 Q. Sitting here right now today, you don't have an 2 opinion as to what components in figure 4 could contain 3 a signal detection circuit? 4 MR. BLUMENKOPF: Objection, form. 5 A. Well, the opinions in my supplemental 6 declaration are about, for example, the Boston 2 chip 7 and in the section we were looking at and also the 8 proposed combination of the -- set forth by the 9 petitioner in which the signal detection unit was 10 claimed by the petitioner to be -- or was laid out in 11 Chang to be part of the bridge chip of Chang. 12 So that's where -- for the purposes of my 13 declaration, that's what I was analyzing. This is a 14 different question than was raised that I couldn't spend 15 time to analyze. So it wasn't part of the analysis for 16 my supplemental declaration for the '643. 17 BY MR. JENSEN: 18 Q. So you haven't analyzed and have no opinion 19 about where a signal detection circuit could be located 20 in figure 4 of the Aptiv patent? 21 MR. BLUMENKOPF: Objection, form. 22 A. Well, I described to you where it says that 23 part in figure 4. So that part in figure 4, a person of 24 ordinary skill would understand that that's talking 25 about the capability to do signal detection; and the
Page 241 1 labeled "signal detection circuit" in figure 4, the 2 description of figure 4 makes it clear to a person of 3 ordinary skill that the system has the capability to 4 detect which mode the connected devices are in. 5 BY MR. JENSEN: 6 Q. What component or components in figure 4 could 7 contain a signal detection circuit? 8 MR. BLUMENKOPF: Objection, form. 9 A. I'm not sure that in response to the petition's 10 claims that there was any claim about where the circuit 11 was or wasn't in figure 4 that I would have had a need 12 to include that in my analysis for the purposes of my 13 supplemental declaration. 14 BY MR. JENSEN: 15 Q. Are you able to answer my question? 16 MR. BLUMENKOPF: Objection, form. 17 A. I don't think I address this directly in my 18 supplemental declaration because it wasn't raised in the 19 petition in a way that I would have -- I could have done 20 some analysis around this. 21 So I think I need some time to think about 22 it. I wouldn't be -- I wouldn't -- I would want to 23 consider the whole of the specification and give it some 24 time. 25 BY MR. JENSEN:	Page 243 1 embodiments listed include that the implementation can 2 be done in an integrated circuit. 3 So I think it's pretty clear that there 4 is -- it's describing a signal detection circuit in the 5 description of figure 4. 6 BY MR. JENSEN: 7 Q. Let me just ask the question this way. Could 8 the signal detection circuit be located in the box in 9 figure 4 labeled "USB Routing Multiplexing Switches"? 10 MR. BLUMENKOPF: Objection, form. 11 A. I'd want to spend more time looking at the 12 other parts of the specification here; but it's clear 13 that the process of what's happening, described in 14 conjunction with figure 4 and I think other parts, it 15 would be clear to a POSITA that there is such a signal 16 detection circuit because the system is able to detect 17 which mode the consumer-facing ports, the devices 18 connected to those ports are in. That's certainly 19 described partly in the description of figure 4 here. 20 BY MR. JENSEN: 21 Q. And my question is could that signal detection 22 circuit that you reference be located in the box in 23 figure 4 labeled "USB Routing Multiplexing Switches"? 24 MR. BLUMENKOPF: Objection, form. 25 A. So, you know, as part of the analysis for my

Page 244 1 declaration responding to petitioner's arguments and 2 setting forth the section we're looking at with the 3 table, I mean, that wasn't directed to this part of 4 figure 4. So I don't think I specifically included 5 that. It wasn't part of the analysis that I did with 6 respect to my supplemental declaration. 7 I mean, I would want to take time to think 8 about it; but I would need to spend time looking at the 9 specification. — — 10 BY MR. JENSEN: 11 Q. Are you familiar with the micro AB connector 12 described in the USB specification? — — 13 MR. BLUMENKOPF: Objection, form. 14 A. Can you point me where you're looking at in the 15 specification, please. 16 BY MR. JENSEN: 17 Q. I'm not looking at any particular location. 18 I'm just asking you are you familiar with the micro AB 19 connector terminology? 20 MR. BLUMENKOPF: Same objection. 21 A. Yeah. I've heard that with respect to USB 22 before, but I don't know where that is in the 23 specification. 24 BY MR. JENSEN: 25 Q. What is a micro AB connector?	Page 246 1 A. I have it open here, and I can see it on the 2 screen. 3 MR. BLUMENKOPF: Doctor, are you looking 4 at the '643 declaration from Mr. Welch? 5 THE WITNESS: Yes. I'm looking at the 6 '643 declaration in the PGR11 case. 7 BY MR. JENSEN: 8 Q. And paragraph 192 of Mr. Welch's declaration 9 includes a modified embodiment of Chang figure 3, 10 correct? 11 MR. BLUMENKOPF: Objection, form. 12 A. There is a modified figure which isn't in Chang 13 but has been altered in Mr. Welch's declaration. 14 BY MR. JENSEN: 15 Q. Is this figure one that you responded to in 16 your report? 17 MR. BLUMENKOPF: Objection, form. 18 A. I mean, I believe I did at points. I don't 19 remember exactly where or what, but we can look at that. 20 BY MR. JENSEN: 21 Q. Are you familiar with the embodiment shown in 22 paragraph 192 of Mr. Welch's report? 23 MR. BLUMENKOPF: Objection, form. 24 A. This is not an embodiment that's in any single 25 prior art. This is a hypothetical combination that was
Page 245 1 MR. BLUMENKOPF: Objection, form. 2 A. Well, if I remember correctly, it's a connector 3 for a specific arrangement that I think is somewhat 4 trapezoidal maybe with round nubs at the corners of the 5 trapezoid, although I think this is something that could 6 be looked up in the specification. I don't know it by 7 heart. 8 So to the best of my recollection, I think 9 that's what it is; but I think we could just look at the 10 specification. 11 BY MR. JENSEN: 12 Q. Do you have an opinion whether the claimed USB 13 ports read on a micro AB connector? 14 MR. BLUMENKOPF: Objection, form. 15 A. I mean, I don't recall saying any such thing in 16 my supplemental declarations; but I don't know them by 17 heart. 18 BY MR. JENSEN: 19 Q. Let's go to Mr. Welch's declaration in 20 paragraphs 192 and 193. 21 A. Of which matter? 22 Q. Any of them. You can pick whatever one you 23 would like. I'm sharing the one from the '643 24 declaration, but they're all the same in the parts I'm 25 going to ask you about.	Page 247 1 created for the purpose of a position. 2 BY MR. JENSEN: 3 Q. Yeah. Are you familiar with the proposed 4 modification described in paragraph 192 of Mr. Welch's 5 report? 6 MR. BLUMENKOPF: Objection, form. 7 A. Yes. 8 BY MR. JENSEN: 9 Q. Okay. Let's look at paragraph 193 of 10 Mr. Welch's report. Can you read the first sentence. 11 Aloud, please. 12 A. It says, "This detection circuitry could be 13 deployed in several obvious ways. In the example above 14 it is associated with the mux." 15 Q. Why don't you go ahead and read aloud, if you 16 will, the entirety of paragraph 193. 17 A. I want to point out that this is the Motivation 18 to Combine section and not the actual analysis section 19 of his, you know, claim element by claim element or 20 claim by claim analysis. But the rest of it's -- the 21 next sentence says, "In another obvious example it could 22 be separate and between the dual-role port 50 and mux." 23 It goes on to say, "This location is 24 obvious because it is the first place a signal from a 25 downstream USB product arrives. In a third obvious

Page 248 1 location, it could be located in the bridge to take 2 advantage of existing logic and circuitry to, for 3 example, process the output of the detection circuit in 4 a manner similar to Chang II's CPU 135." 5 It goes on to give a citation. "It would 6 have been routine and obvious for the bridge and/or the 7 detection unit to control the switching functionality. 8 For example, as I describe above, Chang II's bridge 9 includes a detection unit (in the control chip) that 10 detects the mode of the downstream product for selection 11 of the appropriate transmission path." There's another 12 citation. 13 "The above illustrates the detection unit 14 connected to the mux to show that the host-device 15 detection ultimately controls the mux's select line. 16 Additionally, the detection unit must connect to the 17 downstream port to detect the mode, as shown in 18 Chang II," and another citation. So that's the whole 19 paragraph. 20 Q. In the figure shown in paragraph 192 what box 21 number is identified as the bridge? 22 MR. BLUMENKOPF: Objection, form. 23 A. In the modified figure -- I don't think the 24 label is modified here from the original, but the bridge 25 is labeled 52.	Page 250 1 But the detection -- I forget what 2 Chang II uses. Let me just confirm. Chang II uses the 3 word "detection unit," the phrase; and that's inside the 4 chip, the bridge chip of Chang II. 5 BY MR. JENSEN: 6 Q. Is the detection unit illustrated in the figure 7 in paragraph 192 located inside the bridge 52? 8 MR. BLUMENKOPF: Objection, form. 9 A. So Mr. Welch says why he shows the detection 10 unit in 192. He shows that it's connected to the mux to 11 show that host device -- "The above illustrates the 12 detection unit connected to the mux to show that 13 host-device detection ultimately controls the mux's 14 select line." 15 So it's being illustrated here simply to 16 show that there is a control from -- that the detection 17 unit is connected to the mux to ultimately control the 18 mux's select line. 19 If you look in his analysis, he even says 20 in the previous sentence that "The bridge includes a 21 detection unit (in the control chip) that detects the 22 mode of the downstream product for selection of the 23 appropriate transmission path." 24 And so there's no detection unit in the 25 Chang reference from which figure 3 comes from. So this
Page 249 1 BY MR. JENSEN: 2 Q. And there's another box shown in the figure 3 that says "detection unit," correct? 4 A. There is a box that is added. This was not in 5 the original. But it's described by Mr. Welch as, "The 6 above illustrates the detection unit connected to the 7 mux to show that host-device detection. Ultimately it 8 controls the mux's select line." 9 So it's simply describing here that there 10 is a connection to explicitly show the detection unit, 11 which he also says in the previous sentence that it's in 12 the control chip. But he's simply illustrating here 13 that the detection unit is connected to the mux so that 14 it can control it. But he still says that it's -- in 15 the previous sentence "Chang II's bridge includes a 16 detection unit in the control chip." 17 Q. And that's one place that Mr. Welch says the 18 detection unit could be located, correct, is in the 19 bridge? 20 MR. BLUMENKOPF: Objection, form. 21 A. Well, I think in this later analysis element by 22 element he set -- he relies on it being in the bridge, 23 the bridge chip of Chang II. So, remember, this is a 24 combination. This is a hypothetical. So it's not 25 any -- this is not from the prior art directly.	Page 251 1 was added but to show the control relationship to the 2 mux, which was also added by -- in Mr. Welch's 3 declaration. So this is simply showing a control 4 relationship, and I think there's even a footnote 5 somewhere to indicate that the detection unit is not to 6 be seen as outside the box or something like that. 7 So it's clear that this is illustrating a 8 logical -- a connectivity between detection unit and the 9 mux. He even says that the detection unit is in the 10 control chip. So this is simply illustrating that the 11 detection unit connected to the mux shows that the host 12 device detection ultimately controls the mux's select 13 line. 14 BY MR. JENSEN: 15 Q. Is it your understanding that the image in 16 paragraph 192 is intended to depict the detection unit 17 as being integrated as part of the bridge 52? 18 MR. BLUMENKOPF: Objection, form. 19 A. Mr. Welch himself says in the immediately prior 20 sentence or the second-to-last sentence of paragraph 193 21 of his '643 declaration, he says, "For example, as I 22 describe above, Chang II's bridge includes a detection 23 unit (in the control chip) that detects the mode of the 24 downstream product for selection of the appropriate 25 transmission path."

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1 Then he goes on to say in the next 2 sentence, "The above illustrates the detection unit 3 connected to the mux to show that host-device detection 4 ultimately controls the mux's select line." 5 Sorry. That would have been the 6 third-to-last sentence rather than the second-to-last, 7 the first one I read there. 8 "Additionally, the detection unit must 9 connect to the downstream port to detect the mode-as - 10 shown in Chang II." 11 So he's simply showing the control 12 relationship of the detection unit to the mux, which is 13 what is being illustrated in figure 3. And that's what 14 Mr. Welch says. 15 BY MR. JENSEN: 16 Q. You keep talking about this idea of a control 17 relationship. If we look at paragraph 193, the fourth 18 line down, the sentence begins, "In a third obvious 19 location." Do you see that? 20 A. Yes. 21 Q. And it goes on to say what the third obvious 22 location could be for where the detection circuit could 23 be located, correct? 24 MR. BLUMENKOPF: Objection, form. 25 A. I mean, he says it could be located in the	1 obvious implementations for modifying Chang, for 2 example, using either a mux or a crossbar switch. But 3 later in his analysis for the actual claim element by 4 element portions, he doesn't even talk about some of the 5 alternatives in his analysis. 6 So while there is a sentence there in 193, 7 the third sentence, that's not the actual combination 8 that Mr. Welch himself analyzes later on in this -- in 9 his claim element by claim element analysis section, 10 which is down around paragraph 200 or so, 220-ish. 11 So he may have talked about many obvious 12 implementations, but he chose only to analyze a subset 13 of what he's discussing here in terms of his element by 14 element analysis. 15 MR. JENSEN: Could the court reporter read 16 my question back. 17 (The record was read as requested.) 18 MR. BLUMENKOPF: Same objection. 19 A. So it's clear that the figure does not -- is 20 not showing this -- he's not actually provided -- 21 Mr. Welch is not providing an actual figure that shows 22 the arrangement of the components according to the third 23 sentence in paragraph 193 of the '643 declaration. So 24 he's not specific about it enough. 25 BY MR. JENSEN:
Page 253	Page 255
1 bridge; but Chang II actually shows it is located in the 2 bridge of Chang II. And, furthermore, in the actual 3 analysis that Mr. Welch performs element by element he 4 says it's in the bridge. We can look at that, but 5 that's what his analysis was. 6 BY MR. JENSEN: 7 Q. We certainly have a disagreement about that, 8 but let me ask you about paragraph 193. Let's look at 9 the third sentence. It says, "In another obvious 10 example, it could be separate and between the dual-role 11 port 50 and mux." 12 Do you see that? 13 A. The second sentence, yes, I see that. 14 Q. I think it's the third sentence. "In another 15 obvious example, it," meaning the detection circuitry, 16 "could be separate and between the dual-role port 50 and 17 mux." 18 A. Yes. I do see the third sentence. That's what 19 it says. 20 Q. If the detection unit is located between the 21 dual-role port 50 and the mux, would that be inside or 22 outside of the bridge 52 in the figure of paragraph 192? 23 MR. BLUMENKOPF: Objection, form. 24 A. Well, in this section Mr. Welch discusses many 25 different things. For example, he discusses in 191 two	1 Q. If the detection unit were placed between the 2 dual-role port 50 and the mux in the modified figure of 3 Chang, would the detection unit be located inside or 4 outside of the bridge 52? 5 MR. BLUMENKOPF: Objection, form. 6 A. Well, if you look at paragraph 152 of 7 Mr. Welch's '643 declaration, in the middle he talks 8 about how, "Additionally, Chang teaches that the bridge 9 may be a discrete component (as shown in figure 3) or 10 integrated with other circuitry comprising the hub." 11 And so he's saying that that's what -- 12 he's saying that's what Chang itself teaches. So he 13 hasn't provided a specific figure illustrating what he 14 means by this. But to the extent that these newly added 15 functions are included in the bridge, integrated with 16 the bridge, as he himself describes Chang describing, 17 then it would be all still inside the bridge. 18 BY MR. JENSEN: 19 Q. Is it your testimony, Dr. Houh, that locating 20 the detection unit "between the dual-role port 50 and 21 mux" would be inside of Chang's bridge 52? 22 MR. BLUMENKOPF: Objection, form. 23 A. What I'm saying here is Mr. Welch has not 24 provided a specific figure illustrating what he means, 25 but he has cited to portions of Chang that talk about

Page 256 1 how the bridge may be a discrete component or integrated 2 with other circuitry comprising the hub. 3 So this is a made-up combination 4 illustrated, and he has not provided what he means as to 5 where the detection unit would be on his third sentence. 6 But he has pointed to things that other circuitry could 7 be integrated with the bridge. 8 So to the extent that -- so Mr. Welch is 9 not specific about your question. He's specific about -- 10 what he says in the third sentence, that it can be 11 between the dual-role port and mux. 12 But because Chang is teaching that the 13 bridge can be integrated with other circuitry comprising 14 a hub, this is just one thing he says, which he actually 15 does not analyze in the element by -- he does not set 16 forth as a specific combination he's analyzing in the 17 element by element analysis later on in the '643 18 declaration. 19 BY MR. JENSEN: 20 Q. Let me ask this question, Dr. Houh. Did you 21 analyze a scenario where the detection unit is located 22 outside of the bridge 52 in your declarations? 23 MR. BLUMENKOPF: Objection, form. 24 A. Well, I mean, the main focus of my declaration 25 was to respond to -- of the analysis was responding to	Page 258 1 the bridge. Are you with me? 2 A. Sure. 3 Q. Can you summarize what your argument is as to 4 why that particular embodiment would be inoperable, or I 5 think you used the term "dead end state." However you 6 want to describe it, can you just summarize for me why 7 you think the proposed modification with the detection 8 unit inside the bridge would not work. 9 MR. BLUMENKOPF: Objection, form. 10 A. So to start with -- I think you acknowledged 11 this -- that the petition relies on Chang II's bridge 12 device and detection unit, which is within the bridge of 13 Chang II, to provide the control signals that cause the 14 multiplexer to route the downstream ports to the 15 appropriate transmission path. 16 So the proposed combination has a 17 structural flaw. And as we were looking at just now in 18 Mr. Welch's '643 declaration in paragraph 193, he says 19 that the detection unit must connect to the downstream 20 port to detect this mode as shown in Chang II. 21 And so the detection unit of Chang II is 22 part of the bridge; but the claims of the '643 patent 23 require "routing the USB signals from the consumer USB 24 device to the first USB port via the routing logic, 25 connected directly to the USB hub and thereby bypassing
Page 257 1 the actual combination that petitioner set forth in the 2 challenges in which that specific combination relied on 3 the bridge and the detection unit inside the bridge. 4 I think that was made very clear, I think, 5 either in the petition or Mr. Welch's declaration or 6 both. So there may be some parts that I address the 7 particular issue that you asked about. I don't know my 8 whole -- I don't know -- I don't have a photographic 9 memory. But I know that the main arguments were 10 directed to what the petitioner and Mr. Welch actually 11 set forth as the combination, which is simply using the 12 bridge of Chang II in the combination as the bridge in 13 which the detection unit is inside the bridge. 14 BY MR. JENSEN: 15 Q. Can you point me to anywhere in any of your 16 declarations where you analyze a scenario where the 17 detection unit is located outside of the bridge 52? 18 MR. BLUMENKOPF: Objection, form. 19 BY MR. JENSEN: 20 Q. In the interest of time and since you haven't 21 been able to find anything just yet, let me ask a 22 different question. I think you mentioned this a couple 23 of times yesterday and possibly today as well. 24 Let's talk about the scenario that you did 25 analyze where the detection unit is located inside of	Page 259 1 the USB bridge in accordance with the determination that 2 the consumer device is in the USB device mode." 3 So in the combinations set forth by 4 petitioner, in order to satisfy -- and, thus, in order 5 to satisfy the bypassing the USB bridge limitation of 6 the claims, the detection circuit in the proposed 7 combination must be bypassed when the USB signals are 8 routed to the USB hub when the consumer device is in the 9 USB device mode. 10 And so if you look then at paragraph 87 of 11 my '643 declaration -- and I believe I have a very 12 similar discussion in the rest of my declarations -- now 13 we're bypassing the bridge, as I show in 87. There's 14 some very technical arguments, for example, in 88 about 15 tri-state high impedance so that there's actually no 16 signal -- that the signal is not also being received at 17 the bridge. That's kind of summarized in 88. And that 18 when the bridge is bypassed by the multiplexer in the 19 combination, it's electrically disconnected from the 20 ports coupled to the multiplexer, the input port. 21 And so now the bridge device can't send or 22 receive signals from a downstream USB port in this 23 state; and, therefore, the bridge device of Chang II, 24 which has the detection unit in it, is rendered 25 incapable of detecting whether a device is in host or

Page 260 1 device mode as laid out in figure 6 of Chang II. And 2 that, accordingly, prevents the bridge device from 3 generating or providing control signals to the 4 multiplexer. 5 And it's that -- if you actually look at 6 figure 6 of Chang II, "In the disconnected state the 7 bridge device is unable to exchange signals with an 8 external device and, thus, the bridge device will never 9 reach stages S607 or S619 in figure 6." — 10 And so that is -- you know, because the 11 bridge device then is unable to detect -- the bridge 12 device of the combination set forth by petitioner is 13 unable to detect a newly inserted external device, the 14 petition's USB hub module will remain in device mode 15 even if a new device is connected. And that's what I'm 16 calling this dead end state, and the petition fails to 17 address that. And that is what renders the combination 18 set forth by petitioner incapable of meeting the claimed 19 dynamic switching as described above. 20 BY MR. JENSEN: 21 Q. Is what you're saying -- let me just see if I 22 can summarize this, and you can tell me if I get it 23 right or wrong. Assuming that the bridge is located -- 24 strike that. 25 Assuming that the detection unit is	Page 262 1 the behavior of the multiplexer thus demonstrates the 2 need for Mr. Welch's admonition about -- that the port 3 has to be -- the detection unit must be connected to the 4 downstream port to detect this mode. 5 And so in either the hub 46 or hub 40 6 implementations when the multiplexer connects the 7 downstream port to the hub via the bridge 52, the bridge 8 52 is connected to the downstream port 50 through the 9 multiplexer. But when the multiplexer connects to the 10 downstream port by the direct-to-hub path, when the 11 device on the port is in device mode, it bypasses the 12 bridge. 13 So now because the bridge is now 14 electrically isolated from the port 50 as labeled in the 15 figure from Mr. Welch's declaration that I have added 16 purple arrows to, that detection unit is now isolated 17 from the signal and is not connected. Mr. Welch himself 18 acknowledges that the detection unit must be connected 19 in order to make a detection. 20 BY MR. JENSEN: 21 Q. Yeah. Sorry. My question is a little bit 22 different, right? 23 Would you agree with me that the modified 24 version of Chang could switch from a host-to-host path 25 to a host-to-device path, but it could not switch back?
Page 261 1 located inside of the bridge, if you had a host device 2 connection that was going through the bridge, you would 3 be able to detect a mode change from host to device and 4 reroute the signal directly to the upstream port; but 5 you wouldn't be able to switch back. Is that right? 6 MR. BLUMENKOPF: Objection, form. 7 A. Yeah. I mean, that's the dead end state. It's 8 the main feature of Chang II, which describes its 9 ability to, you know, be able to swap back and forth. 10 So this combination is inoperable and, 11 furthermore, it's basically killing or -- I don't know 12 what the right word there is. It's taking the main 13 feature that Chang II says is its main feature and 14 basically throwing it away. So it's not really directed 15 to the principle of operation of Chang II because it's 16 taking that main feature away, for example. 17 BY MR. JENSEN: 18 Q. You would agree with me, however, that the 19 modified embodiment would be able to detect a change 20 from host to device and reroute the signals to create a 21 host-device detection, correct? 22 MR. BLUMENKOPF: Objection, form. 23 A. So I do talk about how in the proposed 24 combination -- well, if you look at paragraph 86, I talk 25 about the behavior of the multiplexer. And it's the --	Page 263 1 MR. BLUMENKOPF: Objection, form. 2 A. It could switch from the communication path 3 internally in the proposed combination at first going 4 through the bridge, as I've illustrated in the figure in 5 86 of the '643 declaration. I think there's similar 6 figures and description in the other supplemental 7 declarations as well. 8 It is going through the bridge. And if it 9 detects the -- if the detection unit in that case 10 detects the downstream device, or the device connected 11 at port 50 rather, is now in device mode, then it 12 switches; and that's what the bridge control logic is at 13 least able to start the switching over. You know, in 14 Chang it does describe bypassing; but it describes it 15 with respect to the internal switch that's in the bridge 16 chip while leaving the input port of the Chang II bridge 17 connected to the detection unit. 18 But what's happening in the combination 19 set forth by petitioner is that the external mux 20 embodiment that the petitioner or Mr. Welch analyzed 21 then switches over externally the path to bypass the 22 bridge chip entirely. And that's when it connects that 23 the device is in -- the device connected to port 50 is 24 in device mode. And that's illustrated using a figure 25 from the petition that I -- actually, I'm not sure if

Page 264 1 that purple -- I don't remember if that purple is -- we 2 can look. But it shows that there is a path that 3 actually bypasses the entire bridge chip of Chang II in 4 both hub 46 and hub 40 implementations. 5 The bridge is now actually electrically 6 isolated from the signals on port 50. So the detection 7 unit can never then function to detect any change in the 8 status of the device or the device plugged into port 50 9 has been unplugged and a different device plugged-in -- 10 that could be in host mode. 11 So I think I give reasons, you know, in my 12 '643 declaration why that -- why a person of ordinary 13 skill would not have made the combination. And there 14 are multiple reasons that I've laid out because -- for 15 the reasons I lay out. We can go there if you want 16 but -- 17 BY MR. JENSEN: 18 Q. Let me see if I can summarize just so we've got 19 a clean answer because that went on for a really long 20 time. 21 You would agree with me that the problem 22 that you identify is not switching from a host-to-host 23 connection to a host-to-device connection, but the 24 problem is switching from a host-to-device connection to 25 a host-to-host connection?	Page 266 1 it can never switch back and detect a USB host being 2 plugged into port 50 to properly connect up the host. 3 So it's a situation like this. You might 4 have to turn off your car and reboot the system to work 5 again, and no one -- that just wouldn't be a workable 6 proposal. 7 BY MR. JENSEN: 8 Q. So what you're saying it's basically stuck in 9 the host-device connection mode, right? 10 A. Well, it would be stuck in this mode and never 11 be able to go back to host-to-host mode when a USB host 12 is plugged into port 50. And that's just not what USB 13 is about. And it's also taking away the main feature of 14 Chang II, putting Chang II into a system where it breaks 15 the main feature of Chang II. It doesn't make any 16 sense, and a POSITA wouldn't want to do that. 17 It basically isn't according to -- one of 18 the main features of USB also is the fact that you can 19 plug in and detach devices and change them. I mean, 20 that's the whole problem. Before USB came along if you 21 wanted to plug in a new card into your computer or a new 22 disk drive to a serial A2A port, you really had to shut 23 down your computer and then plug it in and turn it back 24 on. 25 In this case it's almost what the new --
Page 265 1 MR. BLUMENKOPF: Objection, form. 2 A. I don't think it's as simple as what you said. 3 So no matter what you plug in, after the bridge has been 4 bypassed, whether it's a host or -- there can be no 5 switching. It is literally locked in one state for 6 port 50 in the same state, and there can't be any change 7 after if a host is plugged in -- if the device is 8 unplugged from port 50 and a host device is plugged -- I 9 started to use the word "device" in that context -- a 10 USB host is plugged into port 50. 11 So, I mean, that's the situation. There 12 can never be a switch -- any USB host plugged into 13 port 50 thereafter will not work. And that kind of -- 14 that's eliminating really one of the basic features 15 provided by USB of being able to hot swap and change 16 devices. 17 BY MR. JENSEN: 18 Q. So you're saying anytime there's a host-device 19 connection, regardless of how you got there, you would 20 not be able to switch to a host-to-host connection in 21 the proposed modification? 22 MR. BLUMENKOPF: Objection, form. 23 A. Yeah. Once the combination set forth by 24 petitioner has switched over to a situation where the 25 device plugged into port 50 is in USB device mode, then	Page 267 1 the proposed combination would do is go backwards in 2 time to those days to be able to plug in a host device 3 once the port has been switched over to -- or once a USB 4 device has been plugged into port 50. 5 Q. You make the same dead end argument that we've 6 been discussing for both the hub 46 and hub 40 7 implementations of the proposed modification? 8 MR. BLUMENKOPF: Objection, form. 9 A. I think that's right. I do make that. 10 And by the way, we've been going about an 11 hour and 40 minutes. If we could just take a break when 12 you finish this line of questioning, that would be 13 great. 14 BY MR. JENSEN: 15 Q. Yeah. And you make the same dead end argument 16 that we've been discussing for both the multiplexer 17 implementation and the crossbar implementation of the 18 proposed Chang modification? 19 MR. BLUMENKOPF: Objection, form. 20 A. I do here. And in the relevant different 21 supplemental declarations I respond to the actual 22 combination that was analyzed in the respective 23 petition, which somehow doesn't -- which sometimes, if I 24 remember correctly, sometimes it's the mux 25 implementation that's actually analyzed and the crossbar

Page 268 1 isn't. And sometimes it's the crossbar implementation 2 that's analyzed, and the mux one isn't. 3 So I respond appropriately in the -- to 4 the implementations actually set forth, but I think in 5 paragraph 86 I'm discussing that this is with respect to 6 both limitations. 7 MR. JENSEN: Let's go ahead and take a 8 break. 9 THE VIDEOGRAPHER: The time is 10:42-a.m.- 10 We are now going off the record. 11 (Recess taken) 12 THE VIDEOGRAPHER: The time is 10:58 a.m. 13 We are now back on the record. 14 BY MR. JENSEN: 15 Q. Before the break, Dr. Houh, we were discussing 16 your opinions about the so-called dead end state of the 17 proposed combination. Do you recall that discussion? 18 A. Yes. 19 Q. And as a part of that discussion you mentioned 20 potentially having to do like a reboot. I can't 21 remember if you gave the example of a car, but you used 22 the word "reboot." What does it mean to reboot a 23 system? 24 MR. BLUMENKOPF: Objection, form. 25 A. Well, I think that would be to bring it up in	Page 270 1 highlights the yes answer. So in that case the answer 2 would default to yes, and then the user can change it or 3 just say okay and accept the yes. That's an example of 4 a default option. 5 BY MR. JENSEN: 6 Q. Are you familiar with the term "reset" in the 7 context of electronics? 8 MR. BLUMENKOPF: Objection, form. 9 A. That's very broad. I mean, I've heard the term 10 "reset" in conjunction with some things electronic. 11 BY MR. JENSEN: 12 Q. Are you familiar with the concept of reset in 13 the context of a USB system? 14 MR. BLUMENKOPF: Objection, form. 15 A. I mean, there may be something in the spec 16 about that. I don't recall from memory offhand. 17 BY MR. JENSEN: 18 Q. Are you familiar with the concept of a reset 19 handshake in the context of a USB host device 20 connection? 21 MR. BLUMENKOPF: Objection, form. 22 A. I mean, there might be something in the spec 23 about that. I don't remember all parts of the spec. 24 BY MR. JENSEN: 25 Q. Assuming you had a live host-device connection
Page 269 1 its original state from no power. That's one example. 2 Or to cause it to go -- to completely restart from its 3 original -- as if from its original powered-down state. 4 That's one example. 5 BY MR. JENSEN: 6 Q. What do you mean when you say "to return to its 7 original state"? 8 MR. BLUMENKOPF: Objection, form. 9 A. Well, so it would be a state -- it would be -- 10 if it were off, powered down, and then turned on. Often 11 devices have such a state. 12 BY MR. JENSEN: 13 Q. Is that sometimes referred to as a default 14 state? 15 MR. BLUMENKOPF: Objection, form. 16 A. I wouldn't say that. I think that is a 17 slightly different concept. 18 BY MR. JENSEN: 19 Q. What is a default state? 20 MR. BLUMENKOPF: Objection, form. 21 A. Generally speaking? Is that what you're asking 22 about? A default state option might be the option 23 that's selected initially. 24 So, for example, if you're taking a survey 25 and the answer is yes or no, maybe yes is default, so it	Page 271 1 in a USB hub, how could the host close the connection? 2 MR. BLUMENKOPF: Objection, form. 3 A. I don't know that I address these issues in my 4 supplemental declaration. I mean, you know, I don't 5 think there was any proposal set forth by petitioner 6 about any specificities with respect to this issue in 7 their combination. So it wouldn't have been part of my 8 response in my supplemental declaration. 9 BY MR. JENSEN: 10 Q. Let's turn back to your '643 declaration at 11 paragraph 86. Are you able to see that on the screen? 12 A. Yes, I do. 13 Q. Okay. I just wanted to make sure I was sharing 14 the right window. You can reference a hard copy if you 15 like. Let me know when you're there and have the figure 16 in front of you. 17 A. I'm there. 18 Q. Okay. Do you know which route the mux would 19 connect to when the hub in the proposed modification is 20 first powered on? 21 MR. BLUMENKOPF: Objection, form. 22 A. I don't believe petitioner set forth that 23 combination in that much detail. 24 BY MR. JENSEN: 25 Q. Look at figure 4 of the Aptiv patent. When a

Page 272 1 USB device is first plugged in on a downstream port, is 2 it routed through the bridge or around the bridge? 3 MR. BLUMENKOPF: Objection, form. 4 A. Well, this is -- to be clear, this is the '643 5 patent figure 4 that's on the screen. But in the Aptiv 6 invention the device is able to switch back and forth 7 between different modes, and that's what it's teaching. 8 That's what the invention successfully does. 9 The problem is with the proposed — — 10 combination set forth by petitioner in which I don't 11 believe they laid out what state it starts in. But, 12 furthermore, regardless of that, whenever it switches 13 into the bypass path around the bridge, as we showed 14 in -- as I showed in that figure earlier, the USB 15 port 50, the port 50, is isolated from the detection 16 unit in the bridge of Chang II. That's part of the 17 combination. And the device in the proposed combination 18 can never support them going back -- it can never detect 19 a USB host being plugged into port 50 thereafter. 20 So the Aptiv invention embodiment 21 illustrated in figure 4 doesn't have that issue at all. 22 So no matter where it -- yeah. So it doesn't have that 23 issue. It is always able to detect changes in state or 24 detect a change in type of USB host or device plugged 25 in.	Page 274 1 It even talks about in places with 2 multiple bridge units that you can actually support host 3 mode on multiple simultaneous consumer-facing ports. 4 And so the specification does talk about, 5 for example, when you plug in a phone, which would be a 6 USB host. But at least in my review here I didn't see a 7 detail on the USB device, although it supports -- the 8 patent's about supporting the swapping and hot swapping 9 and mode changing of devices plugged into the 10 consumer-facing ports. 11 BY MR. JENSEN: 12 Q. Could the switch control line in figure 4 of 13 the Aptiv patent provide a default setting for the USB 14 routing multiplexing switch to establish a connection 15 before there had been a host-device determination? 16 MR. BLUMENKOPF: Objection, form. 17 A. I mean, what I analyzed with respect -- what I 18 considered with respect to responding to the petitioner, 19 petitioner's positions, was really the -- what was set 20 forth in the petition. I don't believe that analysis of 21 figure 4 was something set forth as prior art or 22 discussing any defaults that I would have been able to 23 properly respond to in my supplemental declaration. 24 BY MR. JENSEN: 25 Q. You didn't analyze that question in your
Page 273 1 MR. JENSEN: Move to strike that as 2 nonresponsive. 3 BY MR. JENSEN: 4 Q. Do you have figure 4 of the Aptiv patent in 5 front of you? 6 A. You're showing figure 4 of the '643 patent, and 7 I have that in front of me as well in printed form. 8 Q. If someone plugged in a USB device on what's 9 labeled "USB device type A connection 1" -- do you see 10 that in figure 4? 11 A. I mean, I see the type A connector 1 box. It's 12 just c-o-n-n. 13 Q. Suppose that a user plugged in a USB device on 14 that port. 15 A. Okay. 16 Q. Where would the USB routing multiplexing switch 17 initially route the signals coming from that USB device? 18 MR. BLUMENKOPF: Objection, form. 19 A. Well, I'm just trying to look for the level of 20 detail you're asking about in the specification; and 21 just in my short review here I haven't found specifics 22 related to the question you asked. But, I mean, what 23 the invention is directed to is that you can switch back 24 and forth any port to be in either USB device or USB 25 host.	Page 275 1 declaration? 2 MR. BLUMENKOPF: Objection, form. 3 A. Well, I mean, the direction is only so long. I 4 can only address so many issues. I didn't address 5 hypothetical issues that were not raised. 6 BY MR. JENSEN: 7 Q. Do you have an understanding as a POSITA and an 8 expert in the field whether the switch control signal in 9 figure 4 of the Aptiv patent could provide a default 10 setting for the USB routing multiplexing switch? 11 MR. BLUMENKOPF: Objection, form. 12 A. I mean, I'm not sure the -- even in the 13 combination set forth by petitioner they talked anything 14 about any defaults of any sort. 15 BY MR. JENSEN: 16 Q. Yeah. My question is about figure 4, right? 17 I'm not talking about the combination. I'm talking 18 about figure 4 in the patent. So can you answer my 19 question with respect to figure 4 of the Aptiv patent. 20 MR. BLUMENKOPF: Same objection. 21 A. I mean, I don't recall the word "default" being 22 used in the '643 specification. 23 BY MR. JENSEN: 24 Q. And that's why I'm asking for your 25 understanding as a POSITA and an expert.

Page 276 1 MR. BLUMENKOPF: Same objection. 2 A. That's not an issue that came up in my 3 analysis. 4 BY MR. JENSEN: 5 Q. Do you have an opinion, regardless of whether 6 it came up in your analysis? 7 MR. BLUMENKOPF: Objection, form. 8 A. I don't have any written opinions in my 9 supplemental declaration directed to what you're asking 10 about specifically. 11 BY MR. JENSEN: 12 Q. Okay. Let's go back to your declaration, 13 paragraph 86, and look at -- there's a figure of the 14 proposed modification, correct? 15 MR. BLUMENKOPF: Objection, form. 16 A. I'm sorry. Could you repeat that, please. 17 BY MR. JENSEN: 18 Q. Yeah. In paragraph 86 of your declaration you 19 pasted in a copy of one of the proposed modifications 20 from the petition, correct? 21 MR. BLUMENKOPF: Objection, form. 22 A. So this figure that you're showing in 23 paragraph 86 -- there's two; that's the first one -- 24 that comes directly from page 61 of the '643 petition. 25 And I may have said that I annotated it, but this is the	Page 278 1 BY MR. JENSEN: 2 Q. As indicated by the red arrows going through 3 the bridge instead of around the bridge, right? 4 A. This would show going through the bridge, which 5 would indicate in an operational state like this that 6 it's a USB host connected to 42 and port 50. 7 Q. If the multiplexer in the modified embodiment 8 reverted to the bridge route whenever the host-device 9 connection was terminated, would the modified hub have 10 the dead end problem you describe in your report? 11 MR. BLUMENKOPF: Objection, form. 12 A. I mean, that was not what was laid out in the 13 petition. So I didn't respond to this hypothetical in 14 my supplemental -- that was not part of the analysis. 15 BY MR. JENSEN: 16 Q. And you can't say sitting here today one way or 17 the other whether that would solve the dead end problem 18 that you did describe in your report? 19 MR. BLUMENKOPF: Objection, form. 20 A. That was not laid out in the petition or in 21 Mr. Welch's declaration that I saw. 22 BY MR. JENSEN: 23 Q. So you haven't analyzed that question? 24 MR. BLUMENKOPF: Objection, form. 25 A. Well, this is not what was proposed as the way
Page 277 1 original figure with no changes. So it's showing the 2 redline going through the bridge, but that is from the 3 petition. 4 BY MR. JENSEN: 5 Q. Yeah. You didn't create this figure, right? 6 A. No. And I didn't change it for the purposes of 7 showing it here either. I didn't add any annotations. 8 Q. So let's look at the figure, the Chang hub 46, 9 and this shows a multiplexer embodiment, correct? 10 MR. BLUMENKOPF: Objection, form. 11 A. Yeah. This shows a combination using -- 12 illustrating the addition of the mux, which comes from, 13 I think, a -- the petitioner claims that it comes from 14 the knowledge of a person with ordinary skill to do so. 15 BY MR. JENSEN: 16 Q. And it's showing a host-to-host connection, 17 right? 18 MR. BLUMENKOPF: Objection, form. 19 A. So the petition on page 61 does talk about 20 this, which is that it's -- that in this obvious 21 modification consistent with steering the USB product 22 signals to the bridge or bypassing the bridge to provide 23 Chang's host-to-host or host-to-device connection. I 24 think this is saying that there is a host-to-host 25 connection in Chang.	Page 279 1 the combination worked. 2 BY MR. JENSEN: 3 Q. Yes. I just want to confirm whether you 4 analyzed that issue or not. Yes or no? 5 A. I analyzed the actual combinations set forth 6 and not a hundred different hypotheticals that could be 7 raised outside of the petition and Mr. Welch's 8 declaration. 9 So the analysis that was part of my 10 supplemental declaration was actually responding to the 11 actual combination set forth in the petition, which I 12 suppose includes Mr. Welch's declaration. 13 Q. Can you point me in your declaration to 14 anywhere where you analyzed the scenario where the 15 multiplexer in the modified Chang embodiment reverts to 16 a default state in which it is connected to the bridge? 17 MR. BLUMENKOPF: Objection, form. 18 A. There's no such discussion of default state in 19 the proposed combination that I recall seeing. So I 20 actually respond to the actual combination that was laid 21 out, not some set of other hypotheticals that petitioner 22 did not actually lay out in its petition. 23 BY MR. JENSEN: 24 Q. So there's nothing in your report on this 25 topic?

Page 280 1 MR. BLUMENKOPF: Objection, form. 2 A. I mean, my report is my report. I'm just 3 saying that what I really analyzed was the actual 4 combination and the way it works as set forth by the 5 combination in the petition and not additional things 6 that the petitioner didn't raise in the petition that 7 could be -- 8 BY MR. JENSEN: 9 Q. In what paragraph -- 10 A. -- a number of hypotheticals that the 11 petitioner could have raised these issues, but I don't 12 believe they did. 13 Q. In what paragraph of your report do you analyze 14 how the modified combination -- strike that. 15 In what paragraph of your declaration do 16 you analyze how the modified Chang embodiment would 17 operate if the multiplexer had a default state in which 18 it was connected to the bridge? 19 MR. BLUMENKOPF: Objection, form. 20 A. I mean, this is a hypothetical that the 21 petitioner did not raise in his petition, or Mr. Welch I 22 don't believe addressed in his declaration. 23 So, as I just said, I analyzed the actual 24 combination and the way it operated; and I didn't 25 analyze other things that petitioner could have raised	Page 282 1 multiplexer had a default state in which it was 2 connected to the bridge? 3 MR. BLUMENKOPF: Objection, form. 4 A. I don't think the petitioner raised that there 5 was any default state. Had petitioner raised that in 6 the petition, I think I -- if I had an issue with that, 7 I would have taken the time to analyze it. But because 8 they didn't, it wasn't part -- that specific 9 hypothetical default state I didn't consider 10 specifically because it wasn't raised to start with. 11 Well, and it simply wasn't part of my analysis because 12 it wasn't raised in the first part, in the first 13 instance. 14 BY MR. JENSEN: 15 Q. And because you think the petition and 16 Mr. Welch did not address this issue, you did not 17 respond to it, correct? 18 MR. BLUMENKOPF: Objection, form. 19 A. I wouldn't quite put it that way. I analyzed 20 the actual combination the way it operates, the 21 combination as set forth in the petition, as described; 22 and that was the main thrust of my analysis. 23 I addressed the issues that were raised in 24 the petition, not hypothetical issues necessarily that 25 the petitioner could have raised but didn't.
Page 281 1 in his petition but didn't. And so I actually 2 analyzed -- and what was part of my analysis was the way 3 the proposed combination as set forth in the petition 4 operates. 5 BY MR. JENSEN: 6 Q. Is there any analysis in your declaration 7 that's responsive to my question? 8 MR. BLUMENKOPF: Objection, form. 9 A. It stands for itself. I could tell you that I 10 didn't look at hypotheticals that -- situations that you 11 may be asking about now. The main thrust of my analysis 12 was with respect to the way the actual combination set 13 forth in the petition operated and not to these other 14 hypotheticals you're raising now. 15 So my report is what it says. To the 16 extent I talked generally about things, you know, they 17 are what they say. But I specifically analyzed the 18 combination set forth by petitioner, and that was the 19 main thrust of my analysis. 20 BY MR. JENSEN: 21 Q. Yeah. And I'm just trying to find out if you 22 did an analysis or not. I'd appreciate it if you could 23 just provide a "yes" or "no" answer to this question. 24 Did you, Dr. Houh, in your declaration 25 analyze how the proposed combination would work if the	Page 283 1 BY MR. JENSEN: 2 Q. I think we have a disagreement on what you keep 3 characterizing as hypothetical situations, and that's 4 why I keep asking the question. 5 Putting aside whether petitioner raised 6 this argument and putting aside whether Mr. Welch raised 7 this argument, do you sitting here today, Dr. Houh, have 8 an opinion as to how the modified Chang embodiment would 9 operate if the multiplexer had a default state in which 10 it was connected to the bridge? 11 MR. BLUMENKOPF: Objection, form. 12 A. I mean, it's hard to put aside all these things 13 because what I respond to were the actual things, not -- 14 I didn't respond to a hypothetical report. I actually 15 responded to actual positions as raised. 16 So if you could point me somewhere in the 17 original petition or Mr. Welch's declaration that would 18 help me to see where it was raised, then I could locate 19 a more appropriate -- like I could look at the 20 appropriate section where I responded to a specific 21 portion in the petition or Mr. Welch's analysis. But I 22 don't think there was any discussion about any such 23 default state raised about with respect to the proposed 24 combination set forth in the challenges. 25 BY MR. JENSEN:

Page 284 1 Q. Would a POSITA understand that a multiplexer 2 would have a default value set on its select line? 3 MR. BLUMENKOPF: Objection, form. 4 A. I mean, if you have a specific implementation 5 and data sheet you could show me, I could take a look; 6 but I don't see why that's necessarily the case. 7 MR. JENSEN: For the court reporter, would 8 you repeat my question, please. 9 (The record was read as requested.)— 10 MR. BLUMENKOPF: Same objection. 11 A. Are you simply asking the same question again? 12 BY MR. JENSEN: 13 Q. Yeah, because I don't think you answered it. 14 A. Well, if there was a specific implementation of 15 a mux, we could look at the data sheet; but I don't see 16 why that would necessarily be the case. 17 Q. And I'm not talking about a multiplexer in the 18 abstract, right? So I don't -- you know. Let me ask 19 the question, Dr. Houh. 20 Would a POSITA understand that a 21 multiplexer implemented in a system would have a default 22 value set to control its select line? 23 MR. BLUMENKOPF: Objection, form. 24 A. I think we could look at a specific schematic 25 and the specific data sheet for a specific mux and	Page 286 1 details -- no details were raised about that with 2 respect to power or default. But certainly there's no 3 discussion about any default state of any devices raised 4 in the petition that I can recall. 5 BY MR. JENSEN: 6 Q. Would a POSITA understand that in the modified 7 Chang embodiment it would be beneficial to have a 8 default value for the select line on the multiplexer? 9 MR. BLUMENKOPF: Objection, form. 10 A. I mean, this issue wasn't raised one way or the 11 other in the petition that I saw. So, you know, I 12 responded to actual positions that were raised and the 13 actual implementation as set forth by petitioner; and I 14 don't think this particular issue would have been part 15 of my analysis in that case because it wasn't raised. 16 BY MR. JENSEN: 17 Q. Do you have an understanding whether a POSITA 18 would recognize the benefit of providing a default value 19 for the multiplexer in the Chang modified embodiment? 20 MR. BLUMENKOPF: Objection, form. 21 A. There's certainly nothing -- I don't believe I 22 address this specific issue -- this hypothetical issue 23 because it wasn't raised, and I don't think I have a 24 written opinion directed to your exact question in my 25 supplemental declarations as a result.
Page 285 1 limitation used and look at that, but I don't see why 2 that would necessarily be the case. 3 BY MR. JENSEN: 4 Q. Well, let's look at the one that you have in 5 paragraph 86 of your report. So this is the modified 6 Chang implementation, the multiplexer implementation. 7 In such an implementation would a POSITA 8 understand that the multiplexer would have a default 9 value set on its select line? 10 MR. BLUMENKOPF: Objection, form. 11 A. I mean, this figure comes from the petition. 12 The petition I don't think says anything about what you 13 asked, and I don't see why that would necessarily be the 14 case. 15 BY MR. JENSEN: 16 Q. The figure also doesn't show that there's a 17 power connection to the hub; but a POSITA would 18 understand that it's there, right? 19 MR. BLUMENKOPF: Objection, form. 20 A. Well, in that case a POSITA might understand 21 that power is necessary for integrated circuits to work; 22 but some integrated circuits work without the need for 23 constant powering as well. 24 So, you know, you have to consider what 25 the circuit is. You have to consider what the	Page 287 1 BY MR. JENSEN: 2 Q. And you're not prepared to answer that question 3 today? 4 MR. BLUMENKOPF: Objection, form. 5 A. I mean, there's -- it's pretty vague. I 6 wouldn't want to do anything on the fly. If I'm asked 7 to provide written opinion about that later, I could 8 spend the time to do that. 9 BY MR. JENSEN: 10 Q. Would you agree with me that providing a 11 default value to the multiplexer that routed the host 12 port 50 to the bridge whenever a new connection was 13 being established would solve the dead end problem that 14 you discuss in your report? 15 MR. BLUMENKOPF: Objection, form. 16 A. This is a hypothetical that was not raised, and 17 I don't have -- I certainly don't have any written 18 opinions about this in my supplemental declaration right 19 now. 20 BY MR. JENSEN: 21 Q. Respectfully, Dr. Houh, you're here to answer 22 hypothetical questions. That's one of the things that 23 experts are uniquely qualified to do. 24 So I'm asking you, as an expert, can you 25 answer the question that I asked? And if you can't,

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1 that's okay. I'll accept that. If you say, "I can't 2 answer it," or, "I don't know," or, "I would need 3 further time to consider that," that's fine. But I 4 haven't heard you actually respond to the question. 5 MR. BLUMENKOPF: Objection, form. 6 A. Well, that's an issue I'd need further details 7 and time to consider things. 8 BY MR. JENSEN: 9 Q. What additional details would you need? — 10 MR. BLUMENKOPF: Objection, form. 11 A. I mean, that's part of what would take time to 12 think about. 13 BY MR. JENSEN: 14 Q. Can you identify any details that you would 15 need? 16 MR. BLUMENKOPF: Objection, form. 17 A. I mean, none of this was raised in the 18 petition. I actually analyzed what was in the petition. 19 I think petitioner had the opportunity to think through 20 some of this beforehand, Mr. Welch as well. 21 But I stand by what I've written in my 22 declaration because the way the petition set forth the 23 combination is inoperable as I've described. It 24 doesn't -- a person of ordinary skill would still not be 25 motivated to do these things for the reasons I've laid	1 A. So you're saying -- I'm sorry. I just want 2 to -- you have host and device, and I want to make sure 3 I understand. Could you repeat that, please. 4 BY MR. JENSEN: 5 Q. How does a USB device close an existing data 6 connection with a host? 7 MR. BLUMENKOPF: Same objection. 8 A. If there's such a thing, I think it would be in 9 the spec; but I don't have all that memorized. It's 10 mainly the case that the host is the one issuing 11 commands, but we'd have to look through the spec. 12 BY MR. JENSEN: 13 Q. Can a USB device terminate a data connection it 14 has with a host? 15 MR. BLUMENKOPF: Objection, form. 16 A. So there's lots of scenarios in the protocols. 17 I don't have them all memorized. I think we could just 18 simply look at the spec if we wanted to look at the 19 spec. 20 BY MR. JENSEN: 21 Q. When a dual-mode USB product switches from host 22 mode to device mode, does it have to terminate the 23 existing host-to-host connection before doing so? 24 MR. BLUMENKOPF: Objection, form. 25 A. I mean, these kind of specific situations we
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1 out -- to make the combination for the reasons I've laid 2 out in my supplemental declaration. 3 And so I would want further details around 4 some of the context and situations, and then I'd still 5 need to take time to consider. But this was not an 6 issue that was raised that I had the appropriate amount 7 of time to respond to through the normal process of a -- 8 through submitting a declaration as part of a -- a 9 supplemental declaration as part of the -- I don't know 10 if this is the patent owner's response or what part of 11 the process. 12 But there was a time for that to have 13 enough time to do analysis; and that's, I think, why 14 there's time given for that as opposed to demanding a 15 response within one week or something like that. 16 BY MR. JENSEN: 17 Q. How does a USB device close an existing data 18 connection that it has with a host? 19 MR. BLUMENKOPF: Objection, form. 20 A. I'm sorry. Could you repeat the question, 21 please? 22 BY MR. JENSEN: 23 Q. Yeah. How does a USB device close an existing 24 data connection that it has with a host? 25 MR. BLUMENKOPF: Same objection.	1 could look in the spec to see what they say. So if the 2 spec says you must do it, you must do it according to 3 the protocol, if you want to follow the protocol. 4 BY MR. JENSEN: 5 Q. Supposed you had a dual-mode USB product 6 connected to port 50 of the modified Chang embodiment 7 that was in device mode -- are you with me so far? 8 We've got a dual-mode product plugged into port 50 and 9 the product is in device mode. 10 A. Yes. And the modified either implementation? 11 Q. Yes. 12 A. Got it. 13 Q. And suppose you had a host-to-device connection 14 because the dual-mode product is in device mode, for 15 example, as is shown in the figures in paragraph 87 of 16 your '643 declaration -- 17 A. Okay. I see those. 18 Q. -- would a user have to physically unplug the 19 dual mode device -- strike that. 20 Would a user have to physically unplug the 21 dual-mode USB product for that product to switch from 22 device mode to host mode? 23 MR. BLUMENKOPF: Objection, form. 24 A. I mean, the spec may address this issue as 25 well; but we could take a look through there if you

Page 292 1 want. 2 BY MR. JENSEN: 3 Q. Without looking at the USB spec, can you answer 4 the question? 5 MR. BLUMENKOPF: Objection, form. 6 A. I mean, I certainly don't have the spec 7 memorized. It may address this issue partly, but it may 8 also depend on the features of the item that's plugged 9 in. — — 10 BY MR. JENSEN: 11 Q. Are you familiar with the concepts of 12 attachment and removal in the USB standard? — — 13 MR. BLUMENKOPF: Objection, form. 14 A. I mean, this is a -- generally speaking, many 15 protocols have concepts that might be recognized as 16 being similar to that; but I don't remember exactly what 17 words are used in the spec to describe that offhand. 18 BY MR. JENSEN: 19 Q. In the context of the USB standard, do the 20 concepts of attachment and removal require physically 21 unplugging and plugging in a USB product to a port? 22 MR. BLUMENKOPF: Objection, form. 23 A. If you're asking about the USB standard, we can 24 take a look at the standard to see what it says. But I 25 don't have every possible situation of which there are	Page 294 1 Mr. Welch's POSITA as well. But I'm certainly capable 2 of reading the spec and understanding what's in there 3 and relating those to -- again, as I said, 4 specifications for networking protocols are similar in 5 the sense that they address many of the same issues. So 6 you simply have to look at the details. 7 So if you don't remember the protocol for 8 how you're dealing with the Queen of England, you can 9 look it up. If you don't remember if you have to walk 10 behind her or the left or right, it might be in the 11 protocol. So you simply go look. 12 BY MR. JENSEN: 13 Q. And you don't know what the fundamental concept 14 of removal means in the concept of USB, do you? 15 MR. BLUMENKOPF: Objection, form. 16 A. We can look in the spec. It's a general 17 concept of being -- you know, in communications in 18 networking there's lots of shared concepts. 19 Different protocols may use different 20 terms to describe similar concepts. They may use the 21 same terms sometimes. But all we have to do is look in 22 the spec. I don't have it memorized. I have reviewed 23 portions of the spec before, but I don't memorize 24 everything I read. 25 BY MR. JENSEN:
Page 293 1 probably many, many, many memorized. 2 BY MR. JENSEN: 3 Q. You'd have to look at the standard to answer 4 the question? 5 MR. BLUMENKOPF: Objection, form. 6 A. I mean, I think that's what standards are for 7 is that they're there; they're published. You can kind 8 of look at it whenever you want, and it should lay out 9 the things that the protocol designers wanted to 10 specify. So if it's there, it's there. We can look. 11 BY MR. JENSEN: 12 Q. And without looking at it, you don't know, 13 correct? 14 A. Well, I haven't memorized the spec. 15 Q. So you don't know? 16 MR. BLUMENKOPF: Objection, form. 17 A. We can find out just by looking to see whether 18 it's addressed, but I don't memorize every 19 specification. There's no need to because the 20 specifications are published. 21 BY MR. JENSEN: 22 Q. But you're an expert in USB, correct? 23 MR. BLUMENKOPF: Objection, form. 24 A. I think I'm an expert that meets the 25 qualifications as I've laid out, and we even discussed	Page 295 1 Q. Let's go ahead and look at the USB spec, 2 section 4.6.2. Are you able to see that on the screen, 3 Dr. Houh? 4 A. Yeah. 5 MR. BLUMENKOPF: Counsel, which exhibit 6 are you referring to? 7 MR. JENSEN: This is Exhibit 1018. 8 MR. BLUMENKOPF: For which proceeding? 9 MR. JENSEN: For all of them. 10 A. So I do see that. I do see that. You're 11 pointing to 4.6.2. Is that right? 12 BY MR. JENSEN: 13 Q. Yeah. And what is the title of that section? 14 A. It's 4.6.2, Removal of USB Devices. And it's 15 one paragraph on page 48 of a 650-page document. 16 Q. And the 650-page document is the USB 2.0 17 standard, correct? 18 MR. BLUMENKOPF: Objection, form. 19 A. That's what it says. 20 BY MR. JENSEN: 21 Q. And do you have any reason to disagree? 22 A. No. 23 Q. Okay. Very good. Can you read section 4.6.2 24 to yourself, and let me know when you're done. 25 A. I'm done.

Page 296 1 Q. Having read section 4.6.2 of the USB 2.0 2 specification, do you have an understanding as to 3 whether the removal of a USB device requires physically 4 unplugging it from a port? 5 MR. BLUMENKOPF: Objection, form. 6 A. So this one paragraph I don't see any statement 7 about physical detachment, and I will point out that I 8 did search for "removal" to see if anywhere else it did. 9 The word "removal" appears only three times in this 10 document if the search index is correct, the three times 11 that I found in my search. I didn't see those other 12 places addressed a physical issue. 13 BY MR. JENSEN: 14 Q. Let's go back to Exhibit 2019, which is your 15 declaration; and let's look at the one in the -- we can 16 look at the one in the '643 proceeding. And you've got 17 an image of the modified Chang hub in that paragraph, 18 right? 19 MR. BLUMENKOPF: Objection, form. 20 A. This is a -- I'm showing petitioner's figure 21 here, which does show one of the proposed -- one 22 proposed combination. 23 BY MR. JENSEN: 24 Q. And the bridge 52 is highlighted in orange, 25 correct?	Page 298 1 proposed modification of Chang figure 3 replaces Chang's 2 bridge 52 with the bridge device from Chang II? 3 MR. BLUMENKOPF: Objection, form. 4 A. So in my '643 declaration I lay out in 5 section 9A, which starts on page 30 of exhibit -- my 6 '643 declaration, the petition's proposed combination 7 and that it's proposing combining Chang, Chang II and 8 the POSITA's knowledge. 9 If you look at the hub 46 implementation 10 as a subportion there, right there on page 31, The 11 petition discloses a proposed implementation that 12 inserts a multiplexer within Chang's USB hub 40 -- it's 13 a multiplexer -- and that the multiplexer can connect 14 host port 50 to either Chang's bridge 52, which is 15 Chang II's bridging device 1, or Chang's hub control 16 port depending on its select lines. 17 And I cite to the petition in pages 47 to 18 52. And if you look at pages 47 to 52, at the top of 19 page 47 in the petition -- this is the '643 petition -- 20 the top of that page says, "Detection unit 134 is part 21 of the bridge's control chip." That's a cite to 22 Chang II. 23 "The detection unit detects a host-device 24 connection by" -- and it goes on. But it's saying here 25 that it is part of the bridge's control chip and the
Page 297 1 A. Yeah. I see that the rectangle pointed to is 2 highlighted in orange. 3 Q. Is it your understanding that in the 4 petitioner's proposed modification of Chang figure 3 5 that the bridge 52 was replaced with the bridge from the 6 Chang II reference? 7 MR. BLUMENKOPF: Objection, form. 8 BY MR. JENSEN: 9 Q. It's been several minutes, Dr. Houh. Are you 10 able to answer my question? 11 MR. BLUMENKOPF: Objection, form. 12 A. Yes. I'm just looking for support for my 13 answer. I'm still looking. 14 BY MR. JENSEN: 15 Q. I think we're going on something over ten 16 minutes now. Are you able to answer my question, 17 Dr. Houh? 18 MR. BLUMENKOPF: Objection, form. 19 A. Yes. I think I'm almost done pulling together 20 everything I want to refer to. 21 So -- 22 BY MR. JENSEN: 23 Q. Let me just ask the question clean so we have 24 it clear on the record. 25 Is it your understanding that petitioner's	Page 299 1 bridge in Chang I -- sorry, just regular Chang, is that 2 orange bridge box. So part of the support for that 3 is -- that's what it's saying here. It's talking about 4 in the combination in the petition that there's a bridge 5 and the bridge's control chip. The detection unit is 6 part of that. 7 And if you look at Chang II, if you look 8 at figure 5 of Chang II, for example, it has the control 9 chip. That's the Chang II device, the bridge, and it 10 has within that the detection unit within it. 11 So, I mean, putting that all together, 12 that is showing in the petition where that's part of the 13 support for -- now we have this bridge's control chip 14 that the petition is setting forth that has the 15 detection unit inside of it and that the bridge is 16 simply labeled from the figure 3 of Chang as "bridge" in 17 orange. And that's what the petition is saying. 18 BY MR. JENSEN: 19 Q. So your understanding of the petition is that 20 it replaced the bridge 52 in Chang with the control chip 21 shown in Chang II figure 5? 22 MR. BLUMENKOPF: Objection, form. 23 A. I mean, I don't know that it uses those exact 24 same words; but if you'd look at this proposed 25 combination, you know, it's talking about the bridge and

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1 the control chip of Chang II and where the detection 2 unit is. That's what it's setting forth. 3 MR. JENSEN: Let's go off the record. 4 THE VIDEOGRAPHER: The time is 12:18 p.m. 5 We are now going off the record. 6 (Luncheon recess) 7 THE VIDEOGRAPHER: The time is 1:06 p.m. 8 We are now back on the record. 9 BY MR. JENSEN: — — 10 Q. Welcome back, Dr. Houh. 11 A. Thank you. 12 Q. Let me direct your attention to your '643 13 report starting at paragraph 139. 14 A. Okay. 15 Q. And this is the section of your report where 16 you begin to analyze the secondary considerations, 17 correct? 18 MR. BLUMENKOPF: Objection, form. 19 A. This section is titled -- the title starts 20 "Secondary Considerations." 21 BY MR. JENSEN: 22 Q. And that's where you have your analysis of 23 various secondary considerations of nonobviousness? 24 MR. BLUMENKOPF: Objection, form. 25 A. Well, we're looking at the '643 declaration, so	1 Q. How did you pick which ones to include in your 2 analysis? 3 MR. BLUMENKOPF: Objection, form. 4 A. It's the ones that I had technical support for. 5 BY MR. JENSEN: 6 Q. So let's take as an example the secondary 7 consideration you identify of licenses showing industry 8 respect for the invention. Did you analyze that 9 secondary consideration in your report? 10 MR. BLUMENKOPF: Objection, form. 11 A. I don't see a subsection heading in this '643 12 declaration directed to licenses. 13 BY MR. JENSEN: 14 Q. Are you aware of anyone taking a license to the 15 Aptiv patents? 16 MR. BLUMENKOPF: Objection, form. 17 A. I'm not aware one way or the other. 18 BY MR. JENSEN: 19 Q. Did you investigate that question? 20 MR. BLUMENKOPF: Objection, form. 21 A. I don't believe I did for the purposes of this 22 declaration. 23 BY MR. JENSEN: 24 Q. Why not? 25 MR. BLUMENKOPF: Objection, form.
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1 this page is where it is in the '643 declaration. 2 BY MR. JENSEN: 3 Q. And the paragraph numbers might be different in 4 your other declarations; but they also include a 5 Secondary Considerations section as well, correct? 6 A. That sounds right. 7 Q. Okay. And in paragraph 139 you provide a list 8 of a number of the secondary considerations of 9 nonobviousness, correct? 10 A. Sure. 11 Q. And the list includes "copying, long-felt but 12 unsolved need, failure of others, commercial success, 13 unexpected results created by the claimed invention, 14 unexpected properties of the claimed invention, licenses 15 showing industry respect for the invention, and 16 skepticism of skilled artisans before the invention," 17 correct? 18 A. Yes. That's what it says. 19 Q. Did you analyze all of those secondary 20 considerations of nonobviousness? 21 MR. BLUMENKOPF: Objection, form. 22 A. I don't think I have a section directed to -- I 23 don't think I have sections directed to all those at 24 issue, only some of them. 25 BY MR. JENSEN:	1 A. It just wasn't an issue that ended up in the 2 supplemental declaration. 3 BY MR. JENSEN: 4 Q. Another one of the secondary considerations you 5 list is commercial success, correct? 6 A. Yes. 7 Q. Do you provide any opinions in your report on 8 the commercial success of the Aptiv dual-role hub? 9 MR. BLUMENKOPF: Objection, form. 10 A. In the '643 declaration I'm looking at right 11 now I don't see a subheading directed to commercial 12 success. 13 BY MR. JENSEN: 14 Q. Did you provide an analysis in your declaration 15 concerning unexpected results created by the claimed 16 invention? 17 MR. BLUMENKOPF: Objection, form. 18 A. I don't think so, no, in the '643 declaration. 19 BY MR. JENSEN: 20 Q. Do you provide an opinion in your declaration 21 regarding unexpected properties of the claimed 22 invention? 23 MR. BLUMENKOPF: Objection, form. 24 A. In the '643 declaration I don't think I have a 25 section directed to that.

Page 304 1 BY MR. JENSEN: 2 Q. Do you render any opinions in any of your 3 declarations on the secondary considerations of licenses 4 showing industry respect for the invention, commercial 5 success, unexpected results created by the claimed 6 invention, or unexpected properties of the claimed 7 invention? 8 MR. BLUMENKOPF: Objection, form. 9 A. Just flipping through my other four — 10 declarations, I don't see any subheadings in this 11 section, the same section in the other ones, that are 12 directed to those issues you asked about in your — 13 question. 14 BY MR. JENSEN: 15 Q. Do you discuss in your declarations any awards 16 that Aptiv received? 17 MR. BLUMENKOPF: Objection, form. 18 A. Did you ask in any of my declarations? 19 BY MR. JENSEN: 20 Q. Yes. 21 A. I mean, while I have in my materials considered 22 a few references directed to a PACE Award, I don't 23 believe that I actually discuss that in the body of any 24 of my supplemental declarations. 25 Q. Do you know what the PACE Award is?	Page 306 1 BY MR. JENSEN: 2 Q. Had you heard of the PACE Award before working 3 on this case? 4 MR. BLUMENKOPF: Objection, form. 5 A. It's possible that I have heard of it before. 6 BY MR. JENSEN: 7 Q. But you can't say one way or the other with any 8 certainty? 9 MR. BLUMENKOPF: Objection, form. 10 A. I don't know how to be certain. I mean, I grew 11 up in Detroit reading The Detroit News every day, 12 including the business section. So it's quite possible 13 I had read about it at some point previously. I just 14 don't remember. 15 But I don't have a firm memory in my mind 16 of actually a time I did. It's just that it seems kind 17 of likely that I may have read about it at some point or 18 read about some winners or something in a newspaper 19 article. 20 BY MR. JENSEN: 21 Q. You don't have any specific recollections that 22 you can remember today? 23 MR. BLUMENKOPF: Objection, form. 24 A. No, no specific recollections. 25 Let me just clarify. I spent some years
Page 305 1 MR. BLUMENKOPF: Objection, form. 2 A. Well, I mean, I reviewed the documents about 3 the PACE Award. It's an automotive industry award, I 4 think. 5 BY MR. JENSEN: 6 Q. Do you know who gives the PACE Award? 7 MR. BLUMENKOPF: Objection, form. 8 A. I mean, not offhand; but I think it may be in 9 one of the exhibits. 10 BY MR. JENSEN: 11 Q. Do you know what criteria are used to determine 12 who receives a PACE Award? 13 MR. BLUMENKOPF: Objection, form. 14 A. I may have seen this maybe in a deposition 15 transcript I reviewed or in some of the documents. I 16 think there is -- yeah. There are other documents that 17 also talk about the PACE Award aside from the three 18 listed that use the word "PACE Award" in the title. 19 BY MR. JENSEN: 20 Q. But you don't discuss any of that in the body 21 of your declaration, correct? 22 MR. BLUMENKOPF: Objection, form. 23 A. I mean, I did a quick search through all of 24 them. I didn't find the use of the word "award" in that 25 context in the body of any of my declarations.	Page 307 1 in Detroit, but I grew up more in the suburbs of 2 Detroit. 3 BY MR. JENSEN: 4 Q. Let's look at paragraph 141 of your '643 5 declaration. Do you have that? 6 A. What paragraph again, please? 7 Q. 141. 8 A. Okay. 9 Q. And that's underneath the heading "Long-felt 10 but Unsolved Needs," correct? 11 A. Yes. 12 Q. What is the long-felt but unsolved need that 13 you believe the Aptiv patents solved? 14 MR. BLUMENKOPF: Objection, form. 15 A. I think the need was embodied in, as I 16 discussed in paragraph 142, these three features that 17 automakers demanded. 18 BY MR. JENSEN: 19 Q. At what point in time did the automakers you 20 refer to start demanding the three features you identify 21 in paragraph 142? 22 MR. BLUMENKOPF: Objection, form. 23 A. In paragraph 142 I don't see a specific date 24 given; but in paragraph 141 I do talk about the timeline 25 starting in 2010, "when Apple partnered with BMW to

Page 308 1 develop a product referred to as iPod Out which would 2 allow an iPod or iPhone to connect with an in-car 3 display and provide a standardized Apple provided user 4 interface." 5 So I think certainly at that time there 6 were kind of the foundations for the kind of features 7 that automakers were looking for as evidenced by this 8 partnership. 9 BY MR. JENSEN: — — 10 Q. In paragraph 142 you say in the first sentence, 11 "From my review of the trial record, I understand that 12 automakers demanded three features for any viable 13 CarPlay solution." 14 Do you see that? 15 A. Yes. 16 Q. When did Apple announce CarPlay? 17 MR. BLUMENKOPF: Objection, form. 18 A. I don't see it listed here in paragraph 142. 19 My recollection is it's sometime in the early-ish 2010s, 20 but it may be in one of these documents. I just don't 21 see it in paragraph 142. 22 BY MR. JENSEN: 23 Q. All right. Let me direct your attention to 24 paragraph 41 of your declaration. 25 A. Yes. I see that now. That's the kind of	Page 310 1 would have had formulated its requirements before then 2 and had it laid down before then. And a lot of those 3 would be based on Apple's experience prior to the date 4 it issued its requirements to automakers. 5 BY MR. JENSEN: 6 Q. Do you know when Apple published -- strike 7 that. 8 Do you know when Apple made available its 9 CarPlay specification to carmakers? 10 MR. BLUMENKOPF: Objection, form. 11 A. I don't know that offhand. 12 BY MR. JENSEN: 13 Q. Have you ever seen the CarPlay specification? 14 MR. BLUMENKOPF: Objection, form. 15 A. I don't see that on the list of materials I 16 considered, but certainly any need would have been 17 formulated prior to the date of any issuance of that 18 CarPlay -- I forgot what you called the requirements. 19 BY MR. JENSEN: 20 Q. Do you know if the CarPlay specification is a 21 confidential document? 22 MR. BLUMENKOPF: Objection, form. 23 A. I mean, I don't think I know that one way or 24 the other. But regardless of when a specification was 25 issued, a need for what's in the specification arose
Page 309 1 number -- 2013 is what it says -- I had in mind. I just 2 couldn't remember the exact year, but that's what I 3 consider early-ish 2010s. 4 Q. And is 2013 the same year that the Aptiv patent 5 application was originally filed? 6 MR. BLUMENKOPF: Objection, form. 7 A. Which specific application are you referring 8 to? 9 BY MR. JENSEN: 10 Q. The priority application. 11 A. Of the earliest-issued patent with the lowest 12 number? Are you asking about that one? 13 Q. Of any of them. It should be the same. They 14 all claim priority to the same original patent 15 application. 16 A. I'm looking at the '037 in that; and it talks 17 about a provisional application filed on September 26, 18 2013 on its face. 19 Q. Do you think that the demand for CarPlay 20 starting in 2013 constitutes a long-felt need when the 21 patent application was filed in September of 2013? 22 MR. BLUMENKOPF: Objection, form. 23 A. Well, I mean, I wouldn't equate to this 24 announcement of Apple informing automakers as the 25 earliest date of the need. But, I mean, clearly Apple	Page 311 1 before that time. 2 BY MR. JENSEN: 3 Q. How could a need for CarPlay arise before Apple 4 announced CarPlay? 5 MR. BLUMENKOPF: Objection, form. 6 A. Because they decided in advance they were going 7 to announce CarPlay. 8 BY MR. JENSEN: 9 Q. Well, what do you mean by that? 10 A. They didn't just decide one day they wanted 11 CarPlay and issue the specification. Clearly they would 12 have had to be working on the specification and develop 13 the specification before they issued the specification. 14 Q. I see. You're talking about Apple. So let me 15 clarify my question. I'm asking you about the 16 automakers. 17 How would the automakers have an unsolved 18 need and demand for CarPlay if they didn't know it 19 existed? 20 MR. BLUMENKOPF: Objection, form. 21 A. Well, the automakers -- for example, BMW in its 22 partnership with Apple, that it -- the partnership which 23 started -- well, I say in 132 in 2010. They were 24 working to develop a product, and certainly Apple had a 25 need. That's what they wanted.

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1 BY MR. JENSEN: 2 Q. Did Apple partner with anybody besides BMW to 3 develop a product referred to as iPod Out? 4 MR. BLUMENKOPF: Objection, form. 5 THE VIDEOGRAPHER: Sorry for disturbing 6 you. Three hours and 30 minutes on the record. 7 A. I don't see that I discuss any other 8 partnerships Apple had before -- sorry, in the section 9 paragraph 132 to 134 of my '643 supplemental -- 10 declaration. 11 BY MR. JENSEN: 12 Q. I think you may have got the paragraph numbers 13 off, but that's okay. 14 A. Oh, I'm sorry. I'm looking at the wrong -- 15 sorry. Let me close this one so I don't refer to it by 16 mistake. 17 Paragraphs 141 through 143 of my '643 18 declaration. 19 Q. Did Apple and BMW, in fact, develop a product 20 referred to as iPod Out? 21 MR. BLUMENKOPF: Objection, form. 22 A. So what I'm setting here in paragraph 141 is 23 articles in Tech Crunch, which appear to be from mid-ish 24 2010 discussing iPod Out, and also another article in 25 Edmunds. I'm not sure what date that article was. It	1 Did Apple and BMW release a feature called 2 iPod Out? 3 MR. BLUMENKOPF: Objection, form. 4 A. I don't see that I address a release date in 5 paragraph 141, but I do see the article in Tech Crunch 6 from what appears to be July 2010. It has a title or 7 search term words for search engine optimization saying 8 that "iOS's hidden iPod Out feature brings iPhone 9 support to your car without the messy third-party UI." 10 BY MR. JENSEN: 11 Q. And you said they call that a hidden feature? 12 A. Well, the web link uses the phrase "hidden iPod 13 Out feature." 14 Q. And that's the link you cite in your report? 15 A. I do cite that link in my report. 16 Q. Did you provide an analysis anywhere in your 17 report as to whether CarPlay practices any of the 18 challenged claims? 19 MR. BLUMENKOPF: Objection, form. 20 A. I mean, where I do a mapping of the claims to a 21 product is with respect to Aptiv's product in the nexus 22 session. 23 BY MR. JENSEN: 24 Q. And that's not mapping CarPlay to the claims; 25 that's mapping the Aptiv product to the claims, correct?
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1 doesn't say here. 2 BY MR. JENSEN: 3 Q. Did Apple and BMW release an iPod Out product? 4 MR. BLUMENKOPF: Objection, form. 5 A. I think that the partnership clearly indicated 6 a need to connect, for example, an iPod -- to have an 7 iPod Out GUI. And what I say is it laid the groundwork 8 for what would eventually be known as CarPlay. 9 BY MR. JENSEN: 10 Q. Yeah. Did they release a product called iPod 11 Out? 12 MR. BLUMENKOPF: Objection, form. 13 BY MR. JENSEN: 14 Q. I get you say they were working on developing 15 one. My question is a little bit different. 16 Did they actually create an iPod Out 17 product? 18 MR. BLUMENKOPF: Same objection. 19 A. I mean, I don't think it would be called a 20 product. I think it might be referred to as a feature. 21 BY MR. JENSEN: 22 Q. Okay. I'm using the words from your report. 23 You called it a product; but if you want to change that 24 and call it a feature, I'm happy to accept that 25 terminology.	1 MR. BLUMENKOPF: Objection, form. 2 A. Yeah. The nexus session is mapping Aptiv's 3 product to the claims but this section is with respect 4 to long-felt need and it's about the long-felt need and 5 not about how other products or features relate to the 6 claims. 7 BY MR. JENSEN: 8 Q. And you include in your reports a section on 9 copying starting at paragraph 147, correct? 10 A. Yes. 11 Q. Did you enter an opinion that Microchip copied 12 Aptiv's dual-role hub to create their own products? Is 13 that right? 14 MR. BLUMENKOPF: Objection. Form. 15 A. I mean, my opinion is that I concluded that 16 Microchip developed its own products by copying the core 17 components in operation of Aptiv's Boston 2 chip, 18 including its host mode bridge and USB routing switches. 19 BY MR. JENSEN: 20 Q. Do you know how much engineering effort, time 21 and money Microchip invested in developing its product? 22 MR. BLUMENKOPF: Objection, form. 23 A. Well, I don't see that I address that in its 24 section; but my conclusion is support -- I cite the 25 evidence in this section that supports my conclusion,

Page 316 1 including the evidence of Microchip's engineers -- or 2 Microchip actually like analyzing an Aptiv product by 3 etching away portions of the chip to analyze it layer by 4 layer or to study the inner workings of the chips. 5 BY MR. JENSEN: 6 Q. Do you know how much time, effort and money 7 Aptiv spent to develop its dual-role hub product? 8 MR. BLUMENKOPF: Objection, form. 9 A. I don't address that in this section, I don't - 10 think; but it doesn't negate the evidence that Microchip 11 actually copied Aptiv's products. 12 BY MR. JENSEN: 13 Q. Do you know if Aptiv reverse-engineered any USB 14 products when developing its dual-role hub? 15 MR. BLUMENKOPF: Objection, form. 16 A. I mean, this section is directed to Microchip's 17 evidence of copying Aptiv chips, not towards what Aptiv 18 did. 19 BY MR. JENSEN: 20 Q. Have you ever spoken with any Microchip 21 engineers? 22 MR. BLUMENKOPF: Objection, form. 23 A. I don't know the job of every person I've ever 24 talked to. So I couldn't say one way or the other. 25 BY MR. JENSEN:	Page 318 1 Decapping is the process of etching away at the cover 2 from an integrated circuit so that the internal workings 3 of the chip can be studied. I, therefore, understand 4 Mr. Bohm's e-mail to be an offer to study the actual 5 connections within Aptiv's Boston 2 chip. From his 6 trial testimony, I also understand that this decapping 7 was actually performed, which would have granted 8 Microchip a detailed understanding of the inner workings 9 of Aptiv's solution." 10 BY MR. JENSEN: 11 Q. Are you accusing Mark Bohm of copying Aptiv's 12 product? 13 MR. BLUMENKOPF: Objection, form. 14 A. That's not quite what I'm saying here, but 15 Mr. Bohm said that Microchip can actually analyze the 16 internal workings of an Aptiv Boston 2 chip. And I 17 understand that that was actually performed, and that 18 would have granted Microchip a detailed understanding of 19 the inner workings of the Aptiv solution. 20 BY MR. JENSEN: 21 Q. Anytime someone analyzes the inner workings of 22 a product on the market, does that mean they're copying 23 the product? 24 MR. BLUMENKOPF: Objection, form. 25 A. This is some of the evidence that I have
Page 317 1 Q. In connection with this case, did you speak 2 with any Microchip engineers? 3 A. No. 4 Q. In connection with this case, did you speak 5 with any Aptiv employees? 6 MR. BLUMENKOPF: Objection, form. 7 A. I'm sorry. Could you repeat the question, 8 please. 9 BY MR. JENSEN: 10 Q. Yeah. In connection with this case, did you 11 speak with any Aptiv employees? 12 A. No. I mean, I have reviewed trial testimony 13 and deposition testimony. I don't remember the roles 14 but I did not speak to the people but I reviewed sworn 15 testimony. 16 Q. Which individuals at Microchip do you accuse of 17 copying Aptiv's products? 18 MR. BLUMENKOPF: Objection, form. 19 A. Well, the only names I use, I think, in this 20 section that I see right now is in paragraph 153, which 21 states that "I have also reviewed an e-mail from one of 22 Microchip's engineers" -- this is the '643 declaration 23 -- "Mark Bohm to Mr. Obolsky in which he states that he 24 received the new GM b.o.b." or b-o-b "that contains the 25 Unwired device and that Microchip can decap the chip.	Page 319 1 reviewed to support my conclusion that Microchip did 2 copy Aptiv's product. But it's all the evidence in here 3 that I considered together. 4 BY MR. JENSEN: 5 Q. Yeah. My question is more specific. Is it 6 necessarily the case that anytime someone analyzes the 7 inner workings of a product on the market, that they are 8 doing so to copy the product? 9 MR. BLUMENKOPF: Objection to form. 10 A. Well, this is not anybody. This is not a 11 hypothetical. This is Microchip's employees, right? I 12 believe they're -- and Microchip's engineers doing this. 13 So this is a company. This is not a hypothetical anyone 14 might do it for whatever reason they may have -- may or 15 may not have. 16 This is Microchip. This is an e-mail that 17 Mr. Bohm sent saying that Microchip could analyze the 18 internal workings of the chip, which I understand they 19 actually did do. And in the context of all the other 20 evidence, this is part of what supports my conclusion 21 that Microchip did copy Aptiv's products. 22 BY MR. JENSEN: 23 Q. Is it necessarily the case that anytime a 24 Microchip engineer analyzes a product on the market, 25 that they are doing so to copy it?

Page 320 1 MR. BLUMENKOPF: Objection, form. 2 A. I'm not discussing any other time Microchip may 3 have done this. I'm discussing the time when Microchip, 4 as indicated by the evidence, Microchip actually did 5 that with Aptiv's Boston 2 chip, along with other 6 evidence that I've cited to in this section that 7 supports my conclusion that Microchip actually did copy 8 Aptiv's product. 9 BY MR. JENSEN: — — 10 Q. Is it necessarily the case that because an 11 engineer at Microchip hypothetically analyzed a product 12 on the market, the Boston 2 chip, that that necessarily 13 means they copied it? 14 MR. BLUMENKOPF: Objection, form. 15 A. This was not a hypothetical analysis of the 16 Boston 2 chip. I understand from the trial testimony 17 that Microchip actually did -- 18 BY MR. JENSEN: 19 Q. Let's suppose they did. Let's suppose they 20 analyzed the chip. Does that mean they copied it? 21 MR. BLUMENKOPF: Objection, form. 22 A. In the context of the evidence -- I've said it 23 here -- this is part of what supports my conclusion that 24 Aptiv's products were copied by Microchip. 25 BY MR. JENSEN:	Page 322 1 evidence that together support my conclusion that 2 Microchip copied Aptiv's Boston 2 chip product. 3 BY MR. JENSEN: 4 Q. Have you ever reverse-engineered a -- 5 MR. BLUMENKOPF: Counsel, Mr. Suarez, 6 what's the time on the record? 7 THE VIDEOGRAPHER: Approximately 3 hours 8 and 47 minutes. 9 MR. BLUMENKOPF: All right. Appears your 10 time's up, Counsel. 11 MR. JENSEN: Let me ask this one last 12 question. 13 BY MR. JENSEN: 14 Q. Have you ever reverse-engineered -- 15 MR. BLUMENKOPF: Counsel -- 16 MR. JENSEN: Look, you kept interrupting. 17 You kept interrupting. Let me ask one question. 18 MR. BLUMENKOPF: I didn't interrupt 19 anything. Your time is up, Counsel. We negotiated ten 20 and a half hours on the record. 21 MR. JENSEN: You can tell the witness not 22 to answer. I'm going to ask the question because you 23 interrupted. 24 BY MR. JENSEN: 25 Q. Dr. Houh, have you ever reverse-engineered a
Page 321 1 Q. Yeah. And I'm not asking about the other. I'm 2 asking about this specific piece of evidence. 3 MR. BLUMENKOPF: Mr. Suarez, what's our 4 time on the record? 5 MR. JENSEN: Let me finish. We'll be done 6 in two minutes, right? I mean, you're just 7 interrupting. 8 BY MR. JENSEN: 9 Q. So my question for you, Dr. Houh, is, if you 10 can answer it, does it necessarily -- strike that. 11 Is it necessarily the case that because an 12 engineer at Microchip looked at Aptiv's Boston 2 chip, 13 that that fact standing alone means that they copied the 14 chip? 15 MR. BLUMENKOPF: Objection, form. 16 A. I don't rely on that fact alone to come to my 17 conclusion that Microchip copied Aptiv's products. 18 There's a bunch of things here that I cite, and the 19 decapping process of Boston 2's chip -- Aptiv's Boston 2 20 chip, which I understand from trial testimony Microchip 21 actually did perform as Mr. Bohm suggested they could 22 do, Microchip -- the evidence shows that Microchip did 23 do that. 24 And with the other evidence I cited, 25 that's -- what I cite here in this section is the	Page 323 1 product? 2 MR. BLUMENKOPF: Dr. Houh, this 3 cross-examination is concluded. Don't answer that. 4 BY MR. JENSEN: 5 Q. Are you going to follow the instruction of your 6 counsel, Dr. Houh? 7 A. The time's up, I understand. So I'm going to 8 listen to my counsel. 9 MR. JENSEN: I pass the witness; but we 10 will leave this deposition open and reserve the right to 11 continue it in view of the interruptions, obstructionist 12 behavior, and numerous nonresponsive answers. 13 MR. BLUMENKOPF: Well, are you passing the 14 witness; or are you suspending the deposition? 15 MR. JENSEN: I'm passing the witness to 16 you while leaving it open to continue at a future date. 17 If there's any redirect you would like to do, you've got 18 your two hours. 19 MR. BLUMENKOPF: Can I take 15 minutes off 20 the record to prepare my notes, and we'll continue with 21 the redirect of Dr. Houh? 22 MR. JENSEN: Sure. 23 THE VIDEOGRAPHER: The time is 1:51 p.m. 24 We are now going off the record. 25 (Recess taken)

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1 THE VIDEOGRAPHER: The time is 2:07 p.m. 2 We are now back on the record. 3 EXAMINATION 4 QUESTIONS BY MR. BLUMENKOPF: 5 Q. This is Bryan Blumenkopf from Morrison & 6 Foerster for the patent owner, Aptiv Technologies. 7 Dr. Houh, I have some follow-up questions for you today. 8 MR. BLUMENKOPF: Before we begin, though, 9 Counsel, at the end of your cross-examination you— 10 indicated you were passing the witness but reserving 11 rights to hold the deposition open. 12 Patent owner is not aware of any such 13 procedure in the IPR rules to hold a deposition open or 14 to considering any rules or authority you can cite for 15 support. Do you have any such rules or authority? 16 MR. JENSEN: I'd refer you to the Federal 17 Rules of Evidence which apply for depositions in IPR 18 proceedings. 19 MR. BLUMENKOPF: Are you going to cite me 20 to a specific rule that you believe applies to allow you 21 to hold the IPR deposition open? 22 MR. JENSEN: I believe that's standard 23 practice in cases such as this. So I'm surprised that 24 you're unaware of anything. 25 MR. BLUMENKOPF: All right. Well, just to	1 Q. And do you recall testifying that the '420 2 patent further claims priority to a provisional patent 3 application dated September 26, 2013? 4 A. I think so. 5 Q. So do you understand September 26, 2013 to be 6 the priority date for the '420 patent? 7 A. I understand it could be generally. 8 Q. Can you please turn to your supplemental 9 declaration in the '495 matter for the '420 patent. So 10 just to be clear, this is the '420 patent with the 11 matter ending in '495. 12 A. Yes. I have it open. 13 Q. Can you turn to paragraph 28 of that 14 declaration. 15 A. I see that. I'm there. 16 Q. Can you read paragraph 28 out loud. 17 A. "I understand that for the claims of the '420 18 patent the priority date of September 26, 2013 should 19 apply." 20 Q. Does that correctly state the priority date for 21 the '420 patent? 22 A. Yes. 23 Q. And do you recall testifying yesterday that 24 your '420 supplemental declaration for the '228 matter 25 in paragraph 27 identified a priority date of
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1 be clear on the record, our position is that we don't 2 believe you have the right to keep this deposition open. 3 Once this deposition ends today, it's done. Dr. Houh is 4 not returning. 5 MR. JENSEN: You stated your position, and 6 we disagree. Go ahead. 7 MR. BLUMENKOPF: That's fine. Just want 8 to make sure it's clear on the record. 9 BY MR. BLUMENKOPF: 10 Q. All right, Dr. Houh. Are you ready? 11 A. Yes. 12 Q. Did you and I speak about your deposition 13 during the break just now? 14 A. No. 15 Q. Did you speak with anyone about your deposition 16 during the break just now? 17 A. No. 18 Q. Dr. Houh, do you recall testifying yesterday 19 about the priority date for the '420 patent in the '228 20 proceeding? 21 A. Yes, I think so. 22 Q. Do you recall testifying that the '420 patent 23 is a continuation of a patent application filed 24 September 16th, 2014? 25 A. I think I do recall that, yes.	1 September 6, 2016 for the '420 patent? 2 A. Yes. I believe we were looking at my 3 declaration for the '420 matter ending in '228 at 4 paragraph 27 of my supplemental declaration. 5 Q. Do you understand that priority date of 6 September 6, 2016 in your '420 supplemental declaration 7 for the '228 matter to be a typographical error? 8 A. Yes. If you look at the previous paragraph, it 9 states the date of invention is September 26, 2013. 10 Q. If you had applied a priority date of 11 September 26, 2013 to your analysis of the '420 patent 12 in the '228 matter, would it have changed your opinions 13 set forth in your supplemental declaration in any way? 14 MR. JENSEN: Object to form and scope. 15 A. No. 16 BY MR. BLUMENKOPF: 17 Q. If you had applied a priority date of 18 September 16, 2014 to your analysis of the '420 patent 19 in the '228 matter, would it have changed your opinions 20 set forth in your supplemental declaration in any way? 21 MR. JENSEN: Object to form and scope. 22 A. No. 23 BY MR. BLUMENKOPF: 24 Q. Dr. Houh, do you recall testifying about the 25 detection of a host mode or a device mode in Chang II?

Page 328 1 MR. JENSEN: Object to form. 2 A. Yes. 3 BY MR. BLUMENKOPF: 4 Q. Can you please take a look at Chang II. 5 A. Okay. I have it open. 6 Q. And please turn to paragraph 43 of Chang II. 7 A. Okay. I'm there. 8 Q. Do you recall testifying about this paragraph 9 in Chang II yesterday? — — 10 MR. JENSEN: Object to form. 11 A. Yes, I do. 12 BY MR. BLUMENKOPF: — — 13 Q. Do you see the sentence that begins with "At 14 the same time" in paragraph 43? 15 A. It's a little below halfway down, but I do see 16 that. 17 Q. Could you please read that sentence out loud. 18 A. "At the same time that bridge transmission is 19 occurring, the further step of checking whether the user 20 has exchanged for other internal device would occur 21 instantly (S613). If it is determined that there are no 22 exchange for other external device, the bridge 23 transmission of data between the first host device 2 and 24 the second host device 3 will continue. However, if the 25 user has exchanged for other external device, then	Page 330 1 art understand the box labeled 3 to represent? 2 MR. JENSEN: Object to form and scope. 3 A. It says -- a POSITA would understand that it's 4 an external device that's a host but different than a 5 slave device. 6 BY MR. BLUMENKOPF: 7 Q. And by "slave device," are you referring to the 8 box labeled 4 in figure 1? 9 MR. JENSEN: Object to form and scope. 10 A. Yes. And there's also a first host device 11 labeled 2, but this is -- yes. 12 BY MR. BLUMENKOPF: 13 Q. Would a person of ordinary skill in the art 14 understand the box labeled 3 and the box labeled 4 in 15 figure 1 to represent different external devices? 16 MR. JENSEN: Object to form and scope. I 17 include in that form objection, leading. 18 A. Yes. 19 BY MR. BLUMENKOPF: 20 Q. Would a person of ordinary skill in the art 21 understand Chang II to disclose exchanging a USB device 22 for another device without physically removing the USB 23 device? 24 MR. JENSEN: Object to form and scope, 25 leading.
Page 329 1 return to step S603." 2 Q. Would a person of ordinary skill in the art 3 understand that phrase, "other external device," in the 4 sentence? 5 MR. JENSEN: Object to form and scope. 6 A. They would understand that as -- it's in the 7 context of -- it's changed. It's been exchanged. 8 BY MR. BLUMENKOPF: 9 Q. How would a POSITA understand the word "other" 10 in that sentence? 11 MR. JENSEN: Object to form and scope. 12 A. That it's a different external device. 13 BY MR. BLUMENKOPF: 14 Q. Would a person of ordinary skill in the art 15 understand exchanging an external device for a different 16 external device to include physically removing the 17 external device? 18 MR. JENSEN: Object to form and scope. 19 A. Yes. 20 BY MR. BLUMENKOPF: 21 Q. Let's take a look at figure 1 from Chang II. 22 A. Okay. 23 Q. And you see a box labeled 3? 24 A. Yes. 25 Q. What would a person of ordinary skill in the	Page 331 1 A. No. 2 BY MR. BLUMENKOPF: 3 Q. Would a person of ordinary skill in the art 4 understand Chang II to disclose a USB device switching 5 between a USB host mode and a USB device mode? 6 MR. JENSEN: Object to form and scope, 7 leading. 8 A. No, not based on what we've looked at. 9 BY MR. BLUMENKOPF: 10 Q. Would a person of ordinary skill in the art 11 understand Chang II to disclose detecting that a USB 12 device has switched from a USB host mode to a USB device 13 mode? 14 MR. JENSEN: Object to form and scope, 15 leading. 16 A. No. 17 BY MR. BLUMENKOPF: 18 Q. Would a person of ordinary skill in the art 19 understand Chang II to disclose detecting that a USB 20 device has switched from a USB host mode to a USB device 21 mode? 22 MR. JENSEN: Object to form and scope, 23 leading. 24 A. No. 25 BY MR. BLUMENKOPF:

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1 Q. Would a person of ordinary skill in the art 2 understand Chang to disclose detecting that a USB device 3 has switched from a USB host mode to a USB device mode? 4 MR. JENSEN: Object to form and scope, 5 leading. 6 A. Are you referring to Chang or Chang II? 7 BY MR. BLUMENKOPF: 8 Q. My question refers to Chang. Feel free to 9 consult the Chang reference if you need to to answer my- 10 question. 11 A. No, no, in the case of Chang. 12 Q. Do you recall testifying about the '643 -- 13 proceeding? 14 A. Yes. 15 Q. And do you recall testifying about Mr. Welch's 16 declaration in the '643 proceeding? 17 A. I think so. 18 Q. When you testified about the '643 proceeding 19 and Mr. Welch's declaration in that proceeding, was that 20 testimony directed to all five proceedings? 21 MR. JENSEN: Object to form and scope, 22 leading. 23 A. I think it was directed towards just the '643 24 because that's what we were looking at. 25 BY MR. BLUMENKOPF:	1 they'd understand that would be physically detached in 2 order to exchange for another device, a different 3 device. 4 Q. Yeah. Let me clarify my question. 5 You agree that there were dual-mode USB 6 products available in 2013, correct? 7 MR. BLUMENKOPF: Objection, form. 8 A. I don't know what you're referring to. 9 BY MR. JENSEN: 10 Q. Do you know what a dual-mode USB product is, 11 Dr. Houh? 12 MR. BLUMENKOPF: Objection, form. 13 A. Yeah. I mean, I don't know the universe of 14 products available in 2013 and all their features. 15 That's not part of what's in my supplemental 16 declarations, I don't think. 17 BY MR. JENSEN: 18 Q. Let's look at the Aptiv patent, and I'll do a 19 screen share for -- this is the '643 patent. And let me 20 direct your attention to column 2, the paragraph toward 21 the bottom beginning at around line 43. Do you see 22 that? 23 A. Yes. 24 Q. And that paragraph discusses smartphones, 25 correct?
Page 333	Page 335
1 Q. Would it be accurate to apply that testimony to 2 proceedings other than the '643 proceeding? 3 MR. JENSEN: Object to form and scope, 4 leading. 5 A. No. I think -- because there are some issues 6 specific to the '643. 7 BY MR. BLUMENKOPF: 8 Q. All right. Thank you, Dr. Houh. 9 MR. BLUMENKOPF: With that, I pass the 10 witness. 11 RE-EXAMINATION 12 QUESTIONS BY MR. JENSEN: 13 Q. Dr. Houh, you were just asked some questions 14 about the Chang II reference, correct? 15 A. Yes. 16 Q. Is there any reason that a dual-mode USB 17 product would not work with the bridge device disclosed 18 in Chang II? 19 A. Chang II, if you look at the flow chart and the 20 description of the flow chart, it talks about exchanging 21 for other device. It doesn't talk about what you asked 22 about. And so a person of ordinary skill would 23 understand that Chang II is teaching what it's teaching 24 in its description of figure 6, which is talking about 25 exchanging for other external device, which would -- and	1 MR. BLUMENKOPF: Objection, form. 2 A. I see the phrase "smartphones" used right where 3 you're highlighting. 4 BY MR. JENSEN: 5 Q. And let me highlight a sentence for you and ask 6 you to read it. This is at line 60 to 63. Can you read 7 that sentence aloud, please. 8 A. "Therefore, leading mobile device manufacturers 9 and system designers have begun designing their mobile 10 device products (i.e., smartphones, tablets, et cetera) 11 to support both USB and USB device roles." 12 Q. Do you disagree with that statement in the 13 Aptiv patent? 14 MR. BLUMENKOPF: Objection, form. 15 A. I mean, it says what it says. I don't think I 16 have an opinion specifically in my declaration about 17 whether I believe that's true or not. But it simply 18 says they've begun designing them, designing mobile 19 device products to support both USB host and USB device 20 roles. 21 BY MR. JENSEN: 22 Q. Do you know what a dual-role product is in the 23 context of USB? 24 MR. BLUMENKOPF: Objection, form. 25 A. Well, the specification goes on to say, "In

Page 336 1 other words, the phone may configure itself such that it 2 can function as a USB device when it needs to be, or as 3 a USB host when it needs to be." 4 BY MR. JENSEN: 5 Q. Do you understand that to be describing a 6 dual-role USB product? 7 MR. BLUMENKOPF: Objection, form. 8 A. Well, I think that sentence is consistent with 9 the previous sentence. — — 10 BY MR. JENSEN: 11 Q. Yeah. And do you understand that to refer to a 12 dual-role USB product? — — 13 MR. BLUMENKOPF: Objection, form. 14 A. Could you repeat your question, please. 15 MR. JENSEN: Could the court reporter read 16 it back. 17 (The record was read as requested.) 18 MR. BLUMENKOPF: Objection, form. 19 A. Well, I would say that there are two roles that 20 the earlier sentence discusses. That's two roles. I 21 mean, I think I use -- I discuss a different phrase in 22 my '643 supplemental declaration. It's not referring to 23 the product itself but to the ports. But I don't think 24 I addressed this specific question about the product 25 side that I recall in the '643 declaration.	Page 338 1 the specification of the '643 patent that we just looked 2 at. There are two roles. 3 So, you know, as an ordinary English term, 4 dual role might be understood as referring to two roles. 5 But that's using the '643 patent specification to teach 6 that. My point is that neither Chutorash discusses or 7 contemplates dual-role devices or dual-role ports. And 8 as I say in paragraph 54, Chang II also does not 9 contemplate dual-role devices. 10 BY MR. JENSEN: 11 Q. Yeah. My question is what do you mean by the 12 term "dual-role device"? Are you referring to a product 13 that can act as either a host or a device? 14 MR. BLUMENKOPF: Objection, form. 15 A. They can play at least -- it has two roles to 16 play. 17 BY MR. JENSEN: 18 Q. And those roles are host and device, correct? 19 MR. BLUMENKOPF: Objection, form. 20 A. Well, the example in the '643 patent that's 21 given of two roles are USB host and USB device roles. 22 BY MR. JENSEN: 23 Q. Okay. 24 A. That's the example given in the '643 patent. 25 My point is Chutorash doesn't discuss dual-role devices
Page 337 1 BY MR. JENSEN: 2 Q. I think in the '643 declaration you refer to it 3 as a dual-role device instead of a dual-role product. 4 And because the "device" term is a little bit of a 5 loaded term, I'm using the word "product." 6 Let me just ask you, Dr. Houh. Do you 7 know what a dual-role USB product is? 8 MR. BLUMENKOPF: Objection, form. 9 A. I mean, I'm searching my '643 declaration. I 10 don't think I refer to anything as a dual -- I don't see 11 the phrase "dual-role device" used in it. I mean, I've 12 talked about the ports being dual role. 13 BY MR. JENSEN: 14 Q. I'm referring to your '643 POPR declaration 15 that's Exhibit 2001. So let me just take you there in 16 the interest of getting all of us moving along. And I 17 can direct you to, for example, paragraph 75. And in 18 paragraph 75 you have -- the second sentence says, 19 "Chutorash does not contemplate, much less disclose 20 dual-role devices, dual-role ports, or host-to-host 21 communication." 22 What do you mean in your declaration when 23 you refer to a dual-role device, Dr. Houh? 24 MR. BLUMENKOPF: Objection, form. 25 A. So as I said, there are two roles laid out in	Page 339 1 and neither does Chang II. 2 Q. Yeah. And so with the understanding that a 3 dual-role product is a product that can act as either a 4 device or as a host, what would happen if you plugged 5 such a product into the second connection interface in 6 the Chang II reference? 7 MR. BLUMENKOPF: Objection, form. 8 A. Chang II doesn't contemplate dual-role devices. 9 So Chang II doesn't say anything about what would 10 happen, I don't think. 11 BY MR. JENSEN: 12 Q. Does the dual-role product -- I'm sorry. Go 13 ahead. 14 A. We can look at Chang II if you want, but I 15 don't recall it talking about -- 16 Q. Yeah. We're looking at Chang II. We're 17 looking at -- let's go to figure 5 in Chang II. On the 18 right-hand side of figure 5 there is a second connection 19 interface 12, correct? 20 MR. BLUMENKOPF: Object to form. 21 A. I see a box 12 that says "second connection 22 interface" in figure 5 of Chang II. 23 BY MR. JENSEN: 24 Q. And a user could plug in a USB device into that 25 interface, correct?

Page 340 1 MR. BLUMENKOPF: Objection, form. 2 A. With appropriate cable. 3 BY MR. JENSEN: 4 Q. And a user could plug in a USB product that was 5 a host as well, correct? 6 MR. BLUMENKOPF: Objection, form. 7 A. A host device could be plugged in; but, as 8 described in figure 6, the process involves exchanging 9 the device for another device which a person of ordinary 10 skill would understand requires physical detachment of 11 the device as described in the flow chart. 12 BY MR. JENSEN: 13 Q. Yeah. And that's not what I'm asking. I'm 14 just asking you would agree with me that a user could 15 plug in either a USB host or a USB device into the 16 second connection interface 12 in Chang II figure 5? 17 MR. BLUMENKOPF: Objection, form. 18 A. They're two different devices, sure. But if 19 you -- you couldn't plug them both in at the same time. 20 BY MR. JENSEN: 21 Q. Exactly, right. You could only have one of 22 them plugged in at a time, correct? 23 MR. BLUMENKOPF: Objection, form. 24 A. That's what Chang II is talking about. 25 BY MR. JENSEN:	Page 342 1 A. If it was that inquire signal from the external 2 device as determined in step 617. 3 BY MR. JENSEN: 4 Q. And on the host side if a user plugged in a 5 dual-role USB product in host mode to the second 6 connection interface 12 in Chang II figure 5, would the 7 Chang II figure 5 embodiment be able to detect that the 8 connected USB product was in host mode if it produced 9 the appropriate signals? 10 MR. BLUMENKOPF: Objection, form. 11 A. Well, step 603 is part of what addresses this 12 which it says, "Switch to a virtual slave state in order 13 to produce an inquire signal to the external device," 14 and then determine if -- step 605 is "determine if there 15 is a response to the external device." And if "yes," 16 that's the determination that the external device is a 17 second host device. 18 But either way, when it's operating in 19 host mode, there's a loop that's indicated by both 20 steps 613 and steps S625 that is checking whether the 21 user has exchanged for other external device. And 22 that's talking about physically disconnecting the 23 current device and plugging in a different device. 24 BY MR. JENSEN: 25 Q. My question is just when you plug it in in the
Page 341 1 Q. And either of those scenarios would be handled 2 just fine by Chang II, would they not? 3 MR. BLUMENKOPF: Objection, form. 4 A. Following the flow chart in figure 6 described 5 in -- at least partly in paragraph 43 of Chang II, that 6 describes how to physically exchange and plug in a 7 device and then exchange it for another device. 8 BY MR. JENSEN: 9 Q. If a user plugged in a dual-role USB product 10 that was in device mode, would the system in Chang 11 figure 5 be able to detect that that product was a USB 12 device? 13 MR. BLUMENKOPF: Objection to form. 14 A. If you look at figure 6 with respect to 15 step 617, it says "determine if there is an inquire 16 signal from the external device," and then if it says 17 "yes," then the external device is a slave device. And 18 that's the process that it uses to determine whether the 19 external device is a slave device. 20 BY MR. JENSEN: 21 Q. And if the dual-mode product that was plugged 22 into the second interface 12 produced the appropriate 23 signal, would the system in Chang II recognize it as a 24 slave device? 25 MR. BLUMENKOPF: Objection, form.	Page 343 1 first instance. So nothing's plugged in. A user plugs 2 in a USB product which is in host mode into the second 3 connection interface. Would the Chang II figure 5 4 embodiment be able to recognize that connected USB 5 product as a host if it received the appropriate 6 response? 7 MR. BLUMENKOPF: Objection, form. 8 A. Well, we just walked through those states in 9 this flow chart in S603, S605 and S607 where if -- well, 10 first they're switching to a virtual slave state in 11 order to produce an inquire signal to the external 12 device. That's S603. Then S605 is "determine if there 13 is a response from the external device." And then if 14 "yes," that goes on to S607, and that's that the 15 external device is a second host device. 16 BY MR. JENSEN: 17 Q. Yeah. And that process could work just fine if 18 a user plugged in a dual-role USB product that was in 19 host mode that provided the appropriate response? 20 MR. BLUMENKOPF: Objection, form. 21 A. I mean, this doesn't address -- Chang II 22 doesn't talk about dual-role devices. It talks about 23 determining if there's a response from the external 24 device after producing an inquire signal to the external 25 device.

Page 344 1 BY MR. JENSEN: 2 Q. If the external dual-role USB product provided 3 a response, the embodiment in Chang II figure 5 would 4 recognize that product as a USB host, correct? 5 MR. BLUMENKOPF: Objection, form. 6 A. So step 605, if there's a response from the 7 external device, that's what tells it -- that's what in 8 this flow chart causes the state to change down to S607 9 because that's a "yes." It got a response from the 10 external device in response to the inquire signal 11 produced to the external device in step S603. 12 So if it's "yes" there, it then goes to 13 the external device as a second host device, step S607. 14 BY MR. JENSEN: 15 Q. If the external dual-role USB product provided 16 a "yes" response to the Chang II figure 5 embodiment, 17 that embodiment would recognize the connected product as 18 a second host device in step S607 of figure 6, correct? 19 MR. BLUMENKOPF: Objection, form. 20 A. I mean, what it's describing here is simply 21 that you're receiving a response from the external 22 device in response to the production of an inquire 23 signal to the external device from step S603. 24 I mean, the chart doesn't say anything 25 about what the device is as long as it responds	Page 346 1 A. Yes. 2 Q. And in the interest of time, let me ask you. 3 What, if any, of your testimony that you have given over 4 the last day and a half does not apply to the other four 5 declarations that you provided? 6 MR. BLUMENKOPF: Objection, form. 7 A. Well, there were some portions of the '643 that 8 we were reviewing; and I was trying to be as specific as 9 I could that that's what I was responding to in the 10 context of the '643 supplemental declaration. 11 And so I think whenever I was referring to 12 the '643, I think it would fairly be just for the '643 13 matter. 14 BY MR. JENSEN: 15 Q. Okay. Well, let's walk through all of your 16 other declarations then. We'll do it one by one, and 17 this will be a tremendous waste of time. But if you 18 guys want to play that game, we'll go ahead and play it. 19 So let's take a look at your declaration 20 for the '072 patent. That's Exhibit 2019 in the '230 21 proceeding. 22 MR. JENSEN: And I'll note on the record 23 the whole purpose of having a consolidated deposition 24 was to avoid the need of having five separate 25 depositions, one in each proceeding; and that was the
Page 345 1 appropriately. But steps S613 and S625 talk about 2 actually exchanging the device for other external 3 device. 4 BY MR. JENSEN: 5 Q. Yeah. And I'm not talking about that. I'm 6 just talking somebody just plugged it in. They haven't 7 done anything else. All they've done is plug it in. So 8 that was the scenario that I was positing. There had 9 been no exchange of a device. Somebody plugged one 10 in -- I shouldn't use the word "product." 11 Somebody plugged in a dual-role product, 12 and it provided a response as set forth in step S605 13 that would lead to step S607. That's all I was talking 14 about. 15 Did you understand my question 16 differently? I'm happy to ask it again. I want to make 17 sure we've got this straight on the record. 18 A. It doesn't matter what other capabilities of 19 what's plugged in as long as the device that's plugged 20 in is acting as a USB host and provides the appropriate 21 response as a USB host. This flow chart says that it 22 would then go from S605 to S607. 23 Q. Okay. Do you recall being asked by your 24 counsel some questions regarding the testimony you gave 25 while looking at the '643 declaration?	Page 347 1 basis on which we agreed to having a consolidated 2 deposition. 3 Counsel, are you reneging on that 4 understanding? 5 MR. BLUMENKOPF: Counsel, this is your 6 time to use as you see fit. You're the one choosing the 7 questions. 8 MR. JENSEN: Yeah. And I'm asking you. 9 I'm trying to get us all out of here, right? 10 MR. BLUMENKOPF: We stand by the 11 agreement, Counsel, if that's what you're asking. 12 MR. JENSEN: Okay. Very good. 13 Put it this way. You guys had deposed 14 Mr. Welch on his declaration. We did not raise this 15 silly objection that because they only asked a question 16 in the context of one of his declarations, that it would 17 not apply to the other proceedings. We did not raise 18 that. Are you raising such an objection here? 19 MR. BLUMENKOPF: I'm not objecting to 20 anything in particular right now. You've asked Dr. Houh 21 the questions, and he's provided his testimony. 22 MR. JENSEN: Yeah. And I'm just trying to 23 get this on the record because, you know, we had an 24 understanding. And if you have a changed understanding 25 or a different understanding, then, you know, we will

Page 348 1 move to compel four more depositions of Dr. Houh, one on 2 each of his declarations. 3 I'm just trying to figure out if that's 4 going to be necessary or not or if we can stipulate that 5 his testimony that he gave today, you know, is 6 admissible and applies in all five proceedings. 7 MR. BLUMENKOPF: Like I said, Counsel, we 8 stand by the agreement. I'm not stipulating to anything 9 right now. — — 10 MR. JENSEN: Okay. And what is your 11 understanding of the agreement? 12 MR. BLUMENKOPF: Well, as set forth in the 13 correspondence between the parties, there was a two-day 14 deposition of Dr. Houh with the time parameters we set 15 forth earlier, 10 1/2 hours on cross followed by 2 hours 16 of redirect followed by 1.5 hours on recross to cover 17 the five proceedings and the four patents. 18 MR. JENSEN: And the basis on which that 19 agreement was reached was because of the massive 20 overlapping commonality between the patents and issues 21 in the five IPRs, right? 22 MR. BLUMENKOPF: I can't speak to the 23 basis of why that was agreed to, but that is the 24 agreement. 25 MR. JENSEN: Do you have a different	Page 350 1 about the '643 with respect to the '720 individually 2 because I certainly am not going to remember everything. 3 And I wouldn't make a blanket statement about -- and if 4 there were differences, I wouldn't remember exactly what 5 I testified to with respect to the '643. 6 But there are differences in the various 7 declarations as indicated by -- the '072 declaration is 8 84 pages, and the '643 declaration is 90 pages. So it's 9 clear that there's some differences. 10 Q. Yeah, there are. And I'm not asking whether 11 there's differences in the declarations. I'm asking 12 whether there's any substantive difference in the 13 testimony that you gave that would not apply to the 14 declarations in the '072, '420 and '962 patents. 15 MR. BLUMENKOPF: Objection, form. 16 A. I don't remember everything I testified to. 17 BY MR. JENSEN: 18 Q. Can you identify anything that would be 19 different? 20 A. Well, in order to identify things, I need to go 21 look at testimony and what you asked and examine the 22 differences. So I'm not prepared to give you a 23 statement about what might be different in my testimony 24 because I don't remember all my testimony. 25 Q. But you can't tell me any specific thing
Page 349 1 understanding? 2 MR. BLUMENKOPF: The agreement speaks for 3 itself, Counsel. 4 MR. JENSEN: Well, you seem to be raising 5 a question in your redirect that changes the basis of 6 that understanding. So I would very much appreciate 7 having a clear statement of what your position is 8 regarding the admissibility of Dr. Houh's testimony in 9 the five IPR proceedings. 10 MR. BLUMENKOPF: My questions were for 11 Dr. Houh, Counsel. I'm not saying anything further on 12 that matter at this time. 13 BY MR. JENSEN: 14 Q. Okay. Let's continue, Dr. Houh. 15 Can you identify anything in your '072 16 declaration regarding the testimony that you gave in 17 this deposition that would not be -- strike that. Let 18 me ask a better question. 19 What, if anything, in the deposition 20 testimony that you have given over the course of this 21 deposition would not apply to the declaration in the 22 '230 proceeding for the '072 patent? 23 A. I certainly don't remember everything I 24 testified to, and it would be difficult to answer that 25 without going through specific questions you asked me	Page 351 1 sitting here right now that would be different, correct? 2 MR. BLUMENKOPF: Objection, form. 3 A. There certainly are differences in the various 4 claims of the '643 from -- if the claims were the same, 5 I don't think there -- my understanding, I'm not a 6 lawyer, but I understand that would be double patenting. 7 So the claims can't be the same, as I 8 understand it. And they are different. There are 9 differences, subtle differences, in the analysis or 10 different in some portions. And I'm not going to be 11 able to remember offhand all my testimony what I 12 testified about yesterday with respect to -- 13 BY MR. JENSEN: 14 Q. I'm just asking if you can identify anything. 15 I'm not asking even for everything. I'm asking can you 16 identify anything? 17 MR. BLUMENKOPF: Objection, form. 18 A. Well, in order to do that, I'm going to need to 19 look at what I -- the questions I was asked and look at 20 how that applies in the other matters such as the '720. 21 BY MR. JENSEN: 22 Q. And you would agree with me, Dr. Houh, would 23 you not, that your testimony would apply the same in 24 each of the five IPR proceedings to the extent that your 25 declaration is the same in those proceedings, correct?

Page 352 1 MR. BLUMENKOPF: Objection, form. 2 A. I mean, there were times I did say things like, 3 "And there are similar sections in my other 4 declarations." And those sections, when I said that, I 5 was intending to convey that there are similarities in 6 which similar answers would apply; but there's some 7 times I didn't say that. 8 So you can look back at the transcript to 9 see where I might have said that or not. At least we 10 could start with those where I didn't indicate that 11 there were similar sections -- 12 BY MR. JENSEN: 13 Q. Yeah. And my question is a little bit 14 different, which is can we agree that your testimony 15 would apply equally to the declaration -- all five 16 declarations to the extent those declarations have 17 identical statements and language in them? 18 MR. BLUMENKOPF: Objection, form. 19 A. I mean, I think it depends on the context. I 20 still would want to look through to some extent. I'm 21 not denying that there are similar or even identical 22 passages between the declarations. 23 BY MR. JENSEN: 24 Q. Yeah. My question is assuming that it is 25 identical --	Page 354 1 related but different and they were somehow all confined 2 to those identical passages between the different 3 declarations. But I can't recall that right now because 4 I don't remember the whole of my testimony. If you're 5 asking me to say what I think is different, well -- 6 BY MR. JENSEN: 7 Q. No. I'm not asking that. I'm just asking if 8 we can agree that your answers would be the same where 9 your declaration contains the identical paragraphs. 10 MR. BLUMENKOPF: Objection, form. 11 A. And it depends what the point was and the 12 questions being asked when you were asking because 13 sometimes you were asking about some passages where you 14 weren't actually asking about the context or section 15 those passages were within, but it was about some other 16 unrelated issue. 17 So I would have to consider whether -- the 18 context again. But I'm not going to deny that there are 19 passages you asked me about that were identical. And 20 the times where I felt I remembered that there were 21 similar arguments made throughout the various 22 declarations, I tried to say that. 23 BY MR. JENSEN: 24 Q. Yeah. And oftentimes you didn't say anything 25 one way or the other, either that it was the same or
Page 353 1 A. If I could just finish and explain. There are 2 definitely variations in the analyses and slight 3 differences in the claim language. So there are subtle 4 differences. 5 And where I remembered I thought that 6 there were similar passages in other ones, I said that. 7 And where I wasn't -- where I didn't say that I was at 8 least not -- I was trying to -- well, I was at least not 9 signaling that I felt there were some analyses in other 10 supplemental declarations. 11 So there were times that I did say that, 12 and there were times that I did not. So we could start 13 with the questions that we did not -- I did not say 14 that, and then we could look at the question and the 15 answers with respect -- 16 Q. Yeah. My question is a little bit different, 17 right? 18 Assuming that there were 50 pages of 19 identical declaration testimony, would you agree with me 20 that your answers to the questions about those pages of 21 your declarations would be the same and apply equally to 22 all five declarations? 23 MR. BLUMENKOPF: Objection, form. 24 A. I mean, to the extent those issues may have -- 25 I'm not like -- touched other things that were somehow	Page 355 1 that it was different. So I'm just trying to see if we 2 have an understanding that where your declarations 3 contain identical paragraphs, that your testimony would 4 apply equally to the same paragraphs that say the same 5 thing in the other declaration. 6 MR. BLUMENKOPF: Objection, form. 7 A. I mean, I still would like to look at the 8 context of the question because there are times when -- 9 I know there were some very specific issues you asked me 10 about that were specifically related to the '643 and 11 really not to other ones that I answered really just for 12 the '643. And I tried to indicate that. So I would 13 still like to look at that. 14 MR. JENSEN: All right. Counsel, do you 15 oppose four more days of deposition for Dr. Houh? 16 MR. BLUMENKOPF: Yes, Counsel, we oppose. 17 This deposition concludes today, and Dr. Houh will not 18 be returning. 19 MR. JENSEN: Okay. Well, we consider this 20 our meet-and-confer and reserve our right to file a 21 motion to compel additional deposition testimony of 22 Dr. Houh given Aptiv's change in position. 23 MR. BLUMENKOPF: Are you finished, 24 Counsel? 25 MR. JENSEN: Yeah. I think we're done.

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1 We'll reserve our right to come back and do this if we
2 need to four more times.
3 MR. BLUMENKOPF: Are we off the record?
4 MR. JENSEN: We can go off the record.
5 THE VIDEOGRAPHER: The time is 2:59 p.m.
6 We are now going off the record.
7 (Proceedings concluded at 2:59 p.m.)
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Page 357

1 CHANGES AND SIGNATURE
2 WITNESS NAME: HENRY H. HOUH
3 DATE OF DEPOSITION: December 20, 2024
4 PAGE LINE CHANGE REASON
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Page 358

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 359

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
13 Case No. IPR2024-00228
14 U.S. Patent No. 9,619,420
15
16
17 REPORTER'S CERTIFICATE
18 ORAL DEPOSITION OF HENRY H. HOUH
19 December 20, 2024
20
21 I, Melinda Barre, Certified Shorthand Reporter in
22 and for the State of Texas, hereby certify to the
23 following:
24 That the witness, HENRY H. HOUH, was duly sworn by
25 the officer and that the transcript of the oral
deposition is a true record of the testimony given by
the witness;
That the original deposition was delivered to

Page 360

1 Travis Jensen.

2 That a copy of this certificate was served on all
3 parties and/or the witness shown herein
4 on _____.

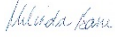
5 I further certify that pursuant to FRCP Rule
6 30(f)(1), that the signature of the deponent:

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

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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 Melinda Barre
21 Texas CSR 2192
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