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1 UNITED STATES PATENT AND TRADEMARK OFFICE
2
3 BEFORE THE PATENT TRIAL AND APPEAL BOARD
4
5 APPLE, INC.,
6 Petitioner
7
8 vs.
9 COREPHOTONICS, LTD.,
10 Patent Owner.
11
12 Case IPR2020-00877
13 U.S. Patent 10,288,840
14
15 Case IPR2020-00878
16 U.S. Patent 10,330,897
17
18 VIDEO-RECORDED DEPOSITION OF JOSE SASIAN,
19 Ph.D., taken remotely via Zoom at 9:06 a.m.,
20 Friday, January 22, 2021, before Theresa JoAnn
21 Phillips-Blackwell, CSR 12700.
22
23
24
25

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23
24
25

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1 I N D E X
2
3 DEPONENT EXAMINED BY PAGE
4 Jose Sasian Ph.D. Mr. Rubin 6
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9 EXHIBITS
10
11 (NONE MARKED)
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13 INSTRUCTED NOT TO ANSWER
14 PAGE LINE
15 60 22
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1 (Remotely via Zoom; Friday, January 22, 2021, 9:06 a.m.)
2
3 **THE VIDEOGRAPHER:** Good morning. We're now on
4 the record. My name is John Hank here today for Barkley
5 Court Reporters. Today is January 22nd, 2021. The time
6 is 9:06 a.m. We are located remotely via
7 videoconferencing technology.
8 This deposition of Dr. Jose Sasian is being
9 taken today on behalf of the patent owner in the case
10 captioned Apple, Inc., versus Corephotonics, LTD., in
11 the United States Patent and Trademark Office Before the
12 Patent Trial and Appeals Board, Case No. IPR2020-00877,
13 Patent No. 10,288,840 and IPR2020-00878, Patent
14 No. 10,337,897 [sic].
15 Will counsel for the parties please identify
16 yourselves with city and state where you are appearing
17 from.
18 **DEPOSITION OFFICER:** I think you got the patent
19 number wrong again, John.
20 **THE VIDEOGRAPHER:** Okay.
21 **MR. RUBIN:** Yeah. There's an extra 7, I think,
22 in what you read.
23 **THE VIDEOGRAPHER:** All right. The court
24 reporter will correct my audio.
25 Would counsel please introduce yourselves.

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1 **MR. RUBIN:** This is Neil Rubín of Russ, August
2 & Kabat representing Patent Owner Corephotonics,
3 Limited.
4 **MS. SIVINSKI:** Good morning. Stephanie
5 Sivinski with Haynes And Boone representing Petitioner
6 Apple. With me today is Jordan Maucotel and Mike
7 Parsons, also with Haynes And Boone and also on behalf
8 of Apple, and then our colleague Priya Viswanath, who is
9 from Cooley LLP, also on behalf of Apple.
10 **THE VIDEOGRAPHER:** Thank you. Will the court
11 reporter swear in the witness remotely.
12 **DEPOSITION OFFICER:** Raise your right hand,
13 please.
14 You do solemnly state that the evidence you
15 shall give in this matter shall be the truth, the whole
16 truth, and nothing but the truth, so help you God?
17 **THE WITNESS:** (No audible response.)
18 **DEPOSITION OFFICER:** I'm sorry?
19 **THE WITNESS:** Yes.
20 **DEPOSITION OFFICER:** Thank you.
21
22 **EXAMINATION**
23
24 **BY MR. RUBIN:**
25 Q. Good morning, again, Professor Sasian.

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1 **A. Good morning.**
2 Q. So you've been deposed a number of times in
3 IPRs between Apple and Corephotonics; is that right?
4 **A. Yes.**
5 Q. Since the last deposition that you and I had
6 together, have you been deposed in any other matters?
7 **A. No, I haven't.**
8 Q. And the last deposition that we did in Apple
9 versus Corephotonics matter was conducted over Zoom,
10 like today's deposition is; correct?
11 **A. Yes.**
12 Q. So as we discussed a little bit prior to going
13 on the record, I am going to be sharing exhibits by PDF
14 with you using the chat function in Zoom that you'll be
15 able to download and refer to on your computer; and I'll
16 also be sharing my screen at least at some points to
17 show you particular portions of exhibits.
18 You're comfortable with accessing the documents
19 via the chat function and using the Zoom software?
20 **A. Yes. I think so.**
21 Q. Certainly, if you have any -- any difficulties
22 with the technology, please let me know.
23 **A. Thank you.**
24 Q. And you're -- you're familiar with the
25 deposition process, I guess; so I won't belabor the --

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1 explaining that to you.
2 I will remind you that during breaks while I'm
3 conducting my examination of you, you're not allowed to
4 have any discussions with counsel for Apple or with
5 anybody else about your testimony, questions I've asked,
6 questions you expect that I'll ask, answers that you've
7 given. Do you understand that?
8 **A. Yes, I do.**
9 **MS. SIVINSKI:** Just to clarify, Mr. Rubín, we
10 can talk about issues relating to privilege; but
11 otherwise, I agree with your description.
12 **BY MR. RUBIN:**
13 Q. And is there any reason today that you can't
14 give full --
15 (Technical difficulties.)
16 **DEPOSITION OFFICER:** Counsel, I was kicked out
17 of the meeting. The last -- can we go off the record?
18 **MR. RUBIN:** We can go off the record.
19 **THE VIDEOGRAPHER:** We're off the record at
20 9:12.
21 (A recess is taken.)
22 **THE VIDEOGRAPHER:** We're back on the record at
23 9:13.
24 **BY MR. RUBIN:**
25 Q. So let me ask you again. Is there any reason

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1 that you can't give complete and accurate testimony on
2 the subjects of these two IPRs today?
3 **A. No. I can't recall.**
4 Q. Okay. And then I think you were starting to
5 say something about your Internet connection.
6 **A. Yes. I -- the Internet here sometimes just**
7 **stops for a few seconds; so if you lose me, we should**
8 **wait maybe like one minute. I'm -- probably the**
9 **Internet will come back. But if it doesn't come back, I**
10 **have my iPhone and will try to connect through my**
11 **iPhone.**
12 **And the second item is if my dogs -- I am alone**
13 **in the house with my dogs. If my dogs start barking, I**
14 **will have to bring them to the backyard. So I will**
15 **briefly go and take them to the backyard. That's all.**
16 Q. Okay. Well, certainly, we'll -- we'll work
17 together to work around any Internet connection issues
18 and other -- other household demands that come up.
19 Hopefully -- hopefully, things will go smoothly.
20 All right. So let me share with you a window.
21 So on your screen you should see the first page of
22 Exhibit 1003 in the IPR concerning the '897 patent
23 that's IPR2020-00878.
24 Do you see that on your screen?
25 **A. Yes, I do.**

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1 Q. And do you recognize this as the declaration
2 that you submitted in -- on behalf of Apple in that IPR?
3 A. **It appears to be so, yes.**
4 Q. And then on your screen now is Exhibit 1003 in
5 Apple's IPR concerning the '840 patent that's
6 IPR2020-00877.
7 Do you recognize this document as a declaration
8 that you submitted on behalf of Apple in that IPR?
9 A. **Yes. It appears so.**
10 Q. Are there -- is there anything in either of
11 those two declarations that you're aware of that is in
12 error or that you'd like to correct?
13 A. **Well, in the case of the '840 declaration, I --**
14 **at this moment I cannot think of any issue. In the case**
15 **of '897, I am aware of a few clerical errors and an**
16 **omission of a word in a couple of places or so.**
17 Q. What are the clerical errors?
18 A. **There is a misquote for a patent number in one**
19 **of the paragraphs. That's related with Claim 16, I**
20 **believe. There is a misquote of the total track length**
21 **for the first modified lens. Right now those are the**
22 **ones I can recall; but as we go, probably I can remember**
23 **two -- two more or one more. I don't remember exactly**
24 **right now.**
25 Q. And then you said earlier that in addition to

Page 11

1 clerical errors, there was an omission of a word in a
2 couple of places or so. Do you recall where the words
3 were omitted?
4 A. **Yes. From one of the references I am using**
5 **part of a phrase that says, "for a small format sensors**
6 **when issued before a small pixel format sensors."**
7 **So I omitted the word "pixel" in two or three**
8 **places when I referred to that phrase in one of the**
9 **references.**
10 Q. Okay. Anything else?
11 A. **Not that I can think -- think at this moment.**
12 Q. So you said that there was a misquote of a
13 patent number in your discussion of Claim 16.
14 A. **-- our answer.**
15 Q. I'm sorry. Go ahead.
16 A. **And that would be in the chart. That would be**
17 **in the chart for Claim 16.**
18 Q. Do you recall where in the chart?
19 A. **Go forward.**
20 Q. What was that?
21 A. **If you continue going down.**
22 Q. You'll tell me when to stop?
23 A. **Yes, please. You need to go to Claim 16.**
24 Q. Oh, okay. I'm sorry.
25 A. **I'll work on it. Oh, also -- here it is. If**

Page 12

1 **you look at this page, it says on the second paragraph,**
2 **"In more detail as discussed above the '647."**
3 Q. Uh-huh.
4 A. **That is not -- that is the incorrect number.**
5 Q. That should be the '897?
6 A. **'897.**
7 Q. Okay.
8 A. **And also, another -- another item I now recall**
9 **is in the previous page.**
10 Q. Uh-huh.
11 A. **Page 93.**
12 Q. Ninety-three, you said?
13 A. **Yeah. No. I'm sorry. Ninety-four. On the --**
14 **on the third line it reads, "Does Chen Example 1 teaches**
15 **wherein lens element L1-1"; and it should be L2_1. And**
16 **at the end of the line it says "L1_2." It should be**
17 **L2 --**
18 Q. L2, underscore, 2?
19 A. **That's incorrect. Those -- those two should be**
20 **as in the previous page on the -- on the Claim L2_1 and**
21 **L2_2.**
22 Q. Okay. So those are the errors that you're
23 aware of for your section on Claim 16?
24 A. **Yes. As I recall right now, those are the ones**
25 **that I can recall.**

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1 Q. And then you said that there was an error in
2 the TTL for the first modified lens?
3 A. **Yes.**
4 Q. And that's your -- that's the lens based on the
5 combination of Ogino with Bareau; is that right?
6 A. **That's correct.**
7 Q. So that would be this section?
8 A. **Yes.**
9 Q. Starting on Page 54?
10 A. **I believe so.**
11 Q. Do you know where in this section the TTL was
12 wrong?
13 A. **If you go down more, more, more. Right where**
14 **the cross-section of the lens is. Right there. If you**
15 **see on the bottom line it says, "TTL of 5.271."**
16 Q. Uh-huh.
17 A. **It is -- that number is a clerical error. It**
18 **should be 5.05. The other -- but it's 5.05. Same as**
19 **the total track -- the axial length in the drawing.**
20 **DEPOSITION OFFICER:** The axial lens in the
21 what?
22 **THE WITNESS:** As in the axial length in the
23 drawing.
24 **DEPOSITION OFFICER:** Okay.
25 ///

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1 **BY MR. RUBIN:**
 2 Q. I see. So it should be the same number as in
 3 the screenshot and the -- towards the bottom right of
 4 Page 59; is that right?
 5 **A. Yes. In the appendix, when I discuss the**
 6 **number, it's -- it's properly -- it's properly given.**
 7 **And it's 5.05.**
 8 Q. Okay.
 9 **A. There is -- the same error appears maybe in the**
 10 **next page. Let's go to the next -- next page. I think**
 11 **it is on -- on the chart if we go further down. At the**
 12 **beginning of the chart, I -- it's misquote. Rather than**
 13 **5.21, should be 5.05.**
 14 Q. I see.
 15 **A. And part of that is -- maintained is lower.**
 16 **That was a mistake I made.**
 17 Q. I'm not sure I quite understood the sentence
 18 you just said. Can you repeat that.
 19 **A. Yes. The total track is smaller than the**
 20 **original that -- the original total track of 5.273. So**
 21 **the total track length is not maintained. It's lower.**
 22 Q. Uh-huh. Are there any other errors that you're
 23 aware of?
 24 **A. Not that I can think. Thank you.**
 25 Q. Okay. So --

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1 (Telephonic interruption.)
 2 **MR. RUBIN:** Was that somebody's phone?
 3 **MS. SIVINSKI:** Sorry.
 4 **MR. RUBIN:** That's all right. No worries.
 5 **BY MR. RUBIN:**
 6 Q. So turning to Page 37 of your declaration
 7 concerning the '897 patent. You perform a calculation
 8 about the Ogino Example 5 lens using the lens maker
 9 equation from Born.
 10 Do you see that?
 11 **A. Yes.**
 12 Q. And Born -- we can -- let me actually share
 13 Born with you. Sorry. Sorry. It's taking a moment to
 14 upload.
 15 **A. Sure.**
 16 Q. So you should be able to download it now. You
 17 let me know when you're -- when you've got it.
 18 **A. I'm loading now. Yes.**
 19 Q. All right. And you can also see two pages from
 20 Born on your screen. So you make use of the formula
 21 from -- I mean, I guess you make use of both Equations
 22 29 and 30 from Born, Page 162, in order to do your focal
 23 length calculation for Lens 4?
 24 **A. Well, in part, yes. But I think, as I recall,**
 25 **Born & Wolf may have a closer equation. But it is**

Page 16

1 **related to those equations.**
 2 Q. And on the prior page, 161, Born refers to
 3 deriving, quote, the Gaussian formula. Do you see that?
 4 **A. Yes.**
 5 Q. So these -- this formula that you use, which is
 6 a form of the lens maker's equation, is using the
 7 Gaussian approximation; is that right?
 8 **A. Well, it is -- it is -- formula is called the**
 9 **lens maker equations. And it can be derived with the**
 10 **Gaussian formulas, but there is no approximation. The**
 11 **formula gives you the focal length. The focal length,**
 12 **which is a first-order property of the lens and is**
 13 **accurately given by the formula.**
 14 **DEPOSITION OFFICER:** Can you repeat that.
 15 Focal length, which is a --
 16 **THE WITNESS:** It's a first-order property and
 17 is given accurately by the formula.
 18 **DEPOSITION OFFICER:** Thank you.
 19 **BY MR. RUBIN:**
 20 Q. So the value given by this formula -- would it
 21 be exactly identical to a focal length outputted by ray
 22 tracing software like Zemax?
 23 **A. For the case of the singlet lens, yes.**
 24 Q. You said, "For the case of the singlet lens"?
 25 **A. Yes.**

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1 Q. And so that's a -- is a singlet lens -- is that
 2 the same as a -- just a single lens element?
 3 **A. Yes.**
 4 Q. Turning back to your declaration. On Page 43
 5 you make use of an equation from the Walker textbook. I
 6 think in your other declaration you use a similar
 7 formula from another textbook. But the -- so the
 8 expression that you quote from Walker is for the
 9 combined optical power of two lenses separated by the
 10 distance d. Do you see that?
 11 **A. Yes.**
 12 Q. Is this formula based on an approximation?
 13 **MS. SIVINSKI:** Objection. Form.
 14 **THE WITNESS:** The formula could be accurate
 15 if -- if applied to a single lens element if applied to
 16 thin lenses.
 17 **DEPOSITION OFFICER:** What type of lenses?
 18 **THE WITNESS:** Thin.
 19 **DEPOSITION OFFICER:** Thin?
 20 **THE WITNESS:** T-h -- to a couple of thin
 21 lenses. However, if the formula is applied to too thick
 22 lenses, may not be quite accurate. But it will give an
 23 approximation of the combined optical power as long as
 24 the thickness of the individual lenses is not too large.
 25 **MR. RUBIN:** Apologies. Are folks picking up

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1 background noise of a squeaking dog toy?
 2 **DEPOSITION OFFICER:** Yes.
 3 **MR. RUBIN:** My apologies. Hopefully, it will
 4 stop.
 5 **BY MR. RUBIN:**
 6 Q. So on Page 59 of your declaration, I think you
 7 explain that the value of TTL being equal to
 8 5.271 millimeters was incorrect. Do you know what the
 9 origin of that number is? Because it seems to be close
 10 to but not the same as Ogino Example 5.
 11 **A. It is verified -- what do you mean by the**
 12 **origin of which number?**
 13 Q. Well, I guess -- yeah. I mean, is -- so there
 14 is a number 5.271 in your declaration, which you said
 15 earlier is not accurate. Is that a number that actually
 16 appears somewhere in -- in any of the references you
 17 considered or in the calculations you did, or is that
 18 merely an error in typing something into the document?
 19 **A. Well, I don't recall exactly why it ended up.**
 20 **I -- my guess is that there were -- there was a**
 21 **copy-and-paste and -- and I forgot to update the number.**
 22 **Something like that.**
 23 Q. So do you know where that number would have
 24 been pasted from?
 25 **MS. SIVINSKI:** Form.

Page 19

1 **BY MR. RUBIN:**
 2 Q. Namely, the 5.271 number.
 3 **A. No. I -- I don't -- I don't remember. I am**
 4 **right now guessing on how that number originated. I**
 5 **don't remember well.**
 6 Q. So I'd like to talk about the modifications
 7 that you performed -- or that you made to Ogino
 8 Example 5. And maybe the best place to start would be
 9 your appendix. So right now on the screen you should
 10 see Page 104, which was the beginning of the -- of
 11 Subsection B of your appendix Ogino Example 5 modified
 12 for f-number equal 2.8 using Zemax.
 13 Do you see that?
 14 **A. Yes.**
 15 Q. Now, you say, in parentheses next to the word
 16 "Zemax," V 2/14/2011. Does that indicate the particular
 17 version of Zemax that you used?
 18 **A. Yes. That's correct.**
 19 Q. And did you use that same version of Zemax for
 20 all of the work involving Zemax on the two IPRs we're
 21 talking about today?
 22 **A. I believe so.**
 23 Q. So the ray trace on Page 104 depicts a design
 24 that you obtained by Ogino Example 5; is that right?
 25 **A. On the figure on Page 104, it's -- corresponds**

Page 20

1 **to a lens I obtain from slightly modifying Ogino**
 2 **Example 5 in view of why I stop here.**
 3 **DEPOSITION OFFICER:** Can you repeat those last
 4 few words.
 5 **THE WITNESS:** I stop here.
 6 **DEPOSITION OFFICER:** Thank you.
 7 **BY MR. RUBIN:**
 8 Q. And on your screen you should see Exhibit 1005
 9 from the '897 IPR Ogino. And on Page 26 of Ogino,
 10 Column 21 of the patent, there's a table labeled
 11 "Table 9." Do you see that?
 12 Do you see that?
 13 **A. Yes.**
 14 Q. All right. And at the bottom of the same page,
 15 Table 10 is labeled "Example 5 Aspheric Surface Data."
 16 Do you see that?
 17 **A. Yes.**
 18 Q. And is it correct that Tables 9 and 10 together
 19 provide the lens prescription for Ogino Example 5?
 20 **A. Yes.**
 21 Q. And was this lens prescription in these tables
 22 the starting point that you used in coming up with the
 23 modified examples in your declaration?
 24 **A. Yes.**
 25 Q. So turning back to your declaration. On

Page 21

1 Page 107 there's what's labeled "Figure 2D -
 2 Prescription Data." Is that the lens prescription for
 3 the first modified design that you obtained based on --
 4 or starting with Ogino Example 5?
 5 **A. Yes. I believe so.**
 6 Q. So can you explain -- what was the process that
 7 you followed to arrive at this lens prescription
 8 starting with the lens prescription that's actually
 9 given in Ogino?
 10 **MS. SIVINSKI:** Objection. Form.
 11 **THE WITNESS:** Yes. Thank you.
 12 Well, the process start with considering what a
 13 POSITA at the time will have known and considering what
 14 would be the training of that lens design of that POSITA
 15 and also planning a -- or doing a modification -- the
 16 simplest one that someone having that experience would
 17 have known.
 18 And the structure of a lens -- it's primarily
 19 determined by what is known as the first-order
 20 properties as defined by the radii of curvature and the
 21 space in between lens element and -- and the --
 22 existence of refraction. So if we can maintain the
 23 radii curvature and the spacings as given in the
 24 columns' radius thicknesses and glass, we will maintain
 25 essentially the same structure.

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