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Transcript of Hassan Foroosh, Ph.D.

Date: October 18, 2024

Case: Medit Corporation -v- 3Shape A/S (PTAB)

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3SHAPE EXHIBIT 2010

Medit v. 3Shape

IPR2023-01315

Conducted on October 18, 2024

1 UNITED STATES PATENT AND TRADEMARK OFFICE 2 BEFORE THE PATENT TRIAL AND APPEAL BOARD 3 <u>MEDIT CORPORATION</u> 4 Petitioner 5 v. 6 3SHAPE A/S 7 Patent Owner 8 <u>Case No. IPR2023-01315</u> 9 <u>Patent 10,695,151</u> 10 <u>D E P O S I T I O N</u> 11 <u>o f</u> 12 HASSAN FOROOSH, Ph.D., 13 taken on behalf of Patent Owner 14 DATE: October 18, 2024 15 TIME: 10:09 a.m. to 2:38 p.m. Eastern 16 PLACE: Regus - Heritage Park 17 941 West Morse Blvd, Suite 100 18 Winter Park, Florida 32789 19 BEFORE: Dawn A. Hillier, RMR, CRR 20 Stenographic Reporter 21 Notary Public - State of 22 Florida, at Large 23 JOB NO: 555839	1 INDEX PAGE 2 WITNESS - HASSAN FOROOSH, Ph.D. 5 3 EXAMINATION BY MR. WALTERS 5 4 EXAMINATION BY MR. DANLEY 150 5 CERTIFICATE OF OATH 152 6 REPORTER'S CERTIFICATE 153 7 EXHIBITS 8 Premarked Exhibit 1015 28 9 Premarked Exhibit 1018 31 10 Premarked Exhibit 1001 46 11 Premarked Exhibit 1009 82 12 Premarked Exhibit 1010 116 13 Premarked Exhibit 1011 119 14 15 16 CERTIFIED STENOGRAPHER'S NOTE: Exhibits retained by 17 counsel. 18 19 20 21 22
1 APPEARANCES: 2 3 ON BEHALF OF PETITIONER: 4 JEFFREY DANLEY, ESQUIRE 5 BRACEWELL LLP 6 701 5th Avenue, Suite 3420 7 Seattle, Washington 98104 8 jeffrey.danley@bracewell.com 9 bracewell-ip@bracewell.com 10 206.204.6200 11 12 ON BEHALF OF PATENT OWNER: 13 TODD R. WALTERS, ESQUIRE 14 BUCHANAN INGERSOLL & ROONEY PC 15 1737 King Street, Suite 500 16 Alexandria, Virginia 22314 17 703.836.6620 18 todd.walters@bipc.com 19 20 21 22	1 REPORTER'S KEY TO PUNCTUATION: 2 -- At end of question or answer references 3 interruption. 4 ... References a trail-off by the speaker. 5 No testimony omitted. 6 "Uh-huh" "Um-hum" References affirmative sound. 7 "Huh-uh" "Um-um" References negative sound. 8 9 10 CERTIFIED STENOGRAPHER'S NOTE: All quotations from 11 exhibits are reflected in the manner in which they 12 were read into the record and do not necessarily 13 denote an exact quote from the document. 14 15 16 17 18 19 20 21 22

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5 1 HASSAN FOROOSH, Ph.D., 2 was called as a witness and, having first been duly 3 sworn, was examined and testified as follows: 4 THE WITNESS: I do. 5 CERTIFIED STENOGRAPHER: Thank you. 6 EXAMINATION 7 BY MR. WALTERS: 8 Q Good morning. 9 A Good morning. 10 Q My name is Todd Walters. I'm with the law 11 firm of Buchanan, Ingersoll & Rooney and I'm 12 representing 3Shape A/S in this proceeding. 13 As you know, I'm going to ask you 14 questions today and I have to give you some 15 instructions to start off. And the instructions are 16 pretty easy. Basically, if you have any questions 17 about my questions, if you don't understand them, I 18 would ask you to have me clarify the question for 19 you and not reach out to counsel; okay? 20 A Yes. 21 Q You understand that? 22 A Yes.	7 1 the cases? 2 A Mostly, yes. 3 Q Were they all related to intraoral 4 scanners? 5 A Yes. 6 Q And do you recall what companies have 7 hired you? 8 A Different ones. Align. I don't remember 9 all of them off the top of my head. Mostly Align. 10 Q And did you prepare for the deposition 11 today? 12 A Yes. 13 Q How much time did you spend preparing for 14 the deposition today? 15 A The day before yesterday, I spent about a 16 day long. I don't remember the number of hours, 17 exactly, with counsel, Jeff Danley. 18 Q You said the day before yesterday? 19 A The day before yesterday. Yes. On 20 Thursday -- I'm sorry, on Wednesday. 21 Q Did you work on preparing for this 22 yesterday?
6 1 Q Okay. Great. 2 MR. DANLEY: So this is Jeff Danley for 3 petitioner Medit from Bracewell. The only 4 thing I would add to that is if you have a 5 question about possible protection or 6 privilege, then please do ask me. 7 THE WITNESS: I'll do that. Thank you. 8 MR. WALTERS: Sure. 9 BY MR. WALTERS: 10 Q Dr. Foroosh, have you been deposed before? 11 A Yes. 12 Q How many times? 13 A Oh, off the top of my head, I don't 14 remember. Anything between five to 10. 15 Q Five to 10 times? 16 A Somewhere in between. 17 Q And in that five to 10 times, how many 18 times were they patent cases? 19 A They were all patent cases. 20 Q All patent cases? 21 A Yes. 22 Q And do you recall the subject matter of	8 1 A Just at home, looked at some of the 2 exhibits. 3 Q And you say the preparation was with Jeff 4 Danley? 5 A Yes. Counsel of Bracewell. 6 Q Were there any other counsel involved in 7 the preparation? 8 A No. 9 Q Anyone else involved? 10 A No. 11 Q Okay. Do you have a sense of how much 12 time you've spent on this particular case? 13 A I have no idea. 14 Q Would it be more than 50 hours? 15 A I think so, yes. 16 Q More than 100 hours? 17 A You're not talking about prep, are you? 18 Q No. 19 A You're talking about in general? 20 Q I'm talking about since the beginning. 21 Yeah. 22 A Yeah. I mean, this started last year. I

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9 1 don't remember off the top of my head. 2 Q Would you say it was more than 200 hours? 3 A No, I don't think so. 4 Q So between 100 and 200 hours, maybe? 5 A Maybe. Maybe just over 100, but again, 6 off the top of my head, I don't exactly recall how 7 many hours. 8 MR. DANLEY: Just caution the witness 9 to -- or instruct the witness to have a little 10 pause between the question and the response to 11 make it easier for the court reporter. 12 CERTIFIED STENOGRAPHER: Thank you. 13 BY MR. WALTERS: 14 Q Have you testified at trial before? 15 A No. 16 Q Dr. Foroosh, do you know what a 17 spectrophotometer is? 18 A A spectrometer, you mean? 19 Q A spectrophotometer. 20 A Oh, spectro -- 21 MR. DANLEY: Objection, scope. 22 THE WITNESS: I have not personally used,	11 1 spectrometer before. 2 BY MR. WALTERS: 3 Q Do you know if you can use a 4 spectrophotometer to capture color? 5 MR. DANLEY: Objection, scope. 6 THE WITNESS: My guess is that you can, 7 but I'm not sure why this is related to this 8 case. You have my declaration. I have not 9 expressed any opinions on how a 10 spectrophotometer works or how a spectrometer 11 works. 12 BY MR. WALTERS: 13 Q So my question was: Do you know if you 14 can use a spectrophotometer to capture color. 15 MR. DANLEY: Objection, form and scope. 16 THE WITNESS: Again, I answered. I said, 17 yes, I believe that probably you can, but as I 18 said, I am not familiar. I have not used the 19 technology before. 20 BY MR. WALTERS: 21 Q So is it fair to say, then, you don't 22 understand how one -- how a spectrophotometer
10 1 but it's a technology that I heard of. 2 BY MR. WALTERS: 3 Q So you've never personally used a 4 spectrophotometer? 5 A No. 6 MR. DANLEY: Same objection. 7 BY MR. WALTERS: 8 Q Do you know how they work? 9 MR. DANLEY: Same objection. 10 THE WITNESS: I don't remember, off the 11 top of my head, details of the technology. 12 BY MR. WALTERS: 13 Q Do you know what a spectrometer is? 14 MR. DANLEY: Objection, scope. 15 THE WITNESS: Again, as I said, it's a 16 familiarity in a general way, yes, in the sense 17 that I've heard of the technology, but if you 18 ask me details, I may not remember. 19 BY MR. WALTERS: 20 Q Have you ever used a spectrometer? 21 MR. DANLEY: Same objection. 22 THE WITNESS: I have never used a	12 1 captures color? 2 MR. DANLEY: Objection, form and scope. 3 THE WITNESS: No. I disagree with that. 4 You know, I'm basically somewhat familiar with 5 the technology but not completely. 6 BY MR. WALTERS: 7 Q So how does a spectrophotometer work to 8 capture color? 9 MR. DANLEY: Objection, scope. 10 THE WITNESS: Again, as I said, I have not 11 expressed any opinion on that in my 12 declarations, how a spectrophotometer works. 13 BY MR. WALTERS: 14 Q I'm asking you the question now. Could 15 you answer my question? 16 MR. DANLEY: Objection, form and scope. 17 THE WITNESS: That was my answer in the 18 sense that I do not think I have ever expressed 19 any opinion on that. So if you ask me to 20 describe exactly how a spectrophotometer works, 21 I have not used a spectrophotometer before. 22 And -- but I did not express any opinion on

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13 1 that in my declarations either. That's my 2 answer. 3 BY MR. WALTERS: 4 Q Do you know how a spectrophotometer works 5 to capture color? 6 MR. DANLEY: Objection, form and scope. 7 THE WITNESS: I mean, if you want me to 8 speculate on that, I can go with as I told you 9 that I am not -- I do not know the details of 10 the technology, but... 11 I said it, that I do not know the details 12 of the technology. 13 BY MR. WALTERS: 14 Q Do you know if you can capture color with 15 a spectrometer? 16 MR. DANLEY: Objection, scope. 17 THE WITNESS: The prior arts that are 18 disclosed, they talk about that. 19 BY MR. WALTERS: 20 Q Do you know how a spectrometer captures 21 color? 22 MR. DANLEY: Objection, scope.	15 1 cannot give you details. Maybe it's using some 2 filters, for instance, a set of filters to 3 capture different colors. 4 But, as I said, I have not formed any 5 opinion on that and I have not investigated for 6 this particular deposition, or otherwise, how a 7 spectrometer works. 8 BY MR. WALTERS: 9 Q Are you familiar with how a spectrometer 10 works? 11 MR. DANLEY: Same objections. 12 THE WITNESS: I think I answered that 13 question. I said that I cannot recall every 14 details. I might have read about it many times 15 throughout my career, and here is, for 16 instance, some of the background in the 17 technology, but I do not recall, right now, how 18 exactly it functions. 19 BY MR. WALTERS: 20 Q What details do you recall right now about 21 how a spectrometer works? 22 MR. DANLEY: Objection, scope.
14 1 THE WITNESS: Again, as I said, I have not 2 expressed any opinion on that, going into the 3 technology, how a spectrometer is capturing 4 color. I'm just -- I just said that to the 5 prior arts are disclosing that, so... 6 BY MR. WALTERS: 7 Q Are you familiar with how a spectrometer 8 captures color? 9 MR. DANLEY: Objection, form and scope. 10 THE WITNESS: I believe we are going 11 around asking the same question right now. 12 As I said, I answered the question. I 13 have not expressed any opinion on how a 14 spectrometer works and captures color. I just 15 said that I know that some of the prior arts 16 are disclosing that, that spectrometer is an 17 option to capture color. 18 BY MR. WALTERS: 19 Q And I'm asking the question, do you know 20 how a spectrometer captures color? 21 MR. DANLEY: Same objections. 22 THE WITNESS: Again, my answer is that I	16 1 THE WITNESS: I don't want to say 2 something that would be -- 3 (Phone ringing.) 4 BY MR. WALTERS: 5 Q My apologies. 6 A I wouldn't want to say something that 7 would be incorrect. But as I said, it's a 8 technology that I have heard of before and I've 9 seen, probably I've read in the past in the 30 years 10 of my career, but I don't want, at this point, to 11 speculate here it is, because I said, I don't recall 12 details of the technology. 13 Q Do you consider yourself an expert in the 14 area of the use of a spectrometer? 15 MR. DANLEY: Objection, scope. 16 THE WITNESS: I consider myself expert in 17 the area of computer vision, image processing, 18 and visual learning. 19 And you have a copy of my CV. 20 BY MR. WALTERS: 21 Q That's not the question I asked. My 22 question was: Do you consider yourself an expert in

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17 1 the area of the use of a spectrometer? 2 MR. DANLEY: Objection, scope. 3 THE WITNESS: Expert, just to clarify your 4 question, expert in the use of a spectrometer? 5 BY MR. WALTERS: 6 Q Yes. 7 A As I said, I have not personally used a 8 spectrometer before. So given that I have not used 9 it, how can I be an expert? But it doesn't mean 10 that, as an image processing person, I have not 11 heard of it, that I have not read about it. I have, 12 just that I don't, right now, remember details of 13 the technology. 14 Q You can't remember any details of the 15 technology on how a spectrometer obtains color? 16 MR. DANLEY: Objection, form and scope. 17 THE WITNESS: Not at this point, no. I 18 don't recall. 19 BY MR. WALTERS: 20 Q And same question for a spectrophotometer. 21 You don't remember any details on how a 22 spectrophotometer works?	19 1 have come across it, including the prior arts, some 2 of the prior arts that have been discussed. And I 3 know applications, like the ones discussed in the 4 prior art, but I have not personally ever used any 5 of them. 6 Q Do you know how a camera captures color? 7 A Yes. 8 Q How does a camera capture color? 9 MR. DANLEY: Objection, scope. 10 THE WITNESS: I mean, you want me to give 11 you a general description of how a camera 12 functions? 13 BY MR. WALTERS: 14 Q Yes. 15 A I can spend the whole day for you. Do you 16 want me to give a lecture -- one of the lectures 17 from my classes? 18 Q No. You don't have to give me the whole 19 lecture but I'm trying to understand. 20 A You're talking about, first of all, a 21 digital camera? 22 Q Yeah. Let's start with a digital camera.
18 1 MR. DANLEY: Same objections. 2 THE WITNESS: I have read about these 3 technologies, the same answer to you. I have 4 not used these technologies personally. 5 However, I have, in the past, in 30 years 6 of my career, come across on documents or 7 probably papers, publications, talking about 8 both these technologies. 9 BY MR. WALTERS: 10 Q Do you consider yourself an expert on how 11 a spectrophotometer works? 12 MR. DANLEY: Objection, scope. 13 THE WITNESS: I just did answer -- I just 14 answered that question. 15 BY MR. WALTERS: 16 Q Well, what -- 17 A I said that an expert means that I know 18 the nitty-gritties and details. I'm assuming that's 19 what you mean by expert, that you know the details 20 of the technology. If I'm saying that I don't 21 recall the details of the technology and I have not 22 used it before, but I have read about it before. I	20 1 A Okay. Digital camera. 2 MR. DANLEY: Objection, scope. 3 THE WITNESS: Again, I'm not sure how it 4 is related but okay. I mean, a digital camera, 5 the different ways this can be done, two well 6 known methods is you could have three separate 7 sensors at the back of the camera. So a camera 8 consists of an aperture, a lens that integrates 9 the light and projects it on to the focal plane 10 array. The focal plane array could have either 11 three separate sensors or it could be a single 12 sensor, which is a cheaper camera, but with 13 beta filters in front. 14 And then if they use beta filters, you 15 integrate between different colors to create 16 the separate RGB channels. 17 If it's three separate sensors, more 18 expensive cameras, then each sensor is 19 capturing a monochromatic information, RGB. 20 BY MR. WALTERS: 21 Q Why just RGB with a camera? 22 MR. DANLEY: Objection, scope.

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21 1 THE WITNESS: So this is inspired by human 2 visual system. So do you want me to go into 3 details of a human visual system that how 4 RGB... 5 BY MR. WALTERS: 6 Q Sure. If I've heard enough, I'll let you 7 know. 8 A Sure. There are two types of sensors in 9 our eyes. One is called rods and the other one is 10 called cones. And they're functioning very 11 differently. There are a lot more rods than cones. 12 And rods basically gives us -- very 13 simplistic way of describing it, gives us more of a 14 peripheral visual. They are lower resolution. But 15 as cones, they're mostly focused on central part of 16 the retina. 17 They're more high resolution, but the 18 number of them is denser. And they have different 19 sensitivity compared to rods. Cones have 20 sensitivity to different colors, the electromagnetic 21 spectrum within a visible range is known since 22 1600s, time of Newton, that white light consists of	23 1 earlier. 2 As I said, I do not recall the -- how a 3 spectrometer functions right now. So how do 4 you want me to compare with the camera? I just 5 described how a camera captures color. 6 BY MR. WALTERS: 7 Q Do you know if a spectrometer captures 8 more than just red, green, and blue? 9 MR. DANLEY: Objection, scope. 10 THE WITNESS: Again, my answer is the 11 same. Anything I say is going to be 12 speculation because I do not recall the 13 technology behind the spectrometer so I 14 can't -- I mean, anything I say -- because I 15 don't recall, how can I say if it does more 16 than RGB or just RGB. 17 RGB is basically three channels. In 18 hyperspectral imaging, for instance, you can 19 divide it in a narrower range and capture -- 20 you know, divide a visible range to a narrower 21 range so you can collect many different, if you 22 want to call them, colors, but they are not
22 1 all these different colors. 2 So these cones have, depending on the type 3 of cone, have different sensitivities to either R, 4 G, and B, and this has been studied for over a 5 hundred years. 6 Q Just we're clear, the R, G, and B, what do 7 they stand for? 8 MR. DANLEY: Objection, scope. 9 THE WITNESS: Red, green, blue. 10 BY MR. WALTERS: 11 Q Okay. 12 A Those are the primary colors of light. 13 Q Okay. 14 A And I emphasize "light" because it's 15 different perception of light behaves linearly, 16 whereas perception of pigments is different. 17 Q So are there differences between the way a 18 spectrometer captures color and the way a camera 19 captures color? 20 MR. DANLEY: Objection, scope. 21 THE WITNESS: Again, you're asking me 22 almost the same question that you asked me	24 1 truly colors. 2 BY MR. WALTERS: 3 Q And can you do that with a spectrometer, 4 do you know? 5 MR. DANLEY: Objection, scope. 6 THE WITNESS: My answer is the same. I do 7 not recall how a spectrometer functions. And 8 though I don't even know whether there has 9 been, I'm guessing, like any technology, the 10 technology has probably evolved. Spectrometer 11 have probably initially developed, probably 12 captured maybe a certain number. Maybe today 13 it's a different number of colors it captures. 14 I don't -- I do not know. 15 BY MR. WALTERS: 16 Q Is a spectrophotometer different than a 17 spectrometer? 18 MR. DANLEY: Objection, scope. 19 THE WITNESS: My answer is the same. If I 20 do not recall the technology behind 21 spectrometer and spectrophotometer I cannot 22 compare them here. I need to go back and

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25 1 refresh my memory and say, okay, these are the 2 differences, or there are no differences. I do 3 not know the answer to your question at this 4 point in time, no. I don't remember the answer 5 to your question. 6 BY MR. WALTERS: 7 Q When you prepared your first declaration, 8 did you go back and refresh your memory on how a 9 spectrophotometer worked? 10 MR. DANLEY: Objection, form, scope. 11 THE WITNESS: I don't believe so. I might 12 have done this but I don't believe so. I don't 13 know. I might have gone to find some 14 references and read about it but I don't 15 remember. 16 BY MR. WALTERS: 17 Q Would those references have been listed as 18 some of the references that you reviewed in your 19 declaration? 20 MR. DANLEY: Objection, scope. 21 THE WITNESS: No. 22 BY MR. WALTERS:	27 1 Now, if you ask me a specific product by a 2 specific company, I cannot know that. But I have a 3 general knowledge of those technologies. And I have 4 been in a dentist's office, even recently, who 5 scanned with one of these technologies, my own 6 teeth. 7 Q What is an intraoral scanner? 8 MR. DANLEY: Objection, form. 9 THE WITNESS: Again, you want me to give 10 you a general definition what is referred to a 11 scanner? I'm not going to give a general 12 definition. But I can tell you that probably 13 there are scanners who just take images or 14 scanners who take images and produce 3D models 15 or shape, or maybe a combination of both. 16 There are different technologies that I've read 17 about. I have not obviously used any of those 18 technologies because I'm not a dentist. The 19 end user is a dentist. But as a computer 20 vision scientist and image processing 21 scientist, I am familiar with the background 22 technology behind them.
26 1 Q So you reviewed references in preparation 2 of your declaration that are not listed in your 3 declaration? 4 MR. DANLEY: Objection, form, scope. 5 THE WITNESS: That's incorrect. All my 6 opinion in my declarations are entirely based 7 on the references that are cited there. 8 If I read anything about spectrometer at 9 that time, over a year ago, or about a year 10 ago -- I don't remember -- it was just by 11 curiosity. 12 BY MR. WALTERS: 13 Q Do you know what an intraoral scanner is? 14 A I'm familiar with some of them, ever since 15 I have started working on some different patent 16 IPRs. And some of the technologies behind them, I'm 17 familiar way before starting working on IPRs that 18 related to intraoral scanning because those are 19 basically computer vision and image processing 20 techniques. 21 I am familiar with a number of those 22 intraoral scanning technologies.	28 1 BY MR. WALTERS: 2 Q I'm going to hand you what was previously 3 marked as Exhibit 1015. 4 (Exhibit 1015 was previously marked.) 5 BY MR. WALTERS: 6 Do you recognize Exhibit 1015? 7 A Yes. 8 Q What is Exhibit 1015? 9 A It's my original declaration. 10 Q Can you turn to the last page of 11 Exhibit 1015? 12 A Yes. 13 Q Is that your signature on that page? 14 A Yes. 15 Q And what are the letters that are in that 16 signature? 17 MR. DANLEY: Objection, form. 18 THE WITNESS: I'm not sure, again, why 19 that is relevant. That is my signature. Over 20 years, the signature has become, I'm 21 guessing -- not my guess. It's F-o-r-o-s-h. 22 But maybe it's difficult to read now. Over

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29 1 years, I just go very fast and sign. 2 BY MR. WALTERS: 3 Q But that's how you always sign? 4 A I do. 5 Q Okay. Do you have an electronic signature 6 that you use? 7 MR. DANLEY: Objection, form. 8 THE WITNESS: Do you mean, by "electronic 9 signature," an image of my signature or do you 10 mean, for instance, a typical -- because then 11 if you use your username/password, for 12 instance, in pdf documents, you can put an 13 electronic signature where it confirms that it 14 is your signature and you did it on your own 15 machine. 16 I don't know which type of electronic 17 signature you're referring to. 18 And there are some services. I think one 19 of them is called DocuSign, also, that performs 20 an electronic signature, but it does not look 21 like, for instance, your own signature. It 22 just confirms that you did sign that paper.	31 1 THE WITNESS: I do. For my pdf documents, 2 sometimes to sign pdf documents, I use 3 electronic signatures that Adobe allows you, 4 with a password-protected setting, to include 5 your signature in the document. I use that 6 sometimes. 7 BY MR. WALTERS: 8 Q Okay. I'm going to hand you another 9 exhibit that was previously marked as 1018. 10 (Exhibit 1018 was previously marked.) 11 BY MR. WALTERS: 12 Q If we go to the last page of Exhibit 1018. 13 A Yes. 14 Q You didn't actually sign this declaration, 15 did you? 16 A I did. I signed it, however, not by my 17 own hand, no. I just wrote my name and my last 18 name -- or my initial, and my last name, and used a 19 special font. And I said, yes, I approve it, this 20 is my -- I approve this is my declaration. 21 Q So this is not a handwritten signature. 22 This is an electronic signature?
30 1 BY MR. WALTERS: 2 Q But if you actually signed something, it 3 would look like the signature at the end of 4 Exhibit 1015? 5 MR. DANLEY: Objection, form, scope. 6 THE WITNESS: It should, to the extent 7 one's signature, one time, looks like the next 8 time, yes. 9 BY MR. WALTERS: 10 Q Yeah. And then you say there might be 11 different types of electronic signatures. One, you 12 might have a picture. Do you have a picture of your 13 signature that you use or other people could use? 14 MR. DANLEY: Objection, form, scope. 15 THE WITNESS: I have electronic copy of my 16 same signature but nobody should be able to use 17 it. It's password protected. It's just 18 accessible by me. 19 BY MR. WALTERS: 20 Q Okay. And do you have any other 21 electronic type signatures? 22 MR. DANLEY: Objection, form, scope.	32 1 A Yes. This is not a handwritten signature. 2 Q Could someone have copied your signature 3 and then put it on the document I have in front of 4 you? 5 MR. DANLEY: Objection, form. 6 THE WITNESS: No, because this document 7 was shared with me and I approved it. I know 8 all the details of this document. And I know 9 that I signed it at that date. 10 BY MR. WALTERS: 11 Q How would you know that the document I 12 just put in front of you was signed by you? 13 MR. DANLEY: Objection, form. 14 THE WITNESS: I'm assuming that you are 15 giving me an exact copy of that exhibit because 16 it says that it's that exhibit, unless you 17 falsified it yourself, it should be the correct 18 document that it was filed on, you know, by 19 the -- by the law offices of Bracewell on 20 behalf of my declaration. 21 BY MR. WALTERS: 22 Q When you signed the document, did it have

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33 1 an exhibit number on it? 2 A I don't recall that. But if you go 3 through the document, I can confirm whether it is 4 the exact same document. I'd remember the document. 5 Q But you do confirm that this is an 6 electronic signature, not your actual signature? 7 MR. DANLEY: Objection, form. 8 THE WITNESS: Well, it depends what you 9 mean by "actual signature." I'm confirming 10 that I signed my supplemental declaration at 11 this date. And this is how I signed it. By 12 "actual signature," if you mean hand signature, 13 no, this is not my hand signature. 14 BY MR. WALTERS: 15 Q Okay. Can you go to paragraph four of 16 Exhibit 1018? 17 A Yes. 18 Q And in paragraph four, it says that you 19 reviewed the materials listed in that paragraph in 20 preparation of your supplemental declaration. 21 A Yes. 22 MR. DANLEY: Objection to form.	35 1 of your supplemental declaration? 2 A In preparation of the supplemental 3 documents, I reviewed only the documents that are 4 cited here in the supplemental declaration. 5 Q When you say "cited in the supplemental 6 declaration," do you mean the documents cited in 7 paragraph four that we looked at earlier on 8 Exhibit 1018? 9 A I believe that what I'm saying here is 10 that in paragraph four, you mean -- is that 11 right? -- paragraph four of my supplemental 12 document, the documents I'm mentioning there are all 13 the documents I have cited to throughout my 14 supplemental document -- declaration. 15 Q So when you prepared the supplemental 16 declaration, did you go back and look at Korten? 17 A I might have. I don't remember but as I 18 said, my opinions in the supplemental document are 19 based on the documents that I'm citing in paragraph 20 four. 21 Q But you don't remember if you went back 22 and actually looked at Korten in preparing your
34 1 BY MR. WALTERS: 2 Q And the materials that are listed include 3 the initial determination by the patent board, the 4 patent owner's response, the declaration of Eli 5 Saber, the substitute declaration of Dr. Eli Saber, 6 the transcript of Dr. Saber. Did you review 7 anything else in preparing the supplemental 8 declaration? 9 MR. DANLEY: Objection, form. 10 THE WITNESS: No. 11 BY MR. WALTERS: 12 Q So now I want you to go to Exhibit 1015 13 and turn to page nine. 14 A Yes. 15 Q And you see in page nine in paragraph 18, 16 it says that you had reviewed the materials in the 17 table that is found in pages 10 and 11. 18 MR. DANLEY: Objection, scope. 19 THE WITNESS: I see that. 20 BY MR. WALTERS: 21 Q So did you review any of the documents 22 found in the table on pages 10 and 11 in preparation	36 1 supplemental declaration? 2 A I don't remember doing that, no. Again, 3 as I said in paragraph four, I limited my opinions 4 in the supplemental declaration to the documents 5 that I'm mentioning in paragraph four of that 6 document. 7 Q In preparing your supplemental 8 declaration, do you remember looking at either 9 Lehmann I or Lehmann II? 10 A Again, same answer as Korten. Did I look 11 at them? Maybe. I don't remember. But, you know, 12 as I said, in writing this document, I relied on the 13 documents that I'm mentioning in paragraph four. 14 But then again, I mean, those prior arts that you 15 are mentioning, of course, I remembered them at the 16 time. Did I go and have a look at them? I don't 17 remember. But my opinion in the supplemental 18 declaration is based on the documents that I'm 19 citing in paragraph four. 20 But I'm pretty certain I remembered those 21 prior arts at the time. 22 Q So you're pretty familiar with those prior

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37 1 arts? 2 MR. DANLEY: Objection, form. 3 THE WITNESS: It depends. I mean, the 4 word "pretty familiar" is -- 5 BY MR. WALTERS: 6 Q I'm using your words. 7 A -- somewhat ambiguous, you know. I'm 8 familiar with those documents, yes, those prior 9 arts. 10 Q So you're familiar with Korten? 11 A I am familiar with Korten. 12 Q And you're familiar with Lehmann I? 13 A Yes, I'm familiar with Lehmann I. 14 Q And you're familiar with Lehmann II? 15 A I'm familiar with all the prior arts that 16 were used in this IPR. 17 Q I just want to get a record here. You're 18 familiar with Pye? 19 A I am. 20 Q And you're familiar with Babayoff? 21 A Yes. 22 Q Okay. So when you prepared your	39 1 review all of those documents in preparation for 2 your deposition today? 3 A Probably not all of them I referred back, 4 but definitely the prior arts. And the patent, '151 5 patent, I look at that. 6 Q When you say "the prior arts," can you 7 specifically tell me which exhibits that you did 8 look at so we have a clean record? 9 A Sure. I don't remember the exhibit 10 number, but Korten, Lehmann I, Lehmann II, Babayoff, 11 and Pye. 12 Q Okay. Do you recall looking at any other 13 documents in preparation for the deposition today? 14 A I looked at the '151 patent. 15 Q Anything else? 16 A That's it. Yes. 17 Q That's it? Okay. 18 I want you to go back to Exhibit 1018. 19 And specifically, I want you to look at paragraph 20 two. 21 A Yes. 22 Q And you indicate in paragraph two that
38 1 supplemental declaration, sitting here today, you're 2 not even sure you needed to go back and look at the 3 references to provide the opinions that you've 4 provided? 5 A As I said, I might have referred back to 6 those. I don't remember. But, again, my 7 supplemental declaration relies on the documents 8 that I'm citing in paragraph four. 9 Q Do you recall what documents you reviewed 10 in preparing for the deposition today? 11 MR. DANLEY: I would just caution the 12 witness not to reveal any discussions you may 13 have had with counsel, but to the extent that 14 there are documents that you recall, then you 15 can answer. 16 THE WITNESS: All the documents that are 17 related to my declarations. 18 BY MR. WALTERS: 19 Q So going back to Exhibit 1015. That's 20 your first declaration. 21 A Um-hum. 22 Q In the table on pages 10 and 11, did you	40 1 "None of the arguments made by patent owner or 2 opinions rendered by Dr. Saber change my opinions 3 provided in my original declaration supporting the 4 petition." 5 Do you see that? 6 A Yes. 7 Q Does that mean you dispute some of the 8 opinions rendered by Dr. Saber? 9 MR. DANLEY: Objection, form. 10 THE WITNESS: I don't know what you mean 11 by "dispute." It says what it says, that none 12 of them is changing my opinion. 13 BY MR. WALTERS: 14 Q So was there anything in Dr. Saber's 15 declaration that you disagreed with? 16 A Well, anything I disagreed with, I have 17 pointed out in my declaration. So if you refer to 18 any one, I would be more than glad to rediscuss. 19 Q So all the things you've disagreed with 20 are in this declaration? 21 MR. DANLEY: Objection, form. 22 THE WITNESS: To the extent applicable to

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41 1 this declaration. 2 BY MR. WALTERS: 3 Q Okay. You referred to this declaration, 4 Exhibit 1018, as a supplemental declaration. 5 What did you mean by "supplemental"? 6 A A declaration because it was coming after 7 my original declaration and in response to patent 8 owner's response or Dr. Saber's substitute 9 declaration. 10 Q So in the -- in your first declaration, 11 Exhibit 1015, you addressed issues of anticipation 12 and obviousness; correct? 13 MR. DANLEY: Objection, scope. 14 THE WITNESS: If you refer to any specific 15 place, then I can say yes or no. It's a very 16 general question. 17 BY MR. WALTERS: 18 Q Yeah. Sure. So if you look at 19 Exhibit 1015. 20 A Yes. 21 Q And you go to the table of contents. 22 A Yes.	43 1 BY MR. WALTERS: 2 Q And your supplemental declaration is 3 supplementing those arguments; right? 4 MR. DANLEY: Objection, form. 5 THE WITNESS: My supplemental 6 declarations, as I said, was in response to the 7 patent owner's response and Dr. Saber's 8 substitute declaration. 9 BY MR. WALTERS: 10 Q What's your understanding of the term 11 "anticipation"? 12 MR. DANLEY: Objection, scope. 13 THE WITNESS: I'm not a lawyer. I can 14 read from my original declaration what I was 15 advised by the law office as to what 16 "anticipation" means. 17 BY MR. WALTERS: 18 Q What's your understanding of the term 19 "obviousness"? 20 MR. DANLEY: Objection, scope. 21 THE WITNESS: Again, I was advised by the 22 counsel in putting the declaration -- the legal
42 1 Q And if you look at Roman numeral I in the 2 table of contents at the bottom of the page, you see 3 on page 47, you talk about Ground 1 there. And you 4 say Claim 1 is anticipated? 5 A Yes. 6 Q Right? 7 A I see that. 8 Q And then if you turn the page in the table 9 of contents, and you see Ground 2, you see that 10 there? 11 MR. DANLEY: Objection, scope. 12 THE WITNESS: I see that, yes. 13 BY MR. WALTERS: 14 Q And there, you say Claim 1 is rendered 15 obvious. 16 You agree that your first declaration, 17 Exhibit 1015, gave opinions on anticipation and 18 obviousness; right? 19 MR. DANLEY: Objection, scope. 20 THE WITNESS: It says what it says, yes. 21 I mean, Ground 1, based on anticipation and 22 other grounds based on the combinations.	44 1 definition of anticipation and obviousness. So 2 I read them and I applied that throughout my 3 declaration. 4 BY MR. WALTERS: 5 Q In your analysis for either anticipation 6 or obviousness, did you try to understand the 7 meaning of the claim terms? 8 MR. DANLEY: Objection, scope. 9 THE WITNESS: Well, in most -- I don't 10 exactly remember off the top of my head. You 11 need to refer specific pages. 12 But in my declarations, I took the plain 13 and customary meaning of claim terms unless 14 otherwise advised. 15 BY MR. WALTERS: 16 Q Do you recall any terms where you were 17 otherwise advised to use a specific meaning? 18 MR. DANLEY: Objection, form and -- 19 THE WITNESS: Again -- 20 MR. DANLEY: -- I'm going to instruct the 21 witness not to answer based on protection as a 22 communication between expert and attorney. I

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45 1 think there's a different way you can ask that 2 to get an answer. But I think the way it's 3 phrased is not an appropriate question. 4 BY MR. WALTERS: 5 Q In your analysis on anticipation and 6 obviousness, did you give any claim terms a special 7 meaning? 8 MR. DANLEY: Objection, scope. 9 THE WITNESS: Again, I don't recall. If 10 you refer to any pages in my declaration, we 11 can read through to see if claim terms were 12 given specific meaning. But as I said, that 13 plain and customary meaning of the claim terms 14 are used, unless otherwise advised. But we 15 have to go -- if you refer to specific pages in 16 my declaration, we can see whether I consider. 17 BY MR. WALTERS: 18 Q I'm just trying to get an understanding of 19 whether you understood the meaning of the claim 20 terms when you did your analysis. 21 MR. DANLEY: Objection, scope. 22 THE WITNESS: Well, you have to be very	47 1 it somewhere? Or familiarity, in what sense? 2 Q Have you read it? 3 A Yes. 4 Q Did you understand what you read? 5 A Yes. 6 Q So I'd like to turn you to Column 21. And 7 you see in Column 21, Claim 1? 8 A Yes. 9 Q And in Claim 1, at line 30, do you see it 10 refers to a digital 3D representation? 11 A I see that, yes. 12 Q Do you have an understanding of the 13 meaning of a digital 3D representation? 14 A I'm a computer vision scientist. I think 15 yes. The answer, I have a good understanding what 16 is a digital 3D representation. 17 Q And what is that? 18 A It's a representation within a computer 19 because it's digital. It's a 3D model. And it's 20 captured most probably from object of interest, 21 which in this case, intraoral scanning. 22 Q On the next line, you see it says "the
46 1 specific to a particular ground or page in my 2 declaration so I can say, yes, you know, here I 3 used the plain and ordinary meaning of this 4 term. I mean, you're asking me a general 5 question. 6 So if I was using a particular term in a 7 particular ground in a particular combination, 8 yes, I was giving -- I understood the meaning 9 and I was using it. 10 BY MR. WALTERS: 11 Q I'm going to hand you what was previously 12 marked as Exhibit 1001. 13 (Exhibit 1001 was previously marked.) 14 BY MR. WALTERS: 15 Q Do you recognize Exhibit 1001? 16 A I do. 17 Q What is Exhibit 1001? 18 A It's patent '151. 19 Q And are you familiar with this patent? 20 A I think your question's ambiguous a little 21 bit. What do you mean by "familiar"? As in the 22 read it, understood it? Or you mean actually using	48 1 digital 3D representation comprises shape data." 2 Do you see that? 3 A Yes. 4 Q Do you have an understanding of the phrase 5 "shape data"? 6 A Again, I'm going to say that I'm a 7 computer vision scientist. I've been teaching this 8 for the last 30 years of my life. I've researched 9 in this area. Shape, digital representation have 10 different ways of representing shape. Could be 11 surface models. It could be point-based models. It 12 could be different models used, but any description 13 or any representation that provides shape 14 information, in this case, 3D, that's what is meant 15 here. 16 Q Okay. And if you go to line 32, you see 17 there, it refers to "texture data"? 18 A Yes. 19 Q Do you have any understanding of the 20 meaning of texture data? 21 MR. DANLEY: Objection, form. 22 THE WITNESS: Well, I used here that

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49 1 texture meant at least color. That's the -- 2 that's what I used throughout my analysis and 3 declarations. 4 BY MR. WALTERS: 5 Q Now, do you believe that's the ordinary 6 and customary meaning of texture data, that it's at 7 least color? 8 MR. DANLEY: Objection, form. 9 THE WITNESS: It doesn't matter what I 10 believe how texture can be defined. It's what 11 matters, I think, that I was using it as at 12 least color. 13 BY MR. WALTERS: 14 Q And was that a special definition, then, 15 that used in your analysis? 16 MR. DANLEY: Objection, form. 17 THE WITNESS: I don't know what you mean 18 by "special." Can you clarify what you mean, 19 "special"? 20 BY MR. WALTERS: 21 Q Something that was not the ordinary and 22 customary meaning.	51 1 What's your understanding of the meaning of "known 2 texture values"? 3 MR. DANLEY: Objection, form and scope. 4 THE WITNESS: Well, as I said, I used the 5 term "texture," meaning at least color, and the 6 word "known" is -- plain and customary meaning 7 of known is something that is known. So known 8 texture, known color. 9 BY MR. WALTERS: 10 Q And what's your understanding of the 11 meaning, following on on that line, of a reference 12 "tooth shade value"? 13 MR. DANLEY: Same objections. 14 THE WITNESS: Again, as I said, the 15 specifications were referring to as references, 16 reference guides for tooth shade value. I'm 17 assuming that here it's referring to what it 18 was disclosed in the specifications. 19 BY MR. WALTERS: 20 Q What do you mean by "I'm assuming that 21 here it's referring to what it was disclosed in the 22 specifications"?
50 1 MR. DANLEY: Objection, form. 2 THE WITNESS: Ordinary and customary 3 meaning can include color also. 4 BY MR. WALTERS: 5 Q But would it be limited to color? 6 MR. DANLEY: Objection, form. 7 THE WITNESS: It could be or it could not. 8 But I limit it to color and applied that. 9 BY MR. WALTERS: 10 Q Going down one more line in the claim. 11 You see it says "determining a tooth shade value." 12 A Can you tell me which line? 13 Q Yeah. It's 33. 14 A Yes. 15 Q What is a tooth shade value? 16 A I took it in this context as referring to 17 the color based on some references, reference guides 18 that are available. So determining the tooth shade 19 value. Based on what the specifications disclose, I 20 took it as determining based on that. 21 Q On page -- I'm sorry, on line 35, at the 22 very end, it refers to "known texture values."	52 1 A Well, in the specifications, it's 2 referring to various different reference guides that 3 include tooth shade values. I'm referring to those 4 tooth shade values from those references. 5 Q Do you recall whether the '151 patent 6 describes how one might obtain a 3D representation, 7 having shape data and texture data? 8 MR. DANLEY: Objection, scope. 9 THE WITNESS: Do you want me to say off 10 the top of my head or do you want to refer 11 to -- 12 BY MR. WALTERS: 13 Q Do you know off the top of your head? 14 A I remember -- 15 MR. DANLEY: Objection, scope. 16 THE WITNESS: Yeah. I remember that they 17 were talking about the focusing scanning 18 technology for three -- 3D shape capture. 19 MR. DANLEY: Did you say 3D shape or 20 shade? 21 THE WITNESS: Well, once you -- I said 22 shape, but once you combine it with color, as

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53 1 they call texture including color, then it 2 becomes 3D shape plus color. 3 BY MR. WALTERS: 4 Q And are you familiar with focus scanning 5 technology? 6 MR. DANLEY: Objection, scope. 7 THE WITNESS: As a computer vision 8 scientist, yes, I am familiar. 9 BY MR. WALTERS: 10 Q And how does focus scanning work? 11 MR. DANLEY: Objection, scope. 12 THE WITNESS: Again, you want me to go 13 into details of the technology? 14 BY MR. WALTERS: 15 Q Please. I'll stop you when I need. 16 A Okay. I'll try to give a very high level 17 description of that. So there is the -- it's based 18 on a technology that was developed in the 1950s by a 19 professor at MIT. It's the same technology that is 20 used in confocal scanning, confocal scanning 21 microscopy also. And, yeah, is that you encode the 22 motion of -- where you have multiple -- let me go	55 1 record. 2 (A brief recess is had from 11:12 a.m. to 3 11:20 a.m.) 4 CERTIFIED STENOGRAPHER: Okay. Back on 5 the record. 6 BY MR. WALTERS: 7 Q So before we took a break, we were talking 8 about focus scanning. 9 A Um-hum. 10 Q I'm trying to get an understanding of 11 focus scanning. You talked about the focus part. 12 What is the scanning that takes place? 13 MR. DANLEY: Objection, scope and form. 14 THE WITNESS: Well, the process, as I 15 said -- so if it is -- this technology, for 16 instance, if it's made into a probe, so you 17 hold the probe on the object that you want to 18 capture 3D information from or -- and/or color 19 information, you point it towards that object. 20 And the rest of the description that I gave 21 you, based on the depth of field, maybe there's 22 a button the person presses for that to occur.
54 1 back. You have multiple lenses, the optic lens, or 2 eyepieces, but additional lenses that encode when 3 the focusing happens. 4 So any imaging system has a property 5 that's probably less known outside computer vision 6 or optics. It's called the depth of field. So that 7 depth of field defines two planes or two surfaces in 8 space where everything comes to focus. 9 Now, by moving the lens, you bring 10 different parts of an object into focus. You can 11 think of at different points on the object coming 12 into focus. And because this is encoded in the 13 motion of a lens or a group of lenses, the plurality 14 of lenses, if you want to, then you can determine 15 the depth information from that, from the motion of 16 the lens. 17 MR. DANLEY: So we've been going about an 18 hour. So would this be a good time for a 19 break? 20 MR. WALTERS: Sure. We can take a break 21 now. 22 CERTIFIED STENOGRAPHER: Okay. Off the	56 1 And by the motion of the sort of lenses inside 2 the device, that encode the depth, or if you 3 want to, the motion of the depth of field of 4 the sensor. And that defines what comes in 5 focus, tells you what is the depth of those set 6 of points. And these are the points that come 7 to focus, define the -- you know, based on the 8 encoding of the motion of the lens or a group 9 of lenses, define what the depth of those 10 points are. And that's the scanning process. 11 You take multiple of these images by moving 12 these one or more lenses inside your probe. 13 BY MR. WALTERS: 14 Q When you say "multiple of the images," are 15 we talking several or are we talking 10 or are we 16 talking hundreds? What -- 17 MR. DANLEY: Objection, form, scope. 18 THE WITNESS: It depends on what you are 19 scanning and how the scanner is designed. 20 Those are implementation details, you know. I 21 said multiple, just emphasize it's not just a 22 single image. You take multiple images that

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57 1 each image brings a set of points on that 2 object into focus. And based on that, you know 3 that those set of points, at what distance from 4 the object lens they are sitting. So that 5 provides the depth information. 6 And in this process, as I said, one or 7 more lenses are encoding that motion. So 8 that's associated with every image that is 9 taken and therefore the depth is defined based 10 on that for the set of points that have come to 11 focus. 12 BY MR. WALTERS: 13 Q So when does the scan start and when does 14 it stop? 15 MR. DANLEY: Objection, scope. 16 THE WITNESS: Those are implementation 17 details. Like I said, it may vary from one 18 device to another one, or one application to 19 another one, if it's controlled by the user, 20 whether it's controlled by a computer, when 21 does it start and stop. I mean, this is a very 22 general question.	59 1 preset to some number and the device just goes 2 through all of them and it stops. 3 You asked me to describe the general 4 technology. You asked me if I'm familiar with 5 focus scanning. I said, yes, I'm very familiar 6 in the sense that, as a computer vision 7 scientist, I know how the technology works. 8 It's based on the depth of field of your 9 imaging system. 10 BY MR. WALTERS: 11 Q You have in front of you Exhibit 1001. 12 And I want to understand better this scanning. And 13 in particular, I want to refer you to Claim 14 at 14 line 48, approximately. It says "wherein obtaining 15 the digital 3D representation of the tooth comprises 16 recording a series of sub-scans of the tooth." 17 So, again, it says "the 3D representation 18 of the tooth," so it's a tooth. And it "comprises 19 recording a series of sub-scans of the tooth." What 20 is a sub-scan of a tooth? 21 MR. DANLEY: Objection, scope. 22 THE WITNESS: I can only say the word
58 1 So I'm assuming that -- are you meaning 2 dental applications, for instance? If that's 3 what you mean, in dental application, I assume 4 that they want to give the dentist some 5 control, when to start and when to stop, how to 6 point it, et cetera. That's generally true for 7 probably other applications too but could be 8 automated. I don't know. Could be application 9 dependent. 10 BY MR. WALTERS: 11 Q So with the scanning technique, you would 12 start the scanning and you would begin to collect 13 images. And then when the scan is complete, you 14 would stop collecting images? 15 MR. DANLEY: Objection, form, scope. 16 THE WITNESS: Again, it's a little bit -- 17 complete is a vague term here. When is a scan 18 complete. Maybe the device itself, for 19 instance, has a predetermined number of images 20 to take depending on, you know, the application 21 area. For instance, if you know that you're 22 scanning a tooth, maybe the number of images is	60 1 "sub-scan" in the context of the '151 patent, 2 what it means. Is that what your question is? 3 Because the word "sub-scan" may have different 4 meanings in different contexts. 5 BY MR. WALTERS: 6 Q Yeah. Please, in the context of the '151 7 patent, what does sub-scan mean? 8 MR. DANLEY: Same objection. 9 THE WITNESS: I took it that you take a 10 first scan and you take a second scan of, in 11 this case, tooth. And those are -- each of 12 those scans are considered as sub-scans. 13 BY MR. WALTERS: 14 Q And what is the "sub" in sub-scan 15 referring to? 16 MR. DANLEY: Objection, scope. 17 THE WITNESS: I just I think described it 18 is that, first, if you are taking more than one 19 scan of, let's say, the same tooth, the first 20 scan would be one sub-scan, the second one 21 would be the second sub-scan. And it says that 22 "wherein obtaining the digital 3D

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61 1 representation of the tooth comprises recording 2 a series of sub-scans." So more than one scan. 3 And each of them constitute a sub-scan. 4 BY MR. WALTERS: 5 Q And then do you -- you put the sub-scans 6 together to form the 3D representation? 7 MR. DANLEY: Objection, scope. 8 THE WITNESS: That's what the 9 specifications and that claim is referring to, 10 that the 3D representation is made of -- is 11 made of multiple scans or sub-scans, rather. 12 BY MR. WALTERS: 13 Q Does the '151 patent describe how you 14 would obtain a digital 3D representation from a 15 series of sub-scans? 16 MR. DANLEY: Objection, scope. 17 THE WITNESS: If you refer to any 18 particular paragraph, we can go through that. 19 But if you're talking about the Claim 14, it 20 says that these sub-scans and are obtained 21 together to create the digital representation. 22 BY MR. WALTERS:	63 1 BY MR. WALTERS: 2 Q Explain that to me. 3 MR. DANLEY: Objection, scope. 4 THE WITNESS: Well, if you take one scan, 5 it has the 3D representation, it's within the 6 coordinates, the 3D coordinate frame of that 7 scanning process. And then you take a second 8 scan, if you, let's say, moved your scanner and 9 took a second scan, these are now in two 10 different coordinate frames. So in order to 11 combine them, you need to determine the 12 transformation that takes from one scan, the 13 reference frame -- the 3D reference frame from 14 one scan to the first one, or if you have a 15 sequence of scans, to any one of them. It 16 doesn't have to be the first one. You bring 17 everybody to the same 3D reference frame, 3D 18 coordinate system. 19 BY MR. WALTERS: 20 Q And would the sub-scans be overlapping in 21 data? 22 MR. DANLEY: Objection, scope.
62 1 Q So how would you go about, as an expert, 2 putting together a series of sub-scans -- 3 MR. DANLEY: Objection, scope. 4 BY MR. WALTERS: 5 Q -- to form a digital 3D representation of 6 a tooth? 7 MR. DANLEY: Sorry. Objection, scope. 8 THE WITNESS: Do you want me to give you a 9 general way, how I would go or how the patent 10 is claim -- is describing they would -- they've 11 done it? 12 As I said, if you want to go to a 13 particular paragraph of the patent, we can go 14 and read through it. 15 BY MR. WALTERS: 16 Q Do you recall whether the '151 patent 17 describes how to do that? 18 MR. DANLEY: Objection, scope. 19 THE WITNESS: The '151 patent is saying 20 that these scans are putting the common 21 reference frame, and then combined, which could 22 be the reference frame for one of the scans.	64 1 THE WITNESS: I do not remember whether 2 '151 is mentioning anything about overlapping. 3 But, so, it could. It could not. But if 4 you're scanning the same tooth, I think it's 5 implicit there that they're overlapping. 6 You're scanning the same tooth. If you're 7 generating the 3D representation of the same 8 tooth, so you just move it and take it from a 9 different angle. So I'm assuming that if 10 you're scanning the same tooth, they're 11 overlapping. 12 BY MR. WALTERS: 13 Q Um-hum. Why do you assume that? 14 MR. DANLEY: Objection, scope. 15 THE WITNESS: It's the same tooth that you 16 are scanning. 17 BY MR. WALTERS: 18 Q And how, as an expert, might one combine 19 overlapping data points for a tooth? 20 MR. DANLEY: Objection, scope. 21 THE WITNESS: There are many ways you 22 could do that. You could find, if you have --

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65 1 if your sensor has -- you want me to give you 2 an in-general answer is if your sensors that 3 are capturing data have positioning and 4 orientation information, then you can bring -- 5 based on that, you can bring one coordinate 6 frame in alignment with the other coordinate 7 frame and therefore merge them together. Or if 8 you don't have any sensor that describes the 9 position and orientation of your sensor when 10 you're scanning, then you have to use some 11 matching techniques between points and bring 12 the coordinate system into alignment. 13 BY MR. WALTERS: 14 Q So, again, I want to go back to understand 15 the "sub" part of sub-scan. And is that just 16 referring to you don't have a 3D representation of 17 the entire tooth and therefore you have a series of 18 sub-scans to collect the data you want for your 3D 19 representation? 20 MR. DANLEY: Objection, form, scope. 21 THE WITNESS: I think that, yeah, that 22 whether you have the entire tooth captured by	67 1 BY MR. WALTERS: 2 Q Okay. Go to, again, Exhibit 101 -- 1001, 3 Column 11, line 57. 4 A Yes. 5 Q There, it says "The generated digital 3D 6 representation formed by such a procedure comprises 7 shape data expressing the shape of the tooth." And 8 says "The texture information of the sub-scan can be 9 used in various ways to provide that the generated 10 digital 3D representation also comprises texture 11 data expressing a texture profile of the tooth." Do 12 you agree with that? 13 MR. DANLEY: Objection, scope, and form. 14 THE WITNESS: What do you mean by "do you 15 agree with that"? It's disclosing -- the '151 16 patent is disclosing that information. 17 BY MR. WALTERS: 18 Q I mean, do you agree that you can obtain a 19 3D representation having both shape and color as 20 described in that portion of the '151 patent? 21 MR. DANLEY: Same objections. 22 THE WITNESS: But if you use a scanner
66 1 one scan or not or maybe two or more, I think 2 it's a decision made by the user. 3 I mean, those are details that it's, as I 4 said, it's user dependent. So if a user thinks 5 one scan, I guess, has captured the information 6 they're looking for, maybe they would stop at 7 one scan. But you asked me the word -- I mean, 8 the part of the word "sub," what it meant, and 9 my understanding, based on the specification, 10 was that if you're taking more than one scan of 11 the same object, in this case, the tooth, as I 12 say, a tooth, then each of them is a sub-scan 13 of what you eventually want to represent in 3D. 14 BY MR. WALTERS: 15 Q So the "sub" is referring to multiple 16 scans of the same tooth? 17 MR. DANLEY: Objection, form, scope. 18 THE WITNESS: Sub is referring to -- I 19 mean, not multiple. Sub is referring to that 20 if you have multiple scans, if you are taking 21 multiple scans, each of those scans is referred 22 to as a sub-scan.	68 1 that captures both information, well, it's 2 possible to generate a 3D representation that 3 has both shape information and color 4 information. It depends on your scanner. 5 If your scanner provides those 6 information, the answer's yes. If the scanner 7 does not provide those information, then of 8 course that information -- the one information 9 is missing, you cannot do that. 10 BY MR. WALTERS: 11 Q Can you go to Column 3 of Exhibit 1001 and 12 look at line -- 13 A Did you say Column 3? 14 Q Three. Yes. 15 Look at line three. It says "In some 16 embodiments, obtaining the digital 3D representation 17 of the tooth comprises recording a series of 18 sub-scans." That's what we were looking at in 19 Claim 14. 20 "Of the tooth, where at least one of said 21 sub-scans comprises texture information and geometry 22 information for said tooth."

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69 1 And then if you can go to Column 4 at line 2 24 [sic], it says "The digital 3D representation can 3 be generated through registration of sub-scans into 4 a common coordinate system by matching overlapping 5 sections of the sub-scans." 6 Do you see that? 7 A Yes. 8 Q Can you explain to me that process of how 9 you register sub-scans into a common coordinate 10 system? 11 MR. DANLEY: Objection, form, scope. 12 THE WITNESS: But this is a general 13 question you're asking so, as I said earlier, 14 there might be different ways of doing that. 15 You know, if the sensor, for instance, provides 16 positional and rotation information of the 17 sensor, then you can use that to assist you in 18 doing that. 19 If the sensor does not provide that, then 20 you need to use information captured already in 21 the scans. 22 So, for instance, if you're scanning the	71 1 Q Um-hum. 2 A Then you can perform that. 3 If you want to have more accuracy, you 4 know, if you believe that there are outliers in your 5 representations from each sub-scan, then you may 6 want to resort to more point correspondences. 7 You could do a combination of these two 8 approaches. In other words, if you have both sensor 9 information, like positional and orientation sensor 10 information, you could also get assistance from 11 matching points and then so for those six degrees of 12 freedom. 13 If you have a minimum number of points, 14 that would be an exact solution, exact in the 15 mathematical sense. I'm not saying that exact is in 16 perfect alignment. But if you have a lot of points, 17 you use hundreds of point correspondences, for 18 instance, then you end up insulting an 19 overdetermined system of equations so you're fitting 20 the model into your alignment process. 21 Q If you go to Column 4, again, we're still 22 on Exhibit 1001, line 59.
70 1 same tooth, as we discussed earlier, I expect 2 that you would have overlapping regions. 3 And then if you match corresponding 4 points, sufficient number of corresponding 5 points, then you can bring them into the two 6 frames into alignment. It's a Euclidean 7 transformation that has six degrees of freedom. 8 If you want me to get into too technical, 9 those six degrees of freedom are associated 10 with the rotation of the sensor and translation 11 of the sensor. 12 If you figure out what those six degrees 13 of freedom are, you can bring them into 14 alignment. But the way to figure out those six 15 degrees of freedom, you need at least one 16 reference point in common and three that are 17 not relying on the same, no three of them 18 co-linear. So if you have that information, 19 you can perform that matching. 20 That's the minimum number of matching 21 points. 22 BY MR. WALTERS:	72 1 A Yes. 2 Q It says "This approach has the advantage 3 that the derived texture data of the digital 3D 4 representation are not as sensitive to errors in the 5 texture information of a single sub-scan." 6 Do you see that? 7 A Yes. 8 Q Can you explain why you would have that 9 advantage? 10 MR. DANLEY: Objection, scope. 11 THE WITNESS: Again, it could be that they 12 don't rely so much on texture information for 13 performing that alignment. That's one way to 14 think about it. Because texture information, 15 it could be a source of matching, matching 16 points in order to perform that alignment. It 17 could be that. 18 BY MR. WALTERS: 19 Q Could it also be that you're collecting 20 data for the same point multiple times and you would 21 be able to evaluate that same data for the same 22 point from multiple scans?

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73 1 MR. DANLEY: Objection, speculation, 2 scope, form. 3 THE WITNESS: Did you say multiple scans 4 or many scans? I forgot what you said. 5 BY MR. WALTERS: 6 Q Multiple sub-scans. 7 A Multiple sub-scans? 8 MR. DANLEY: Same objections. 9 THE WITNESS: This is a subject of 10 opinion, to my -- I mean, to my opinion. I 11 think, you know, based on my experience of 12 confocal scanning, like the technology that 13 '151 patent is saying, that could be a 14 technology to use. 15 You have -- you've captured enough number 16 of points, for instance, that even with two 17 scans, if you are -- if you are -- if your goal 18 is to take multiple scans, of course, you 19 should have enough points to bring them into 20 alignment. But if not, maybe more scans can be 21 taken. 22 It depends on the -- you know, it depends	75 1 specific order. But if you read through my 2 supplemental declaration, they also say that there's 3 a motivation, actually, he provides motivation. 4 Korten provides motivation to do it -- not in the 5 order that the patent order -- patent owner and 6 Dr. Saber are suggesting, but in the opposite order. 7 Q So my question wasn't that. My question 8 was: Does Korten allow for the specific order of 9 operation advanced by patent owner and Dr. Saber? 10 MR. DANLEY: Objection, form. 11 THE WITNESS: As I said, Korten does not 12 disclose that you have to do it in a specific 13 order. There's no disclosure of that, and as I 14 described in my supplemental declaration. 15 But, based on the information that he 16 probably provides in the specifications, or 17 disclosures and teachings in the 18 specifications, he actually encourages that we 19 first associate the color with the 3D 20 coordinate before determining the tooth shade. 21 BY MR. WALTERS: 22 Q So you said "Korten does not disclose that
74 1 on the sensor also. It depends on the 2 resolution of the scanning system. And by 3 resolution, I mean both spatial resolution and 4 the depth resolution. So it depends on many 5 factors. 6 It's very difficult to answer your 7 question without more knowledge of the context 8 of what is the sensor -- what sensor are we 9 using here. 10 BY MR. WALTERS: 11 Q If you could turn back to your 12 supplemental declaration. And turn to page two. 13 This is Exhibit 1018. Paragraph six. 14 A Yes. I'm there. 15 Q You say "In my opinion, Korten does not 16 require the specific order of operation advanced by 17 patent owner and Dr. Saber." 18 Do you see that? 19 A Yes. 20 Q Does Korten allow for that specific order 21 of operation advanced by patent owner and Dr. Saber? 22 A As I said, it does not require that	76 1 you have to do it in a specific order." 2 A That is correct. 3 Q Then you say it "actually encourages that 4 we first associate the color with the 3D coordinate 5 before determining the tooth shade." It doesn't 6 specifically say to do that, though, does it? 7 MR. DANLEY: Objection, form. 8 THE WITNESS: Again, I'm repeating myself, 9 is it does not disclose you have a particular 10 preferred order. However, for instance, it 11 says that determine the validity of the color 12 using the inclination angle of the probe. So I 13 think that it would be obvious that if you want 14 to determine the tooth shade, first, you want 15 to know whether that color is valid or not 16 instead of going and wasting your time 17 determining the tooth shades for a plurality of 18 points, and then find out that many of them are 19 probably invalid. 20 So it's -- I call that an encouragement to 21 do it in that order because that means that, 22 you know, you're not wasting either your time

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77 1 or computational time or computational power, 2 that you waste your time on something invalid. 3 So it makes sense to my opinion that Korten is 4 encouraging, as I said in my supplemental 5 declaration also, that first associate the 6 color with this 3D representation and then 7 determine the tooth shade value. 8 BY MR. WALTERS: 9 Q So are you relying on obviousness? 10 MR. DANLEY: Objection, form. 11 BY MR. WALTERS: 12 Q You said it would be obvious. I'm asking 13 you a specific question of whether it discloses the 14 order that you should use. 15 A As I said, it does not disclose the order 16 that you should use. 17 Q Okay. 18 A No. I'm not relying in the sense of legal 19 term of obviousness. I'm just saying that Korten 20 does not disclose in any order that that should be 21 done. 22 On the other hand, it encourages the order	79 1 with respect to the surface at a specific point we 2 are talking about. So because we are talking about 3 the angle of inclination with respect to a 4 particular point that we are scanning, so therefore 5 the color -- we need to know the 3D representation 6 at that point. 7 So if you talk about general, yeah, a 8 device could have a measurement unit, IMU, et 9 cetera, that if you even rotate in free space, it 10 tells you the angle of orientation. But we need to 11 look at it in the context. It's saying that finding 12 the angle of inclination with respect to the surface 13 of the tooth, not just the angle of inclination of 14 the device, angle of inclination with respect to the 15 surface of the tooth when the color was captured. 16 Because the color is captured from a particular 17 point on the tooth, therefore we need to have the 18 angle of inclination with respect to the 3D 19 representation. 20 Q And you're not aware of any devices that 21 can measure that angle of inclination that you're 22 referring to?
78 1 opposite to what Dr. Saber and the patent owner is 2 suggesting that Korten is doing. 3 Q I see. 4 Do you know if a dentist can measure the 5 angle of inclination on a tooth? 6 MR. DANLEY: Objection, form. 7 THE WITNESS: Well, I'm not a dentist. 8 And I never asked at the dentist if they could 9 do that. But angle of inclination is not user 10 dependent, I think in this case. It's a 11 technology that's providing that measurement. 12 If the technology's providing, then the 13 end user can use the -- can find the angle of 14 measurement -- I'm sorry -- find the angle of 15 inclination. But if the sensor is not 16 providing that, then the end user would not be 17 able to do that. 18 BY MR. WALTERS: 19 Q Would one skilled in the art have to put 20 data in a 3D representation in order to obtain the 21 angle of inclination? 22 A Yes, because the angle of inclination,	80 1 MR. DANLEY: Objection, form. 2 THE WITNESS: By "devices," you mean 3 intraoral scanning devices? 4 BY MR. WALTERS: 5 Q Yes. 6 MR. DANLEY: Same objection. 7 THE WITNESS: Well, as I said, I have 8 general knowledge of most technologies that are 9 used in intraoral scanning. And generally they 10 have -- equate with maybe IMU or other 11 technologies that provide positional or 12 orientation information. 13 And as I said, of course, that provides on 14 its own the positional information or 15 orientation of the sensor. But in the context 16 of the patent that we are discussing, in 17 Korten, for instance, that we are discussing, 18 it says that finding the orientation of the 19 probe with respect to the surface of the tooth 20 at the time we are capturing -- or from the 21 point we are capturing the color, so to 22 determine whether the color is valid or not.

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81 1 So we're not talking about the color of 2 another point arbitrarily pointing our scanner 3 to another point. We are talking about the 4 particular point on the tooth, you want to know 5 if the color is valid or not. Therefore, we 6 need to find orientation of the sensor with 7 respect to that specific point on the surface 8 of the tooth. 9 So the answer to your question, based on 10 the context, yes, you need to have that 11 inclination with respect to that 3D 12 representation of the tooth. 13 BY MR. WALTERS: 14 Q Going back to paragraph six on page two of 15 Exhibit 1018. 16 A Um-hum. 17 Q You state "For example, Korten describes a 18 first embodiment in both shape and color data are 19 captured from a patient's dentition." 20 See that? 21 A Yes. 22 Q "In this embodiment, the location of the	83 1 a first optical sensor relative to a patient's 2 dentition. The next step is capturing via the first 3 optical sensor, at least a portion of the shape of a 4 tooth in a patient's dentition and based thereon 5 providing a first virtual dentition model 6 representing that shape in a three-dimensional 7 coordinate system." 8 See that? 9 A Yes. 10 Q That capturing doesn't involve the 11 capturing of color; correct? 12 A Because the part that you read is talking 13 about the first sensor. 14 Q Yes. 15 A Yes. 16 Q Right? It's only dealing with shape; 17 right? 18 A At that point, yes. 19 Q Yeah. 20 A It's what – let's correct that. 21 It's not dealing with shape. It's 22 capturing 3D information.
82 1 captured color data is correlated to a coordinate in 2 the first 3D dentition model." 3 And then you reference Column 2, lines 1 4 through 12. 5 I'm going to hand you what was previously 6 marked as Exhibit 1009. 7 (Exhibit 1009 was previously marked.) 8 BY MR. WALTERS: 9 Q Do you recognize Exhibit 1009? 10 A I do. 11 Q What is Exhibit 1009? 12 A It's what I referred in my declaration as 13 Korten. 14 Q And if you could go to Column 2? 15 A Yes. 16 Q Actually, let's start at the bottom of 17 Column 1 at line 65. It says "The invention in one 18 aspect relates to a method of capturing data from a 19 patient's dentition." And it says "The method 20 comprises the steps of." 21 And then this is the area that you cited 22 in your declaration. "The first step is positioning	84 1 Q Okay. 2 A Because what they call shape is when you 3 process that data and create a virtual – as Korten 4 refers to virtual print 3D dentition model. 5 Q Um-hum. And then it says "Independent 6 from capturing the shape." So this is separate from 7 capturing shape. "Measuring a first color at a 8 first location on the tooth portion." 9 And then, it says "And providing a 10 correlation between the first location of the first 11 color and a coordinate in the first virtual 12 dentition model." So would you agree that you have 13 to measure a first color at a first location on the 14 tooth portion before you can correlate between the 15 first location of the first color and a coordinate 16 in the first virtual dentition model? 17 A I think that's the statement of obvious. 18 If you have not done the measurement of the color, 19 you cannot associate it with 3D -- 20 Q Yes. 21 A -- representation. 22 Q Okay. You then indicate in your

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85 1 declaration, that according to Korten, the system 2 "is advantageous in that it provides for relatively 3 precise color measuring and an association between 4 measured colors and the location of these colors at 5 a patient's tooth." 6 You see that? 7 A Yes. 8 Q And you cite to Column 2 again, lines 13 9 through 16. 10 A Yes. 11 Q And that's all part of that first 12 embodiment that you were talking about; correct? 13 A Yes. 14 Q And then you say, in paragraph seven, "In 15 a later embodiment, Korten discloses the step of 16 matching." And you refer to Column 5 there. And in 17 Column 5 at line 28, it, indeed -- it talks about 18 "in a further embodiment, the method comprises the 19 step of matching." And it goes on to describe that 20 matching. 21 So is it your view that every time the 22 patent says "in a further embodiment," it is adding	87 1 mentioned earlier, on the contrary, actually 2 encourages to do it in the order in that I 3 said. In other words, build upon the first 4 embodiment. You know, there's first associate 5 the color with the 3D coordinate before doing 6 the matching as described in the second 7 embodiment. 8 BY MR. WALTERS: 9 Q So if you look at Column 4, at line 41. 10 A I'm sorry. Which exhibit is that? 11 Q This is Korten Exhibit 1009. 12 A Um-hum. Column 4. 13 Q Column 4, line 41. 14 A Yes. 15 Q You see there, it says "In a further 16 embodiment." 17 A Yes. 18 Q You're saying there that that's adding on 19 to the first embodiment as well? 20 A That's my opinion, yes. 21 Q Okay. And then at Column 4, line 60, it 22 says "In an embodiment, the method further
86 1 to the first embodiment? 2 MR. DANLEY: Objection, form. 3 THE WITNESS: As I said in my supplemental 4 declaration, I think it's a logical assumption 5 to make that if, in the first embodiment, 6 Korten is disclosing that color is associated 7 with 3D coordinate, that's the second 8 embodiment, or further embodiments are building 9 upon the first embodiment. 10 That's one of the arguments that I'm 11 putting forward, why this is -- you know, I'm 12 saying that this is a logical thing to assume 13 that other further embodiments built upon the 14 previous embodiments. 15 But that's not my only argument. I'm 16 saying that in the second embodiment, Korten 17 does not disclose, hey, you need to reverse the 18 order of these steps or change the order of 19 these steps. There is no disclosure of any 20 order. I'm also relying on that. 21 Plus, additional things that we can go 22 through supplemental declaration. As I	88 1 comprises." So that's adding on to the first 2 embodiment as well? 3 A I'm assuming that every embodiment adds to 4 the previous embodiment, yes. 5 Q How did you reach that assumption? 6 A I think I just described it a few minutes 7 ago, is that various indications that Korten is 8 giving us. You know, in my supplemental 9 declaration, I go through a set of them. One of 10 them, for instance, Korten does not say reverse the 11 order. Korten say -- has no mention of in what 12 order this is done. So I think the logical 13 assumption is that you assume that the second 14 embodiment is building upon the first embodiment. 15 But, again, as I said, there's more to it. 16 And as we read through Korten -- and of course, we 17 can have a look at that also -- Korten says that you 18 need to determine the validity of -- or teaches that 19 you to determine the validity of a color that has 20 been captured by the sensor. 21 And he, Korten says that to do that, use 22 the inclination of the sensor with respect to the

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89 1 surface of where the color is captured. 2 So for me, this is -- basically Korten is 3 teaching that, first do that step, you know, 4 validate the color before going and finding from 5 your reference guide to what the tooth shade is. 6 Because it wouldn't make sense, I think, that we go 7 through the process of finding all these -- you 8 know, finding the tooth shades based on a set of 9 points that are captured, but then find out that 10 those points were invalid anyway so that doesn't 11 make sense. So it makes sense that first validate 12 before determining the color -- I'm sorry, 13 determining the tooth shade value. 14 Q Going back to Column 2, lines one through 15 12 that you had cited in your declaration, again, 16 none of these embodiments that we've been talking 17 about change the fact that you have to first measure 18 the color before you can correlate the color. 19 A I do not agree with that, your first or 20 second. I'm saying that both measurements need to 21 be done. And they're done by two coordinates 22 disclosing that they're done by two technical	91 1 guide like existing difference guide, as an example, 2 VITAPAN and -- to determine the tooth shade value. 3 Q Are you -- have you ever done VITAPAN 4 color analysis? 5 A I personally have not done it, but I've 6 been in dentists' office that they pick these cards 7 and hold it against my tooth and trying to determine 8 manually what the -- what my tooth shade is. So as 9 a, you know, general knowledge, I've seen that this 10 has been done, my own personal experience. But I 11 also see the teachings. In there, I learn from 12 those teachings also. And those teachings, and 13 those, let's say Korten and others, including the 14 '151 patent also, these are basically saying that it 15 could be automated, so... 16 Q So in Korten, they disclose that you can 17 measure the color and put that into the virtual 18 dentition; right? 19 A Yes. They say that in an embodiment that 20 we just read, that 3D representation can be captured 21 and color information can be captured for at least 22 one first point, and then that correlated with the
90 1 principles. 2 And they could be captured simultaneously 3 but it's just that both information have to be there 4 before we associate color with the 3D coordinate. 5 Q And that means you have to measure the 6 color before you can correlate that color into the 7 virtual -- the virtual dentition? 8 A Yeah. It means that, again, I'm not going 9 to put any order. It means that color and the 3D 10 representation by the shape sensor are captured, and 11 then we correlate these points where the colors are 12 measured with the specific coordinating the 3D 13 representation. 14 But that has nothing to do with what we 15 were discussing, I think, before, about determining 16 the tooth shade value. I'm talking about the order 17 of tooth shade value. This is dealing with color. 18 Q Does Korten require determining a tooth 19 shade value? 20 A What do you mean by "require"? Korten is 21 teaching us determining the tooth shade value. Yes. 22 It says that you compare the color with a reference	92 1 3D coordinate of that point. 2 Q Then they added the embodiment where you 3 can do the matching, for example, with the VITAPAN, 4 which you call determining the tooth shade value. 5 MR. DANLEY: Objection, form. 6 THE WITNESS: You mean what we just read 7 in the second embodiment, earlier we read? 8 BY MR. WALTERS: 9 Q Well, I want to be careful about first and 10 second embodiments because there's a lot of 11 embodiments. 12 A Yes. 13 Q It's the embodiment at Column 5, line 26. 14 A Okay. So that's why I asked you. So I 15 would rather refer exactly to a place. Column 5. 16 Which line was that? 17 Q Twenty-eight. 18 A Twenty-eight? "In a further embodiment, 19 the method comprises the step of matching at least 20 the first color with the standard color from a 21 standard color scheme. Such a standard color scheme 22 may, for example, correspond to the widely used

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93 1 VITAPAN Classical tooth color scheme which typically 2 provides the different tooth colors." That are 3 mentioned there. Yes. 4 Q That's what you're referring to as the 5 tooth shade value, determining the tooth shade 6 value? 7 A I mean determining the tooth shade value 8 for that point, where the measurement is done. 9 Q Yeah. Okay. I want to turn you to 10 Column 2, line 26 of Korten. 11 And it says there, "further, although 12 generally referred to as color herein, the 13 measurement of the color may involve determination 14 of a color according to a color scheme like RGB, 15 L*a*b, VITAPAN, and additionally the determination 16 of translucency and/or a reflectivity." 17 Do you see that? 18 A Yes. 19 Q Have you read that portion of Korten 20 before and considered its impact on your opinions? 21 MR. DANLEY: Objection, form. 22 THE WITNESS: I have read Korten in its	95 1 the steps that are described there. And I read 2 at least part of the specifications. 3 BY MR. WALTERS: 4 Q Well, but you indicate on page three of 5 your declaration that Column 2, lines 13 to 16, you 6 indicated that that was part of the first 7 embodiment. 8 MR. DANLEY: Objection, form. 9 THE WITNESS: Column -- I'm sorry. Can 10 you repeat the lines again? 11 BY MR. WALTERS: 12 Q Yeah. Column 2, lines 13 to 16. 13 A Yes. That does not include what you just 14 read to me, is columns -- line 13 -- Column 2, lines 15 13 to 16 is merely mentioning that the "invention is 16 advantageous in that it provides for relatively 17 precise color measuring and an association with 18 measured colors and the location of these colors to 19 a patient's tooth." 20 It's not go through the other parts that 21 you mentioned in that column. 22 Q It's in the same paragraph as the lines
94 1 entirety before expressing any one of my 2 opinions. 3 BY MR. WALTERS: 4 Q So you see there, it says "generally 5 referred to as color herein, the measurement of the 6 color may involve determination of a color, 7 according to a color scheme." 8 Do you see that? 9 A Yes. 10 Q And that color scheme can be VITAPAN. 11 That's the portion that is mentioned in Column 5, 12 line 28. Do you agree with that? 13 A Yes. 14 Q "And additionally, the determination of 15 translucency and/or reflectivity"; correct? 16 A (No verbal response.) 17 Q And that's all part of that same first 18 embodiment that you referred to in your declaration 19 in paragraph six in Exhibit 1018; correct? 20 MR. DANLEY: Objection, form. 21 THE WITNESS: No. I mean, that's not how 22 I read it. The first embodiment is basically	96 1 you just read. 2 MR. DANLEY: Objection, form. 3 THE WITNESS: It is also in the same 4 document. So I'm not taking it as part of the 5 embodiment there. 6 BY MR. WALTERS: 7 Q You agree that Korten discloses, at line 8 27, that "the measurement of the color may involve 9 determination of a color according to a color 10 scheme"? 11 A I also look at that part of the paragraph 12 that Korten puts color in quotes, double quotes, in 13 saying that, to me, that means that by color, he 14 means not the plain and ordinary meaning, probably, 15 of the color. He's talking about different things 16 here. He says translucency, reflectivity, and other 17 things. 18 Q And the determination of color according 19 to VITAPAN; right? 20 A In that sentence, yes, he talks about 21 that. It says what it says. I cannot change that 22 sentence.

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97 1 Q And in that very same column at line 2 eight, Korten also says to do that measuring, prior 3 to correlation. 4 A Where does it say that? 5 MR. DANLEY: Objection, form. 6 BY MR. WALTERS: 7 Q At line eight, it says "measuring a first 8 color at a first location on the tooth." And you 9 have said multiple times that you have to do that 10 before you can correlate. 11 A No. I didn't say that. I didn't say 12 before or after. I said that both measurements need 13 to be available to you to do that. I didn't say you 14 have to measure that before the other one or vice 15 versa. In fact, the same sensor is used 16 simultaneously to scan and measure color. So there 17 is no before and after here. It's just that you get 18 the 3D representation, 3D coordinates of a given 19 point, you get the color on that, and you associate 20 them. 21 I don't see it as a time or before and 22 after. I'm saying that --	99 1 associate the color. So this sentence can be said 2 in both ways. So that shows that there is no order 3 here. Both have to be available. 4 Q The order I'm referring to is measuring 5 color has to occur before correlation. 6 A Measuring of both information has to be -- 7 has to occur before correlation, not just one or the 8 other one. 9 Q Okay. 10 A Both 3D coordinate and color has to be 11 available before we perform the correlation. Two 12 informations need to be available before prior to 13 correlating them. This is an obvious statement. 14 Q So you're saying you could collect shape 15 first and then collect color and then correlate, or 16 you could collect color first and then shape and 17 then you can correlate? 18 MR. DANLEY: Objection, form. 19 THE WITNESS: I'm saying that there's no 20 order. You know? I believe that the sensors 21 are fast enough probably we could say that from 22 any practical point of view, they're capturing
98 1 Q Don't you have to have the data -- 2 MR. DANLEY: Wait. Wait. Wait. He's 3 still providing his response. Please don't cut 4 him off. 5 BY MR. WALTERS: 6 Q I apologize. 7 A That's okay. 8 I'm saying that in the first embodiment, 9 Korten is disclosing that 3D shape is captured 10 through one sensor, and color for at least one point 11 is captured by another sensor. There is no before 12 or after here. These -- both of these are captured. 13 And then color is associated with its corresponding 14 3D -- coordinating the 3D representation. 15 There is no disclosure of before or after 16 in that -- in that part of the -- I mean, the column 17 that we read in describing the embodiment. 18 Q But don't you have to have the measured 19 color before you can correlate that with the virtual 20 dentition? 21 A Well, let me put it the other way around. 22 You should also have the 3D coordinate before you	100 1 simultaneously both information and then 2 they're correlated. 3 BY MR. WALTERS: 4 Q And when Korten describes the measurement 5 of the color, it's also including not only measuring 6 color, but also the determination of that color 7 using VITAPAN. 8 MR. DANLEY: Objection, form. 9 BY MR. WALTERS: 10 Q Correct? 11 MR. DANLEY: Objection, form. 12 THE WITNESS: I do not understand your 13 question. 14 Are you saying that Korten is teaching all 15 of that in the document or is talking a 16 specific embodiment or are you talking about a 17 particular sentence or paragraph? Korten, of 18 course, is disclosing that shape information is 19 captured, color information is captured, 20 association between color of a point and its 21 corresponding 3D representation is done, and 22 also is teaching and disclosing that tooth

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101 1 shade value for those points where the color is 2 measured are determined by comparison with some 3 standard or, shall I say, rather, reference 4 guide. 5 BY MR. WALTERS: 6 Q So let's go back to Column 2, line 26 of 7 Korten. You see there, it says "Further, although 8 generally referred to as color herein, the 9 measurement of the color may involve determination 10 of a color according to a color scheme." 11 A Yes. I see that. I can read that's 12 correct. 13 Q So it's defining the measurement of the 14 color as either collecting the color or determining 15 it, according to a color scheme; correct? 16 MR. DANLEY: Objection, form. 17 THE WITNESS: No. He says -- it says what 18 it says. It says that "further, although 19 generally referred to as color, in quotes, 20 herein, the measurement of the color may 21 involve determination of a color according to a 22 color scheme." May involve determination of	103 1 corresponding 3D coordinate? 2 BY MR. WALTERS: 3 Q Yeah. 4 A Well, I confirmed that and I put it in my 5 declaration that, yes, Korten is associating 6 color -- measured color with a corresponding 3D 7 coordinate in the 3D representation. 8 Q And that measured color may be the 9 determined color after using a color scheme such as 10 VITAPAN. It says it right here in Column 2. 11 MR. DANLEY: Objection, form. 12 THE WITNESS: No. It says that general 13 definition of color -- I'm sorry. Rather, a 14 color, in between quotes, so I'm reading it as 15 color here, which may refer as tooth shade or 16 color that is measured. It says that 17 measurement of color that we associate with a 18 specific point on 3D coordinate may involve 19 determination of the color based on some color 20 scheme. 21 BY MR. WALTERS: 22 Q It says "The measurement of the color may
102 1 the color according to a color scheme. It's 2 not saying that measurement is involving. It 3 says that determination of the color may 4 involve doing that. 5 BY MR. WALTERS: 6 Q Right. So you don't have to use a color 7 scheme, but if you do, that's part of the 8 measurement? 9 MR. DANLEY: Objection, form. 10 THE WITNESS: That's not how I understand 11 it. I understand is saying that -- let's go 12 back again. "Further, although generally 13 referred to as color herein, the measurement of 14 the color may involve determination of a color 15 according to a color scheme." 16 BY MR. WALTERS: 17 Q And the measurement occurs before 18 correlation. 19 MR. DANLEY: Objection, form. 20 THE WITNESS: Which correlation are we 21 talking about? Are you talking about the 22 correlation between the measured color and its	104 1 involve determination of the color according to a 2 color scheme." And then, above it, in Column 2, it 3 says "Measuring a first color." That measuring of a 4 first color, according to exactly this statement -- 5 A Unless -- 6 MR. DANLEY: Objection, form, asked and 7 answered. 8 THE WITNESS: Unless I'm misunderstanding 9 your question, in there, it also says that 10 color, as put in double quotes, includes 11 translucency and reflectivity. And those are 12 3D properties. Translucency and reflectivity 13 are associated with shape. 14 So he's referring to color in a different 15 sense in that sentence. So if we read it the 16 way you read it, then he's also talking about 17 that it's already associated with the 3D 18 coordinate because he's talking about 19 translucency and reflectivity. 20 But as I said, my understanding, I think, 21 which is the correct understanding, is that 3D 22 point is associated with the -- I'm sorry, the

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105 1 color is associated with the 3D -- its 2 corresponding 3D coordinate before the tooth 3 shade for that point is determined via a 4 reference guide like VITAPAN. 5 Again, if you want to, you know, try to 6 interpret that sentence he puts, I can 7 interpret it further, as an expert, saying that 8 you cannot have reflectivity and translucency. 9 That's why he puts it in double quotes. He 10 says that what I'm talking about color here, it 11 includes. He says it there, it includes 12 translucency and reflectivity, through the 3D 13 properties. You cannot determine translucency 14 and reflectivity without 3D. Which means, 15 then, if I had to expand on your way of 16 arguing, then which means that he has already 17 done the association with the 3D coordinate, 18 then. 19 BY MR. WALTERS: 20 Q Can you get translucency or reflectivity 21 with a spectrophotometer? 22 A Translucency and the reflectivity, and	107 1 associated with 3D coordinate, otherwise shape 2 information like reflectivity wouldn't be there. 3 MR. DANLEY: We've been going for a little 4 over an hour. 5 MR. WALTERS: Give me a few more minutes. 6 MR. DANLEY: Yeah. No problem. 7 BY MR. WALTERS: 8 Q I want you to turn to Column 4, lines 9 42 -- 41 through 59 of Exhibit 1009. 10 A Did you say starting at line 42? 11 Q Forty-one. 12 A Forty-one. 13 Q Yeah. 14 Does that paragraph have anything to do 15 with matching? 16 A Matching what? 17 Q The type of matching that we talked about 18 in Column 5, line 28. 19 A Column 5, line 28? 20 Okay. You're talking about matching to a 21 reference guide, matching the color to a reference 22 guide. I just wanted to make sure that I know which
106 1 definitely reflectivity is a property that includes 2 the material itself and the shape of the surface 3 itself so you're saying that a spectrometer is 4 measuring shape. I don't believe so. Spectrometer 5 is measuring color, not shape. It's not a 3D 6 scanning. Unless you combine it with a 3D scanner, 7 like focusing scanning or other types of scanning. 8 My answer -- I'm giving a general answer. 9 I don't know about, you know, specific technologies 10 that might be used in... 11 But specifically, no, reflectivity and 12 translucency, those are geometry-dependent 13 properties. And it's vastly studied in computer 14 vision, that they're geometry related. 15 So therefore, if I go with your argument 16 and read that sentence, as I said, that's why he 17 probably puts color in double quotes there. That's 18 why what I'm interpreting is that saying that I'm 19 talking about color in the sense that it includes 20 all of this here, in that sentence, including 21 translucency and reflectivity. Therefore, if I go 22 by your argument, it means that it's already	108 1 matching you're talking about. So I have to read 2 it. 3 It says "In a further embodiment" -- 4 that's line 41, Column 4. "In a further embodiment, 5 the method further comprises the step of associating 6 the first color with at least one coordinate in the 7 first virtual dentition model based on the 8 correlation between the first location of the first 9 color and the coordinate in the first virtual 10 dentition model." 11 How far do you want me to go in this 12 paragraph? Up to what line was it? 13 Q Fifty-nine. 14 A Fifty-nine. Oh, I see. So "The measured 15 first color may, for example, be stored in the form 16 of -- in the form of a computer processing data in 17 an appropriate format to define the first color. 18 Further, the at least one coordinate may be stored 19 in an appropriate format to define a unique position 20 in the coordinate system, for example, the format of 21 X, Y, and Z coordinates based on the origin in a 22 Cartesian coordinate system, although recognized by

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109 1 the person skilled in the art, it is noted for the 2 sake of clarity that the X, Y, and Z coordinates in 3 the Cartesian coordinate system refer to different 4 physical parameters than the X, Y, and Z tristimulus 5 values. The association." 6 Is this the one you're talking about? 7 "The association of the first color and at least one 8 coordinate may be provided data based, for example, 9 by a virtual array defining associated data field 10 for storing colors and their associated 11 coordinates." 12 This has nothing to do with comparing with 13 the VITAPAN, as you mentioned earlier. This is 14 talking about associating all of that paragraph. 15 It's talking about associating a color that is 16 measured with its corresponding 3D coordinate point. 17 And it makes it clear, hey, why three-dimensional 18 XYZ coordinate, we don't mean the tristimulus 19 coordinates, which is color coordinates. Those are 20 RGB values. It says that RGB values are getting 21 associated with the 3D coordinates. It has nothing 22 to do with VITAPAN correlation or matching.	111 1 representation. 2 And in the next paragraph, it says that 3 I'm taking that first color, now he's already 4 associated with 3D coordinate. And now he's saying 5 that we take that first color and compare it, and 6 finding the matching reference color from some 7 reference guide. 8 Q But it does not say, in that sentence that 9 you read, that you do that matching after 10 correlation. It doesn't explicitly say that, does 11 it? 12 MR. DANLEY: Objection, form. 13 THE WITNESS: Whatever I said in my 14 supplemental declaration, it doesn't say or 15 give any order of how to do this. It's just -- 16 before, I gave many reasons, several reasons, 17 rather, in my supplemental declaration why I 18 think this is true. These two paragraphs that 19 we read, they came in some order. So it says 20 that by the time we get to the second 21 paragraph, starting at line 60, he's already 22 said and disclosing information that the first
110 1 Q The next paragraph starting at line 60 of 2 Exhibit 1009. 3 A Yes. 4 Q Does that explicitly state that the first 5 color -- let me start that over. 6 Does that explicitly state that you should 7 match the first color with a reference color after 8 correlating the first color with coordinates in the 9 first dentition model? 10 A I need to read it again so it says "In an 11 embodiment the method further comprises the step of 12 comparing the measured first color with a reference 13 color and -- depending on the degree of similarity 14 or the match between the measured first color and 15 the reference color -- determining the validity of 16 the measured first color." 17 Is that far enough in that paragraph for 18 me? 19 So, yes. It's saying that in the previous 20 paragraph that I read earlier, it says that measured 21 color, some tristimulus coordinates, RGB, is 22 associated with a XYZ coordinates of the 3D	112 1 color is associated with the 3D coordinate. 2 And then in line 60 of paragraph [sic] 3 four, it says that no, go and compare with the 4 reference guide. 5 Now, you're saying that he's saying that 6 in that order, but actually he means the 7 opposite order. I'm saying that there are no 8 orders disclosed here. And on the contrary, 9 based on the fact that the way I read it, the 10 order of the lines appearing in the 11 specifications from line 41 of paragraph four 12 all the way to line 65 of paragraph four, this 13 looks like it's saying that that's the logical 14 order that I'm doing it. 15 Besides, as I said earlier, he also 16 discloses that the inclination of the sensor is 17 used as a means of validating the color. And I 18 think it would have been, you know, a logical 19 assumption to make that one would understand 20 that you need to -- before going through the 21 process of determining the -- from the 22 reference colors what the tooth shade is, you

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113 1 would go and first validate it to see if your 2 color measurement is good because it says 3 that -- Korten says that otherwise, send a 4 message, error message, say that, hey, this 5 color is not within some range of inclination. 6 So I think it's logical to assume that -- 7 or rather say that Korten is encouraging us, 8 saying that validate the color first before 9 comparing it to the reference guide. 10 BY MR. WALTERS: 11 Q So you said that Korten does not say or 12 give any order how to do this. Are you saying it 13 has no explicit disclosure of the order? 14 MR. DANLEY: Objection, form. 15 THE WITNESS: I'm not sure what you mean 16 by "explicit." I'm saying that he's not 17 disclosing any order. But on the other hand, 18 other teachings and disclosures indicate that 19 it means that you do first association of the 20 color with the 3D -- with this corresponding 3D 21 coordinate in the 3D representation before 22 comparing your -- the color with the reference	115 1 A Of course. Yes. 2 Q Yeah. Can you describe how Lehmann I 3 obtains color data? 4 MR. DANLEY: Objection, scope. 5 THE WITNESS: By "obtain color data," you 6 mean measurements? Is that what you mean? 7 BY MR. WALTERS: 8 Q Yes. 9 A You're not talking about obtaining the 10 tooth shade value? 11 Q Yeah. Let's start with the type of 12 equipment that is used to obtain color. 13 MR. DANLEY: Objection, scope. And would 14 you like to put Lehmann I in front of him so he 15 can answer questions about it? 16 BY MR. WALTERS: 17 Q Do you need it in front of you? 18 A I was going to exactly ask the same 19 question. Would you like to refer to any specific 20 paragraph and place in Lehmann I? 21 Q I'm going to hand you what was previously 22 marked as Exhibit 1010.
114 1 guide. 2 Again, from the paragraphs you made me 3 read in Column 4, if they come in this logical 4 order also, plus other places where my 5 supplemental declaration is referring to where 6 I believe and I think that -- or it is my 7 opinion that Korten is actually encouraging to 8 do in that order, in the order of first 9 associating color with its corresponding 3D 10 coordinate before determining the tooth shade 11 value for that point. 12 MR. WALTERS: Okay. We can take a break. 13 CERTIFIED STENOGRAPHER: Okay. Off the 14 record. 15 (A luncheon recess is had from 12:42 p.m. 16 to 1:38 p.m.) 17 CERTIFIED STENOGRAPHER: Okay. Back on 18 the record. 19 BY MR. WALTERS: 20 Q Dr. Foroosh, I want to turn now to 21 Lehmann I and Lehmann II. 22 And you're familiar with those references?	116 1 (Exhibit 1010 was previously marked.) 2 BY MR. WALTERS: 3 Q Do you recognize Exhibit 1010? 4 A Yes. 5 Q And what is Exhibit 1010? 6 MR. DANLEY: Objection, scope. 7 THE WITNESS: It is the Lehmann I that we 8 referred to. 9 BY MR. WALTERS: 10 Q Is Exhibit 1010 Lehmann I? 11 A Yes. I believe so. 12 Q And you've reviewed this patent before? 13 A For my original declaration, yes. 14 Q And can you tell me what equipment is 15 described in Lehmann I for obtaining color? 16 MR. DANLEY: Objection, scope. 17 THE WITNESS: Again, for obtaining color, 18 do you mean measurements or do you mean 19 determining -- I don't know what you mean by 20 obtain. 21 BY MR. WALTERS: 22 Q Okay.

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117 1 A So do you mean the measurements of -- 2 Q Yeah. Let's start with the measurement of 3 color. 4 A Okay. If you... 5 MR. DANLEY: Objection, scope. 6 THE WITNESS: Would you like to refer to a 7 specific place that is referring to measurement 8 of color? 9 BY MR. WALTERS: 10 Q In the Lehmann I process, how is the 11 measurement of color obtained? 12 MR. DANLEY: Objection, scope. 13 THE WITNESS: It's obtained by a 14 solid-state camera. But, again, as I said, if 15 you refer to a specific place, then I can put 16 it into context. 17 BY MR. WALTERS: 18 Q So let's start with solid-state camera. 19 What is a solid-state camera? 20 MR. DANLEY: Objection, scope. 21 THE WITNESS: A camera that is using 22 solid-state technology electronics.	119 1 unless you specifically refer to a place in 2 Lehmann I. 3 BY MR. WALTERS: 4 Q Do you know if Lehmann I discloses 5 anywhere the generation of a 3D virtual model? 6 MR. DANLEY: Objection, scope. 7 THE WITNESS: Not that I remember. Again, 8 unless you refer to a specific paragraph and 9 place that we can refer to and we can look at 10 it... 11 BY MR. WALTERS: 12 Q I'm going to hand you what was previously 13 marked as Exhibit 1011. 14 (Exhibit 1011 was previously marked.) 15 BY MR. WALTERS: 16 Q Do you recognize Exhibit 1011? 17 A Yes. 18 Q And is this Lehmann II? 19 MR. DANLEY: Objection, scope. 20 THE WITNESS: Yes. This is I believe what 21 I referred to as Lehmann II. 22 BY MR. WALTERS:
118 1 BY MR. WALTERS: 2 Q What is solid state? 3 MR. DANLEY: Objection -- or same 4 objection. 5 BY MR. WALTERS: 6 Q What is solid-state technology? 7 A Solid state means that use microchips. 8 MR. DANLEY: Same objection to that 9 question. 10 BY MR. WALTERS: 11 Q Do you know if Lehmann I discloses 12 anywhere the use of a spectrometer? 13 MR. DANLEY: Objection, scope. 14 THE WITNESS: I do not remember off the 15 top of my head, unless you refer to specific 16 place. 17 BY MR. WALTERS: 18 Q Do you know if Lehmann I discloses 19 anywhere the use of a spectrophotometer? 20 MR. DANLEY: Objection, scope. 21 THE WITNESS: Again, I don't recall 22 Lehmann I disclosing use of spectrophotometer,	120 1 Q And does Lehmann II, Exhibit 1011 also 2 disclose the use of a solid-state camera -- 3 MR. DANLEY: Objection, scope. 4 BY MR. WALTERS: 5 Q -- to measure color? 6 MR. DANLEY: Objection, scope. 7 THE WITNESS: I'm not relying on any one 8 of my arguments in any of this specific 9 technologies, which I think are implementation 10 details. None of my combinations are 11 combinations they are relying on is related 12 whether they are using a solid-state camera or 13 a different type of camera. Not even relying 14 on whether they're using spectrometer or 15 spectrophotometer. My grounds -- the grounds 16 I'm here to testify, they are not relying on 17 those, any disclosure of that one. I mean, 18 when it comes to Lehmann I and Lehmann II. 19 BY MR. WALTERS: 20 Q So I'm just trying to get a clear record 21 here. Does Lehmann II also disclose the use of a 22 solid-state camera?

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121 1 MR. DANLEY: Objection, form, scope. 2 THE WITNESS: Again, I do not remember off 3 the top of my head whether they're disclosing a 4 solid-state camera or other types of cameras 5 also. But my declaration does not depend on 6 that. 7 BY MR. WALTERS: 8 Q Can you look at paragraph 27, page three? 9 A Which exhibit? 10 Q Of Exhibit 1011. 11 A Paragraph 27, you said? 12 Q Yes. 13 A Yes. Do you want me to read that 14 paragraph? 15 Q Does that refresh your recollection of 16 whether Lehmann II discloses the use of a camera? 17 MR. DANLEY: Objection, scope. 18 THE WITNESS: That's not -- that was not 19 the answer. You asked me, I believe, or at 20 least I understood, does Lehmann II use 21 solid-state camera. I said I do not remember 22 that.	123 1 for color. 2 BY MR. WALTERS: 3 Q Do you know if Lehmann II discloses the 4 use of a spectrometer? 5 MR. DANLEY: Objection, scope. 6 THE WITNESS: Again, as I told you, I 7 don't -- I don't recall that whether Lehmann II 8 is disclosing that but I know that Lehmann II 9 is disclosing using cameras for measuring 10 colors. 11 BY MR. WALTERS: 12 Q Um-hum. 13 A I don't know. Lehmann II might have said 14 that that's one option, and there are other 15 possibilities, in which case, it could imply at 16 least that maybe a spectrometer is used. I don't 17 remember whether Lehmann II is referring to on other 18 maybe non-preferred technical principles. 19 Q Do you know whether Lehmann II describes 20 obtaining a 3D virtual representation? 21 MR. DANLEY: Objection, scope. 22 THE WITNESS: Not to the best of my
122 1 So the fact that Lehmann II is using a 2 camera, that's a separate issue. 3 Now, Lehmann II does not disclose whether 4 it's solid state or not. That being said, it 5 says intraoral CCD camera. So one may 6 understand that or may not. I don't know. But 7 Lehmann II is not disclosing whether it's a 8 solid-state camera or any other type of camera. 9 The only thing in that paragraph also it 10 says that "In particular, an intraoral video 11 camera or an intraoral CCD camera." So it's 12 mentioning that it has to be a camera that be 13 capable of taking pictures of intraoral 14 structures. 15 BY MR. WALTERS: 16 Q Do you know if Lehmann II discloses the 17 use of a spectrophotometer? 18 MR. DANLEY: Objection, scope. 19 THE WITNESS: I do not recall. I don't 20 believe so. I don't remember. Unless you show 21 me a paragraph that Lehmann II is disclosing 22 that, I don't remember Lehmann II using that	124 1 recollection. And I'm not relying on neither 2 Lehmann I or Lehmann II in any one of the 3 grounds on 3D representation disclosed by 4 Lehmann I or Lehmann II. 5 BY MR. WALTERS: 6 Q Turn to your supplemental declaration, 7 Exhibit 1018. 8 A Yes. 9 Q Turn to page eight and paragraph 16. 10 A Yes. 11 Q You say that "The teachings of Lehmann II 12 directed towards limitations 1[b] and 1[c] as part 13 of a proposed combination are likewise highly 14 related." 15 A Um-hum. 16 Q And then at the end of that paragraph, you 17 say "I agree with these statements in the petition, 18 which are consistent with statements in my original 19 declaration." 20 Do you see that? 21 A Yes. 22 Q And in the citation there to your original

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125 1 declaration, Exhibit 1015, you cite to paragraph 2 142. Can you go there? So I'm asking you to look 3 at Exhibit 1015, paragraph 142. 4 A Yes. I'm there. 5 Q In paragraph 142, on page 63, you cite to 6 Korten, and then Lehmann II at paragraph 10. Then 7 you go to paragraph 62 of Lehmann II. You say 8 "moreover, both references disclose matching the 9 color from a data point on the patient's tooth to 10 the color data from the standard two shades from a 11 two-shade guide." 12 Do you see that? 13 A Yes. 14 Q I want to go, now, to paragraph 62 of 15 Lehmann II. 16 MR. DANLEY: Just for the record, that is 17 Exhibit 1011. 18 MR. WALTERS: 1011. 19 THE WITNESS: What paragraph was that? 20 BY MR. WALTERS: 21 Q Paragraph 62. It's on page five. 22 A Yes.	127 1 Paragraph 60? 2 BY MR. WALTERS: 3 Q Sixty-two. 4 A Sixty-two. 5 Paragraph 62, let's read that. It says 6 "As above, this image data 52 is stored into a block 7 such as block 42, Figure 4. The shade analyzer 8 subsystem then compares the digital information 9 within the block of data representing the image 52 10 with the blocks of data representative of the 11 several teeth shades -- tooth shades. In one 12 embodiment, a comparison of the RGB values is made 13 between the tooth image data 52 and the several 14 shades to find the best fit or match." 15 What I'm saying is that when I say I 16 relied on the entire document, what I mean by that 17 is that there might be other places where Lehmann II 18 is talking about best fit. And indeed, I believe, 19 there are probably other places that Lehmann II is 20 talking about the best fit method to find the 21 shades. And that particular paragraph, of course, 22 is referring to that.
126 1 Q Paragraph 62, describe for me how you're 2 actually relying on this paragraph for the 3 combination of Korten and Lehmann II. 4 MR. DANLEY: Objection, form. 5 THE WITNESS: I think that's a 6 misstatement. Your question is not correctly 7 posed, shall I say, because I'm not relying on 8 just one paragraph of this prior art. I mean, 9 I'm relying -- you used the word "relying," I 10 think. I'm relying on the entirety of this 11 document. I'm just citing to that part. But 12 in my combination, I rely on the entire 13 document. 14 BY MR. WALTERS: 15 Q Do you say that in your declaration that 16 you're relying on the entire document? You give 17 citations to what you're relying on; right? 18 MR. DANLEY: Objection, form. 19 THE WITNESS: Well, what I'm saying is 20 that this might be not the only place where 21 it's talking about -- where Lehmann II is 22 talking about -- which paragraph was it?	128 1 So that's what I mean by I'm relying on 2 the entire document. I'm not talking about 3 disclosure of everything for obvious -- obviously, 4 for instance, for 3D representation, I mentioned 5 earlier, I'm not relying on Lehmann II because I'm 6 relying on Korten on that. 7 But as I said, best -- there might be 8 other places. I mean, your question, the way it's 9 formed, it didn't -- it's as if I'm only relying on 10 this paragraph for best fit. I'm saying that there 11 are probably other places that Lehmann II is talking 12 about best fit. 13 Q Can you describe to me what "best fit" is? 14 MR. DANLEY: Objection, form. 15 THE WITNESS: So, I mean, you're meaning 16 the -- you're meaning the context of it, I 17 assume, Lehmann II, because best fit could be 18 anything, in general. 19 BY MR. WALTERS: 20 Q Sure. In the context of Lehmann II. 21 A In the context of best -- I mean, Lehmann 22 II, Lehmann II describes a computation on approach

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129 1 to determine from a given measurement, and a set of 2 reference guides, hard to determine which one best 3 fits -- which tooth shade best fits with the color 4 that we have measured. 5 Q And how does Lehmann II describe doing 6 that? 7 MR. DANLEY: Objection, form, scope. 8 THE WITNESS: I mean, if you go throughout 9 the document, Lehmann II goes through the 10 process of describing, saying that this is the 11 computation we use and these are the equations 12 that you use. If you refer to a specific 13 place, we can discuss that. 14 BY MR. WALTERS: 15 Q Where does Lehmann II describe 16 calculations? 17 MR. DANLEY: Objection, scope. 18 THE WITNESS: Again, I don't have a search 19 algorithm in the hard copy to find the word 20 "best fit." But to my recollection, there are 21 many places that talks about, you know, for 22 instance, there is an equation in paragraph	131 1 agree, it doesn't really matter. 2 The prior art is disclosing that. "It is 3 important to note that this process has several 4 advantages over the prior art." Just says it. 5 I cannot say that I disagree or agree with it, 6 but the prior art is disclosing that. 7 BY MR. WALTERS: 8 Q So you have no opinion on whether you 9 agree or disagree? 10 MR. DANLEY: Objection, scope. 11 THE WITNESS: It's not that whether I have 12 an opinion or not. I'm just saying that the 13 prior art is teaching that. It's disclosing 14 that. They say that -- that best fit is -- has 15 advantages over prior art. 16 BY MR. WALTERS: 17 Q Then if you go to next sentence in that 18 paragraph, it says "In particular, as long as the 19 same camera captures the data of the tooth shades 20 and the patient's tooth shade data" -- 21 A I'm sorry. I'm lost. I don't know where 22 we are. You have to tell me which line, which
130 1 0107, talks about the valid value has to find 2 for everything some range. And there are 3 also -- she also talks about the computational 4 processes in paragraph 89 to 97. There are 5 different parts that are associated with this 6 idea of best fit. It's not in one place that I 7 can refer to. Unless if you refer to a 8 specific paragraph, we can -- I can expand on 9 that. 10 BY MR. WALTERS: 11 Q Let's refer to paragraph 63. 12 A Yes. 13 Q You see, it starts out by saying "It is 14 important to note that this process has several 15 advantages over the prior art." 16 Do you see that? 17 A Yes. 18 Q Do you agree with that statement? 19 MR. DANLEY: Objection, scope. 20 THE WITNESS: This is subjective. I mean, 21 whatever I say, it would be subjective. It 22 says what it says. Whether I agree or I do not	132 1 paragraph again. 2 Q Exhibit 1011. 3 A Um-hum. 4 Q Page five, paragraph 63. 5 A Yes. 6 Q We talked about the first sentence of 7 paragraph 63. Now I'm reading the second sentence. 8 A Oh, I see. 9 Q "In particular, as long as the same camera 10 captures the data of the tooth shades and the 11 patient's tooth shade data, it does not matter that 12 the stored image color within the processor match 13 the perceived color or hue observed by a typical 14 human." 15 Do you see that? 16 A Yes. 17 Q So what is the tooth shades, data of the 18 tooth shades being referred to there? 19 A "In particular, as only as the same camera 20 30 captures the data of the tooth shades," it's... 21 Here, it's referring to the measurement of 22 data to generate the tooth shades and the patient's

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133 1 tooth shade data. So in here it's talking about the 2 patient's tooth shade data. It does not matter. 3 He's saying that if the two cameras are the same so 4 it doesn't matter. I'm not sure if I understand 5 your question. 6 So he's referring to two tooth shades. He 7 says the data of the tooth shades and the patient's 8 tooth shade. As long as those cameras are the same, 9 it does not affect the process of matching them. 10 Q So is the tooth -- the data of the tooth 11 shades the standards or the reference data? 12 MR. DANLEY: Objection, form. 13 THE WITNESS: Well, from the context, it 14 means that one is the reference and one is the 15 one has -- you know, we measured on the 16 patient. 17 BY MR. WALTERS: 18 Q So in Lehmann II, it discloses using a 19 camera to collect data of the tooth shade off of a 20 person's tooth. And then it compares that data with 21 reference tooth shades? 22 MR. DANLEY: Objection, form, scope.	135 1 patient's tooth shade data, it doesn't matter that 2 the stored image color within the processor match 3 the perceived color or hue observed by a typical 4 human. 5 Why would it be important to use the same 6 camera? 7 MR. DANLEY: Objection, scope. 8 THE WITNESS: I'm not going to speculate 9 on what Lehmann II is disclosing. So 10 Lehmann II says that as long as that is true, 11 then, I mean, read -- you just read the 12 paragraph. 13 It didn't say you absolutely have to do 14 that. It says that as long as the same camera 15 is used, the matching would be -- let me go 16 back to exact same sentence. So before, it 17 says "It is important to note that this process 18 has several advantages over the prior art, in 19 particular, as long as the same camera captures 20 the data of the tooth shades and the patient's 21 tooth shade data. It does not matter that the 22 stored image color within the processor match
134 1 THE WITNESS: It describes a process of 2 getting reference shades. And reference shades 3 may be obtained in many different ways. It 4 describes the process of finding different -- 5 I'm sorry, tooth shades so that you can refer 6 to them. 7 BY MR. WALTERS: 8 Q But you need to collect data from a 9 patient's tooth and you need to have reference 10 shades. 11 MR. DANLEY: Objection, scope. 12 BY MR. WALTERS: 13 Q Correct? 14 MR. DANLEY: Objection, scope. 15 THE WITNESS: If you want to -- I think 16 that's true for all the prior arts, that if you 17 want to determine what the tooth shade value 18 is, you need to have references. 19 BY MR. WALTERS: 20 Q And in here, they're saying that as long 21 as the same camera captures both the data of the 22 tooth shades, the reference shades, and the	136 1 the perceived color or hue observed by the 2 typical -- by a typical human." 3 So it's saying that as long as the same 4 camera is used, whether a human would perform 5 this matching or the camera is -- you know, 6 that the processor is performing the matching, 7 it wouldn't matter whether we are matching the 8 color or hue, depending on which color space we 9 are in. The result would be -- I mean, the 10 differences would not be important. There 11 would be -- it says what it says. I'm not sure 12 what you want me to say about that. It says 13 what it says. It says that as long as the two 14 cameras are the same, it wouldn't make any 15 difference, that the match as if -- you know, 16 if it was perceived, the match of color or hue 17 observed by a typical human. 18 I mean, it says even typical human. What 19 is a typical human? I'm not sure. I'm not 20 going to speculate that particular sentence, 21 but unless you tell me what you mean by your 22 question.

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137 1 BY MR. WALTERS: 2 Q If you use different cameras to obtain 3 color, will you necessarily get the same data? 4 A You could. 5 MR. DANLEY: Objection, scope and form. 6 BY MR. WALTERS: 7 Q You could? 8 A Potentially, you could. You could perform 9 transformations or adjustments. Basically, it's a 10 calibration. So you match a calibration, color 11 calibration, you could do that. 12 Also, I think if you were to use 13 Lehmann II's teaching, then you could also say, 14 okay, I'm going to use the same probes that are 15 capturing, you know, the same cameras, basically, 16 that they're capturing color information, you're 17 going to use that for also reference colors. I 18 don't think either way, there's a restriction there. 19 It would be either use the same camera. I mean, 20 this is not creating a restriction, as far as I'm 21 concerned. I mean, any one of our combinations, 22 you're using Lehmann II, Ground 2, specifically.	139 1 disclosing that both options are available. 2 Either use the same camera or if you're using a 3 different camera, then you need to calibrate, 4 which is a process known in image processing 5 computer vision. 6 So either way, it doesn't matter. I don't 7 see how any one of these is restricting our use 8 of Lehmann II. 9 BY MR. WALTERS: 10 Q In your combination of Korten and 11 Lehmann II, what is missing in Korten that you're 12 relying on the disclosure of Lehmann II for? 13 MR. DANLEY: Objection, form. 14 THE WITNESS: For which? 15 BY MR. WALTERS: 16 Q The combination of Korten and Lehmann II. 17 A I understand that. But for which claim 18 are we talking about? Are you talking about 19 Claim 1? 20 Q Let's go back to your declaration -- your 21 first declaration. We'll look at the table of 22 contents. So we're looking at Exhibit 1015. And
138 1 And now you don't think it's a difficulty 2 because Lehmann II is teaching that, hey, you can 3 calibrate. And so -- or use the same camera so it 4 doesn't matter. But here, actually in this sentence 5 says that use the same one. So why not? Okay. We 6 can use the same one. 7 I don't think this is creating any 8 restriction for us. 9 Q And if you go on to the sentence bridging 10 the two columns in paragraph 63, it says "That is, 11 as long as the data captured by the system 12 correlates to the same reference, the same camera -- 13 for example, the same camera 30, the match between 14 the image and the plurality of tooth shades will be 15 calibrated automatically." 16 A Yes. 17 Q So it's saying if you use the same camera, 18 you don't have to do a calibration? 19 A Exactly. 20 MR. DANLEY: Objection, scope. 21 THE WITNESS: But as I said, it really 22 doesn't matter. Both options -- Lehmann II is	140 1 you see on the table of contents, Ground 2. 2 A Yes. 3 Q And for Claim 1 -- 4 A Claim 1. 5 Q Yeah. 6 A So that's my -- that was my question. 7 Which claim you're referring to. You're referring 8 to Claim 1. 9 Q Yeah. Let's start with Claim 1. 10 A Okay. 11 MR. DANLEY: Objection, form. 12 Actually, could you repeat the question 13 because I think it's pretty far up in the 14 transcript. 15 BY MR. WALTERS: 16 Q Yeah. What is missing in Korten that 17 you're relying on Lehmann II for? 18 MR. DANLEY: In Claim 1? 19 THE WITNESS: In Claim 1? 20 BY MR. WALTERS: 21 Q In Claim 1. 22 MR. DANLEY: Objection, form.

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141 1 THE WITNESS: So I disagree with your 2 question that something is missing. In fact, 3 if you go back to Ground 1, I'm saying that 4 Claim 1 is anticipated by Korten. However, 5 you're saying now, in Ground 2, what are you 6 relying on, not that what is missing, what are 7 you relying on. It's complimentary, if you 8 want to -- Lehmann II, it compliments with 9 Korten. 10 Korten is disclosing that color of the 11 first point in the -- in the first scan is 12 matched to, first, to the 3D coordinate, then 13 is compared to a set of references to determine 14 the tooth shade. 15 Now, here, Lehmann II is saying that for 16 that comparison, Lehmann II is proposing to use 17 the best fit approach that Lehmann II describes 18 in the document. 19 So that's the only thing, I'm borrowing -- 20 if you want to, I'm combining with Korten the 21 use of the calculations of best fit tooth 22 shade.	143 1 Korten's idea because Korten has already captured 2 both 3D and color. Now, from that color, we want to 3 go to the tooth shade, that connection between color 4 and tooth shade, Lehmann II provides a little bit 5 more specifics. That's how I'm using my 6 combination. A little bit more specific on how you 7 perform that, Korten says -- as I said, Korten is 8 anticipating that because Korten also discloses that 9 you perform that. It just Lehmann II provides a 10 little bit more details and proposes this best fit 11 solution. 12 Q When you refer to "best fit solution," 13 what exactly are you referring to? 14 A I'm referring to the disclosure of 15 Lehmann II of a best fit calculation. 16 Q Where in Lehmann II are you referring 17 specifically to? 18 MR. DANLEY: Objection, scope. 19 THE WITNESS: Again, I mean, we were 20 reading earlier -- I can't remember off the top 21 of my head, was it paragraph 62? 22 BY MR. WALTERS:
142 1 MR. WALTERS: Bear with me. 2 (Off the record.) 3 BY MR. WALTERS: 4 Q So you said in your answer "I'm combining 5 on with Korten the use of the calculations of best 6 fit tooth shade." What calculations are you 7 referring to? 8 A As I said earlier, Lehmann II is referring 9 to how to determine best fit solution to the closest 10 tooth shade value to a color that is measured on a 11 patient's tooth. 12 I'm saying that that can be combined with 13 the disclosure of Korten. Korten is saying that 14 once you perform color measurements in association 15 with 3D coordinates, you go and compare that with a 16 set of reference tooth shade values to determine the 17 tooth shade, patient's tooth shade. 18 And Lehmann II is saying a little bit 19 more. He says that -- she -- I mean, the Lehmann II 20 says that use a -- use a specific method, she calls 21 as best fit method to determine the tooth shade. 22 I'm saying that that idea could be combined with	144 1 Q Paragraph 62. 2 A Sixty-two. Lehmann II mentions it there, 3 plus, as I said, off the top of my head, I don't 4 remember, but I cannot do a search on hard copy, but 5 the best fit idea is expanded in different places of 6 Lehmann II disclosure. That's what I'm referring 7 to. 8 Q And is it simply the comparison of the 9 digital information within the block of data 10 representing the image with blocks of data 11 representing -- representative of the several tooth 12 shades? Is that -- is that what you're referring 13 to? 14 MR. DANLEY: Objection, form, scope. 15 THE WITNESS: Well, I don't know where you 16 are reading that from, unless you point me -- 17 BY MR. WALTERS: 18 Q Paragraph 62. 19 A Paragraph 62 again. Okay. "So as above, 20 this image data is stored into a block such" -- no. 21 The word "block" -- we have a misunderstanding on 22 this. It's talking about this block diagram in

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145 1 Figure 4. It says block 42 of that. It's not 2 talking about block of images. Yeah. It says that 3 "As above, this image data, 52, is stored into a 4 block, such as block 42, Figure 4. The shade 5 analyzer subsystem then compares the digital 6 information within the block of data representing 7 the image with the blocks of data representative of 8 the several tooth shades. In one embodiment, a 9 comparison of the RGB values is made between the 10 tooth image data and the several shades to find the 11 best fit or match." 12 So I think it's the last sentence that 13 he's talking about the best fit. He says in one 14 embodiment, a comparison of RGB values of the 15 measurement is done with several shades that is in 16 reference to determine the best fit. 17 The earlier parts, I don't see talking 18 about best fit. 19 Q Yeah. 20 A Except for the last sentence. 21 Q So and I'm trying to understand what you 22 mean by "the best fit or match." What exactly would	147 1 THE WITNESS: As I said throughout the 2 document, Lehmann II, in different places, talk 3 about best fit. So it's not just one paragraph 4 here. I disagree with you. It's not just that 5 sentence in that paragraph, I mean best fit. 6 So I'm talking about the teaching of best fit 7 in Lehmann II. 8 Can I expand on the previous question a 9 little bit as I was just going through the 10 different paragraphs? 11 For instance, in paragraph 70, it says 12 "The event that the system 29 of Figure 2 does 13 not find a close match to one existing tooth 14 shade, the subsystem 34 specifies a combination 15 of tooth shades that correspond to the color of 16 the patient's tooth image data, e.g., the image 17 52 of Figure 5." And it goes on describing 18 other -- that's what I mean. It goes on 19 through that paragraph 70 describing other 20 things. It's not just -- as I said, it's not 21 just that paragraph 62 that you were referring 22 to that is talking about how to determine the
146 1 you take from Lehmann II and use in Korten? 2 MR. DANLEY: Objection, form, scope. 3 THE WITNESS: It's the same answer. 4 Everywhere where Korten -- I'm sorry, 5 Lehmann II is describing best fit, I'm using 6 teaching from all those parts and I'm saying 7 that that is what we can use along with Korten 8 because Korten has already captured color 9 information and associated that with 3D. 10 Now, the next step, Korten is disclosing 11 that you take that color and compare it with a 12 reference guide to determine the tooth shade. 13 I'm saying that for that, we could also do 14 that with what Lehmann II is disclosing because 15 Lehmann II is disclosing that you compare -- as 16 the last sentence there was saying in that 17 paragraph, you compare the color with various 18 tooth shades that are in the reference and you 19 find the best fit from there. And then -- 20 BY MR. WALTERS: 21 Q Is that what you mean by "best fit"? 22 MR. DANLEY: Objection, form, scope.	148 1 best fit. There are different places and gives 2 that Lehmann II is teaching us to how to do 3 this. 4 MR. WALTERS: Let's take a break. 5 CERTIFIED STENOGRAPHER: Okay. Off the 6 record. 7 (A brief recess is had from 2:26 p.m. to 8 2:34 p.m.) 9 CERTIFIED STENOGRAPHER: Back on the 10 record. 11 BY MR. WALTERS: 12 Q Dr. Foroosh, do you know whether you can 13 measure translucency with a spectrophotometer? 14 MR. DANLEY: Objection, scope. 15 THE WITNESS: I think I answered that 16 question earlier. I don't know. In prior arts 17 that I'm disclosing, that's not disclosed so... 18 Also, I don't know how that would affect 19 any one of the obviousness claims that I'm 20 disclosing in my declaration. 21 BY MR. WALTERS: 22 Q Do you know whether with a

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149 1 spectrophotometer you can measure reflectivity? 2 MR. DANLEY: Objection, scope. 3 THE WITNESS: As I said, off the top of my 4 head, no. This is a general question. I 5 cannot answer. Maybe there are technologies 6 that -- I mean, various different 7 spectrophotometries that are designed to do 8 that today. I don't even recall off the top of 9 my head, if at the priority date of the '151 10 patent, this would have been possible. So 11 you're asking me this very general question 12 about spectrophotometry, could they measure 13 reflectivity. No. You said translucency. You 14 didn't say reflectivity. 15 BY MR. WALTERS: 16 Q I said translucency first and then I said 17 reflectivity. 18 A So okay. Both of them, basically. So off 19 the top of my head, I cannot answer that question. 20 I need to really dig into the literature to find out 21 if at the priority date of the '151 patent there 22 were any spectrophotometry, I think. You didn't say	151 1 couple of questions. So if you were to physically 2 sign your first declaration today, would you change 3 any of your opinions? 4 A No. 5 Q And if you were to physically sign your 6 supplemental declaration today, would you change any 7 of your opinions? 8 A No. 9 Q No further questions. 10 CERTIFIED STENOGRAPHER: Okay. Are we 11 concluded? 12 MR. WALTERS: We're done. 13 (The reading and signing of the deposition 14 is not waived.) 15 (At 2:38 p.m. the deposition was 16 concluded.) 17 18 19 20 21 22
150 1 spectrometry -- that can be used for measuring 2 translucency and... 3 Q During the course of questioning today, we 4 took several breaks, including a lunch break. And I 5 want to ask if you had any substantive discussions 6 with counsel during any of the breaks. 7 A No. You mean about -- 8 Q About the questions -- 9 A The questions. 10 Q -- and the case. 11 A No. 12 Q All right. I have no further questions. 13 MR. DANLEY: Give us five minutes. 14 MR. WALTERS: Okay. 15 CERTIFIED STENOGRAPHER: Okay. Off the 16 record. 17 (Off the record.) 18 CERTIFIED STENOGRAPHER: Okay. Back on 19 the record. 20 EXAMINATION 21 BY MR. DANLEY: 22 Q Yeah. So, Dr. Foroosh I just have a	152 1 CERTIFICATE OF OATH 2 3 STATE OF FLORIDA) 4 COUNTY OF ORANGE) 5 6 I, the undersigned authority, certify that 7 HASSAN FOROOSH, PH.D. appeared before me remotely 8 and was duly sworn. 9 WITNESS my hand and official seal this 20th day 10 of October 2024. 11 12 13  14 DAWN A. HILLIER, RMR, CRR, CLR 15 Notary Public - State of Florida 16 My Commission No.: HH 300744 17 Expires: 12-15-2026 18 19 20 21 22

Conducted on October 18, 2024

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1 CERTIFICATE OF SHORTHAND REPORTER - NOTARY PUBLIC

2 I, Dawn Hillier, Reporter and Notary Public within

3 and for the Florida do hereby certify:

4 That HASSAN FOROOSH, PH.D., the witness whose

5 deposition is hereinbefore set forth, was duly sworn

6 by me before the commencement of such deposition and

7 that such deposition was taken before me and is a

8 true record of the testimony given by such witness.

9 I further certify that the adverse party,

10 Petitioner, was represented by counsel at the

11 deposition.

12 I further certify that the deposition of HASSAN

13 FOROOSH, PH.D. occurred at the offices of

14 Regus - Heritage Park at 941 West Morse Blvd,

15 Suite 100, Winter Park, Florida on Friday, October

16 18th, 2024, commencing at 10:09 a.m. to 2:38 p.m.

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1 I further certify that I am not related to any of

2 the parties to this action by blood or marriage, I

3 am not employed by or an attorney to any of the

4 parties to this action, and that I am in no way

5 interested, financially or otherwise, in the outcome

6 of this matter.

7 IN WITNESS WHEREOF, I have hereunto set my

8 hand this 20th day of October, 2024.

9

10

11

12

13 

14 DAWN A. HILLIER, RMR, CRR, CLR

15 Notary Public - State of Florida

16 My Commission No.: HH 300744

17 Expires: 12-15-2026

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