

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.

Petitioner,

v.

MASIMO CORPORATION,

Patent Owner.

IRP2024-00241, IPR2024-00243, IPR2024-00244

REMOTE DEPOSITION OF DR. BRIAN W. ANTHONY

March 21, 2025

12:00 p.m. (EST)

Reported by: Eileen Mulvenna, CSR/RMR/CRR/RDR

DIGITAL EVIDENCE GROUP

1730 M Street, NW, Suite 812

Washington, D.C. 20036

(202) 232-0646

1 REMOTE DEPOSITION of DR. BRIAN W.
2 ANTHONY, a Witness on behalf of Petitioner in the
3 above-titled action, held on Friday, March 21, 2025,
4 commencing at approximately 12:00 p.m., before
5 Eileen Mulvenna, CSR/RMR/CRR/RDR, Certified
6 Shorthand Reporter, Registered Merit Reporter,
7 Certified Realtime Reporter, Registered Diplomat
8 Reporter, and Notary Public of the State of New
9 York.

10

11

12

13

14

15

16

17

18

19

20

21

22

1 APPEARANCES:

2

3 On behalf of the Petitioner, Apple, Inc.:

4 FISH & RICHARDSON P.C.

5 BY: PATRICK BISENIUS, ESQUIRE

6 60 South Sixth Street, Suite 3200

7 Minneapolis, Minnesota 55402

8 612-337-2510

9 bisenius@fr.com

10

11 On behalf of the Patent Owner, Masimo Corporation:

12 KNOBBE MARTENS OLSON & BEAR, LLP

13 BY: PERRY OLDHAM, ESQUIRE

14 2040 Main Street, 14th Floor

15 Irvine, California 92614

16 949-760-0404

17 perry.oldham@knobbe.com

18

19

20

21

22

1 I N D E X

2	WITNESS	EXAMINATION BY	PAGE
3	DR. BRIAN W. ANTHONY		
4		MR. OLDHAM	6
5		MR. BISENIUS	179
6		MR. OLDHAM	181

7

8 E X H I B I T S

9			PAGE
10	Exhibit 1003	Previously marked	10
11	Exhibit 1079	Previously marked	11
12	Exhibit 1003	Previously marked	11
13	Exhibit 1079	Previously marked	11
14	Exhibit 1003	Previously marked	11
15	Exhibit 1079	Previously marked	11
16	Exhibit 1001	Previously marked	13
17	Exhibit 1004	Previously marked	13
18	Exhibit 1042	Previously marked	98
19	Exhibit 1095	Previously marked	126
20	Exhibit 1	No Bates Numbers, American	129
21		Heritage College	
22		dictionary, Third Edition	

1 (Continued)

2 E X H I B I T S

3 Exhibit 2 No Bates Numbers, American 144
4 Heritage College
5 dictionary, Fourth Edition

6 Exhibit 2078 Previously marked 174

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

1 THE REPORTER: Counsel, before I swear
2 in the witness, do all counsel stipulate to
3 the witness being sworn in remotely?

4 MR. OLDHAM: Yes.

5 MR. BISENIUS: Yes.

6 THE REPORTER: Counsel, please state
7 your appearances and whom you represent for
8 the record.

9 MR. OLDHAM: This is Perry Oldham from
10 Knobbe Martens, representing the patent
11 holder, Masimo.

12 MR. BISENIUS: This is Patrick
13 Bisenius from Fish & Richardson, representing
14 petitioner, Apple.

15 DR. BRIAN ANTHONY,
16 having been duly sworn by Eileen Mulvenna,
17 a Notary Public of the State of New York,
18 was examined and testified as follows:

19 EXAMINATION

20 BY MR. OLDHAM:

21 Q. Good afternoon. Will you please state
22 your name for the record?

1 A. Brian W. Anthony.

2 Q. You've been deposed before; right?

3 A. Yes.

4 Q. How many times?

5 A. Probably 12, 14 times.

6 Q. Is there any reason you cannot provide
7 complete, accurate, and truthful testimony today?

8 A. No.

9 Q. If at any time you don't understand my
10 questions, please ask me to clarify. If you do not
11 ask for clarification, I will assume that you fully
12 understand my question. Agreed?

13 A. Agreed.

14 Q. What did you do to prepare for today's
15 deposition?

16 A. Reviewed my declarations, the
17 supplemental declarations, my earlier declarations,
18 the primary references, and had conversations with
19 counsel.

20 Q. Did you have conversations with anyone
21 else?

22 A. No.

1 Q. What counsel did you have
2 conversations with?

3 A. Mr. Bisenius and -- actually, just
4 him.

5 Q. Where are you physically located for
6 the deposition?

7 A. In my office at MIT in Cambridge,
8 Massachusetts.

9 Q. Who is in the room with you?

10 A. Just me.

11 Q. Do you have anything open on your
12 computer other than this Zoom meeting?

13 A. No.

14 Q. Do you understand that you are here to
15 testify regarding three separate IPR matters?

16 A. Yes.

17 Q. Do you understand that you are here to
18 testify regarding IPR2024-00241 for U.S. Patent
19 No. 10,687,743?

20 A. I don't remember the other numbers,
21 but the '743, yes. It's -- yes.

22 Q. Do you understand that you are here to

1 testify regarding IPR2024-00243 for U.S. Patent
2 No. 10,722,159?

3 A. Yes.

4 Q. And do you understand that you are
5 here to testify regarding IPR2024-00244 for U.S.
6 Patent No. 10,722,159?

7 A. Yes.

8 Q. I will upload exhibits to the Zoom
9 chat and the file name will include the IPR number
10 and the last four digits of the file name will be
11 the exhibit number. I'll start with IPR2024-00241,
12 Exhibit 1003.

13 A. And, also, I do have clean printouts
14 of my declarations. Sometimes it's much easier for
15 me to see on the paper. So just -- I won't
16 reference them unless you post them, but...

17 BY MR. OLDHAM:

18 Q. Do you have any other documents with
19 you?

20 A. No.

21 Q. Okay. So Exhibit 1003 should be in
22 the chat. Please let me know when you have that

1 open.

2 A. I don't see anything in the chat.

3 Q. Oh, I need to hit send, sorry.

4 Okay. It should be there now.

5 A. Yes.

6 (Exhibit 1003, Previously marked.)

7 BY MR. OLDHAM:

8 Q. Exhibit 1003 is your December 9, 2023,
9 declaration in IPR2024-00241; right?

10 A. And I'm going to also bring my paper
11 version up -- but yes.

12 Q. Okay. So I'm going to upload -- this
13 might be faster to upload all of your declarations
14 at the same time so that we don't --

15 A. Okay.

16 Q. -- keep going back and forth to the
17 chat.

18 So I'm going to upload IPR2024-00241,
19 Exhibit 1079; IPR2024-00243, Exhibit 1003;
20 IPR2024-00243, Exhibit 1079; IPR-2024-00244, Exhibit
21 1003; and IPR2024-0024 Exhibit 1079. So I will
22 upload those momentarily. And you're free to look

1 at your paper copies, as well.

2 (Exhibit 1079, Previously marked.)

3 (Exhibit 1003, Previously marked.)

4 (Exhibit 1079, Previously marked.)

5 (Exhibit 1003, Previously marked.)

6 (Exhibit 1079, Previously marked.)

7 THE WITNESS: So just collectively,
8 those are the three original declarations and
9 the two supplementary?

10 BY MR. OLDHAM:

11 Q. Correct.

12 I believe they should all be uploaded
13 to the chat at this point.

14 A. Okay. I'm going to clear the
15 downloads and let you know.

16 Q. Okay. Please let me know when the
17 downloads are complete.

18 A. Yep, it's still --

19 MR. BISENIUS: I might be mistaken
20 here, but I'm not seeing the '241
21 Exhibit 1079 in here.

22 MR. OLDHAM: Maybe I uploaded 243

1 twice. Is that what it looks like?

2 THE WITNESS: Let me see. So I have
3 '241, 1003; '243, 1003; '244, 103. And then
4 I have '243, 1079; '244, 1079.

5 MR. OLDHAM: Okay. I just uploaded
6 '241, 1079.

7 THE WITNESS: Two '241s, two '244s,
8 and two '243s. Okay.

9 BY MR. OLDHAM:

10 Q. And so these six documents are the
11 original declarations and the supplemental
12 declarations that you prepared in the three IPR
13 matters that we're discussing today; right?

14 A. Yes.

15 Q. Is it your understanding that --
16 (Cross talk.)

17 BY MR. OLDHAM:

18 Q. Is it your understanding that
19 Exhibit 1079 in IPR2024-00243 and Exhibit 1079 in
20 IPR2024-00244 are the same declaration?

21 A. The supplementary for the '159s should
22 be the same, and so that is -- I know them by the

1 patent numbers, not the 2-4 numbers.

2 I'm sorry, say the numbers again,
3 please.

4 Q. So it's IPR2024-00243, Exhibit 1079,
5 and IPR2024-0244, Exhibit 1079.

6 A. Yes. Yeah, those are the 15 -- on the
7 '159 patent. Yes, those are identical.

8 Q. Okay. And I just loaded Exhibit 1001,
9 which is U.S. Patent No. 10,722,159 to the chat.

10 (Exhibit 1001, Previously marked.)

11 Q. And I'm also going to upload to the
12 chat IPR2024-00241, Exhibit 1004, which is a patent
13 to Iwamiya.

14 (Exhibit 1004, Previously marked.)

15 Q. Please let me know when you have
16 Iwamiya open.

17 A. The 1 -- the 81 -- '819. Sorry, it
18 says '819? Yeah, '819.

19 Q. No, it's 1004 are the exhibit numbers.

20 A. Right, but isn't it -- yes, so --

21 Q. Oh, sorry, sorry, you're talking about
22 the patent number.

1 A. Yes, so Exhibit 1004 is Patent
2 No. '819 -- it ends in patent number '819.

3 Q. Correct.

4 And the first named inventor is
5 Iwamiya; correct?

6 A. Yes, correct.

7 Q. Is it okay if we refer to this patent
8 as the Iwamiya patent today, and you'll understand
9 what I'm talking about?

10 A. Yes.

11 Q. Will you please turn to Column 5
12 beginning at line 52 in Iwamiya.

13 A. Column 5, what line?

14 Q. Line 52.

15 A. Okay.

16 Q. Iwamiya illustrates a first embodiment
17 in Figures 1 to 10 and 30, as stated in that column;
18 right?

19 A. So in the '819 of the Iwamiya, first
20 embodiment applied to a wristwatch described with
21 reference to Figures 1 to 10 and 30.

22 Q. And Iwamiya describes the first

1 embodiment from Column 5, line 52, to Column 14,
2 line 52; right?

3 A. So the first embodiment is described
4 from Column 5, line 62, through Column 7, 8, 9, 10,
5 11, 12, 13, and 14, ending at roughly line 52 in
6 Column 14.

7 Q. Please turn to Column 8, lines 38 to
8 42.

9 A. Column 8, line?

10 Q. Lines 38 to 42.

11 A. 38. Okay.

12 Q. Column 8, lines 38 to 42, state, As
13 illustrated in Figures 3 and 4, between the light
14 receiving unit 9 and the scattered light taking
15 unit 8, an optical filter 17 is disposed in a state
16 where the optical filter is mounted on the lower
17 side of a light shielding frame 18 to surround the
18 light receiving unit 9.

19 Do you see that?

20 A. I do see that.

21 Q. Iwamiya discloses a light shielding
22 frame 18 as part of the first embodiment; right?

1 A. Well, what's described there is a --
2 is disposed in a state where the optical -- as
3 illustrated in Figures 3 and 4, between the light
4 receiving unit and the scattered light taking unit,
5 an optical filter 17 is disposed in a state where
6 the optical filter is mounted on the lower side of a
7 light shielding frame 18 to surround the light
8 receiving unit 9, yes.

9 Q. So Iwamiya discloses the light
10 shielding frame 18 as part of the first embodiment;
11 right?

12 A. Well, as I said, what's described
13 there is illustrated in Figures 3 and 4. There's a
14 light receiving unit, scattering light taking unit,
15 optical filter 17 disposed in a state where the
16 optical filter is mounted on the lower side of a
17 light shielding frame 18 to surround the receiving
18 unit 9.

19 Q. And this is a yes-or-no question.

20 Iwamiya discloses a light shielding
21 frame 18 as part of the first embodiment; right?

22 A. Well, it's describing many things as

1 part of the first embodiment in Figures 3 and 4, the
2 scattered light taking unit, optical filter lower
3 side of the light shielding frame 18 to surround the
4 light receiving unit.

5 Q. Are you able to provide a yes-or-no
6 answer to my question?

7 A. I did answer the question.

8 Q. Are you able to provide a yes-or-no
9 answer to my question?

10 MR. BISENIUS: Objection, asked and
11 answered.

12 BY MR. OLDHAM:

13 Q. You can answer.

14 A. I'm just noting you are frozen -- the
15 screen is frozen. So just making sure that I'm
16 coming through.

17 Q. You're coming through.

18 Are you able to provide a yes-or-no
19 answer to my question?

20 A. Can you repeat the question, please?

21 Q. Iwamiya discloses a light shielding
22 frame 18 as part of the first embodiment; right?

1 A. The paragraph you pointed out includes
2 a --

3 Q. No, wait --

4 A. -- Figures 3 and 4, between the
5 light --

6 Q. So the question that was pending is:
7 Are you able to provide a yes-or-no answer?

8 A. I am answering the question. It's a
9 little bit more than just a yes or no, other things
10 disclosed. So I'm answering your question in the
11 context of what is described here.

12 Q. So my understanding is you're not able
13 to answer that question yes or no; is that correct?

14 A. I'm answering the question in the way
15 that I think the question should be answered.

16 Q. And I'm asking if you can answer it as
17 a yes-or-no answer, and is that -- can you or can
18 you not?

19 MR. BISENIUS: Objection, asked and
20 answered.

21 THE WITNESS: It is not just a
22 yes-or-no answer to the question. Because

1 what is described in that paragraph is a --
2 multiple things.

3 As illustrated in Figures 3 and 4, a
4 light receiving unit 9, scattered light
5 taking unit 8, optical filter 17 disposed in
6 a state where the optical filter is mounted
7 on the lower side of a light shielding frame
8 to surround the light receiving unit, as I
9 just explained.

10 BY MR. OLDHAM:

11 Q. So you cannot give a yes-or-no answer
12 to the question: Iwamiya discloses a light
13 shielding frame 18 as part of the first embodiment;
14 right?

15 MR. BISENIUS: Objection, asked and
16 answered.

17 THE WITNESS: And light shielding
18 frames are discussed in many places
19 throughout there, and a light shielding frame
20 is described amongst other components in that
21 embodiment.

22

1 BY MR. OLDHAM:

2 Q. So you cannot give a yes-or-no answer
3 to the question of whether Iwamiya discloses a light
4 shielding frame 18 as part of the first embodiment;
5 right?

6 MR. BISENIUS: Objection, asked and
7 answered.

8 THE WITNESS: Again, what's described
9 there includes the light receiving unit,
10 scattered light taking unit, lower side of
11 light shielding frame, and surrounding the
12 light receiving unit. It describes all of
13 those things.

14 BY MR. OLDHAM:

15 Q. Okay. So --

16 A. By receiving is described in multiple
17 places in other embodiments, as well.

18 Q. Do you know if Iwamiya discloses a
19 light shielding frame 18 as part of the first
20 embodiment?

21 A. I talk extensively, as well, about the
22 light shielding frame in my declarations. And in

1 that paragraph that you pointed out in Column 8, it
2 describes the light taking unit 8, the optical
3 filter, the receiving unit, surrounding the light
4 receiving unit.

5 And then it describes multiple
6 embodiments. And it also highlights in Column 48,
7 for example, that there are additional advantages
8 and modifications will readily occur to those
9 skilled in the art. Therefore, the invention in its
10 broader aspects is not limited to the specific
11 details and embodiments shown and described.

12 And so various modifications can be
13 made without departing in the spirit or scope of the
14 general inventive concept. And light shielding
15 frame is described there, as you pointed out, but as
16 a teaching that's broadly applicable.

17 Q. Do you know if Iwamiya discloses a
18 light shielding frame 18 as part of the first
19 embodiment?

20 A. Well, I think that's the same question
21 that you've asked here, and I think I've answered it
22 as in that paragraph there's the light receiving

1 unit, scattered light taking unit, optical filter
2 disposed in a state where the optical filter is
3 mounted on the lower side of the light shielding
4 frame.

5 And that description that you pointed
6 out there is indeed described under the first
7 embodiment. And the light shielding frame, also a
8 POSITA would -- reading that would understand how
9 to -- how it's used and its general teaching.

10 Q. I want you to answer this question
11 without reading from your report.

12 Do you know if Iwamiya discloses a
13 light shielding frame 18 as part of the first
14 embodiment?

15 MR. BISENIUS: Objection, asked and
16 answered.

17 If it's helpful, Counsel, if you look
18 back on the realtime at 12:15:43, when you
19 asked this question the first time, you can
20 see that he responded "yes."

21 MR. OLDHAM: No, he didn't.

22 MR. BISENIUS: It literally says

1 "yes."

2 MR. OLDHAM: At 12:43? I don't see
3 anything with 12:43 on it.

4 MR. BISENIUS: 12:15:43. 12 o'clock,
5 15 minutes and 43 seconds is your question.

6 MR. OLDHAM: Okay.

7 MR. BISENIUS: And he responded "yes."

8 MR. OLDHAM: I don't see that. I
9 think we have different realtime feeds. But
10 let's go ahead and get him to answer the
11 question here.

12 BY MR. OLDHAM:

13 Q. So the question that was pending --

14 MR. OLDHAM: And by the way, please
15 don't interrupt when the question's pending.

16 BY MR. OLDHAM:

17 Q. So I want you to answer this question
18 without reading from your report.

19 Do you know if Iwamiya discloses a
20 light shielding frame 18 as part of the first
21 embodiment.

22 MR. BISENIUS: Objection, asked and

1 answered.

2 THE WITNESS: Well, as we pointed --
3 as we're discussing in Column 8, when we are
4 talking about the description of the first
5 embodiment in the Iwamiya specification,
6 there is, as described, as illustrated in
7 Figures 3 and 4, between the light receiving
8 unit 9 and the scattered light taking unit 8,
9 an optical filter 17 is disposed in a state
10 where the optical filter is mounted on the
11 lower side of a light shielding frame 18 to
12 surround the light receiving unit 9.

13 And it goes on to further explain
14 that, As illustrated in Figure 8, the optical
15 filter 17 is configured to transmit light of
16 a specific wavelength band of 900 nanometers
17 or more and shield light of a wavelength band
18 of 900 nanometers or less, such that the
19 light receiving unit 9 alleviates an
20 influence from a measurement change due to
21 external light, such as sunshine.

22 So, indeed, what is described there

1 includes a light shielding frame and other
2 components.

3 BY MR. OLDHAM:

4 Q. So my question was: Are you able to
5 answer that without reading?

6 A. I have not memorized the patents, and
7 what is described there is as I've answered.

8 Q. Okay. So I understand your answer to
9 mean that you are not able to answer the question of
10 whether Iwamiya discloses a light shielding frame 18
11 as part of the first embodiment unless you read it
12 from your report or the patent; is that right?

13 A. I have answered the question in the
14 context of the documents that are the basis of my
15 opinions, and I did not memorize the documents. I'm
16 pointing out where in the documents that I'm
17 answering your question.

18 Q. So you can't answer that question
19 without reading the documents.

20 Is that your testimony?

21 A. My testimony is I've answered your
22 question.

1 Q. And you understand your credibility as
2 a witness is going to be judged by the answers you
3 give here today; right?

4 A. Yes.

5 Q. Are you able to answer the question of
6 whether Iwamiya discloses a light shielding frame 18
7 as part of the first embodiment without reading from
8 other documents?

9 MR. BISENIUS: Objection, asked and
10 answered.

11 THE WITNESS: I am able to answer the
12 question, and I have answered the question.

13 BY MR. OLDHAM:

14 Q. So it's a yes-or-no question.

15 Does Iwamiya disclose a light
16 shielding frame 18 as part of the first embodiment?

17 MR. BISENIUS: Objection, asked and
18 answered.

19 THE WITNESS: So as is described there
20 in Column 8, there's a light taking unit
21 described as part of the first embodiment.
22 There's an optical filter described, there's

1 a light shielding frame, there's a light
2 receiving unit, all described as part of the
3 first embodiment.

4 And I also highlight that in
5 paragraph -- or line -- Column 48 also talks
6 about the fact that the things that are
7 described in various embodiments are
8 applicable to other -- just representative
9 embodiments. But certainly what's described
10 there includes a light shielding frame,
11 amongst other components.

12 BY MR. OLDHAM:

13 Q. All right. Now I want you to try and
14 answer the question without reading from other
15 documents. Okay?

16 Does Iwamiya disclose a light
17 shielding frame 18 as part of the first embodiment?
18 It's a yes-or-no question.

19 MR. BISENIUS: Objection, asked and
20 answered.

21 THE WITNESS: I have not read any
22 other documents other than the Iwamiya

1 document, and describing what's described
2 there includes the light receiving unit, the
3 scattered light taking unit, the optical
4 filter, the light shielding frame, light
5 receiving unit 9, as a representative
6 embodiment that's in the Section 1. And so
7 it includes all those pieces, yes.

8 BY MR. OLDHAM:

9 Q. So can we understand from that answer
10 that you are unable to answer my question without
11 reading from other documents?

12 Is that fair to say?

13 MR. BISENIUS: Objection, asked and
14 answered.

15 THE WITNESS: I was not reading from
16 other documents.

17 BY MR. OLDHAM:

18 Q. I saw your head looking down reading
19 from other documents. Look at the camera when I --
20 look at the camera, please, when I ask this
21 question --

22 MR. BISENIUS: Objection. You're

1 badgering the witness here.

2 MR. OLDHAM: No, I'm trying to get an
3 answer.

4 MR. BISENIUS: He said "yes" --

5 MR. OLDHAM: I'm -- I'm --

6 MR. BISENIUS: -- multiple times to
7 your question here.

8 MR. OLDHAM: Listen, I --

9 MR. BISENIUS: He said it --

10 MR. OLDHAM: Please let me make my
11 record. I need the witness to be looking at
12 the camera, not looking down reading
13 documents.

14 BY MR. OLDHAM:

15 Q. Dr. Anthony, will you please look at
16 the camera --

17 MR. BISENIUS: There's no
18 requirement -- do we need to end this? He's
19 allowed to read his reports. He's allowed to
20 reads the exhibits.

21 MR. OLDHAM: I'm allowed to ask if he
22 can answer the question without reading. I

1 let him read. He's read it many times. Now
2 I'm trying to figure out if he can answer the
3 question without reading.

4 Please stop interrupting my questions.

5 MR. BISENIUS: Objection to the nature
6 with which you're conducting this deposition.

7 BY MR. OLDHAM:

8 Q. Okay. Dr. Anthony, will you please
9 look at the camera when I ask you this question, and
10 don't look down?

11 Dr. Anthony, will you please look at
12 the camera?

13 Does Iwamiya disclose a light
14 shielding frame 18 as part of the first embodiment?

15 MR. BISENIUS: Objection, asked and
16 answered.

17 THE WITNESS: So in the Iwamiya, in
18 the first embodiment, in Figures 3 and 4, it
19 describes multiple things. It describes the
20 light receiving unit, the optical filter, the
21 light shielding frame, receiving unit.

22 And then later on in Column 48, it

1 describes that these are representative
2 embodiments, and certainly the light
3 shielding frame is described in -- amongst
4 other components in that first embodiment.

5 BY MR. OLDHAM:

6 Q. Okay. Now, keep looking at the
7 camera. Keep looking at the camera.

8 MR. BISENIUS: Objection.

9 BY MR. OLDHAM:

10 Q. Keep looking at the camera. Keep
11 looking at the camera.

12 Are you able to answer my question yes
13 or no, does Iwamiya disclose a light shielding frame
14 18 as part of the first embodiment?

15 MR. BISENIUS: Objection, asked and
16 answered. Objection to the nature with which
17 you're conducting this deposition today.

18 THE WITNESS: I believe I have
19 answered the question.

20 BY MR. OLDHAM:

21 Q. Yes or no, what was the answer?

22 A. Just to clarify, I wasn't -- I did not

1 understand that you could -- that I had to take my
2 answers from what you tell me the answers have to
3 be. I'm answering the question in the way that I
4 understand the question and the way that I
5 understand the references.

6 What's described in the embodiment in
7 Figures 3 and 4 includes the light receiving unit,
8 it includes the scattered light taking unit, some
9 filtering, the light shielding frame, and the light
10 receiving unit in -- that's described in embodiment
11 one.

12 And later on after the four
13 embodiments that are described, these are also
14 representative embodiments that are illustrative in
15 nature, but certainly what's described there
16 includes a light shielding frame.

17 Q. So are you able to use yes or no as
18 your only answer when I ask the question: Iwamiya
19 discloses a light shielding frame 18 as part of the
20 first embodiment; right?

21 MR. BISENIUS: Objection, asked and
22 answered.

1 THE WITNESS: I've answered the
2 question with yeses and noes and describing
3 what's described there. So as I've said,
4 what's described in embodiment one is not --
5 embodiment one is not just a light shielding
6 frame. It describes an embodiment -- many
7 things that include a light shielding frame
8 and other things.

9 BY MR. OLDHAM:

10 Q. So are you able to answer the question
11 with a yes-or-no answer --

12 MR. BISENIUS: Objection.

13 BY MR. OLDHAM:

14 Q. -- does Iwamiya disclose a light
15 shielding frame 18 as part of the first embodiment?

16 MR. BISENIUS: Objection, asked and
17 answered.

18 MR. OLDHAM: So I understand the
19 answer is no. He's not able to answer the
20 question with a yes or no; is that correct?
21 Is that what we're -- is that the answer?

22 MR. BISENIUS: You've asked this

1 question, I think, ten times at this point,
2 and he's answered multiple times.

3 MR. OLDHAM: Yeah, it's because
4 he's -- I have a nonresponsive witness.

5 MR. BISENIUS: And he's used the word
6 "yes" multiple times. You're trying to
7 confuse the witness because he doesn't know
8 what he's supposed to say to you. I pointed
9 out to you where he said yes the first time
10 you asked the question.

11 MR. OLDHAM: There's no -- there's
12 no --

13 MR. BISENIUS: I don't know what
14 you're looking for.

15 MR. OLDHAM: -- clear answer where
16 it's a simple yes or no. Don't distort the
17 record. There's no single time where -- you
18 show me where there's a single "yes" or a
19 single "no."

20 MR. BISENIUS: He puts it in context,
21 but says "yes."

22 MR. OLDHAM: Okay. Yeah, don't be

1 making stuff up on the record here.

2 MR. BISENIUS: You can go --

3 MR. OLDHAM: There is no single
4 yes-or-no answer. So don't be making stuff
5 up.

6 MR. BISENIUS: Okay. Objection --

7 BY MR. OLDHAM:

8 Q. Dr. Anthony --

9 MR. BISENIUS: -- asked and answered.

10 BY MR. OLDHAM:

11 Q. Dr. Anthony, are you able to answer
12 with a simple yes or no to the question: Does
13 Iwamiya disclose a light shielding frame 18 as part
14 of the first embodiment?

15 MR. BISENIUS: Objection, asked and
16 answered.

17 THE WITNESS: As a simple yes or no,
18 there is, as described there, yes, in that
19 embodiment, as described in Figures 3 and 4,
20 all of these things, the light receiving
21 unit, light scattering taking unit, optical
22 filter, and a light shielding frame. So,

1 indeed, light shielding frame is described as
2 part of that embodiment.

3 BY MR. OLDHAM:

4 Q. So I heard lots of words in there. I
5 did not hear a simple yes or no.

6 Can you give me a simple yes or no?

7 MR. BISENIUS: Objection, asked and
8 answered.

9 BY MR. OLDHAM:

10 Q. Are you able to answer the question
11 yes or no to whether Iwamiya discloses a light
12 shielding frame 18 as part of the first embodiment?

13 MR. BISENIUS: Objection, asked and
14 answered.

15 THE WITNESS: So yes, what's described
16 there includes a light shielding frame, light
17 receiving unit, and other components of that
18 first embodiment as representative of the
19 teachings. So yes, it's there as part of
20 embodiment one.

21 BY MR. OLDHAM:

22 Q. And you're not willing to provide a

1 simple yes-or-no answer; right?

2 MR. BISENIUS: Objection, asked and
3 answered.

4 THE WITNESS: I have answered the
5 question.

6 BY MR. OLDHAM:

7 Q. Okay. This is going to be a very long
8 deposition.

9 The light shielding frame in the first
10 embodiment shields light; right?

11 A. I do describe -- I talk a lot, at
12 least in paragraph -- let's see which declaration.
13 In the '159 supplemental declaration, I do
14 describe -- let's see. I do talk a bit about
15 Iwamiya on page 10 of the '159 supplemental in
16 paragraph 6, where I talk about the -- the --
17 Iwamiya's light shielding frame was made of light
18 shielding material.

19 However, as I discussed in my first
20 '243 declaration, Iwamiya's original light shielding
21 frame 18 was intended to block unwanted light from
22 reaching the photodiodes. Iwamiya does not disclose

1 a material or implementation for achieving that
2 light blocking functionality.

3 So the reflective material the Patent
4 Owner insists must be used to implement the light
5 shielding frame comes from different embodiments of
6 Iwamiya and is employed for different purposes than
7 the light shielding frame 18.

8 And as I discussed back in the '243
9 declaration, a POSITA would recognize that using a
10 dark-colored or black coating, as suggested by
11 Sarantos, would have resulted in predictable
12 benefits and improvements.

13 So as I say here, based on my review,
14 a POSITA would have recognized that an opaque and
15 light-absorbing material in the form of a
16 dark-colored coating like that taught in Sarantos to
17 be obvious and well-known for implementing the light
18 shielding frame function of Iwamiya's frame 18.
19 And, indeed, the use of such dark-colored coating
20 was common practice.

21 MR. OLDHAM: Eileen, are you able to
22 provide a copy of the transcript with time

1 stamps that show when the questions and the
2 answers are being provided?

3 THE REPORTER: Yes.

4 MR. OLDHAM: Thank you.

5 BY MR. OLDHAM:

6 Q. So, Dr. Anthony, this is a yes-or-no
7 question, and I want you to look at the camera while
8 you answer this question.

9 MR. BISENIUS: Objection.

10 BY MR. OLDHAM:

11 Q. The light shielding frame in the first
12 embodiment shields right -- strike that.

13 Dr. Anthony, please look at the camera
14 when you answer this question yes or no. The light
15 shielding frame in the first embodiment shields
16 light; right?

17 MR. BISENIUS: I'm going to object to
18 any more requests to make eye contact with
19 you while he's answering the questions.
20 Witnesses -- expert witnesses are allowed to
21 read from their documents of record in
22 this -- in these depositions.

1 There's no requirement that he needs
2 to look into the camera to answer you. So
3 objection to this question.

4 MR. OLDHAM: Please don't trample over
5 my record. I'm allowed to test the witness'
6 knowledge without reading from the documents.

7 BY MR. OLDHAM:

8 Q. Dr. Anthony, please look at the
9 camera, and please answer this question yes or no.
10 The light shielding frame in the first embodiment
11 shields light; right?

12 MR. BISENIUS: Objection.

13 THE WITNESS: Well, as I described --
14 as I described, Iwamiya is silent on how that
15 light shielding frame is fabricated and the
16 materials -- and I was describing in -- and
17 as I describe in my declaration, its
18 intention is to shield light. And the
19 teachings of Sarantos help give sort of more
20 clarity on how that could be done.

21 BY MR. OLDHAM:

22 Q. Are you able to answer that question

1 yes or no? Please look at the camera.

2 MR. BISENIUS: Objection.

3 BY MR. OLDHAM:

4 Q. Dr. Anthony, are you able to answer
5 that question yes or no?

6 A. Please, can you repeat the question
7 then?

8 Q. The light shielding frame in the first
9 embodiment shields light; right?

10 A. Well, as I've described, the function
11 of the light shielding --

12 Q. No, I'm asking you -- yes or no, are
13 you able to answer it yes or no? That's all I need
14 to know.

15 Are you physically able to answer that
16 question yes or no?

17 A. I'm answering it in the way that I've
18 formed my opinions and the context of what I've
19 described. And the light shielding frame as
20 described and as I highlight in my declaration, it
21 is serving a function of trying to shield light, and
22 the Sarantos teachings help to improve how that

1 performance would be done.

2 Q. But you are unable to provide a
3 yes-or-no answer as to whether the light shielding
4 frame in the first embodiment shields light; right?

5 A. Well, if we break down the words, a
6 light shielding frame, it's a frame that is
7 presumptively shielding light. But in the context
8 and the motive -- what I've described here in my
9 opinions, there's a strong motivation to take the
10 teachings of Sarantos, in combination with Iwamiya,
11 to accomplish that in a robust way.

12 Q. But you are physically unable to say
13 "yes" or "no" to the question of the light shielding
14 frame in the first embodiment shields light; is that
15 correct?

16 MR. BISENIUS: Objection, asked and
17 answered.

18 THE WITNESS: I believe I have
19 answered the question. Its light shielding
20 frame's intention is to shield light. And as
21 I describe, the POSITA would have recognized
22 the improvement that comes from using a

1 light-absorbing material, as taught by
2 Sarantos, to improve that function.

3 BY MR. OLDHAM:

4 Q. It's a yes-or-no question. Both of
5 those are single words. One has three letters, one
6 has two letters.

7 Are you able to answer this question
8 yes or no: Does Iwamiya -- does the light shielding
9 frame in the first embodiment shield light?

10 MR. BISENIUS: Objection, asked and
11 answered.

12 THE WITNESS: I believe I have
13 answered it. Iwamiya's light shielding
14 frame --

15 BY MR. OLDHAM:

16 Q. You're answering a different question.
17 Are you able to answer the question
18 yes or no? That's all I'm asking.

19 Are you able -- I'm asking if you're
20 able. Do you understand that?

21 A. When there's a question that merits a
22 simple yes or no without further explanation, I am

1 able to answer yes or no. But I'm answering it in
2 the way that I think makes the most sense given what
3 you're asking and given the context of the documents
4 that we're here today to discuss.

5 Q. So you are not able to answer with a
6 yes-or-no answer? If I'm understanding your ability
7 to answer this, right, not -- I don't want the
8 answer to the question. I want your ability to
9 answer this. Is that clear?

10 You are not able to answer the
11 question of whether the light shielding frame in the
12 first embodiment shields light with a yes-or-no
13 answer; is that correct?

14 MR. BISENIUS: Objection, asked and
15 answered. Objection, double negative.

16 THE WITNESS: I'm actually no longer
17 clear which question you're asking and which
18 question I'm trying to answer.

19 BY MR. OLDHAM:

20 Q. Okay. Let me explain --

21 A. The light shielding --

22 Q. No, let me explain it here. Just let

1 me clarify.

2 I'm asking about your ability and your
3 ability to provide a yes-or-no answer.

4 Do you understand that?

5 A. Yes.

6 Q. Thank you.

7 Are you able to answer this question,
8 and I'm asking about your ability, do you have the
9 ability to answer this question with a yes-or-no
10 answer, and the question would be: The light
11 shielding frame in the first embodiment shields
12 light; right?

13 MR. BISENIUS: Objection.

14 THE WITNESS: I do have the ability to
15 answer that question.

16 BY MR. OLDHAM:

17 Q. With a yes-or-no answer?

18 A. I do have the ability to answer that
19 question.

20 Q. With a yes-or-no answer; is that
21 correct?

22 MR. BISENIUS: Objection, asked and

1 answered.

2 THE WITNESS: With a yes-or-no

3 answer --

4 BY MR. OLDHAM:

5 Q. Okay.

6 A. -- that describes -- that also adds
7 the context of the --

8 Q. That's not a yes-or-no answer. I'm
9 sorry, that's not a yes-or-no answer; is it?

10 Do you understand the difference
11 between a yes-or-no answer and an answer with a lot
12 more words in it? Do you understand that?

13 A. Yes, I do.

14 Q. Okay. So let me ask this again. Are
15 you able to answer -- do you have the ability to
16 answer with yes or no the following question: Is
17 the light shielding frame in the first embodiment
18 shielding light?

19 MR. BISENIUS: Objection; asked and
20 answered.

21 THE WITNESS: I do have the ability to
22 answer that question, yes.

1 BY MR. OLDHAM:

2 Q. With a yes-or-no answer; right?

3 A. I do --

4 MR. BISENIUS: Objection.

5 THE WITNESS: -- have the ability to
6 answer that question with a yes-or-no answer.

7 BY MR. OLDHAM:

8 Q. Okay. Will you please answer it with
9 a yes-or-no answer and nothing else? The light
10 shielding frame --

11 A. I have the ability --

12 Q. Okay. You have the ability to do it,
13 but you're not going to. Is that what you're
14 telling me?

15 A. You asked if I had the ability, and
16 I'm saying that I have an ability. And now you're
17 asking a question, and I'm answering the question.

18 Q. Okay. So using your ability to
19 provide a single word answer, yes or no, does the
20 light shielding frame in the first embodiment shield
21 light?

22 MR. BISENIUS: Objection, asked and

1 answered.

2 THE WITNESS: So as I've described,
3 the light shielding frame --

4 BY MR. OLDHAM:

5 Q. No. No, I'm not asking -- you're
6 answering the wrong -- you told me you had the
7 ability. I want to see your ability. Show me your
8 ability. Okay?

9 Show me that you're able to answer the
10 following question with a yes-or-no answer: Does
11 the light shielding frame in the first embodiment
12 shield light?

13 A. As I've described --

14 MR. BISENIUS: Objection, asked and
15 answered.

16 THE WITNESS: -- I've answered the
17 question. The light shielding frame is
18 intended to block light. Iwamiya is -- as I
19 described in the motivation to combine,
20 Iwamiya is silent on what that material would
21 be, and that was motivation to combine to add
22 the functionality of Sarantos.

1 BY MR. OLDHAM:

2 Q. I'm trying to conduct this deposition
3 as efficiently as possible so that we can all get
4 out of here, but I need yes-or-no answers to
5 yes-or-no questions. And this deposition is going
6 to go very long if we're not able to -- if you don't
7 have the ability to answer yes or no, just tell me,
8 I don't have the ability to answer yes or no.

9 But when you say you have the ability
10 to answer yes or no and then you won't do it, I have
11 to stay on the same question until I -- because I --
12 now I know that you have the ability to do it, and
13 until I get the answer that shows you can do it, I
14 have to stay on this question. It's going to be a
15 very long deposition.

16 Yes or no, does the light shielding
17 frame in the first embodiment shield light?

18 MR. BISENIUS: Objection, asked and
19 answered.

20 THE WITNESS: The light shielding
21 frame, as described, is intended to shield
22 light. And what is described in my

1 declarations is giving the context of how I
2 use that in forming my opinions and why
3 Sarantos would beneficially be combined. So
4 it's intended to shield light as I described,
5 yes.

6 BY MR. OLDHAM:

7 Q. So can I understand from your answer
8 that you are intentionally refusing to answer yes or
9 no, even though you have the ability to answer yes
10 or no; is that fair?

11 A. I am answering the question. I don't
12 understand -- I did not understand that you can
13 constrain the way that I answer a question. I'm
14 answering the question as an expert in the context
15 of what we're describing.

16 Q. Well, I'm sorry, I can -- actually,
17 maybe that's why I'm the attorney here. I can
18 constrain how you answer the question.

19 So with that understanding, understand
20 that I can constrain your answers to yes or no and
21 you have the ability to answer yes or no, so far
22 you've been refusing to answer yes or no, and I have

1 to stay on this question until you answer yes or no
2 because you told me you have the ability to answer
3 yes or no.

4 Does Iwamiya disclose a light
5 shielding frame in the first embodiment that shields
6 light?

7 (The reporter seeks clarification.)

8 BY MR. OLDHAM:

9 Q. Yes or no, this is the constraint, do
10 you understand that?

11 Do you understand that, Dr. Anthony?

12 A. I've given my answer. I've explained
13 how I --

14 Q. No. Answer my question --

15 (The reporter seeks clarification.)

16 BY MR. OLDHAM:

17 Q. Dr. Anthony, do you understand that
18 you have to answer this question yes or no?

19 Please answer.

20 A. I'm sorry, was there a question?

21 Q. Do you understand that you have to
22 answer my yes-or-no question with a "yes" or "no"?

1 A. I have answered your question several
2 times now.

3 Q. Do you understand that you have to
4 answer my yes-or-no question with a "yes" or a "no"?

5 A. I'm answering the question in the way
6 that I think the question should be answered,
7 describing yes or no with a little bit of
8 explanation as to why it's yes or no.

9 Q. But you don't get to do that here.
10 I'm the one asking the questions, and I'm stuck with
11 my yes-or-no answers, if that's how I ask the
12 question. Okay. You don't get to refrain my
13 question. I'm the one that's asking the questions.
14 You provide the answers, and until we can get past
15 simple -- these are very simple questions.

16 The finder of fact is going to be
17 looking at these questions and say, Why in the world
18 can this expert not answer the question of whether
19 the light shielding frame in the first embodiment
20 shields light?

21 This is your credibility. So please
22 answer with a yes-or-no answer.

1 MR. BISENIUS: Objection, badgering
2 the witness.

3 BY MR. OLDHAM:

4 Q. Does the light shielding frame in the
5 first embodiment shield light?

6 A. And in defense of my credibility, as
7 I've described, it shields light, and it's silent on
8 the mechanism -- the material by which that would be
9 sufficiently done. And Sarantos, as I describe in
10 my declaration, sort of in the combination, gives
11 more clarity on how that would be done.

12 So my credibility is absolutely on the
13 table here, and I'm describing how I come to my
14 answer, which is the basis of my credibility.

15 Q. And so you can't provide a yes-or-no
16 answer; is that right?

17 A. I have several times now, sir.

18 Q. No, you have not. A "yes" is a one
19 word. A "no" is a one word.

20 MR. BISENIUS: Objection, badgering
21 the witness.

22

1 MR. OLDHAM: Well, no. Apparently,
2 we're having some misunderstandings here, and
3 I'll just trying to clarify.

4 BY MR. OLDHAM:

5 Q. "Yes" is one word. "No" is one word.

6 MR. BISENIUS: He said "yes" to your
7 question.

8 BY MR. OLDHAM:

9 Q. Are you able to provide a one-word
10 answer to the question --

11 MR. BISENIUS: Counsel, he said "yes"
12 to your question --

13 MR. OLDHAM: Stop interrupting my
14 questions. Stop interrupting my questions.
15 Stop interrupting my questions.

16 MR. BISENIUS: I object to you
17 badgering the witness.

18 MR. OLDHAM: Stop interrupting my
19 questions. This deposition is going to go
20 very long the way we're going here. I'm on
21 my second question, and I can't get a
22 yes-or-no answer.

1 BY MR. OLDHAM:

2 Q. Dr. Anthony, yes or no, one-word
3 answer, does the light shielding frame in the first
4 embodiment shield light?

5 MR. BISENIUS: Objection, asked and
6 answered. Objection to badgering the
7 witness. He's answered "yes" to this
8 question multiple times and given context for
9 his answer. He can answer the questions in
10 the way --

11 MR. OLDHAM: Please withhold your
12 speaking objections.

13 BY MR. OLDHAM:

14 Q. You can answer, Dr. Anthony.

15 A. I'm sorry, can you repeat the
16 question, then.

17 Q. Yes or no, one-word answer, does the
18 light shielding frame in the first embodiment shield
19 light?

20 A. As I've described, yes. And as I've
21 described in the context of my answer, I'm pointing
22 to my declaration that gives the context for the

1 motivation to combine with Sarantos, and it's how it
2 would help to accomplish that light shielding
3 functionality.

4 Q. But you can't provide a yes-or-no
5 answer. Is that the understanding?

6 A. I have, sir.

7 Q. No, you haven't. "Yes" is one word,
8 and "no" is one word.

9 Do you understand that?

10 MR. BISENIUS: Objection, asked and
11 answered. Objection, badgering the witness.

12 BY MR. OLDHAM:

13 Q. Do you understand that "yes" is one
14 word?

15 Dr. Anthony, do you understand that --

16 A. Yes, I do.

17 Q. -- "yes" is one word?

18 A. Yes, I do understand that "yes" is one
19 word.

20 Q. Do you understand that "no" is one
21 word?

22 A. Yes, I understand that "no" is one

1 word.

2 Q. I'm asking you a question that's
3 calling for a one-word answer. The light shielding
4 frame in the first embodiment shields light; right?

5 MR. BISENIUS: Objection, asked and
6 answered.

7 THE WITNESS: I have asked -- you have
8 asked. I have answered this. The light
9 shielding frame is intended to shield light,
10 yes. And in the context of what I described
11 there, Sarantos teaches more on how that
12 would be beneficially accomplished.

13 BY MR. OLDHAM:

14 Q. The light shielding frame surrounds
15 the light receiving unit 9; right?

16 A. So what's described there is -- in
17 Column 8 is the optical filter mounted on the lower
18 side of the light shielding frame 18 to surround the
19 light receiving unit 9.

20 Q. That's a yes; right?

21 That's a yes; right?

22 A. I'm sorry?

1 Q. That's a yes; right?

2 A. Well, what I said is, yes, what's
3 described there is the lower side of the light
4 shielding frame 18 that surrounds the light
5 receiving unit 9. That is what's described in
6 Column 8, lines 40, 41.

7 Q. An optical filter is mounted on the
8 lower side of the light shielding frame; right?

9 A. What is described there is the optical
10 filter is mounted on the lower side of the light
11 shielding frame 18 to surround the light receiving
12 unit 9.

13 And at some point soon, it would be
14 good to take a quick bio break. Just whenever we
15 get a break --

16 Q. So your answer was a yes; correct?

17 A. My answer was, yes, what's described
18 there is the optical filter is mounted on the lower
19 side of the light shielding frame and surrounds the
20 light receiving unit 9.

21 MR. OLDHAM: All right. We can take a
22 break. How long do you want?

1 THE WITNESS: Five minutes.

2 MR. OLDHAM: Okay. Sounds good.

3 THE REPORTER: All right. We're off
4 the record.

5 (Recess from the record.)

6 THE REPORTER: We're back on the
7 record.

8 BY MR. OLDHAM:

9 Q. Please turn to Iwamiya Column 8,
10 lines 42 through 47. And those lines state, As
11 illustrated in Figure 8, the optical filter 17 is
12 configured to transmit light of a specific
13 wavelength band of 900 nanometers or more and shield
14 light of a wavelength band of 900 nanometers or
15 less, such that the light receiving unit 9
16 alleviates an influence from a measurement change
17 due to external light, such as sunlight.

18 Do you see that?

19 A. Yes, I do.

20 Q. The optical filter blocks light with
21 wavelengths less than 900 nanometers; right?

22 A. The listed figure there, transmit

1 light of a specific wavelength band of
2 900 nanometers or more and shield light of a
3 wavelength of 900 nanometers or less. So it's
4 intended to shield light of 900 nanometers or less,
5 yes.

6 Q. Figure 3 shows a side view of the
7 first embodiment; right?

8 A. Figure 3 -- I believe I discuss
9 Figure 3 and Figure 4, and Figure 3 is described
10 as -- yes, from the first embodiment.

11 Q. And Figure 3 shows a side view of the
12 first embodiment; right?

13 A. Yes, a cross-sectional view.

14 Q. Figure 3 shows a side view of the
15 light shielding frame 18; right?

16 A. It shows a cross-sectional view of the
17 embodiment described in, yes, including 18.

18 Q. The cross-sectional view of the light
19 shielding frame 18 shows that it is wider at the top
20 and narrower at the bottom; correct?

21 A. Along which dimensions are you
22 referring to?

1 Q. So there's vertical, and there's
2 horizontal. Is that what you're asking about?

3 When I say "top" and "bottom" --

4 A. Well, the --

5 Q. Help me understand the confusion.

6 A. You asked about the dimensions of the
7 light shielding frame, and there's -- the light
8 shielding frame is made of a material there that
9 seems to have uniform thickness, at least as drawn
10 in that cross-sectional view.

11 Q. I'm not asking about the thickness of
12 the frame. I'm asking about the overall size of the
13 light shielding frame.

14 Do you see that it is wider at the top
15 and narrower at the bottom?

16 A. I don't want to assume which axes
17 you're talking about, but the material itself at the
18 top is one thickness, and at the bottom it's the
19 same thickness. So it's the same width from the top
20 and the bottom of the material.

21 Q. Do you see that there are two sides in
22 the cross-sectional view of light shielding

1 frame 18?

2 A. Do you want to bring up the figure to
3 make sure we're understanding each other?

4 Q. Let me see if I can do that.

5 Do you see Figure 3?

6 A. Now I do, yes.

7 Q. Okay. And do you see on the left
8 side, there's a callout 18? Are you able to see my
9 cursor?

10 A. Yes, I can see your cursor.

11 Q. Callout 18 connects to an upper
12 portion of the light shielding frame 18; right?

13 And do you see on the other side,
14 where my cursor is, there's a corresponding portion
15 of light shielding frame 18? Do you see the other
16 side of light shielding frame 18?

17 A. Yes, I see your cursor, as well.

18 Q. And do you agree that the other side
19 is also light shielding frame 18?

20 A. Yes, I think that's correct.

21 Q. And do you see where my cursor is at
22 the top of light shielding frame 18?

1 A. Yes.

2 Q. And the distance from the left to the
3 right at the top is greater than the distance if I
4 go down to the bottom of the light shielding frame
5 from left to right? Do you see that it's wider at
6 the top and narrower at the bottom?

7 A. Yes, I do.

8 Q. Figure 3 shows a side view of the
9 optical filter 17; right?

10 A. A cross-sectional view, yes.

11 Q. The cross-sectional view shows that
12 the optical filter 17 is at the bottom of the light
13 shielding frame 18; correct?

14 A. It shows it as sort of at the -- the
15 inverted cutoff pyramid, I guess if you want to
16 describe it, yes, across the -- or in one contiguous
17 surface between the frame on the left, the filter
18 and the frame on the right.

19 Q. Do you see that Figure 3 shows a
20 cross-sectional view of the scattered light taking
21 unit 8?

22 A. Yes, at the bottom it has the beam

1 with the light shaping curvature in it, yes.

2 Q. So it's the -- sorry, the item that
3 has a spherical cutout, is that what you're
4 referring to with the curvature?

5 A. Element 8. Element 8 is the light
6 receiving unit.

7 Q. Can you please turn to Column 7,
8 lines 55 to 57?

9 A. Column 7, say again, 50 --

10 Q. Column 7, lines 55 to 57. And I'll
11 read what it says there.

12 "The scattered light taking unit 8 is
13 formed in a shape of a concave lens to increase
14 light reception sensitivity of an outer
15 circumferential portion of the scattered light
16 taking unit 8."

17 Do you see that?

18 A. Yes.

19 Q. So the outer shape of the scattered
20 light taking unit 8 is circular; right?

21 A. Yes, I believe it is circular.

22 Q. And if you could open up Exhibit 1079

1 from the '241 IPR. Maybe I can open that up, as
2 well, so we can look at it together. And I'm going
3 to go to page 25.

4 Okay. I have it on the screen here.

5 A. So this is -- I'm sorry, this is the
6 supplemental declaration or this is the --

7 Q. The supplemental, Exhibit 1079. And
8 this is in the '241 IPR, page 25. I believe there
9 are similar -- I believe there are similar figures
10 in the other IPRs, as well. This is just for
11 reference.

12 So the outer shape of the scattered
13 light taking unit 8 is circular; right?

14 A. I'm sorry, repeat that.

15 Q. The outer shape of the scattered light
16 taking unit 8 is circular; right?

17 A. Correct.

18 Q. Figure 2 is a view of the back cover
19 of Iwamiya's first embodiment; right?

20 A. Figure 2 is a plan view of the main
21 portion of the back cover of wristwatch of Figure 1,
22 which is the first embodiment.

1 Q. And can we say that this is a view of
2 the back cover?

3 A. Right. It's the -- as it's described,
4 it's the main portion of the back cover of the --
5 what's in Figure 1, which is the first embodiment.

6 Q. You made annotations to Figure 2 in
7 your supplemental declaration; right?

8 A. Yes, as the light -- as I point there,
9 to the light block, which is surrounding --

10 Q. Your annotations -- sorry, go ahead.

11 A. -- which is surrounding the light
12 taking unit.

13 Q. And your annotations to Figure 2 state
14 that light taking unit 8 is circular; right?

15 A. You broke up there. Can you repeat?

16 Q. Your annotations to Figure 2 state
17 that light taking unit 8 is circular; right?

18 A. Right. And the light block is
19 surrounding it, yes.

20 Q. Do you see a series of concentric
21 circles in Figure 2?

22 A. There are many circles, yes, in

1 Figure 2.

2 Q. And so if we start from the center and
3 work outward, the second -- I'll call it the second
4 innermost circle, does that make sense?

5 A. Probably be better if you point to it
6 so that we're clear on what we're --

7 Q. Well, but I need a written record. So
8 I need -- how would you like to describe this circle
9 where the cursor is right here?

10 Can we see that's the second innermost
11 circle?

12 A. It's the -- I guess the inner side of
13 my annotation. So -- okay.

14 Q. So the inner side of the blue circle,
15 is that what we're talking about?

16 A. Assuming that's where you're pointing
17 to, yes.

18 Q. Okay. And that shows the outer edge
19 of the light taking unit 8; correct?

20 A. That would be the outer edge of the --
21 I guess I would also point out, for example,
22 referencing Figure 2, as you have on the screen, to

1 my annotated Figure 3 in the '15 -- in my first
2 declaration in the '159 Iwamiya, where I show the
3 surface 15, which is the light reflection layer, as
4 a light block that is that outer -- that inner
5 boundary that's surrounding the light taking unit 8.

6 Q. Okay. And I'm not really asking
7 questions about the light block right now. I just
8 want to make sure I understand -- that we're all in
9 agreement on what the circular light taking unit 8
10 is. And so I'm just trying to make sure that we
11 have an understanding of what the circular light
12 taking unit 8 is in this figure.

13 So maybe you can give me your
14 understanding of what circular light taking unit 8
15 is in Figure 2?

16 A. It is -- as it's being pointed to
17 there, it's the region inside of the -- my
18 annotation in blue through which we're seeing the
19 frame, the LEDs, the opening in the frame and -- but
20 it's the bottom surface of the light taking unit,
21 through which we can see --

22 Q. You mentioned the frame -- you

1 mentioned the frame. Can you describe what you're
2 talking about with the frame?

3 A. The frame is the -- let's see. The
4 horizontal -- the things that I've pointed to as 18
5 is the frame. And then there's the hole in the
6 frame where the filter would be that's over atop the
7 LEDs -- or the red squares, the receivers.

8 Q. And so the frame is the rectangular
9 shape 18; right?

10 A. I believe that is the case, 18, yes.

11 Q. And as we looked at Figure 3, we saw
12 that the upper portion of the frame was wider than
13 the lower portion of the frame; right?

14 A. Well, the frame would -- you know,
15 what's shown there is the outer edge of the frame,
16 and so that's just the surface view. And comparing
17 it to the cross-sectional view of that frame would
18 be going down from the edges of the -- the thing
19 that's pointed to as 18, down to the filter -- or
20 the opening for the filter.

21 Q. Okay. And the opening for the filter
22 is kind of the square portion in the center; is that

1 right? Well, let's strike that. There's --
2 there's, I guess, too many squares for that to be a
3 good question.

4 So there's a -- can we agree that 18
5 is pointing to a larger rectangle that is wider than
6 it is high?

7 A. 18 is -- well, it's pointing to -- and
8 there's a piece that is sort of dotted line, as
9 well, right, that actually -- hold on.

10 So the -- 18 includes the piece that
11 is in the circle, if you will, and the thing goes
12 out to the dotted lines outside of the circle. So
13 that would be the 18, which is the light shielding
14 frame. And it extends beyond, as you can also see
15 in Figure 2.

16 Yeah, I mean, so that -- for 18 is the
17 lines that are solid inside of the blue -- what I've
18 annotated as the blue circle and the dotted lines
19 that are also outside of the circle.

20 Q. Okay. And the dotted lines represent
21 the widest part of the light shielding frame 18;
22 right?

1 A. Yeah, the 18 is the light shielding
2 frame.

3 Q. And we saw in Figure 3 that the light
4 shielding frame tapered on both sides. Both the
5 left and the right taper from the top to the bottom;
6 is that right? In Figure 3?

7 A. Yes, they taper from the top to the
8 bottom -- or from the -- yes, in that orientation.

9 Q. And so the narrower part of the light
10 shielding frame is shown in solid black, but there's
11 a -- you can see that the outline of the light
12 shielding frame -- the thickness, if you will,
13 continues down into what looks like a rectangle
14 going the other direction; is that right?

15 A. It would probably be better to point
16 with your cursor, because I'm not following you.

17 Q. So I'm trying to describe -- and it
18 would maybe be better if you described it, but I'm
19 trying to describe this -- do you see the cursor
20 here --

21 A. Yes.

22 Q. -- where I'm moving it around?

1 And that would be -- you can see that
2 there -- if the frame has a width, you can see that
3 the -- and when I say "the width," I'm talking about
4 the width of the material, not the width of the
5 overall frame. Does that make sense?

6 The thickness. How about we say a
7 thickness, the frame has a thickness. Do you
8 understand what I'm saying when I say that?

9 A. Again, I'm not sure which dimensions
10 you're pointing to here.

11 Q. Okay.

12 A. If you can zoom in on it and make sure
13 we're clear.

14 Q. Sure.

15 So you see my cursor drawing around
16 this portion right here; right? Can you see my
17 cursor move?

18 A. Yes.

19 Q. And you agree that's the lower part of
20 the light shielding frame; right?

21 A. In comparing that figure to Figure 3,
22 so that's probably the tapered portion, if you will,

1 of the bottoms of the frame.

2 Q. Okay. And I'm trying to find the best
3 way to describe that. Do you have a way of
4 describing that in the figure, in words?

5 A. Well, it's labeled as 18. So --

6 Q. Okay.

7 A. -- I guess I'm not sure which --

8 Q. Well, maybe I can help.

9 So you see callout 8 that points to --
10 it kind of ends in empty space? Do you see that?

11 A. Yes.

12 Q. And where callout 8 ends in empty
13 space, to the right of that there is a vertical
14 line.

15 Do you see that?

16 A. Yes.

17 Q. And then just to the right of that,
18 there's another vertical line.

19 Do you see that?

20 A. Can you point to the line? Sorry,
21 which --

22 Q. You see there are two vertical lines

1 running in parallel?

2 A. Yes.

3 Q. And those both correspond to the light
4 shielding frame 18; right?

5 A. 18. Okay. Lower side of the light
6 shielding frame 18. So light shielding frame is 18.
7 9 is the light receiving unit, and that's the --
8 it's pointing to that square that's around my
9 annotations of the red squares. And so -- and 8 is
10 the scattered light taking unit, yes.

11 Q. Okay. So the -- just to be clear, the
12 two vertical lines just to the right of where the
13 callout to 8 ends, those two vertical lines are part
14 of the light shielding -- sorry, the light shielding
15 frame 18; correct?

16 A. I'm sorry, can you ask that again?

17 Q. Callout 8 ends in what looks kind of
18 like empty space. And to the right of where it
19 ends, there are two vertical lines that are part of
20 the light shielding frame 18; right?

21 A. Yes, 18 is the light shielding frame,
22 and 8 points to the light receiving -- sorry, the

1 scattered light taking unit.

2 Q. And it's not a big issue. I'm just
3 trying to get clarity. But the two vertical lines
4 to the right of where callout 8 ends, that's part of
5 light shielding frame 18; right?

6 A. Well, it's also not shown here --
7 let's see. What's not shown here is the -- let's
8 see. 17 is labeled here, which is the -- the
9 filter; is that correct? Let's see.

10 So 18 is denoting the -- some of the
11 structural components of the light shielding frame.

12 Q. All right. And so my question is:
13 Are those vertical lines part of that structure?

14 A. Yes, I think that's part of the --
15 what's not shown here is the filter.

16 Q. Okay. And I wasn't trying to make it
17 complicated. It's just hard to describe with words.

18 So the light shielding frame --

19 A. And there's an opening that --

20 Q. Go ahead.

21 A. -- I think that would be in that
22 light -- there's an opening that would -- lets the

1 light pass through into the light receiving unit
2 through the light shielding frame.

3 Q. Okay. And that would be the -- so we
4 were just talking about two vertical lines next to
5 8. The opening would be the right line. Is that
6 what you're saying?

7 A. Well, it's unclear completely here
8 because it's not -- what's not labeled is the -- is
9 17 denoting exactly where that sits relative to
10 everything.

11 Q. Okay. The light shielding frame 18
12 has four sides; right?

13 A. Well, I mean, if you're just talking
14 about the external convex hull -- or not even convex
15 hull -- external perimeters, it's rectangular in
16 nature. It has -- a rectangle has four sides, but
17 there's multiple surfaces there.

18 Q. Four surfaces; is that right?

19 A. I'm sorry?

20 Q. There would be four surfaces, right,
21 for the four sides?

22 A. Well, but it's not -- I mean, we're

1 looking at a plan view. So it's not a -- it's a
2 three-dimensional object. So it has sides where
3 things join the bottom surface where the light
4 filter -- or the opening would be, which is not
5 shown in the filter that would be inside of it.

6 Q. Okay. So there would be -- if you
7 were looking at a 3D view, there would be four side
8 surfaces, and then the bottom surface would be where
9 the filter is; is that right?

10 A. Well, what's not shown in this view is
11 where the projection of the filter is. So the
12 filter is an opening in the frame that would allow
13 light to be passing through it to the detector unit.

14 Q. Okay. And the frame is a rectangular
15 tube with a wider top and a narrower bottom; right?

16 A. I'm sorry?

17 Q. So thinking of a 3D view, the frame
18 looks like a rectangular tube with a wider top and a
19 narrower bottom; right?

20 A. Well, at least as what's drawn here,
21 there is -- if we look at the inner rectangle
22 that's -- as some of the profile lines of the frame,

1 it is a rectangle that -- in the orientation of the
2 page has a height that seems to be bigger than the
3 width, at least as drawn here.

4 Q. And the four sides of the shielding
5 frame 18 would all be on different planes; is that
6 right? Strike that.

7 If we were looking at a 3D view of the
8 light shielding frame 18, the four sides would be on
9 different planes; right?

10 A. I guess I'm not completely sure what
11 you're -- you have a visualization in mind. I'm not
12 sure that I understand what your visualization is.

13 Q. Yeah, I know it's hard to -- and I'm
14 not very good with describing isometric designs with
15 words.

16 Let's take a look at the second
17 embodiment in Iwamiya. So if you could turn to
18 Column 14, beginning at line 54.

19 A. Column --

20 Q. Column 14, line 54.

21 A. Okay.

22 Q. And Iwamiya describes the second

1 embodiment -- well, strike that.

2 Iwamiya illustrates a second
3 embodiment in Figures 11 to 14 and 30; right?

4 A. Let's see. Second embodiment
5 references Figures 11 to 14 and 30, yes.

6 Q. I'm not sure if your answer was clear.
7 What was the answer? Was that a yes or no?

8 A. You asked -- well, can you reask the
9 question? Apologies.

10 Q. Okay. Iwamiya describes the second
11 embodiment from Column 14, line 54, to Column 26,
12 line 49 -- sorry, strike that.

13 Iwamiya illustrates a second
14 embodiment in Figures 11 to 14 and 30; right?

15 A. That is as described in that Column 14
16 at lines 56 through 58, yes.

17 Q. And Iwamiya describes the second
18 embodiment from Column 14, line 54, to Column 26,
19 line 49; right?

20 A. To Column 26, line 55, I think, yeah.

21 Q. Can you please turn to Column 18? And
22 I'm going to start at line 61 -- line 61 to 65.

1 Those lines state, In this case, the
2 holder portion 43 of the light receiving unit 33 is
3 formed of a metal with a light shielding property,
4 such as aluminum, and its surface is subjected to
5 aluminite -- strike that -- alumite treatment to
6 have a reflection function. Thereby, the light
7 receiving element 33a can be optically protected.

8 So the light -- sorry, strike that.

9 The holder portion 43 acts as a light
10 shield; right?

11 A. So I do discuss -- I'm just
12 referencing my supplementary declaration in the
13 '743. On page 15, I'm comparing the embodiment of
14 Figure 3 and in Figure 13, where we have the holder
15 portion 43 in one and the light shielding frame in
16 the other and discussing how they are different
17 embodiments that have different geometries and so
18 treated differently. Just reassociating myself with
19 what I had written.

20 Can you go ask the question again,
21 please, then?

22 Q. The holder portion 43 acts as a light

1 shield; right?

2 A. Right. So the second embodiment has a
3 different geometry. And as I describe in my
4 declaration of the -- my supplemental declaration on
5 the '743 on paragraphs 10, for example, and through
6 11 and 12, you know, highlighting that in -- you
7 know, in that embodiment, which is the -- not the
8 embodiment, but I'm describing in my proposed
9 combinations.

10 But that is a different geometry
11 serving, as well, a function in that other
12 embodiment of blocking some light, yes.

13 Q. And I think you misunderstood my
14 question. So let me ask it again.

15 The holder portion 43 acts as a light
16 shield; right?

17 A. Well, what's described there in that
18 case in paragraph 18 -- I'm sorry, Column 18, the
19 holder portion 43 of the light receiving unit 33 is
20 formed of a metal with a light shielding property,
21 such as aluminum, and the surface is subjected to
22 alumite treatment to have a reflection function.

1 Thereby, the light receiving element in that second
2 embodiment can be optically protected.

3 And, again, as I was pointing out,
4 though, you know, I'm using the first embodiment in
5 my description of what Sarantos, in combination with
6 Iwamiya, teaches.

7 Q. But I just want to make sure you
8 understand my question. The holder portion 43 acts
9 as a light shield; right?

10 A. As I subscribed in that embodiment,
11 which is not the embodiment that I'm using to form
12 my opinions in the declaration, but it's, as
13 described there, formed of a metal with a light
14 shielding property. So presumptively, it's there to
15 shield some light in that embodiment.

16 Q. Okay. Can you -- let's move to
17 Columns -- sorry, Column 18, lines 51 to 55. And
18 those lines state, As illustrated in Figures 13 and
19 14, at the lower side of the light receiving
20 element 33a, that is, between the light receiving
21 element 33a and the scattered light taking unit 8,
22 an optical filter 17 is disposed in the holder

1 portion 43 positioned below the light receiving
2 element 33a.

3 So my question is: The light shield
4 surrounds the light receiving element 33a; right?

5 A. Again, in forming my opinions talking
6 about embodiment No. 1 with a particular
7 configuration of the light shielding frame and why a
8 POSITA would understand that that met the sort of --
9 he taught what was claimed, but in this alternative
10 embodiment, it has a different geometry.

11 In that embodiment, which is not the
12 one that I was using in describing my opinions, it
13 seems to -- with that different geometry also
14 helping to separate the various components and the
15 light.

16 Q. The light shield surrounds the light
17 receiving unit element 33a; right?

18 A. I'm sorry, say that again.

19 Q. The light shield surrounds the light
20 receiving element 33a; right?

21 A. So in that embodiment, again, which is
22 not the one that I used in forming my opinions, the

1 figure -- as illustrated in Figures 13 and 14, the
2 lower side of the light receiving elements 33a, the
3 scattered light taking unit 8 and the optical filter
4 17 is disposed in the holder portion of 43, which
5 I've annotated in red on page 15 of my supplemental
6 declaration for the '743, and I'm sure other places.

7 And that has -- is surrounding the
8 light taking unit. And in this case, the holder
9 portion 43 -- continuing in Column 18, line 61, the
10 holder portion 43 of the light receiving unit is
11 formed of a metal with a light shielding property,
12 such as aluminum.

13 And continuing in line 64, thereby,
14 the light receiving element 33a can be optically
15 protected. But, again, as I've described in my
16 declaration, I'm opining on how thick the embodiment
17 of Figure -- embodiment No. 1 embodying Figure 3 with
18 the light shielding frame, in combination with
19 Sarantos, is -- teaches the art.

20 Q. An optical filter is mounted on the
21 lower side of the light shield in the second
22 embodiment; right?

1 A. In the second embodiment on Column 18,
2 line 53, 54, scattered light taking unit 8 and
3 optical filter 17 is disposed in their holder
4 portion 43 positioned below the light receiving
5 element 33a. But, again, that's not the embodiment
6 that I was opining on in forming my opinions.

7 Q. The light shielding frame holds the
8 optical filter; right?

9 A. You broke up, I'm sorry.

10 Q. The light shielding frame holds the
11 optical filter; right? Strike that.

12 The light shield holds the optical
13 filter; right?

14 A. Where do you see described that the
15 light shield is being held -- I'm sorry. I thought
16 you said the light shield is being held by the
17 optical filter?

18 Q. It's backwards. The light shield
19 holds the optical filter; right?

20 Just to help you out, so earlier we
21 said that holder portion 43 is a light shield;
22 right? And the holder portion 43 holds the optical

1 filter; right?

2 A. What's described there is the optical
3 filter 17 -- this is in Column 18, line 53, 54, 55.
4 But the scattered light taking unit 8 and optical
5 filter 17 is disposed in the holder portion 43
6 positioned below the light receiving element 33a.
7 So it says it's disposed in. It's not saying that
8 it's held by, but it's saying that it's disposed in
9 is what's described.

10 Q. That's called a holder portion; right?

11 A. The optical filter 17 is disposed in
12 the holder portion 43. And then if you look at, for
13 example, my annotated Figure 13 on page 15 of my
14 supplemental '743 declaration, 17 is sort of within
15 the things that I've -- the red boxes that I've
16 highlighted as the holder portion.

17 So it's disposed inside. At least in
18 that profile view, it's not clear that's holding it,
19 but it's disposed inside as it's described.

20 Q. And it's called a holder portion;
21 right?

22 A. What is described is it describes a

1 holder portion. And, again, just highlighting that
2 in forming my opinions, I was not relying on the
3 second embodiment. You know, it's a very different
4 geometry as what's taught in the first embodiment,
5 in the combination of that embodiment with Sarantos.

6 Q. But you're not sure if the holder
7 portion is holding anything?

8 A. Well, it says it's disposed in.
9 That's what's described.

10 Q. Okay. And so you're not sure if it's
11 actually holding it?

12 A. It's not described as holding it.
13 It's described as being disposed in.

14 Q. It's described as a holder portion;
15 right?

16 A. It is described as a holder portion
17 positioned below the light receiving element, but
18 with respect to the optical filter, it's described
19 as the optical filter is disposed in the holder
20 portion.

21 Q. Okay. Let's look at the
22 third embodiment. Can you turn to Column 26,

1 beginning at line 32?

2 A. I'm sorry?

3 Q. Column 26, beginning at line 52.

4 Sorry, I misspoke there.

5 Are you there?

6 A. I am, yes.

7 Q. Iwamiya illustrates a third embodiment
8 in Figures 15, 16, and 30; right?

9 A. Third embodiment, where the invention
10 is applied to a wristwatch, is described with
11 references to Figures 15, 16, and 30. Yes, 15, 16,
12 and 30. Okay. Yes.

13 Q. Iwamiya describes the third embodiment
14 from Column 26, line 52, to Column 31, line 48;
15 right?

16 A. Yes.

17 Q. Please turn to Column 28, lines 64 to
18 67.

19 Those lines state, Even in this case,
20 the holder portion 43 of the light receiving unit 33
21 is formed of a metal with a light shielding
22 property, such as aluminum, and its surface is

1 subjected to alumite treatment to have a reflection
2 function.

3 In the third embodiment, the holder
4 portion 43 acts as a light shield; right?

5 A. Well, what's described there, the
6 holder portion 43 of a different geometry than the
7 embodiment of Figure -- of embodiment 1, which is in
8 Figure 3, which is what I used for forming my
9 opinion.

10 But in this embodiment, what's
11 described there is the holder portion 43 of the
12 light receiving unit is formed of a metal with a
13 light shielding property, such as aluminum, in that
14 embodiment, which is different than the embodiment
15 No. 1, which is the -- in combination with Sarantos,
16 the basis of my opinions.

17 Q. The light shield in the
18 third embodiment shields light; right?

19 A. Well, what's described there is the
20 holder portion 43 of the light receiving unit 33 is
21 formed of a metal with a light shielding property,
22 such as aluminum, its surface is subjected to

1 alumite treatment to have a reflection function.

2 Therefore, the light receiving element can be
3 optically protected.

4 But as I describe extensively, as
5 well, you know, in those embodiments that are
6 similar in nature -- embodiment 3 is similar in
7 nature to embodiment 2, which doesn't have, for
8 example, the air gap and the cavity channel around
9 the light shielding frame. And so it has different
10 tradeoffs and different design decisions that would
11 need to be brought to bear. So as I describe in my
12 opinion --

13 Q. I think you misunderstood my --
14 (Cross talk.)

15 A. -- as I describe in my opinions, I'm
16 talking about embodiment 1, in combination with
17 Sarantos.

18 Q. I think you misunderstood my question,
19 so let me ask it again.

20 The light shield in the
21 third embodiment shields light; right?

22 A. Well, in the geometry of the

1 third embodiment, as described there in Column 28,
2 the holder portion 43, which doesn't exist in
3 embodiment No. 1, but the holder portion 43 of the
4 light receiving unit is formed of a metal with a
5 light shielding property.

6 It goes on, Thereby, the light
7 receiving element can be optically protected.

8 In an embodiment that's different than
9 the one that I'm opining on, has a different
10 geometry and doesn't have the same characteristics
11 or geometrical layout of components; but in that
12 embodiment, which is not the one that I was opining
13 on, is serving a shielding functionality, as well.

14 Q. Can you look at lines 52 to 58 in
15 Column 28?

16 And those lines state, As illustrated
17 in Figure 16, the light receiving unit 33 is
18 disposed in the central portion positioned at the
19 inner circumferential side of the
20 diffusion/reflection ring portion 35, in a state
21 where the light receiving element 33a and the
22 element substrate 33b are stored in a holder portion

1 43. On the bottom surface of the light receiving
2 unit 33, an optical filter 17 is disposed.

3 So my question is: The light shield
4 surrounds the light receiving unit -- sorry, strike
5 that.

6 The light shield surrounds the light
7 receiving element 33a; right?

8 A. So in that embodiment in Figure 16,
9 for example, what's described there in Figure 16,
10 the light receiving unit 33 is disposed in the
11 central portion positioned at the inner
12 circumferential side of the diffusion reflection
13 ring portion 35, in a state where the light
14 receiving element 33a and the element substrate 33b
15 are stored in a holder portion 43.

16 So they, in that figure, are on the
17 inside of 43, which, as you point out, is the light
18 receiving -- is formed with a metal with a light
19 shielding property. And, again, but that is a very
20 different geometry and configuration than what I was
21 describing in forming my opinions with respect to
22 embodiment No. 1 that has a cavity channel empty

1 space between the light shielding frame, as I
2 describe in several places but certainly in the
3 supplemental declaration of '743 on pages 14 and 15.

4 Q. An optical filter is mounted on the
5 lower side of the light shield; right?

6 A. Well, it's described there in
7 Column 28, line 56, on the bottom surface of the
8 light receiving unit 33, an optical filter 17 is
9 disposed, which is -- again, this is a different
10 embodiment than the one I was opining on and a
11 POSITA would understand in combination with Sarantos
12 to teach the -- in the prior art.

13 Q. Let's look at the fourth embodiment in
14 Iwamiya. Can you turn to Column 31, beginning at
15 line 50?

16 Iwamiya illustrates a fourth
17 embodiment in Figures 17 to 29 and 31; right?

18 A. Fourth embodiment, where the invention
19 is applied to a wristwatch, it references Figure 17
20 and 29 through 31. So Figure 17 is the
21 cross-sectional view of embodiment 4, which, again,
22 I note is very different -- extremely different

1 than -- is very similar in nature to the second,
2 third, and fourth embodiments in terms of the
3 structural layout, but very different than the
4 embodiment No. 1 with the light shielding frame and
5 the cavity and air gap around it.

6 Q. And the paper copies of the patents
7 and declarations you have, do they have any notes on
8 them?

9 A. They do not, no.

10 Q. Iwamiya describes the fourth
11 embodiment from Column 31, line 50, to Column 48,
12 line 21; right?

13 A. To Column 48, line 21, correct.

14 Q. Please turn to Column 39, lines 20
15 through 23.

16 A. I'm sorry, which column?

17 Q. Column 39.

18 A. Okay.

19 Q. Lines 20 through 23.

20 And those lines state, In this case,
21 the holder portion 43 of the light receiving unit 33
22 is formed of a metal with a light shielding

1 property, such as aluminum, and its surface is
2 subjected to alumite treatment to have a reflection
3 function. Thereby, the light receiving element 3A
4 can be optically protected.

5 My question is: The holder portion 43
6 in the fourth embodiment acts as a light shield;
7 right?

8 A. So fourth embodiment contains this
9 thing called the holder portion 43, which does not
10 exist in embodiment No. 1, which is the embodiment
11 that I was describing in forming my opinions. But
12 in this case, the holder portion 43 of the light
13 receiving unit 33 is formed of a metal with a light
14 shielding property, such as aluminum, and its
15 surface is subjected to alumite treatment to have a
16 reflection function.

17 So 4 is similar to 2 and 3, but all
18 three are very different than the embodiment in
19 Figure 1, which does not have a holder portion and
20 has this cavity channel and empty space between the
21 various components that don't exist in the other
22 embodiments.

1 Q. Iwamiya discloses a light shield as
2 part of the fourth embodiment; right?

3 A. The holder portion 43 of the light
4 receiving unit 33 is formed of a metal with a light
5 shielding property. And, again, as I described with
6 respect to embodiment No. 2 in my declaration,
7 that's a very different embodiment than as I
8 described in the embodiment No. 1 that has the light
9 shielding frame of 18.

10 Q. The light shield in the fourth
11 embodiment shields light; right?

12 A. Again, the fourth embodiment was not
13 the embodiment that I was referring to in forming my
14 opinions, but what's described there is a light
15 shielding property of the -- of the light receiving
16 unit -- of the holder portion 43.

17 Q. Please turn to Column 39, lines 9
18 through 13.

19 And those lines state, As illustrated
20 in Figures 19 and 24 to 26, at the lower side of the
21 light receiving element 33a, that is, between the
22 light receiving element 33a and the scattered light

1 taking unit 8, an optical filter 17 is disposed in
2 the holder portion 43 positioned on the lower side
3 of the light receiving element 33a.

4 And my question is: The light shield
5 surrounds the light receiving element 33a; right?

6 A. And, again, in forming my -- the
7 embodiment of Figure 1 -- or Figure 2 does not have
8 the -- this holder portion and has different
9 geometrical -- different constraints. But in this
10 embodiment, it's described as the holder portion,
11 and the light receiving unit is inside of that
12 holder portion.

13 Q. Optical filter is mounted on the lower
14 side of a light shield in the fourth embodiment;
15 right?

16 A. What's described is the scattered
17 light taking unit and optical filter 17 is disposed
18 in the holder portion 43 positioned in the lower
19 side of the light receiving unit. And the holder
20 portion 43 is -- as described in Column 39,
21 lines 20, 21, the holder portion 43 of the light
22 receiving unit is formed of a metal with a light

1 shielding property.

2 And, again, this is a very different
3 geometry than the embodiment No. 1 that has the air
4 gap in the light shielding frame and does not have
5 this holder portion 43.

6 MR. BISENIUS: Counsel, we've been
7 going a bit over an hour now. Now might be a
8 good time for another break.

9 MR. OLDHAM: It's a perfect time for a
10 break. Let's go off the record.

11 THE REPORTER: We're off the record.
12 (Recess from the record.)

13 THE REPORTER: We're back on the
14 record.

15 MR. OLDHAM: I uploaded IPR2024-00241,
16 Exhibit 1042, to the chat. Please let me
17 know when you have that open.

18 (Exhibit 1042, Previously marked.)

19 BY MR. OLDHAM:

20 Q. I believe this exhibit has been
21 referred to as the Fontaine reference. It's a
22 document titled, "Reflectance-based pulse oximeter

1 for the chest and wrist"; right?

2 I think you're on mute. Sorry.

3 A. Can you hear me?

4 Q. I can hear you now. Were you speaking
5 before?

6 A. Actually, I was mumbling to myself.
7 The file is not opening.

8 Q. Okay. I saw lips moving, but I didn't
9 hear anything. So...

10 MR. OLDHAM: Are you able to open it,
11 Patrick?

12 MR. BISENIUS: Yeah, I was able to get
13 it to open up.

14 MR. OLDHAM: Okay.

15 MR. BISENIUS: Yeah, if it's not
16 working, when I resent all the exhibits to
17 you a few weeks ago, this should have been in
18 that collection if you have that folder
19 somewhere.

20 THE WITNESS: Okay.

21 Okay. Got it.

22

1 BY MR. OLDHAM:

2 Q. Exhibit 1042 is a document titled,
3 "Reflectance-based pulse oximeter for the chest and
4 wrist"; right?

5 A. Yes.

6 Q. Exhibit 1042 is unsigned; right?

7 A. That is correct.

8 Q. Exhibit 1042 was not approved; right?

9 A. If this is -- many theses are not
10 signed in the modern era of digital submission of
11 theses. This is the thesis of Alexandria --
12 Alexandra Fontaine.

13 Q. It was not approved; right?

14 A. There are no signatures on the cover
15 page. That does not mean it was not approved. I
16 haven't signed a thesis in many years now, and they
17 are all approved.

18 Q. On the cover page, there is a line
19 that says "Approved by," and then there is a
20 signature line for Professor Mendelson; right?

21 A. Yes. And as I've described, I have
22 not signed a thesis in many years as well given the

1 modern methods much digital submission. But e-mail
2 verification to the universities is the modern
3 method, at least in my experience, for approving
4 theses.

5 Q. And do those theses include signature
6 lines with your name on them or signature?

7 A. That is correct.

8 Q. There's no signature of
9 Professor Mendelson on the "Approved by" line;
10 correct?

11 A. That is correct. And, again, as I've
12 described to you, I don't sign theses anymore
13 either.

14 Q. There's no indication on Exhibit 1042
15 that the exhibit was, in fact, approved by
16 Professor Mendelson; right?

17 A. There is no signature on that cover
18 page, but I believe it has been approved and
19 accepted by the university.

20 Q. Exhibit 1042 is not peer-reviewed;
21 right?

22 A. I missed your question, apologies.

1 Q. Strike that.

2 What is your basis for saying that you
3 believed it had been approved and accepted by the
4 university?

5 A. Again, in my experience, theses are
6 not really signed anymore. So this was obtained
7 from the WPI thesis repository. So I believe it's
8 the accepted thesis.

9 Q. Do you have an association --

10 A. And it's not the only -- this is not
11 the only copies of prior art that I rely on to
12 demonstrate in forming my opinions.

13 Q. You have an association with WPI?

14 A. I do not.

15 Q. Do you have any knowledge of the
16 thesis approval process at WPI?

17 A. I do not.

18 Q. Exhibit 1042 was not peer-reviewed;
19 right?

20 A. It's not submitted to a journal, but
21 it's not -- it's a thesis. So it hasn't gone
22 through the journal review process, but it's gone

1 through review of advisors and presumptively peers
2 in the lab.

3 Q. Do you have knowledge of the review
4 process at WPI?

5 A. Again, I do not have an appointment at
6 WPI, no.

7 Q. So you don't know what review process
8 happened at WPI; right?

9 A. In general, the review process at
10 universities is not very -- there's not a lot of
11 variation in terms of the mechanism. But, again, I
12 do not have an appointment at WPI.

13 Q. How many universities do you have
14 experience with on the review process?

15 A. I've been with MIT most of my
16 professional academic career.

17 Q. So you have experience with one
18 university; right?

19 A. Well, in the mechanisms that we've set
20 up at NUS and NTU, at UMass, where some of my former
21 students teach, at Singapore University of
22 Technology Design, at Skoltech, at Georgia Tech,

1 where I have collaborators and we talk about
2 mechanisms. But, again, I don't have appointments
3 at these universities, but the mechanisms are all
4 very similar.

5 Q. So describe the mechanisms at all
6 those universities that you just identified, that
7 you have personal knowledge of.

8 A. Well, again, the main theses -- my
9 dominant approval -- thesis approval process is
10 submission through MIT, which is done all by e-mail.
11 And a thesis is submitted to the department, and I
12 send an e-mail saying, Yes, I approve and I accept,
13 and it gets pushed along to the libraries.

14 Q. All right. I wasn't asking about MIT.
15 I was asking about all those other universities that
16 you said you had experience with. Describe your
17 experience with those other universities on the
18 approval process.

19 A. Well, I helped found Skoltech. So the
20 process there is very similar to what we do at MIT.
21 MIT helped to found Singapore University of
22 Technology and Design. So the mechanism is very

1 similar there.

2 And, again, I do not have firsthand
3 knowledge -- I'm not approving theses at these other
4 universities, but I have no reason to doubt the
5 validity of the -- of this thesis forming the basis
6 of Alexandra Fontaine's work.

7 Q. Who are the individuals you spoke with
8 at those universities that provided the bases for
9 your understanding of how they approve theses?

10 A. Again, I have colleagues that we do
11 this thing for a living. We approve theses. But,
12 again, I have first direct hand knowledge of how we
13 do it at MIT and no reason to doubt the validity of
14 this document being the valid thesis of the
15 Alexandra.

16 Q. Provide the names of the people at the
17 other universities you mentioned where you're
18 familiar with their approval process and that you
19 gained your information on the approval process
20 from?

21 A. I believe in my CV, I probably have
22 listed people that I collaborate with and coauthors.

1 So those would be the people that I have connections
2 and relationships with. But, yeah, I've not gone
3 through and said, Hey, what's your process?

4 But, again, I have no reason to doubt
5 that this document is a valid thesis of the student.

6 Q. Provide the names of the people that
7 have provided your understanding of how the
8 peer-review authorization happens at other
9 universities.

10 A. Again, we can pull up my CV and look
11 at the people I've collaborated with. With these
12 people, I have not gone through, like, What's your
13 process? I have the intimate knowledge of how we do
14 it at MIT, but I have no reason to doubt that this
15 document is a valid thesis of the student.

16 Q. So you don't know how the peer-review
17 approval process works at other universities; right?

18 A. As I've described, it's not going to
19 be that dissimilar from the way that it is at MIT.
20 But, no, I do not have firsthand knowledge of how
21 exactly it's done at the other universities.

22 Q. How do you know it's not dissimilar

1 from how it's done at MIT?

2 A. The process of academic research is
3 very -- you know, nobody's surprised once they go
4 from one university to the next. We don't have
5 people going, Oh, my goodness, you're doing it so
6 different. You should do it this way.

7 Again, my first -- direct firsthand
8 knowledge is how we do it at MIT. But, again, I
9 have no reason to doubt the validity of this thesis.

10 Q. And so your experience is all with
11 MIT; right?

12 A. Well, and as an undergraduate student
13 at Carnegie Mellon; but as a professional, yes, at
14 MIT, in terms of the theses that I approved. But
15 again, I have no reason to doubt that this thesis is
16 a valid thesis.

17 Q. Apple's attorneys have provided you
18 with Exhibit 1042; right?

19 A. I'm sorry. Can you repeat the
20 question?

21 Q. Apple's attorneys provided you with
22 Exhibit 1042; right?

1 A. I actually don't recall whether this
2 was a reference that I found or counsel found, but I
3 certainly, in normal process of forming my opinions,
4 identify references and documents that are also
5 applicable to forming my opinions.

6 Q. You don't know if you independently
7 identified Exhibit 1042; right?

8 A. You broke up there for a second.

9 Q. You don't know if you independently
10 identified Exhibit 1042; right?

11 A. I do not recall whether this is one
12 that I had personally identified or not.

13 Q. And you don't know when the first time
14 was that you saw Exhibit 1042; right?

15 A. Again, you broke up.

16 Q. You don't know when you first saw
17 Exhibit 1042; right?

18 A. At this point it would be many years
19 ago prior to, but I do not recall when I first saw
20 it, no.

21 Q. And why do you say it would be many
22 years ago?

1 A. I believe this was -- let's see -- was
2 this -- actually, now I recall -- I forget whether
3 this is one I referenced in the first declarations,
4 which were signed back in 2023. Let me see.

5 Q. So by "many years ago" you're talking
6 about 2023; right?

7 A. Yes, so the date prior to the -- at
8 least prior to the first references that I used to
9 form.

10 Q. So approximately 2023?

11 A. It may have been -- it may have been
12 earlier. I don't -- I don't recall.

13 Q. But not many years before that; right?

14 A. Again, I don't recall when I first
15 became familiar with this reference.

16 Q. Let's assume I go to a toy store and
17 buy a doctor kit, and it includes a toy thermometer.
18 And the thermometer always displays 98.6 for the
19 temperature. I then use that thermometer on three
20 friends, and for each of the friends, the
21 thermometer is accurate within 1 degree.

22 Is that a valid way to show the toy

1 thermometer accurately measures temperature?

2 MR. BISENIUS: Objection, relevance.

3 THE WITNESS: You're not describing a
4 thermometer. You were describing a piece of
5 plastic, I believe, that has a fixed reading.
6 So...

7 BY MR. OLDHAM:

8 Q. A toy; right?

9 A. I think I may have misunderstood your
10 question.

11 Q. No, I'm describing a toy plastic
12 thermometer that has a fixed reading at 98.6. You
13 got that right. And if I use that thermometer to
14 take the temperature of three friends and it's
15 accurate within 1 degree for each of those three
16 friends, does that show that the plastic thermometer
17 is an accurate thermometer?

18 A. I'm confused by your question. How
19 would you know that it was accurate? You're using a
20 piece of plastic that is not a sensor. There's no
21 notion of accuracy or measurement.

22 Q. I use a reference --

1 A. So I --

2 Q. I use a reference thermometer in
3 addition to the plastic thermometer to get the
4 reference readings. And the plastic thermometer toy
5 is within 1 degree of the reference thermometer.

6 Is that an accurate way to show that
7 the plastic toy thermometer is accurate for
8 measuring temperature?

9 MR. BISENIUS: Objection, relevance.

10 THE WITNESS: Well, again, it's not
11 measuring. What you've described is not a
12 measurement device. It's something that
13 shows a fixed number. So it's not making a
14 measurement.

15 BY MR. OLDHAM:

16 Q. But it comes up with the same answer.
17 So doesn't that show it's accurate?

18 A. I think you're confused on how
19 measurements work, but a measurement -- a device
20 that makes a measurement needs to make a
21 measurement. A piece of plastic is not making --
22 with a fixed number on it is not making a

1 measurement.

2 Q. Oh, it is. It has the measurement
3 written right on it, 98.6.

4 MR. BISENIUS: Objection, relevance.

5 BY MR. OLDHAM:

6 Q. So how would you determine the
7 accuracy of a plastic toy thermometer? What would
8 you change in my scenario to determine the accuracy
9 of that toy thermometer?

10 MR. BISENIUS: Objection, relevance.

11 THE WITNESS: Accuracy presupposes
12 you're making a measurement and using a
13 sensor or a transducer that has something
14 that changes in response to the thing that
15 it's trying to measure.

16 What you're describing is looking at a
17 piece of plastic or paper that is not a
18 sensor. It could be equivalent to a book
19 that has text on it. It's not a sensor.
20 It's not making a measurement. There's no
21 notion of it having accuracy. It's not a
22 sensor.

1 BY MR. OLDHAM:

2 Q. Let's assume I make a digital
3 thermometer and I wire it up wrong and it gets stuck
4 always measuring 98.6. And I use that digital
5 thermometer that I -- with a temperature sensor on
6 it, and I measure the temperature of three friends.
7 And that digital thermometer comes within 1 degree
8 of the reference measurement that I also take of
9 those three friends.

10 Is that an accurate way to determine
11 the accuracy of my digital thermometer?

12 MR. BISENIUS: Objection, relevance.
13 Objection, form.

14 THE WITNESS: Well, you already
15 described that it's a broken thermometer. So
16 I would be using a different thermometer.

17 BY MR. OLDHAM:

18 Q. So how would you know it was a broken
19 thermometer, though?

20 MR. BISENIUS: Objection, relevance.
21 Objection, form.

22 THE WITNESS: Well, let's say it makes

1 a measurement and measure -- if it's always
2 giving the same number no matter what you do,
3 whether it's in contact with the person or
4 not or -- you know, it's -- in its nonuse it
5 would change.

6 So if it's always giving -- if
7 you're -- if you have a display that is
8 always showing the same thing no matter what
9 you do to it, you know the display is broken.
10 So you have a sensor. It's always showing
11 the same thing no matter what you do to it,
12 you know, you have a high suspicion that the
13 sensor is broken. So you would not use it.

14 BY MR. OLDHAM:

15 Q. But a better way to find out if it's
16 changing is to measure different temperatures;
17 right?

18 MR. BISENIUS: Objection, relevance.
19 Objection, form.

20 THE WITNESS: I didn't understand the
21 question.

22

1 BY MR. OLDHAM:

2 Q. So in order to determine that the
3 thermometer is broken, you need to test different
4 reference temperatures, right, to see if it changes
5 with the reference temperature?

6 A. That would be one way to
7 characterize --

8 MR. BISENIUS: Objection, relevance.

9 THE WITNESS: That would be one way to
10 characterize a thermometer. If you have
11 references for calibration and comparison,
12 that would be one way to see if --

13 BY MR. OLDHAM:

14 Q. Can you think of other ways --

15 A. -- a sensor.

16 Q. So let's change the hypothetical. And
17 I use this digital thermometer to take the
18 temperature of a friend and my digital thermometer
19 reads 98.6, but the reference thermometer reads
20 101.6. So then I take the digital thermometer and
21 test the temperature of another friend and the
22 digital thermometer reads 98.6, but the reference

1 temperature measures 95.6.

2 If I then average the two measurements
3 from the digital thermometer, I would get an average
4 measurement of 98.6; right?

5 A. I lost track of the numbers, and I'm
6 not completely following what is the question.

7 Q. Okay. So one friend, the digital
8 thermometer measures 98.6, the reference thermometer
9 measures 101.6.

10 Do you have that?

11 A. 98.6 and 101.6. Okay.

12 Q. So 3 degrees high.

13 The second friend, the digital
14 thermometer measures 98.6, and the reference
15 thermometer measures 95.6. So it's 3 degrees low.

16 You got that?

17 A. Okay.

18 Q. The average temperature of the digital
19 thermometer that I made reads out 98.6, right, for
20 the two individuals?

21 A. Well, why would you average together
22 two measurements from two different individuals if

1 you're trying to measure an individual? Yeah, I
2 would not do that experiment.

3 Q. Okay. That's a good observation, but
4 let's continue the scenario.

5 So let's assume you do average it, and
6 you get 98.6 as the average. And then if you
7 average the reference values, 101.6 and 95.6, you
8 also get 98.6; right?

9 MR. BISENIUS: Objection, relevance.
10 Objection --

11 (Cross-talk.)

12 MR. BISENIUS: Sorry. Objection,
13 relevance. Objection, form.

14 THE WITNESS: So for the numbers you
15 gave, if you take the average of two 98.6,
16 you get 98.6. And averaging together two
17 numbers that are plus or minus with respect
18 to 98.6, you would get an average of 98.6,
19 assuming that I did my mental math correctly.

20 BY MR. OLDHAM:

21 Q. The average of the reference would be
22 98.6, and the average of the device under test would

1 be 98.6; right?

2 MR. BISENIUS: Same objections.

3 THE WITNESS: In this incorrect
4 experiment that you're describing, yes.

5 BY MR. OLDHAM:

6 Q. And why is this experiment incorrect?

7 MR. BISENIUS: Same objections.

8 THE WITNESS: Again, I don't know why
9 you're measuring -- you're trying to get a
10 repeated measurement on a -- comparing two
11 individuals. You're -- I'm just confused by
12 the nature of your question, sorry.

13 BY MR. OLDHAM:

14 Q. Okay. Well, let's change it up a
15 little bit so there's just one individual. And you
16 take the first measurement at one point, and the
17 digital thermometer that you're testing is 98.6.
18 The reference thermometer is 101.6.

19 And then later on, you take a
20 measurement of the same individual and the digital
21 thermometer under test is 98.6, and the reference
22 thermometer is 95.6.

1 So you're taking measurements from the
2 same individual, and if you average the two values
3 from the digital thermometer, you get 98.6. And you
4 average the two values from the reference
5 thermometer, and you get 98.6.

6 Is that a valid way to test the
7 accuracy of the thermometer under test?

8 MR. BISENIUS: Objection, relevance.
9 Objection, form.

10 THE WITNESS: So if I'm understanding
11 what you're describing, you have some sensor
12 that is a little more stable than you're
13 using as a reference and then you have
14 another sensor that may be a little bit noisy
15 and you're asking how do you characterize the
16 variability, the resolution --

17 BY MR. OLDHAM:

18 Q. Yeah, that's a -- go ahead and answer
19 that question. That would be fine.

20 A. Well, I'm not sure what the question
21 is.

22 Q. Well, so averaging is not a good way

1 to test the accuracy of the digital thermometer;
2 right?

3 MR. BISENIUS: Objection, relevance.
4 Objection, form.

5 THE WITNESS: Again, I'm not
6 completely understanding the context, but
7 averaging as a technique is a perfectly
8 acceptable way to try to improve the
9 resolution of a measurement.

10 You know, sampling theory tells you
11 that if you have a sample mean and a sample
12 variation, whatever it may be, the certainty
13 with which your sample mean improves is --
14 goes -- improves by the square root of the
15 number of measurements.

16 So two measurements, you know, your
17 signal-to-noise ratio, your air bars go down
18 by the square root of two. Four measurements
19 go down by two. So multiple measurements is
20 a perfectly acceptable way if you have a
21 noisy sensor to improve the quality of the
22 measurement you get, as opposed to a sensor

1 that has a high level of accuracy that is
2 sufficient for -- that can be done with one
3 measurement, but I'm not sure that's --

4 BY MR. OLDHAM:

5 Q. Yeah, that's not what I was asking at
6 all. That's not the hypothetical I was asking. So
7 let me put it this way.

8 So if you have a gold standard
9 thermometer reference; right? Gold standard
10 thermometer reference measures 101.6 on an
11 individual the first time. And then later the gold
12 standard reference measures 95.6 on that same
13 individual. So the gold standard reference, we're
14 assuming is accurate. It's the gold standard.

15 You also have a device under test
16 that's measuring 98.6 both times. It wouldn't be
17 accurate to take the average of the two gold
18 standard measurements and compare it with the
19 average of the two device under test measurements;
20 would it?

21 MR. BISENIUS: Objection, relevance.

22 Objection, form.

1 THE WITNESS: And there's a lot more
2 that you need to consider. I mean, you know,
3 I guess I don't really -- I'm not fully
4 understanding the question, but you're
5 describing two sensors that have different
6 levels of accuracy, precision. And can the
7 sensor be noisy and still be useful?

8 It can have an error or a difference
9 between something that's the ground truth and
10 still be useful, certainly. Depends on
11 the -- ultimately the resolution with which
12 you need to measure the underlying phenomenon
13 that you're trying to characterize. So I
14 guess I need a bit more context to really
15 understand the question.

16 BY MR. OLDHAM:

17 Q. If you were trying to test the
18 accuracy of a thermometer like the device I
19 described, would you go to averaging the gold
20 standard or the ground truth references and
21 averaging the measurements of the device under test
22 and use that to determine how accurate the device

1 under test is?

2 MR. BISENIUS: Objection, relevance.

3 THE WITNESS: Averaging can be used
4 with either a ground truth measurement or a
5 device under test measurement. If you're
6 trying to compare one measurement -- or one
7 sensor to another, you would look at, for
8 example, the error between individual
9 measurements presumptively acquired at the
10 same location at the same time and look at
11 the deviation between the measurements.

12 And -- but at the same time, you could
13 average measurements together for either one
14 and use that as the effective measurement of
15 your ground truth and the effective
16 measurement of your sensor or the device
17 under test. I guess I need more context to
18 fully understand what it is you're trying to
19 ask.

20 BY MR. OLDHAM:

21 Q. Let's return to your supplemental
22 declaration, which is Exhibit 1079. And let's --

1 A. Which one, the '159 or the '743?

2 Q. Let's do the one that ends in '244 for
3 the IPR number. Do you have that?

4 A. Which one is that? Is that the '159
5 or the '743 patent?

6 MR. BISENIUS: That's the '159 patent.
7 It's also one of the documents that you would
8 have downloaded at the very beginning today.

9 THE WITNESS: It is. I'm just looking
10 at the paper because it's easier if I look at
11 the paper.

12 MR. BISENIUS: Yeah, it's the '159
13 patent.

14 BY MR. OLDHAM:

15 Q. And if you could turn to page 8.
16 Do you have that?

17 A. Yes.

18 Q. And you list three dictionaries there;
19 right? Actually, I'm not sure -- let's see. I
20 think it might be the --

21 A. Yeah, it's the '743, yeah, on page 8
22 has three dictionaries.

1 Q. Okay. Now, let's look at that.

2 A. Okay.

3 Q. How did you pick those dictionaries?

4 A. They are representative of
5 dictionaries --

6 Q. And how did you pick them?

7 A. -- for the -- I do not recall whether
8 these were ones that I suggested or counsel
9 suggested, but, you know, they represent
10 dictionaries.

11 Q. You provided excerpts from these
12 dictionaries in your supplemental declaration;
13 right?

14 A. And now I will go to the digital
15 version so I can cross-reference here.

16 I don't recall whether these were
17 cited in the supplemental, or these were also
18 references that were in the original. Let's see.
19 '743. So if you can point out a particular place
20 where I cite these in my declaration, I'm happy to
21 go to that.

22 Q. I didn't say you cited them in your

1 declarations. I just said you provided the excerpts
2 as part of your declaration; right?

3 If that's too tough of a question, I
4 can skip it.

5 A. Well, these are -- these are -- this
6 is the list of materials that I cite in the
7 declaration, including up through those bullets.
8 But I don't remember where in the declaration I cite
9 to those.

10 Q. And those exhibits have excerpts of
11 definitions; right?

12 A. You just posted the -- okay. Let me
13 see.

14 Q. I posted one of them, yes. I posted
15 Exhibit 1095. We can talk about that one, if you
16 want to talk about that one.

17 (Exhibit 1095, Previously
18 marked.)

19 THE WITNESS: Okay. I have it open.

20 BY MR. OLDHAM:

21 Q. How did you pick the excerpts that you
22 included in Exhibit 1095?

1 A. This would have been in conversation
2 with counsel.

3 Q. So you don't think you picked these
4 excerpts?

5 A. I do not recall whether these are
6 excerpts that I picked, but I believe these were
7 done in collaboration with counsel.

8 Q. Can you read to me the definition of
9 "anonymous" from the Exhibit 1095?

10 A. At least the version that you sent to
11 me, it's not -- the text is -- it seems to be
12 compressed, and so it's not legible. It might be
13 easier if you share it on the screen.

14 Q. Well, I have the same problem. So can
15 you -- why don't you share with me the version that
16 you looked at?

17 A. I have no other documents in front of
18 me.

19 Q. Okay. We can wait. I'll let you --
20 I'm sure either you or your counsel can provide the
21 version that you looked at to me.

22 MR. BISENIUS: Can we go off the

1 record for five minutes, and I can find this?

2 MR. OLDHAM: Well, it's fine. I can
3 stay on the record.

4 MR. BISENIUS: Okay.

5 MR. OLDHAM: If you want to just
6 e-mail it to me, or just put it in the chat.

7 MR. BISENIUS: Dr. Anthony, I'm going
8 to make a couple of phone calls, but I'm
9 having a hard time finding this. I'm
10 wondering if you could take a look at your
11 e-mail, because Usman would have sent this to
12 you at some point.

13 THE WITNESS: Just confirming, it's
14 okay to do that?

15 BY MR. OLDHAM:

16 Q. Yeah. And just for the record, I will
17 ask you about the document that's in your e-mail,
18 but I won't ask you about anything else that's on
19 your e-mail as part of this deposition. But I'll
20 ask when you received the document and ask you to
21 share the document.

22 A. Okay.

1 Q. And then you can close the e-mail --
2 once we're done with this, you can close your e-mail
3 down.

4 A. Sorry, just to confirm which
5 reference, this is the -- you said the 1095 is the
6 one that you want to refer to?

7 Q. Right.

8 A. 1095, got it. Okay.

9 Q. You can just upload it to the chat.

10 A. So it's the same resolution, it seems.
11 It looks like it's been corrupted or filtered in
12 the --

13 Q. Can you still upload it to the chat?
14 We'll mark it as Deposition Exhibit 1.

15 (Exhibit 1, No Bates Numbers, American
16 Heritage College dictionary, Third Edition,
17 received and marked.)

18 THE WITNESS: I did. It should have
19 gone through. No?

20 BY MR. OLDHAM:

21 Q. Oh, I see it. Okay.

22 And what as the date you received that

1 document?

2 A. Again, this is a clean download of all
3 documents, because I didn't want to -- make sure I
4 had -- so this is -- the date on it is March 15th
5 when I downloaded it.

6 Q. And you can't read --

7 A. So that would have been when I --

8 Q. Yeah. It's not legible, though;
9 right?

10 A. That is -- yes, it has similar
11 compression problems to the one that you had shared.

12 Q. Do you recall actually looking at the
13 dictionary definition from the American Heritage
14 College Collegiate [sic] dictionary?

15 A. Certainly not between March 15th and
16 now, but prior, yes, I'm certain I did.

17 Q. Where's the version that you looked at
18 prior?

19 A. I do not know at the moment. It's in
20 my other collections of files.

21 Q. When would you have looked at it
22 prior?

1 A. Certainly prior to forming my
2 declaration.

3 Q. Okay. And did you receive it by
4 e-mail?

5 A. Yes, March 15th is when --

6 Q. And if you said you looked at it
7 prior, did you receive what you looked at prior by
8 e-mail, as well?

9 A. I do not recall how that -- the
10 original PDF was either created or acquired, but
11 certainly this one is suffering from digital
12 compression issues.

13 Q. Do you recall looking at a different
14 version?

15 A. Again, I don't remember when I looked
16 at it originally.

17 Q. Do you recall looking at it?

18 A. I don't remember the timing of looking
19 at various references, but I'm certain I've looked
20 through the references that I cite.

21 Q. Do you recall looking at this
22 dictionary definition?

1 A. Well, I can't see which dictionary
2 definition we're talking about. So I -- on the
3 version that we're looking at now.

4 Q. Do you recall looking at the American
5 Heritage Collegiate dictionary?

6 A. Again, I don't recall when I looked at
7 it, but certainly would have browsed it prior to
8 forming my opinions.

9 Q. Okay. Well, go ahead and look through
10 your e-mails and find where you would have received
11 it.

12 You didn't create this yourself;
13 right?

14 A. Again, I don't remember. This would
15 have been prior to when I signed the declaration.
16 So I don't recall. Again, this was either something
17 that -- done in collaboration with counsel. So I
18 don't remember when the --

19 Q. Okay. Well, go ahead and look for it
20 and see -- you have all those records still; right?

21 A. I'm sorry, I'm not following what it
22 is that you --

1 Q. I'm asking for you to find the
2 original version that you looked at.

3 A. I do not currently know where the
4 original versions of files are. I purged -- or I --
5 they're in my files, but I don't know where that
6 currently is at the moment.

7 Q. Okay. Well, I'll give you some time
8 to look.

9 A. I'm not seeing the non-corrupted PDF.
10 This may have been the -- the dictionary that I
11 have -- one of the sets of dictionaries I have at
12 home, but I don't have a PDF at the moment that I
13 can find that's not corrupted.

14 Q. Can you show me the PDF that you gave
15 to counsel, then, if you're claiming it's from your
16 dictionary at home?

17 A. Again, I do not currently have in
18 my -- finding in my e-mail the --

19 Q. So you don't have any record of you
20 giving this to counsel?

21 A. Not the non- --

22 Q. The non- -- what was that?

1 A. I do not have in my e-mail that I can
2 at least find at the moment the non-corrupted
3 version of the PDF.

4 Q. Okay. And you don't have any record
5 of you giving this to counsel?

6 A. I do not -- in my searching here, I do
7 not seem to have the PDF non-corrupted.

8 Q. So based on your searching the first
9 time -- or the first document that you have
10 downloaded was downloaded March 15th? Is that what
11 you testified?

12 A. I asked counsel for a clean copy of
13 all documents, and so this is the -- what is the --
14 has the corrupt PDF in it.

15 Q. And you received that on Marsh 15th?

16 A. Well, that's when I received all the
17 documents of the clean record of all -- all
18 exhibits.

19 Q. And you don't have any record of that
20 dictionary prior to March 15th, 2025; right?

21 A. Again, in my e-mail, I do not see the
22 earlier versions.

1 Q. And the version you have you can't
2 read; right?

3 A. That is correct, as we can't.

4 Q. Let's return to your supplemental
5 declaration, Exhibit 1079. And this is in the '241
6 case. So it's the one we had open just a few
7 minutes ago.

8 A. The '743 patent?

9 I'm just noting for the moment, both
10 Patrick and Eileen are frozen on my screen. So I
11 don't know if they're still there.

12 MR. BISENIUS: I am still here. Can
13 you hear me?

14 THE WITNESS: I can, yes.

15 THE REPORTER: And I'm still here.

16 THE WITNESS: Okay.

17 BY MR. OLDHAM:

18 Q. This is with the '743 patent.

19 If you can turn to page 75. Let me
20 know when you have that.

21 A. Which page? Which page?

22 Q. 75.

1 A. 75. Okay.

2 Q. In paragraph 70, you rely upon the
3 dictionary definitions of "width" and "length";
4 right?

5 A. So a "length" is defined as a
6 measurement of the extent of something along its
7 greatest dimension. And a "width" is defined as the
8 distance across something from one side to another.
9 So that is not an unusual or unexpected definition,
10 but that is as I quote in paragraph 70.

11 Q. How did you pick the dictionary
12 definitions to use?

13 A. Well, as I've described here, there
14 are multiple instances of widths and lengths that I
15 highlight above paragraph 68. But a length, you
16 know, it's -- a length along its dimension and a
17 width from one side to another.

18 So that's not a -- it's a definition
19 of "width" and "length." And many examples here
20 that I highlight in the declaration where there are
21 widths and lengths that correspond to these
22 different dimensions.

1 Q. You picked the definitions for "width"
2 and "length," or did counsel pick the definitions
3 for "width" and "length"?

4 A. Again, the declaration is my
5 opinions -- are my opinions and, you know, this
6 is -- these are my opinions. And as I describe
7 here, there are multiple examples on page 74 and
8 page 75 with lengths and widths that would -- a
9 POSITA would understand taught lengths and widths in
10 the art.

11 Q. But the dictionary you cited to has --
12 the PDF is illegible; right?

13 A. Well, in paragraph 70, for example, I
14 don't rely purely on that. I also describe, for
15 example, in some cases, the width of the annulus can
16 be calculated by subtracting the radius of the inner
17 circle from the radius of the outer circle, as I
18 highlight in the -- on page 74 above Figure 2, where
19 there there's an outer radius and an inner radius,
20 the subtraction of the two is the width. The
21 diameter is a length. And a POSITA would understand
22 that Sarantos discloses a length and a width, as

1 shown in the figures.

2 Q. And that's based on the dictionary
3 definitions from Exhibit 1095 that you can't read;
4 right?

5 A. So, again, I don't just rely on those
6 definitions. Those are -- the definitions of the
7 current PDF, yeah, those are compressed, and we
8 can't read them at the moment. It doesn't change my
9 opinions, though, in terms of what a POSITA would
10 understand a length and a width to be, and that
11 Iwamiya, in combination with Sarantos, teaches a --
12 discloses a width and length that are different than
13 shown in the figures.

14 Q. In paragraph 70, you state that the
15 width of the annulus can be calculated by
16 subtracting the radius of the inner circle from the
17 radius of the outer circle; right?

18 A. Correct.

19 Q. That calculation only works if you are
20 working with circles; right?

21 A. Well, it would also be true if you
22 were operating with an oval or sort of -- yeah, it

1 would be modified a little bit, but you would still
2 have a width of the shape of the annulus in this
3 case, but certainly as I described there in the
4 figure that I put above Figure 2 on page 74. But
5 you would have commensurately a width if you
6 stretched a little bit and had other --

7 Q. Circles have a single radius --
8 (Cross talk.)

9 BY MR. OLDHAM:

10 Q. Circles have a single radius; right?

11 A. Well, a circle has a radius.

12 Q. Ovals don't have a radius; do they?

13 A. No, they have two radii. I mean, an
14 oval is described as having two radiuses, two radii.

15 Q. What's your source for that?

16 A. You know, it -- well, that's knowledge
17 of a POSITA. I mean, an oval is described
18 mathematically as having two -- that's basic math.

19 Q. So you're just saying it's something
20 you're pulling out of your head, and you can't cite
21 anything that says an oval has two radii?

22 A. A POSITA, as they describe them, in

1 describing an oval, an oval has the minor and the
2 major radius. That's how an oval is described. But
3 you asked about an oval. I answered about an oval.

4 Q. Okay. So if a person trying to assess
5 your credibility and your abilities as an expert, if
6 they did a search for ovals having two radii --
7 radii and were not able to find an oval with two
8 radii, they could discredit your testimony; right?

9 A. Sorry. An oval can be mathematically
10 described as having a major and a minor axis, a
11 major and minor radii.

12 Q. Well, I agree that there can be a
13 major and minor axis, but that's not the same thing
14 as radius.

15 Are you able to point to a source that
16 shows an oval will have two radii?

17 A. I did not quote a reference here, and
18 if I spent some time searching one that would
19 describe the mathematics and describe it in terms of
20 axis or radius, I'm certain both of those things
21 would be found in basic math --

22 Q. Okay. So somebody --

1 (Cross talk.)

2 BY MR. OLDHAM:

3 Q. Somebody could judge your credibility
4 by doing that search themselves and seeing if ovals
5 have two radii; right?

6 A. I'm comfortable describing an oval as
7 having two dominant axes or two radii that are
8 variable around the ring.

9 Q. I'm not trying to dispute that it has
10 two axes. I don't know why we keep going back to
11 that. We're talking about radii.

12 A. I described it as both. I think I
13 stated both. It can be described as having a
14 dominant axis and a minor -- a major and a minor
15 axis or a major and a minor radii. You will find
16 mathematics books that -- and certainly, you know, a
17 POSITA would not be confused by describing it as
18 either major and minor axis or the major and minor
19 radii.

20 Q. In paragraph 71 of your supplemental
21 declaration, you state that a person of skill in the
22 art would have understood that a ring encompasses an

1 oval shape; correct?

2 A. Well, as I describe at the bottom of
3 paragraph 71, a POSITA would have understood the
4 shape of output light corresponds to the shape of
5 the guide unit 7, a POSITA would have found it
6 obvious that an annular guide unit would generate an
7 annulare output light pattern, which encompasses, by
8 definition, an oval-shaped light pattern.

9 Q. Was it your testimony that a person of
10 skill in the art would have understood that a ring
11 encompasses an oval shape?

12 A. Well, all rings are ovals. Not all
13 ovals are necessarily exactly rings, but
14 encompasses -- you know, an annular light guide can
15 form an oval on a light pattern, as I describe.

16 Q. What's your source for saying all
17 rings are ovals?

18 A. Knowledge of a POSITA.

19 Q. But you agree that not all ovals are
20 rings; right?

21 A. But as I describe here, an annular
22 light guide would generate an annular output light

1 pattern, which encompasses an oval light shape
2 pattern.

3 Q. You relied upon the American Heritage
4 College dictionary in Exhibit 1095 for your
5 understanding of a ring encompasses an oval shape;
6 right? Sorry, strike that.

7 You relied upon the American Heritage
8 College dictionary, Exhibit 1095, for your
9 understanding of the oval shape; right?

10 A. Well, that's an example. It's not the
11 exclusive -- my exclusive understanding. You know,
12 I cite something there, but that's not the only
13 thing that I could have cited. But certainly what's
14 described there is -- didn't form the basis of my
15 understanding. A POSITA would understand as I've
16 described.

17 Q. Exhibit 1095 is the one you can't
18 read; right?

19 A. Of the version that we looked at
20 today, that is correct.

21 Q. And you weren't able to find one that
22 you could read; right?

1 A. Agreed. But that doesn't mean that I
2 didn't look at the physical copy or that if I had
3 searched more time -- I mean, certainly it exists.
4 But, again, in the version that we're looking at
5 today, it was compressed.

6 Q. Did you look at the physical copy?

7 A. I don't recall. I have a lot of
8 dictionaries. I prefer paper, as we can tell,
9 but...

10 Q. So you don't know if you looked at the
11 physical copy. You're just saying you might have as
12 a saving grace; right?

13 A. I'm saying what I say here, in terms
14 of I quote the reference. It's not made up. It's
15 as I describe.

16 MR. OLDHAM: I'm uploading what will
17 be marked as Depo Exhibit 2.

18 Let me know when you have that open.

19 (Exhibit 2, No Bates Numbers, American
20 Heritage College dictionary, Fourth Edition,
21 received and marked.)

22 THE REPORTER: So what was Exhibit 1?

1 MR. OLDHAM: I'm sorry. What was
2 that?

3 THE REPORTER: What was Exhibit 1?

4 MR. OLDHAM: Exhibit 1 was his version
5 of the Exhibit 1095 that we couldn't read.

6 THE REPORTER: Thank you.

7 MR. OLDHAM: I marked it as a
8 different number so that we can keep it
9 separate from my Exhibit 1095.

10 THE REPORTER: Okay.

11 BY MR. OLDHAM:

12 Q. Do you have Exhibit 2 open?

13 A. Not yet. It's giving me -- hold on.
14 Okay.

15 Q. Do you see Exhibit 2 is excerpts from
16 the American Heritage Collegiate dictionary?

17 A. Yes.

18 Q. Is it legible?

19 A. Fourth Edition.

20 Q. Is it legible?

21 A. Yes.

22 Q. Can you turn to -- it's page 1198 in

1 the dictionary. This is the page that has
2 definitions for the word "ring."

3 Will you read -- so the word "ring"
4 has multiple entries. One is as a noun. The second
5 is as a verb.

6 Do you see that?

7 A. Yes.

8 Q. And can we agree that for purposes of
9 what we're discussing today, we're going to be
10 talking about the noun form of the word "ring"?

11 A. Fair enough.

12 Q. Will you read the first definition for
13 the noun form of "ring"?

14 A. So the first definition in the Fourth
15 Edition, the one that you just sent, the American
16 Heritage College dictionary -- sorry, my PDF handler
17 is zooming -- okay.

18 A circular -- under "ring," noun.
19 Definition No. 1, a circular object, form, or line,
20 or arrangement with a vacant circular center.

21 Q. Would you agree that's a good
22 definition for "ring"?

1 A. Well, there are many definitions here,
2 but that's the first definition in this version --

3 Q. Would you agree that this --

4 A. -- in this --

5 Q. -- definition 1 is a good definition?

6 A. Well, as is definition 12, relevant to
7 what we're talking about here. The area between two
8 concentric circles; an annulus.

9 Q. Okay. So --

10 A. But --

11 Q. Go ahead, sorry.

12 A. No, that's fine.

13 Q. So you agree 12 is a good definition,
14 as well; right?

15 A. Again, this is the version that --
16 this is a different version of the dictionary than
17 the one that -- this is the Fourth Edition. So --
18 but it's -- you know, those are the definitions of
19 "ring" that's listed here in the dictionary.

20 But as I described here in
21 paragraph 71, understanding the ring is consistent
22 with ring for describing sort of shapes around

1 planetary objects. I'm describing jewelry around a
2 finger, which is also described here. And, you
3 know, would have found it obvious that the annular
4 light guide, as I described, generates an annular
5 output light pattern, which encompasses an oval
6 shape light pattern.

7 Q. Definition 1 of "ring" describes
8 "ring" as circular; right?

9 A. Definition 1, circular object, form,
10 line, or arrangement with a vacant circular center.

11 Q. Will you read definition 2?

12 A. A small circular band, usually made of
13 precious metal and often with jewels, worn on the
14 finger.

15 Q. And definition 2 describes "ring" as
16 circular, as well; right?

17 A. Small circular band, usually made of
18 precious metal.

19 Q. Okay. Let's go back to definition 12.
20 You like that definition; right?

21 A. That's one of many definitions. Also,
22 there's a circular band -- you know, No. 3, circular

1 band for carrying, holding, or containing something.
2 4 is rings. A boxing ring is described as a ring,
3 which is not circular, but, you know, there's a
4 boxing ring. That would be another -- a rectangular
5 area.

6 But, again, in the context of the
7 patent and person, as I describe, would -- you know,
8 as I describe in paragraph 71.

9 Q. Yeah, so a person of skill in the art
10 wouldn't rely on the definition of "ring" for a
11 boxing ring as being relevant to the '743 patent;
12 right?

13 A. Right. They would understand it in
14 the context of what's described and disclosed. And
15 as I describe here, you know, the dictionary
16 definition of "annular" includes "shaped like or
17 forming a ring." And a POSITA would have understood
18 that a ring encompasses an oval shape, right. And
19 oval is a ring.

20 Q. So in all these definitions --

21 A. And so a ring --

22 Q. In all the definitions of "ring," we

1 have at least 15 different definitions of "ring" as
2 a noun. How many of those definitions mention oval?

3 A. Well, it includes, for example, to
4 surround with or as if with -- as if with a ring to
5 encircle, right. And, you know, my ring here that I
6 just took off, this is not a circle. This is an
7 oval in nature.

8 But, you know, as I describe, you
9 know, understanding a ring is consistent with the
10 use of ring, for example, when describing
11 oval-shaped rings, the rings around planets, around
12 jewelry around a finger.

13 And a POSITA would have understood the
14 shape of the output light pattern would correspond
15 to the shape of --

16 Q. That's --

17 (Cross talk.)

18 A. -- guide unit 7, and a POSITA would
19 have found it obvious that an annular light guide
20 would generate an annular output light pattern,
21 which encompasses an oval-shaped light pattern.

22

1 Q. All that testimony about oval did not
2 come from the dictionary, though; right? I want to
3 make sure you're -- you're acting like you're
4 reading from the dictionary, but there's no mention
5 of "oval" in the dictionary; right?

6 A. Well, what I'm describing is a POSITA
7 would have found -- a POSITA would have
8 understand -- understood in the context of the
9 patent and as I describe here. I'm reading the
10 definitions, but that's in the context of the
11 patent, as I describe in paragraph 71, what a POSITA
12 would have understood.

13 Q. So what dictionary would a POSITA have
14 gone to to find the definition that uses the word
15 "oval"?

16 A. So I highlight here, you know, the
17 dictionary definition of "annular" is "shaped like
18 or forming a ring." And a POSITA would have
19 understood that a ring encompasses an oval-shaped.
20 Understanding of "ring" is consistent with -- for
21 example, when describing oval-shaped rings around
22 planetary objects or describing jewelry.

1 Because a POSITA would have understood
2 the shape of output light pattern would correspond
3 to the shape of the guide unit 7, a POSITA would
4 have found it obvious that an annular light guide
5 would generate an annular output light pattern,
6 which encompasses, by definition, an oval-shaped
7 light pattern.

8 And even if, for example, you take --
9 a POSITA would understand if you take a ring and
10 it's tilted a little bit, you know, the projection
11 on the surface that it's illuminating is going to be
12 ovular.

13 Q. Let's go back to definition 12, which
14 is the one that you picked out as one you liked.

15 And it says, "The area between two
16 concentric circles; annulus." That's equating
17 annulus as the area between two concentric circles;
18 right?

19 A. Agreed. And what I've described here,
20 as well, is that an annulus -- even though that
21 could generate both a perfectly circular ring and,
22 if it were off axis a little bit, would also

1 generate on the projected surface an oval. And so
2 that ovular light would be coming from even a
3 perfectly sort of round -- or two concentric
4 circles; annulus.

5 And so it's -- as I describe here, the
6 oval-shaped light pattern certainly come from an
7 annulus.

8 Q. You didn't provide any testimony in
9 your declaration about making a circle off axis so
10 it forms an oval shadow; right?

11 This is new testimony; right?

12 A. Well, I'm describing the understanding
13 of a POSITA, and could I have added more words to
14 this? And I'm adding the words now to explain to
15 reinforce my opinions in what I'm describing here
16 and trying to be responsive to the question.

17 But an annular output light pattern
18 would certainly come from -- encompasses an oval
19 light shape pattern, and if we took the annulus on a
20 skin surface that's curved would not be -- unless it
21 were perfectly planer would not be a circle. It
22 would have an extended shape, which a POSITA would

1 understand could also be an oval -- an oval annular
2 shape.

3 Q. Would a person of skill in the art be
4 misled by the definitions that are found in the
5 American Heritage Collegiate dictionary?

6 A. Well, I think a POSITA reading the
7 specification would understand as I've described
8 here, that an annular ring is -- annular guide would
9 generate an annular light pattern, and it's --
10 includes an oval-shaped pattern for many reasons.

11 An oval -- a circle is an oval. An
12 annulus is perfectly concentric. A circle is also
13 an oval annulus. And even if it were perfect sort
14 of two -- or a perfect ring-shaped or sort of
15 classic radius annular when projected onto the skin,
16 it's unlikely to remain as a perfect ring and would
17 in some cases certainly be ovular in nature.

18 Q. You understand what an oxygen
19 saturation value is; right?

20 A. I'm sorry, can you ask that again?

21 Q. You understand what an oxygen
22 saturation value is; right?

1 A. Well, oxygen saturation is looking at
2 the relative ratio of oxygenated and deoxygenated
3 blood.

4 Q. You agree that oxygen saturation is
5 expressed as a percentage between zero and a hundred
6 percent; right?

7 A. Most devices are sort of describing it
8 as sort of a relative, you know, ratio between sort
9 of fully oxygenated than not. Can it be quantified
10 more? Yes, but in practice it's done as a relative
11 ratio.

12 Q. Do you know what would generally be
13 considered a normal oxygen saturation value for a
14 healthy person?

15 A. I think that is described, but it's --
16 you know, you don't like to drop very far. It's
17 high 90s. And it also depends on what type of
18 sensor. Because, you know, you can have sensors
19 that are -- depending on their construction and the
20 noise associated with them, it may vary a little
21 bit. But when you're looking at a sort of finger
22 worn, there's a -- you want to keep it high 90s.

1 Q. You agree that oxygen saturation
2 cannot be below zero; right?

3 A. It would be unfortunate to have a
4 saturation below zero.

5 Q. And if the saturation was a value of
6 negative 200 percent, that means the sensor isn't
7 working correctly; right?

8 A. Oh, I would -- your hypothetical, I'm
9 not sure if you have a particular example. But, you
10 know, in general, the sensors are going to be
11 reporting sort of percentages between zero and a
12 hundred.

13 Q. A person with an oxygen saturation of
14 zero would be dead; right?

15 A. Highly likely.

16 Q. Each of your declarations -- sorry,
17 strike that.

18 Each of your supplemental
19 declarations, which are marked as Exhibit 1079 in
20 each proceeding, discuss testimony from Apple's
21 engineers during an ITC investigation; correct?

22 A. Yes. And I believe that's why they're

1 marked as confidential protective order material.

2 For example, on the -- in the '159, for example --

3 just for example, on page 53, I believe that is --

4 as I quote in paragraph 45, that's ITC testimony.

5 Q. You did not attend the ITC hearing;

6 right?

7 A. I did not, no.

8 Q. You have never spoken with Dr. Paul

9 Mannheimer; right?

10 A. I have not, no.

11 Q. You have never spoken with Brian Land;

12 right?

13 A. I have not, no.

14 Q. You have never spoken with Stephen

15 Waydo; right?

16 A. I have not, no.

17 Q. You have never spoken with Sahil

18 Mehra; right?

19 A. I have not, no.

20 Q. You have never spoken with Vivek

21 Venugopal; right?

22 A. I have not, correct.

1 Q. You have never spoken with Tao Shui;
2 right?

3 A. But -- I've not, but I have -- as
4 here, I have access to the testimony. I described
5 forming my opinions around that testimony, but I've
6 not spoken to those individuals, no.

7 Q. You have never spoken with Ueyn Block;
8 right?

9 A. That is correct. And, again, I
10 understand this to be the testimony of those
11 individuals, and I formed my opinions according to
12 the written record.

13 Q. You've never spoken with any of the
14 Apple engineers whose testimony you discuss in your
15 supplemental declaration; right?

16 A. That is correct.

17 Q. Can you open up Exhibit 1079 from the
18 '244 IPR?

19 A. '244 is which one, the '159 or the
20 '743?

21 MR. BISENIUS: That's for the '159
22 patent.

1 THE WITNESS: Okay.

2 BY MR. OLDHAM:

3 Q. Can you go to paragraph 49?

4 A. Yes.

5 Q. In this paragraph you discuss
6 testimony from Dr. Waydo; right?

7 A. Yes, that is what is described.
8 Waydo's testimony is trying to cover the wide
9 variety of human physiology in use cases. So trying
10 to cover things like gender, variable skin tones,
11 ethnic groups, to try to tackle the complex
12 variability that you would see as a product, such as
13 the Apple Watch.

14 Q. Beginning at the fifth line of
15 paragraph 49, you quoted Dr. Waydo as saying, quote,
16 trying to tackle... [REDACTED]

[REDACTED]

[REDACTED]

19 Do you see that?

20 A. I do, yes.

21 Q. Is it your opinion that the Apple
22 Watch is able to measure oxygen saturation while the

1 user is running?

2 A. So what they were working towards is
3 trying to tackle, as they describe there, [REDACTED]

4 [REDACTED]

5 [REDACTED] Whereas, prior
6 techniques were developed in the context of very
7 different -- rejecting small motions, which might be
8 present, for example, in a hospital bed environment
9 when a person is moving a little bit.

10 And then I guess going up, for
11 example, to page 65, the feature target, the high
12 level goals for the scandium version, the activity
13 type there was sedentary conditions only, not
14 supported during motion.

15 But that was described as, you know,

16 [REDACTED]

17 [REDACTED]

18 [REDACTED] So there's certainly complexity, as I
19 describe here, in getting it to work under all those
20 conditions, which is what they were trying to
21 address.

22 Q. There was a gap of time, and you may

1 have forgotten my question.

2 Is it your opinion that the Apple
3 Watch is able to measure oxygen saturation while the
4 user is running?

5 MR. BISENIUS: Objection, asked and
6 answered.

7 THE WITNESS: I didn't need to opine
8 upon whether or not how well it works when
9 running and whether it's relative to forming
10 my opinions, but certainly a POSITA knew that
11 it was possible to make measurements at the
12 wrist.

13 The accuracy would decrease when
14 moving, as the POSITA would also know. But
15 in forming my opinions, you know, whether it
16 was active during running was not necessary
17 in forming my opinions.

18 BY MR. OLDHAM:

19 Q. Is it your opinion that the Apple
20 Watch is able to measure oxygen saturation while the
21 user is running, irrespective of accuracy?

22 MR. BISENIUS: Objection, asked and

1 answered.

2 THE WITNESS: Again, in forming my
3 opinions here, I didn't need to opine upon
4 whether it's -- how it's working during
5 running.

6 BY MR. OLDHAM:

7 Q. Do you know if it works when the user
8 is running?

9 MR. BISENIUS: Objection, asked and
10 answered.

11 THE WITNESS: Whether or not it's a
12 functionality that's exposed to the user, you
13 know, given what a POSITA would be wanting --
14 or an Apple engineer would want, they
15 would -- even if it -- they would want it to
16 be a certain level of quality.

17 So it may be able to do it but not
18 display to the user, or able to do it and
19 display to the user depending on the level of
20 quality that they wanted to guarantee
21 underneath the different motion scenarios.

22 But in forming my opinions, it's not

1 necessary to know whether -- how good it
2 works while running, but it can be done. In
3 general, a POSITA would know that the
4 accuracy would be less, but it doesn't mean
5 it's not a measurement that would be
6 worthwhile.

7 BY MR. OLDHAM:

8 Q. You don't know if the Apple Watch even
9 tries to take a measurement when the user is
10 running; right?

11 A. Again, that's not necessary -- well,
12 it's not necessarily to opine upon in forming my
13 opinions here.

14 Q. Is it your opinion that the Apple
15 Watch is able to measure oxygen saturation while the
16 user is walking?

17 A. Again, it's not necessarily to
18 demonstrate all the different use scenarios, but the
19 Apple Watch does certainly measure pulse ox, makes
20 the measurements. And it wasn't necessarily to
21 opine upon the different scenarios where the
22 performance may degrade and they turn it on or off,

1 depending on user skin tone, motion, but certainly
2 the measurements can be made at the wrist.

3 Q. Is it your opinion that the Apple
4 Watch is able to measure oxygen saturation while the
5 user is exercising?

6 A. So, again, as I describe, at least in
7 paragraph 52 on page 66, none of the complex product
8 constraints relevant to the skin -- variable skin
9 tone, running or not, are relevant to the claim's
10 simple requirement for determining some unspecified
11 oxygen saturation parameter.

12 All the other factors that are being
13 discussed here are sort of trying to make it work
14 under the diversity of humanity and the diversity of
15 humanity's things they do. But certainly it was
16 possible -- a POSITA knew it was possible to measure
17 pulse ox at the wrist.

18 Q. Is it your opinion that the Apple
19 Watch is able to measure oxygen saturation while the
20 user is moving?

21 A. Again, it's not necessarily in forming
22 my opinions as to which version of the Apple Watch

1 and how it just uses to report during motion or not.
2 All those product considerations are not relevant to
3 the fact that it was possible to measure parameter
4 of oxygen saturation at the wrist, as I describe in
5 paragraph 52.

6 Q. Yes or no, do you have an opinion that
7 the Apple Watch is able to measure oxygen saturation
8 while the user is moving?

9 A. I have an opinion that it most
10 certainly is taking measurements. Whether or not it
11 chooses to display those with -- as a product
12 designer, would I, if I were an Apple engineer,
13 which I'm not, if I detect that the accuracy is
14 decreasing, choose to not convey that to the user.

15 But the functionality of having the
16 light there, there would certainly be able to make
17 measurements. The question is: How accurately can
18 you make the measurements relative to the stringent
19 requirements and choosing or not as a user interface
20 and customer expectations for how you choose to say
21 that, represent that?

22 But, again, all those are product

1 concerns that aren't relevant to the fact that a
2 POSITA knew that it was possible to make oxygen
3 saturation measurements at the wrist.

4 Q. How do you know that the Apple Watch
5 was taking measurements while the user was moving --
6 strike that.

7 How do you know that the Apple Watch
8 was able to take oxygen saturation measurements
9 while the user was using -- strike that.

10 How do you know that the Apple Watch
11 was able to take oxygen saturation measurements
12 while the user was moving?

13 A. Again, it wasn't necessary in forming
14 my opinions to get into the details of how exactly
15 the Apple Watch is functioning. However, a POSITA
16 would know, as is taught in the art, using multiple
17 wavelengths of light, you would use that to get
18 oxygen sat -- the relative ratio to get oxygen
19 saturation.

20 A POSITA would also know that if
21 there's movement, the quality of that measurement
22 may degrade. And what is described here is the

1 complexities that Apple went through in trying to
2 make it as robust as possible to skin tone and how
3 the user wears it and how they're moving.

4 But if the device can get those two
5 relative sort of optical measurements, light -- two
6 different wavelengths of light, motion would degrade
7 it, but it doesn't mean the measurement is not
8 there.

9 Q. Would your opinions be impacted if you
10 learned that the Apple Watch does not attempt to
11 take oxygen saturation measurements while the user
12 is moving?

13 A. No, my opinions would not change in
14 terms of what is taught in the art and the -- the
15 ability for making measurements at the wrist.

16 Q. So the testimony from Waydo that you
17 cited is not relevant to your opinions; is that
18 correct?

19 A. Well, what I'm describing here is the
20 fact that the Apple engineers are trying to deal
21 with all of the product issues associated with the
22 diversity of humanity, size of wrist, color of skin,

1 how the user wears it, how it -- how people are
2 moving around.

3 It doesn't change my opinion that
4 these complex product constraints are not
5 required -- are not relevant to knowing that, Hey,
6 we can actually make the measurement at the wrist,
7 as I've described.

8 Q. Is it your opinion that one of the
9 difficulties in developing the Apple Watch was
10 measuring oxygen saturation at the wrist while the
11 user was moving?

12 A. Well, as you pointed out and as I
13 quote here, yeah, that's one of the issues that they
14 wanted to deal with as making the product.

15 Q. What is basis for that opinion?

16 A. Well, for example, in paragraph 49,
17 trying to tackle collecting measurements under
18 motion, running, walking. Whereas, prior techniques
19 were designed -- developed in the context of
20 rejecting small motion. And it also goes on to
21 describe the -- dealing with the diversity cover
22 things like gender, skin tones, different ways of

1 wearing it.

2 So my opinions are formed based on
3 what they're describing here, but the challenges
4 that they're talking about is dealing with all that
5 diversity. But, fundamentally, a POSITA knew that
6 you could make measurements at the wrist.

7 Q. Is it your opinion that measuring
8 oxygen saturation at the wrist while the user was
9 moving contributed to the long development time of
10 the Apple Watch?

11 A. I'm sorry, say that again.

12 Q. Is it your opinion that measuring
13 oxygen saturation at the wrist while the user was
14 moving contributed to the long development time of
15 the Apple Watch?

16 A. Well, there are many things that went
17 into the long development. You know, in
18 paragraph 50, [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

[REDACTED]

Putting a couple of LEDs in the watch would improve SpO2, but not to the level that they were looking for. So the development time was associated with getting it to the level that they were looking for, the level of performance that they were targeting. I clarified that those are the attributes. Those are the things that took a long time to --

Q. I don't think you heard --

A. -- get the Apple Watch --

Q. I don't think you heard my question.

Is it your opinion that measuring oxygen saturation at the wrist while the user was moving contributed to the long development time of the Apple Watch?

A. So all of the factors that I listed;

[REDACTED]

[REDACTED]

[REDACTED]. It

does not change the fact that a POSITA knew that you could make the measurements at the wrist.

1 Q. What is the basis for that opinion?

2 A. Well, first, as I describe in at least
3 the first declaration on the '159, which is the --
4 mainly leading with the Iwamiya reference, for
5 example, on page 76, starting at paragraph 100,
6 describe over the dozen references underscore how
7 determining oxygen saturation at the wrist was not
8 only well-known, but it actually had been
9 successfully and repeatedly performed before the
10 '159 patent's earliest priority date.

11 And then in the new declarations, I go
12 on to -- you know, the basis for my opinions is in
13 the original declaration there. And I opine on it
14 more on, for example, page 30, paragraph 25 of the
15 '159 supplementary -- sorry, at paragraph 25 and 26.
16 So there's lots of prior literature that I cite in
17 the original declaration and then augment in my
18 supplemental declaration.

19 Q. Let me clarify the question a little
20 bit.

21 What is the basis for your opinion
22 that measuring oxygen saturation at the wrist while

1 the user was moving contributed to the long
2 development time of the Apple Watch?

3 A. I was listing all the issues that they
4 were trying to deal with. And so my opinion is
5 discussing the variability of humanity that the
6 Apple engineers are discussing, including skin tone,
7 the level of accuracy they're trying to achieve,
8 movement, environmental conditions.

9 So all those factors certainly
10 contributed to getting a product out the door to
11 address all those --

12 Q. And I'm asking specifically --
13 (Cross talk.)

14 THE WITNESS: -- one of many.

15 BY MR. OLDHAM:

16 Q. I'm asking specifically while the user
17 was moving. So what is the basis for your opinion
18 that measuring oxygen saturation at the wrist while
19 the user was moving contributed to the long
20 development time of the Apple Watch?

21 A. Well, as I've described, there are
22 many factors that the Apple engineers described that

1 they wanted to address. POSITAs understood that it
2 was possible to measure at the wrist. And certainly
3 understanding that motion impacts, skin tone
4 impacts, those are not unknown things.

5 And so my opinion is based on the
6 knowledge of a POSITA, that dealing with all those
7 factors in a product to deal with all that
8 variability would lead to design tradeoffs and
9 development time and design challenges to
10 miniaturize everything in the small form factor
11 to -- with low power to give long battery life. All
12 those factors would matter.

13 Q. What documents specifically are you
14 referring to that show the knowledge of a person of
15 skill in the art with respect to your opinion that
16 measuring oxygen saturation at the wrist while the
17 user was moving contributed to the long development
18 time of the Apple Watch?

19 A. Again, I'm describing in my -- in
20 describing what the Apple engineers are pointing to,
21 right, they're pointing to deal with all that
22 variability and all those -- dealing with all those

1 issues, that is what would take time to get all that
2 functionality stuffed into a small form factor and
3 being power efficient. So everything would matter
4 to impact the development time. So, I mean, that's
5 as I've described.

6 MR. OLDHAM: I'm uploading
7 IPR2024-00244, Exhibit 2078 to the chat.
8 (Exhibit 2078, Previously marked.)

9 BY MR. OLDHAM:

10 Q. Please let me know when you have
11 Exhibit 2078 open. And if you could turn to
12 page 926.

13 A. What page?

14 Q. 926.

15 A. There's only 30 -- oh, I'm sorry,
16 the -- okay, the number at the top. 926. Okay.

17 Q. So there's question at line 23 and an
18 answer beginning at line 25. Would you read the
19 question and answer into the record?

20 A. [REDACTED]
[REDACTED] the
22 question at line 23 and 24.

1 And 25, it says, [REDACTED] [REDACTED]

[REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

[REDACTED]

9 Q. [REDACTED] your

10 earlier testimony that the Apple Watch most

11 certainly takes measurements during movement; right?

12 A. I said it most certainly could. I

13 didn't say it most certainly did.

14 Q. Well, the record speaks for itself.

15 Let's turn to page 927. Beginning at

16 line 19, there's a question, and an answer beginning

17 at line 22.

18 Can you read the question and answer

19 there?

20 A. The question at line 19?

21 Q. Yes.

22 A. [REDACTED]

1 [REDACTED] [REDACTED]ction on
2 motion as part of blood oxygen algorithm?"

3 The answer is: [REDACTED]

4 [REDACTED]

5 [REDACTED]

6 [REDACTED] [REDACTED]

7 [REDACTED]

8 [REDACTED]

9 [REDACTED]

10 [REDACTED]

11 [REDACTED]

12 [REDACTED]

13 [REDACTED] [REDACTED]

14 [REDACTED]

15 [REDACTED]

16 [REDACTED]

17 Q. You weren't aware of this testimony
18 when you prepared your opinions; were you?

19 A. This does not change my opinion. It's
20 choosing to not show something based on the accuracy
21 achievable. It doesn't mean that it couldn't be
22 done with decreased accuracy. Again, a POSITA knew

1 that the measurements could be made, and a variety
2 of factors impact it, skin tone, motion.

3 Here, [REDACTED]

4 [REDACTED]
5 [REDACTED] there's no stated accuracy that's required in
6 the claims, and a POSITA knew that you could make
7 the measurements.

8 Apple, as a product, is choosing in
9 that case to forego that complexity to have a
10 product. It doesn't change the fact that a POSITA
11 knew that you could make the measurements at the
12 wrist.

13 Q. You didn't take this testimony into
14 account in preparing your opinions; right?

15 A. I quote various aspects of the
16 testimony in my declaration, but this is -- does not
17 change my opinions at all. It's -- again, as a
18 product, you choose different design factors,
19 different manufacturing factors, different cost
20 factors in order to hit a price point, and a cost
21 and complexity and a miniaturization doesn't change
22 the fact that a POSITA knew that you could make the

1 measurements at the wrist, as they described.

2 Q. My question is: You didn't take this
3 testimony that you just read into the record into
4 account in forming your opinions; right?

5 A. What I quoted in my declaration is
6 sort of relevant sections. But, again, this
7 testimony -- it doesn't change my opinions.

8 MR. OLDHAM: No further questions.

9 MR. BISENIUS: I have -- give me
10 ten minutes. I want to look through the
11 record and see if I have a redirect.

12 MR. OLDHAM: Okay.

13 THE REPORTER: We're off the record.

14 (Recess from the record.)

15 MR. BISENIUS: I've got a few more
16 questions. So I'm ready to go on whenever
17 you are.

18 THE REPORTER: We're back on the
19 record.

20

21

22

1 EXAMINATION

2 BY MR. BISENIUS

3 Q. Dr. Anthony, in preparing the opinions
4 expressed in your declarations and during your
5 deposition today, at any point in time did you
6 review the actual functionality of the Apple Watch,
7 such as by reviewing descriptions of the
8 functionality, marketing materials, descriptions of
9 teardowns of the Apple Watch, anything along those
10 lines?

11 MR. OLDHAM: Objection, leading,
12 outside the scope.

13 THE WITNESS: No, I did not.

14 BY MR. BISENIUS:

15 Q. Have you performed any teardowns or
16 evaluations of the function of the Apple Watch in
17 preparing your opinions in these declarations in
18 this deposition?

19 A. No, I did not.

20 Q. Did you spend any time comparing
21 functionality between different versions of the
22 Apple Watch in preparing your opinions for your

1 declarations and this deposition?

2 A. No, I did not.

3 Q. Were your opinions in your
4 declarations regarding the requirements for the
5 version of the Apple Watch having pulse oximetry
6 based on materials describing actual functionality
7 of the Apple Watch based on the testimony of Apple's
8 engineers or both?

9 MR. OLDHAM: Objection, compound,
10 leading.

11 THE WITNESS: Can you please ask the
12 question again?

13 BY MR. BISENIUS:

14 Q. Yes.

15 When forming your opinions as
16 expressed in your declarations and during your
17 deposition today regarding the version of the Apple
18 Watch having pulse oximetry features, were those
19 opinions based on materials that you've reviewed
20 describing actual functionality of the Apple Watch,
21 were they based on testimony of Apple's engineers,
22 were they based on both or on something else?

1 MR. OLDHAM: Objection, leading,
2 compound.

3 THE WITNESS: The testimony of the
4 Apple engineers and knowledge of a POSITA.

5 MR. BISENIUS: No further questions.

6 MR. OLDHAM: I just have a couple.

7 EXAMINATION

8 BY MR. OLDHAM

9 Q. You testified that your testimony was
10 based on the knowledge of the Apple engineers;
11 right?

12 A. My testimony is based on the -- my
13 opinions were formed on the opinions of the
14 testimony that I cite in my declarations.

15 Q. So you just gave an answer.

16 MR. OLDHAM: Can we read back the last
17 question and answer from Mr. Bisenius?

18 (Record read.)

19 BY MR. OLDHAM:

20 Q. So the testimony of the Apple
21 engineers that you relied on are the snippets that
22 were selected by counsel for you to read; correct?

1 A. The declaration, you know, it was a
2 claritive effort. You know, this is not really
3 something that I was told to cite, but this is my
4 opinions formed on both the knowledge of the POSITA
5 and the references and sort of describing my
6 understanding of the challenges as described in the
7 testimony of what an Apple engineer was trying to
8 deal with.

9 Q. But you didn't read the full testimony
10 of the Apple engineers; right?

11 A. I do not have it memorized. And I
12 certainly skimmed through all the documents that I
13 cite, but this is my declaration, my opinions based
14 on the materials that I cite.

15 Q. For example, you didn't read
16 Mr. Waydo's testimony about motion prior to today;
17 right?

18 A. I do not recall.

19 MR. OLDHAM: No further questions.

20 Thank you for your time.

21 (Deposition concluded. Off the record
22 at 4:40 p.m.)

1 STATE OF NEW YORK)
2 ss:
3 COUNTY OF WESTCHESTER)
4

5 I, EILEEN MULVENNA, CSR/RMR/CRR/RDR, a
6 Certified Court Reporter, Registered Merit Reporter,
7 Certified Realtime Reporter, Registered Diplomate
8 Reporter, and Notary Public in and for the State of
9 New York, do hereby certify:

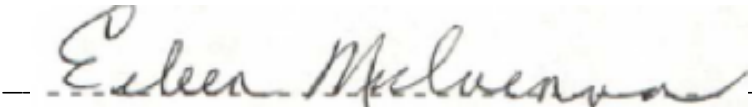
10 That I reported the taking of the
11 deposition of the witness, DR. BRIAN W. ANTHONY,
commencing on the 21st day of March, 2025, at the
hour of 12:00 p.m.

12 That prior to being examined, the witness
13 was duly sworn by me to testify to the truth, the
whole truth, and nothing but the truth.

14 That I thereafter transcribed my said
15 shorthand notes into typewriting and that the
16 typewritten transcript of said deposition is a
complete, true and accurate transcription of my
said shorthand notes taken down at said time, and
that a request has been made to review the
transcript.

17 I further certify that I am not a relative
18 or employee of an attorney or counsel of any of the
parties, nor a relative or employee of any attorney
or counsel involved in said action, nor a person
financially interested in the action.

19 IN WITNESS WHEREOF, I have hereunto
20 set my signature this 23rd day of March, 2025.

21 
22 EILEEN MULVENNA, CSR/RMR/CRR

1 Dr. Brian W. Anthony, c/o
2 FISH & RICHARDSON P.C.
3 60 South Sixth Street, Suite 3200
4 Minneapolis, Minnesota 55402
5

Case: Apple, Inc. v. Masimo Corp.

6 Date of deposition: March 21, 2025

Deponent: Dr. Brian W. Anthony

7

8 Please be advised that the transcript in the above
referenced matter is now complete and ready for signature.

9 The deponent may come to this office to sign the transcript,
10 a copy may be purchased for the witness to review and sign,
11 or the deponent and/or counsel may waive the option of
12 signing. Please advise us of the option selected.

13 Please forward the errata sheet and the original signed
signature page to counsel noticing the deposition, noting the
14 applicable time period allowed for such by the governing
Rules of Procedure. If you have any questions, please do
15 not hesitate to call our office at (202)-232-0646.

16

17

18 Sincerely,

19 Digital Evidence Group

20 Copyright 2025 Digital Evidence Group

21 Copying is forbidden, including electronically, absent
22 express written consent.

1 Digital Evidence Group, L.L.C.
2 1730 M Street, NW, Suite 812
3 Washington, D.C. 20036
4 (202) 232-0646

5
6 SIGNATURE PAGE
7 Case: Apple, Inc. v. Masimo Corp.
8 Witness Name: Dr. Brian W. Anthony
Deposition Date: March 21, 2025

9
10 I do hereby acknowledge that I have read
and examined the foregoing pages
of the transcript of my deposition and that:

11
12 (Check appropriate box):
() The same is a true, correct and
13 complete transcription of the answers given by
me to the questions therein recorded.
14 () Except for the changes noted in the
attached Errata Sheet, the same is a true,
15 correct and complete transcription of the
answers given by me to the questions therein
16 recorded.

17 _____
DATE WITNESS SIGNATURE

18
19
20
21 _____
22 DATE NOTARY

1 Digital Evidence Group, LLC
2 1730 M Street, NW, Suite 812
3 Washington, D.C. 20036
4 (202) 232-0646

5
6 ERRATA SHEET

7
8 Case: Apple, Inc. v. Masimo Corp.
9 Witness Name: Dr. Brian W. Anthony
10 Deposition Date: March 21, 2025

11 Page No. Line No. Change

12
13
14
15
16
17
18
19
20
21

22 _____

Signature Date

A	112:7,8,11,21 113:11 119:7 120:1 121:1 122:6,18 161:13,21 163:4 165:13 172:7 176:20 176:22 177:4,5	advised 184:8 advisors 103:1 afternoon 6:21 ago 99:17 108:19 108:22 109:5 135:7 agree 62:18 70:4 72:19 140:12 142:19 146:8 146:21 147:3 147:13 155:4 156:1 Agreed 7:12,13 144:1 152:19 agreement 68:9 ahead 23:10 66:10 75:20 119:18 132:9 132:19 147:11 air 90:8 94:5 98:3 120:17 169:21 Alexandra 100:12 105:6 105:15 Alexandria 100:11 algorithm 176:2 alleviates 24:19 59:16 allow 77:12 allowed 29:19,19 29:21 39:20 40:5 184:14 alternative 83:9 aluminite 80:5 aluminum 80:4 81:21 84:12 88:22 89:13,22 95:1,14 alumite 80:5 81:22 89:1 90:1 95:2,15 American 4:20 5:3 129:15 130:13 132:4 143:3,7 144:19 145:16 146:15	154:5 and/or 184:11 annotated 68:1 70:18 84:5 86:13 annotation 67:13 68:18 annotations 66:6 66:10,13,16 74:9 annular 142:6,14 142:21,22 148:3,4 149:16 150:19,20 151:17 152:4,5 153:17 154:1,8 154:8,9,15 annulare 142:7 annulus 137:15 138:15 139:2 147:8 152:16 152:17,20 153:4,7,19 154:12,13 anonymous 127:9 answer 17:6,7,9 17:13,19 18:7 18:13,16,17,22 19:11 20:2 22:10 23:10,17 25:5,8,9,18 26:5,11 27:14 28:9,10 29:3,22 30:2 31:12,21 32:18 33:10,11 33:19,19,21 34:15 35:4,11 36:10 37:1 39:8 39:14 40:2,9,22 41:4,13,15 42:3 43:7,17 44:1,5 44:6,7,8,9,10 44:13,18 45:3,7 45:9,10,15,17 45:18,20 46:3,8 46:9,11,11,15	46:16,22 47:2,6 47:6,8,9,19 48:9,10 49:7,8 49:10,13 50:7,8 50:9,13,18,21 50:22 51:1,2,12 51:14,18,19,22 52:4,18,22,22 53:14,16 54:10 54:22 55:3,9,9 55:14,17,21 56:5 57:3 58:16 58:17 79:6,7 111:16 119:18 174:18,19 175:16,18 176:3 181:15 181:17 answered 17:11 18:15,20 19:16 20:7 21:21 22:16 24:1 25:7 25:13,21 26:10 26:12,18 27:20 28:14 30:16 31:16,19 32:22 33:1,17 34:2 35:9,16 36:8,14 37:3,4 42:17,19 43:11,13 44:15 46:1,20 48:1,15 48:16 49:19 52:1,6 55:6,7 56:11 57:6,8 140:3 161:6 162:1,10 answering 18:8 18:10,14 25:17 32:3 39:19 41:17 43:16 44:1 47:17 48:6 50:11,14 52:5 answers 26:2 32:2,2 39:2 49:4 50:20 52:11,14 185:13,15
----------	---	--	--	---

Anthony 1:14 2:2 4:3 6:15 7:1 29:15 30:8,11 35:8,11 39:6,13 40:8 41:4 51:11 51:17 55:2,14 56:15 128:7 179:3 183:10 184:1,6 185:8 186:9 anymore 101:12 102:6 apologies 79:9 101:22 Apparently 54:1 APPEAL 1:3 appearances 3:1 6:7 Apple 1:5 3:3 6:14 158:14 159:13,21 161:2,19 162:14 163:8 163:14,19 164:3,18,22 165:7,12 166:4 166:7,10,15 167:1,10,20 168:9 169:10 169:15 170:11 170:16 172:2,6 172:20,22 173:18,20 174:20 175:10 177:8 179:6,9 179:16,22 180:5,7,17,20 181:4,10,20 182:7,10 184:5 185:7 186:8 Apple's 107:17 107:21 156:20 180:7,21 applicable 21:16 27:8 108:5 184:14 applied 14:20	88:10 93:19 appointment 103:5,12 appointments 104:2 appropriate 185:12 approval 102:16 104:9,9,18 105:18,19 106:17 approve 104:12 105:9,11 approved 100:8 100:13,15,17 100:19 101:9 101:15,18 102:3 107:14 approving 101:3 105:3 approximately 2:4 109:10 area 147:7 149:5 152:15,17 arrangement 146:20 148:10 art 21:9 84:19 93:12 102:11 137:10 141:22 142:10 149:9 154:3 166:16 167:14 173:15 asked 17:10 18:19 19:15 20:6 21:21 22:15,19 23:22 26:9,17 27:19 28:13 30:15 31:15 32:21 33:16,22 34:10 35:9,15 36:7,13 37:2 42:16 43:10 44:14 45:22 46:19 47:15,22 48:14 49:18 55:5 56:10 57:5,7,8	61:6 79:8 134:12 140:3 161:5,22 162:9 asking 18:16 41:12 43:18,19 44:3,17 45:2,8 47:17 48:5 52:10,13 57:2 61:2,11,12 68:6 104:14,15 119:15 121:5,6 133:1 172:12 172:16 aspects 21:10 177:15 assess 140:4 associated 155:20 167:21 170:5 association 102:9 102:13 assume 7:11 61:16 109:16 113:2 117:5 assuming 67:16 117:19 121:14 atop 69:6 attached 185:14 attempt 167:10 attend 157:5 attorney 50:17 183:17,17 attorneys 107:17 107:21 attributes 170:8 augment 171:17 authorization 106:8 average 116:2,3 116:18,21 117:5,6,7,15,18 117:21,22 119:2,4 121:17 121:19 123:13 averaging 117:16 119:22 120:7 122:19,21	123:3 aware 176:17 axes 141:7 axis 140:10,13,20 141:14,15,18 152:22 153:9 axes 61:16 141:10 <hr/> B <hr/> B 4:8 5:2 back 10:16 22:18 38:8 59:6 65:18 65:21 66:2,4 98:13 109:4 141:10 148:19 152:13 178:18 181:16 background 176:12 backwards 85:18 badgering 29:1 53:1,20 54:17 55:6 56:11 band 24:16,17 59:13,14 60:1 148:12,17,22 149:1 bars 120:17 based 38:13 134:8 138:2 169:2 173:5 176:20 180:6,7 180:19,21,22 181:10,12 182:13 bases 105:8 basic 139:18 140:21 basis 25:14 53:14 89:16 102:2 105:5 143:14 168:15 171:1 171:12,21 172:17 Bates 4:20 5:3 129:15 144:19	battery 173:11 beam 63:22 bear 3:12 90:11 bed 160:8 beginning 14:12 78:18 88:1,3 93:14 124:8 159:14 174:18 175:15,16 behalf 2:2 3:3,11 believe 11:12 31:18 42:18 43:12 60:8 64:21 65:8,9 69:10 98:20 101:18 102:7 105:21 109:1 110:5 127:6 156:22 157:3 believed 102:3 beneficially 50:3 57:12 benefits 38:12 best 73:2 better 67:5 71:15 71:18 114:15 beyond 70:14 big 75:2 bigger 78:2 bio 58:14 Bisenius 3:5 4:5 6:5,12,13 8:3 11:19 17:10 18:19 19:15 20:6 22:15,22 23:4,7,22 26:9 26:17 27:19 28:13,22 29:4,6 29:9,17 30:5,15 31:8,15 32:21 33:12,16,22 34:5,13,20 35:2 35:6,9,15 36:7 36:13 37:2 39:9 39:17 40:12 41:2 42:16 43:10 44:14
---	---	--	---	---

45:13,22 46:19 47:4,22 48:14 49:18 53:1,20 54:6,11,16 55:5 56:10 57:5 98:6 99:12,15 110:2 111:9 112:4,10 113:12,20 114:18 115:8 117:9,12 118:2 118:7 119:8 120:3 121:21 123:2 124:6,12 127:22 128:4,7 135:12 158:21 161:5,22 162:9 178:9,15 179:2 179:14 180:13 181:5,17 bisenius@fr.com 3:9 bit 18:9 37:14 52:7 98:7 118:15 119:14 122:14 139:1,6 152:10,22 155:21 160:9 171:20 black 38:10 71:10 block 37:21 48:18 66:9,18 68:4,7 158:7 blocking 38:2 81:12 blocks 59:20 blood 155:3 174:21 176:2,8 blue 67:14 68:18 70:17,18 BOARD 1:3 book 112:18 books 141:16 bottom 60:20 61:3,15,18,20 63:4,6,12,22 68:20 71:5,8	77:3,8,15,19 92:1 93:7 142:2 bottoms 73:1 boundary 68:5 box 185:12 boxes 86:15 boxing 149:2,4 149:11 break 42:5 58:14 58:15,22 98:8 98:10 Brian 1:14 2:1 4:3 6:15 7:1 157:11 183:10 184:1,6 185:8 186:9 bring 10:10 62:2 broad 21:10 broadly 21:16 broke 66:15 85:9 108:8,15 broken 113:15 113:18 114:9 114:13 115:3 brought 90:11 browsed 132:7 bullets 126:7 buy 109:17 <hr/> C <hr/> c/o 184:1 calculated 137:16 138:15 calculation 138:19 calculations 169:21 calibration 115:11 California 3:15 call 67:3 184:15 called 86:10,20 95:9 calling 57:3 callout 62:8,11 73:9,12 74:13 74:17 75:4	calls 128:8 Cambridge 8:7 camera 28:19,20 29:12,16 30:9 30:12 31:7,7,10 31:11 39:7,13 40:2,9 41:1 career 103:16 Carnegie 107:13 carrying 149:1 case 69:10 80:1 81:18 84:8 88:19 94:20 95:12 135:6 139:3 177:9 184:5 185:7 186:8 cases 137:15 154:17 159:9 176:11,12,16 cavity 90:8 92:22 94:5 95:20 center 67:2 69:22 146:20 148:10 central 91:18 92:11 certain 130:16 131:19 140:20 162:16 certainly 27:9 31:2 32:15 93:2 108:3 122:10 130:15 131:1 131:11 132:7 139:3 141:16 143:13 144:3 153:6,18 154:17 160:18 161:10 163:19 164:1,15 165:10,16 172:9 173:2 175:11,12,13 182:12 certainty 120:12 Certified 2:5,7 183:6,7	certify 183:9,16 challenges 169:3 169:19 173:9 182:6 change 24:20 59:16 112:8 114:5 115:16 118:14 138:8 167:13 168:3 170:21 176:19 177:10,17,21 178:7 186:11 changes 112:14 115:4 185:14 changing 114:16 channel 90:8 92:22 95:20 characteristics 91:10 characterize 115:7,10 119:15 122:13 chat 9:9,22 10:2 10:17 11:13 13:9,12 98:16 128:6 129:9,13 174:7 Check 185:12 chest 99:1 100:3 choose 165:14,20 177:18 chooses 165:11 choosing 165:19 176:20 177:3,8 circle 67:4,8,11 67:14 70:11,12 70:18,19 137:17,17 138:16,17 139:11 150:6 153:9,21 154:11,12 circles 66:21,22 138:20 139:7 139:10 147:8 152:16,17 153:4	circular 64:20,21 65:13,16 66:14 66:17 68:9,11 68:14 146:18 146:19,20 148:8,9,10,12 148:16,17,22 148:22 149:3 152:21 circumferential 64:15 91:19 92:12 circumstances 175:2 cite 125:20 126:6 126:8 131:20 139:20 143:12 171:16 181:14 182:3,13,14 cited 125:17,22 137:11 143:13 167:17 claim's 164:9 claimed 83:9 claiming 133:15 claims 177:6 clarification 7:11 51:7,15 clarified 170:7 clarify 7:10 31:22 45:1 54:3 171:19 claritive 182:2 clarity 40:20 53:11 75:3 classic 154:15 clean 9:13 130:2 134:12,17 clear 11:14 34:15 44:9,17 67:6 72:13 74:11 79:6 86:18 close 129:1,2 coating 38:10,16 38:19 coauthors 105:22 collaborate
---	---	---	---	---

105:22	93:11 138:11	36:17 75:11	considered	copy 38:22
collaborated	combinations	83:14 91:11	155:13	134:12 144:2,6
106:11	81:9	95:21	considering	144:11 184:10
collaboration	combine 48:19	compound 180:9	176:11	Copying 184:21
127:7 132:17	48:21 56:1	181:2	consistent 147:21	Copyright
collaborators	combined 50:3	compressed	150:9 151:20	184:20
104:1	come 53:13 151:2	127:12 138:7	constrain 50:13	Corp 184:5 185:7
colleagues	153:6,18 184:9	144:5	50:18,20	186:8
105:10	comes 38:5 42:22	compression	constraint 51:9	Corporation 1:8
collecting 159:16	111:16 113:7	130:11 131:12	constraints 97:9	3:11
160:3 168:17	comfortable	computer 8:12	164:8 168:4	correct 11:11
collection 99:18	141:6	concave 64:13	construction	14:3,5,6 18:13
collections	coming 17:16,17	concentric 66:20	155:19	33:20 42:15
130:20	153:2	147:8 152:16	contact 39:18	44:13 45:21
collectively 11:7	commencing 2:4	152:17 153:3	114:3	58:16 60:20
College 4:21 5:4	183:10	154:12	containing 149:1	62:20 63:13
129:16 130:14	commensurately	concept 21:14	contains 95:8	65:17 67:19
143:4,8 144:20	139:5	concerns 166:1	context 18:11	74:15 75:9
146:16	common 38:20	concluded	25:14 34:20	94:13 100:7
Collegiate 130:14	compare 121:18	182:21	41:18 42:7 44:3	101:7,10,11
132:5 145:16	123:6	conditions	46:7 50:1,14	135:3 138:18
154:5	comparing 69:16	160:13,20	55:8,21,22	142:1 143:20
color 160:17	72:21 80:13	170:18 172:8	57:10 120:6	156:21 157:22
167:22	118:10 179:20	conduct 49:2	122:14 123:17	158:9,16
column 14:11,13	comparison	conducting 30:6	149:6,14 151:8	167:18 181:22
14:17 15:1,1,4	115:11	31:17	151:10 160:6	185:12,15
15:4,6,7,9,12	compensate	confidential	168:19	correctly 117:19
21:1,6 24:3	160:16	157:1	contiguous 63:16	156:7
26:20 27:5	complete 7:7	configuration	continue 117:4	correspond 74:3
30:22 57:17	11:17 183:14	83:7 92:20	Continued 5:1	136:21 150:14
58:6 59:9 64:7	184:8 185:13	configured 24:15	continues 71:13	152:2
64:9,10 78:18	185:15	59:12	continuing 84:9	corresponding
78:19,20 79:11	completely 76:7	confirm 129:4	84:13	62:14
79:11,15,18,18	78:10 116:6	confirming	contradicts 175:9	corresponds
79:20,21 81:18	120:6	128:13	contributed	142:4
82:17 84:9 85:1	complex 159:11	confuse 34:7	169:9,14	corrupt 134:14
86:3 87:22 88:3	164:7 168:4	confused 110:18	170:15,19	corrupted 129:11
88:14,14,17	complexities	111:18 118:11	172:1,10,19	133:13
91:1,15 93:7,14	167:1	141:17	173:17	cost 177:19,20
94:11,11,13,14	complexity	confusion 61:5	conversation	counsel 6:1,2,6
94:16,17 96:17	160:18 177:9	connections	127:1	7:19 8:1 22:17
97:20	177:21	106:1	conversations	54:11 98:6
Columns 82:17	complicated	connects 62:11	7:18,20 8:2	108:2 125:8
combination	75:17	consent 184:22	convex 76:14,14	127:2,7,20
42:10 53:10	components	consider 122:2	convey 165:14	132:17 133:15
82:5 84:18 87:5	19:20 25:2	considerations	copies 11:1 94:6	133:20 134:5
89:15 90:16	27:11 31:4	165:2	102:11	134:12 137:2

183:18 184:11 184:13 COUNTY 183:3 couple 128:8 170:2 181:6 Court 183:6 cover 65:18,21 66:2,4 100:14 100:18 101:17 159:8,10 168:21 create 132:12 created 131:10 credibility 26:1 52:21 53:6,12 53:14 140:5 141:3 Cross 12:16 90:14 139:8 141:1 150:17 172:13 cross-reference 125:15 cross-sectional 60:13,16,18 61:10,22 63:10 63:11,20 69:17 93:21 Cross-talk 117:11 CSR/RMR/CRR 183:22 CSR/RMR/CR... 1:17 2:5 183:5 current 138:7 currently 133:3,6 133:17 cursor 62:9,10,14 62:17,21 67:9 71:16,19 72:15 72:17 curvature 64:1,4 curved 153:20 customer 165:20 cutoff 63:15 cutout 64:3 CV 105:21	106:10 <hr/> D D 4:1 D.C 1:21 185:3 186:3 dark-colored 38:10,16,19 date 109:7 129:22 130:4 171:10 184:6 185:8,17,22 186:10,22 day 183:10,19 dead 156:14 deal 167:20 168:14 172:4 173:7,21 182:8 dealing 168:21 169:4 173:6,22 December 10:8 decisions 90:10 declaration 10:9 12:20 37:12,13 37:20 38:9 40:17 41:20 53:10 55:22 65:6 66:7 68:2 80:12 81:4,4 82:12 84:6,16 86:14 93:3 96:6 123:22 125:12 125:20 126:2,7 126:8 131:2 132:15 135:5 136:20 137:4 141:21 153:9 158:15 171:3 171:13,17,18 177:16 178:5 182:1,13 declarations 7:16 7:17,17 9:14 10:13 11:8 12:11,12 20:22 50:1 94:7 109:3 126:1 156:16	156:19 171:11 179:4,17 180:1 180:4,16 181:14 decrease 161:13 decreased 176:22 decreasing 165:14 defense 53:6 defined 136:5,7 definition 127:8 130:13 131:22 132:2 136:9,18 142:8 146:12 146:14,19,22 147:2,5,5,6,13 148:7,9,11,15 148:19,20 149:10,16 151:14,17 152:6,13 definitions 126:11 136:3 136:12 137:1,2 138:3,6,6 146:2 147:1,18 148:21 149:20 149:22 150:1,2 151:10 154:4 degrade 163:22 166:22 167:6 degree 109:21 110:15 111:5 113:7 degrees 116:12 116:15 demonstrate 102:12 163:18 denoting 75:10 76:9 deoxygenated 155:2 departing 21:13 department 104:11 depending 155:19 162:19	164:1 depends 122:10 155:17 Depo 144:17 deponent 184:6,9 184:11 deposed 7:2 deposition 1:14 2:1 7:15 8:6 30:6 31:17 37:8 49:2,5,15 54:19 128:19 129:14 179:5,18 180:1 180:17 182:21 183:10,14 184:6,13 185:8 185:10 186:10 depositions 39:22 describe 37:11 37:14 40:17 42:21 53:9 63:16 67:8 69:1 71:17,19 73:3 75:17 81:3 90:4 90:11,15 93:2 104:5,16 137:6 137:14 139:22 140:19,19 142:2,15,21 144:15 149:7,8 149:15 150:8 151:9,11 153:5 160:3,19 164:6 165:4 168:21 171:2,6 described 14:20 15:3 16:1,12 18:11 19:1,20 20:8,16 21:11 21:15 22:6 24:6 24:22 25:7 26:19,21,22 27:2,7,9 28:1 31:3 32:6,10,13 32:15 33:3,4 35:18,19 36:1 36:15 40:13,14	41:10,19,20 42:8 48:2,13,19 49:21,22 50:4 53:7 55:20,21 57:10,16 58:3,5 58:9,17 60:9,17 66:3 71:18 79:15 81:17 82:13 84:15 85:14 86:2,9,19 86:22 87:9,12 87:13,14,16,18 88:10 89:5,11 89:19 91:1 92:9 93:6 96:5,8,14 97:10,16,20 100:21 101:12 106:18 111:11 113:15 122:19 136:13 139:3 139:14,17 140:2,10 141:12,13 143:14,16 147:20 148:2,4 149:2,14 152:19 154:7 155:15 158:4 159:7 160:15 166:22 168:7 172:21,22 174:5 178:1 182:6 describes 14:22 20:12 21:2,5 30:19,19 31:1 33:6 46:6 78:22 79:10,17 86:22 88:13 94:10 148:7,15 describing 16:22 28:1 33:2 40:16 50:15 52:7 53:13 73:4 78:14 81:8 83:12 92:21 95:11 110:3,4
--	--	---	--	---

110:11 112:16 118:4 119:11 122:5 140:1 141:6,17 147:22 148:1 150:10 151:6 151:21,22 153:12,15 155:7 167:19 169:3 173:19 173:20 180:6 180:20 182:5 description 22:5 24:4 82:5 descriptions 179:7,8 design 90:10 103:22 104:22 173:8,9 177:18 designed 168:19 designer 165:12 designs 78:14 details 21:11 166:14 detect 165:13 detector 77:13 determine 112:6 112:8 113:10 115:2 122:22 determining 164:10 171:7 developed 160:6 168:19 developing 168:9 development 169:9,14,17 170:4,15 172:2 172:20 173:9 173:17 174:4 176:4 deviation 123:11 device 111:12,19 117:22 121:15 121:19 122:18 122:21,22 123:5,16 167:4 devices 155:7	diameter 137:21 dictionaries 124:18,22 125:3,5,10,12 133:11 144:8 dictionary 4:22 5:5 129:16 130:13,14 131:22 132:1,5 133:10,16 134:20 136:3 136:11 137:11 138:2 143:4,8 144:20 145:16 146:1,16 147:16,19 149:15 151:2,4 151:5,13,17 154:5 difference 46:10 122:8 different 23:9 38:5,6 43:16 78:5,9 80:16,17 81:3,10 83:10 83:13 87:3 89:6 89:14 90:9,10 91:8,9 92:20 93:9,22,22 94:3 95:18 96:7 97:8 97:9 98:2 107:6 113:16 114:16 115:3 116:22 122:5 131:13 136:22 138:12 145:8 147:16 150:1 160:7 162:21 163:18 163:21 167:6 168:22 177:18 177:19,19 179:21 differently 80:18 difficulties 168:9 diffusion 92:12 diffusion/reflec... 91:20	digital 1:20 100:10 101:1 113:2,4,7,11 115:17,18,20 115:22 116:3,7 116:13,18 118:17,20 119:3 120:1 125:14 131:11 184:19,20 185:1 186:1 digits 9:10 dimension 136:7 136:16 dimensions 60:21 61:6 72:9 136:22 Diplomate 2:7 183:7 direct 105:12 107:7 direction 71:14 disclose 26:15 27:16 30:13 31:13 33:14 35:13 37:22 51:4 disclosed 18:10 149:14 discloses 15:21 16:9,20 17:21 19:12 20:3,18 21:17 22:12 23:19 25:10 26:6 32:19 36:11 96:1 137:22 138:12 discredit 140:8 discuss 44:4 60:8 80:11 156:20 158:14 159:5 discussed 19:18 37:19 38:8 164:13 discussing 12:13 24:3 80:16 146:9 172:5,6	display 114:7,9 162:18,19 165:11 displays 109:18 disposed 15:15 16:2,5,15 19:5 22:2 24:9 82:22 84:4 85:3 86:5 86:7,8,11,17,19 87:8,13,19 91:18 92:2,10 93:9 97:1,17 dispute 141:9 disrupted 176:10 dissimilar 106:19 106:22 distance 63:2,3 136:8 distort 34:16 diversity 164:14 164:14 167:22 168:21 169:5 170:18 doctor 109:17 document 28:1 98:22 100:2 105:14 106:5 106:15 128:17 128:20,21 130:1 134:9 documents 9:18 12:10 25:14,15 25:16,19 26:8 27:15,22 28:11 28:16,19 29:13 39:21 40:6 44:3 108:4 124:7 127:17 130:3 134:13,17 173:13 182:12 doing 107:5 141:4 dominant 104:9 141:7,14 door 172:10 dotted 70:8,12,18 70:20	double 44:15 doubt 105:4,13 106:4,14 107:9 107:15 download 130:2 downloaded 124:8 130:5 134:10,10 downloads 11:15 11:17 dozen 171:6 Dr 1:14 2:1 4:3 6:15 29:15 30:8 30:11 35:8,11 39:6,13 40:8 41:4 51:11,17 55:2,14 56:15 128:7 157:8 159:6,15 179:3 183:10 184:1,6 185:8 186:9 drawing 72:15 drawn 61:9 77:20 78:3 drop 155:16 due 24:20 59:17 duly 6:16 183:12 <hr/> E E 4:1,8 5:2 e-mail 101:1 104:10,12 128:6,11,17,19 129:1,2 131:4,8 133:18 134:1 134:21 e-mails 132:10 earlier 7:17 85:20 109:12 134:22 175:10 earliest 171:10 early 176:3,15 easier 9:14 124:10 127:13 easily 176:10 edge 67:18,20 69:15
---	---	--	--	--

edges 69:18	46:17 47:20	73:12 74:13,17	151:21 152:8	exists 144:3
Edition 4:22 5:5	48:11 49:17	74:19 75:4	156:9 157:2,2,3	expect 176:13
129:16 144:20	51:5 52:19 53:5	124:2	160:8,11	expectations
145:19 146:15	55:4,18 57:4	engineer 162:14	168:16 171:5	165:20
147:17	60:7,10,12,17	165:12 182:7	171:14 182:15	experience 101:3
effective 123:14	65:19,22 66:5	engineers 156:21	examples 136:19	102:5 103:14
123:15	78:17 79:1,3,4	158:14 167:20	137:7	103:17 104:16
efficient 174:3	79:11,14,18	172:6,22	excerpts 125:11	104:17 107:10
efficiently 49:3	80:13 81:2,7,8	173:20 180:8	126:1,10,21	experiment
effort 182:2	81:12 82:2,4,10	180:21 181:4	127:4,6 145:15	117:2 118:4,6
Eileen 1:17 2:5	82:11,15 83:6	181:10,21	exclusive 143:11	expert 39:20
6:16 38:21	83:10,11,21	182:10	143:11	50:14 52:18
135:10 183:5	84:16,17,22	entries 146:4	exercising 159:18	140:5
183:22	85:1,5 87:3,4,5	environment	160:5 164:5	explain 24:13
either 101:13	87:22 88:7,9,13	160:8	exhibit 4:10,11	44:20,22
123:4,13	89:3,7,7,10,14	environmental	4:12,13,14,15	153:14
127:20 131:10	89:14,18 90:6,7	172:8	4:16,17,18,19	explained 19:9
132:16 141:18	90:16,21 91:1,3	equating 152:16	4:20 5:3,6 9:11	51:12
electronically	91:8,12 92:8,22	equivalent	9:12,21 10:6,8	explanation
184:21	93:10,13,17,18	112:18	10:19,19,20,20	43:22 52:8
element 64:5,5	93:21 94:4,11	era 100:10	10:21 11:2,3,4	exposed 162:12
80:7 82:1,20,21	95:6,8,10,10,18	errata 184:13	11:5,6,21 12:19	express 184:22
83:2,4,17,20	96:2,6,7,8,11	185:14 186:6	12:19 13:4,5,8	expressed 155:5
84:14 85:5 86:6	96:12,13 97:7	error 122:8	13:10,12,14,19	179:4 180:16
87:17 90:2 91:7	97:10,14 98:3	123:8	14:1 64:22 65:7	extended 153:22
91:21,22 92:7	embodiments	ESQUIRE 3:5,13	98:16,18,20	extends 70:14
92:14,14 95:3	20:17 21:6,11	EST 1:16	100:2,6,8	extensively 20:21
96:21,22 97:3,5	27:7,9 31:2	ethnic 159:11	101:14,15,20	90:4
elements 84:2	32:13,14 38:5	evaluations	102:18 107:18	extent 136:6
embodiment	80:17 90:5 94:2	179:16	107:22 108:7	external 24:21
14:16,20 15:1,3	95:22	Evidence 1:20	108:10,14,17	59:17 76:14,15
15:22 16:10,21	emboding 84:17	184:19,20	123:22 126:15	extremely 93:22
17:1,22 19:13	employed 38:6	185:1 186:1	126:17,22	eye 39:18
19:21 20:4,20	employee 183:17	exactly 76:9	127:9 129:14	
21:19 22:7,14	183:17	106:21 142:13	129:15 135:5	F
23:21 24:5	empty 73:10,12	166:14	138:3 143:4,8	fabricated 40:15
25:11 26:7,16	74:18 92:22	EXAMINATI...	143:17 144:17	face 175:7
26:21 27:3,17	95:20	4:2 6:19 179:1	144:19,22	fact 27:6 52:16
28:6 30:14,18	encircle 150:5	181:7	145:3,4,5,9,12	101:15 165:3
31:4,14 32:6,10	encompasses	examined 6:18	145:15 156:19	166:1 167:20
32:20 33:4,5,6	141:22 142:7	183:11 185:10	158:17 174:7,8	170:21 177:10
33:15 35:14,19	142:11,14	example 21:7	174:11	177:22
36:2,12,18,20	143:1,5 148:5	67:21 81:5	exhibits 9:8	factor 173:10
37:10 39:12,15	149:18 150:21	86:13 90:8 92:9	29:20 99:16	174:2
40:10 41:9 42:4	151:19 152:6	123:8 137:13	126:10 134:18	factors 164:12
42:14 43:9	153:18	137:15 143:10	exist 91:2 95:10	170:17,19
44:12 45:11	ends 14:2 73:10	150:3,10	95:21	172:9,22 173:7

173:12 177:2	26:22 28:4	45:11 46:17	formed 41:18	20:19,22 21:15
177:18,19,20	30:20 35:22	47:20 48:11	64:13 80:3	21:18 22:4,7,13
fair 28:12 50:10	57:17 58:7,10	49:17 51:5	81:20 82:13	23:20 24:11
146:11	58:18 59:11,20	52:19 53:5 55:3	84:11 88:21	25:1,10 26:6,16
familiar 105:18	63:9,12,17 69:6	55:18 57:4 60:7	89:12,21 91:4	27:1,10,17 28:4
109:15	69:19,20,21	60:10,12 65:19	92:18 94:22	30:14,21 31:3
far 50:21 155:16	75:9,15 77:4,5	65:22 66:5 68:1	95:13 96:4	31:13 32:9,16
faster 10:13	77:9,11,12	82:4 87:4	97:22 158:11	32:19 33:6,7,15
FDA 170:1	82:22 84:3,20	105:12 107:7	169:2 181:13	35:13,22 36:1
feature 160:11	85:3,8,11,13,17	108:13,16,19	182:4	36:12,16 37:9
features 180:18	85:19 86:1,3,5	109:3,8,14	former 103:20	37:17,21 38:5,7
feeds 23:9	86:11 87:18,19	118:16 121:11	forming 50:2	38:18,18 39:11
fifth 159:14	92:2 93:4,8	134:8,9 146:12	83:5,22 85:6	39:15 40:10,15
figure 24:14 30:2	97:1,13,17	146:14 147:2	87:2 89:8 92:21	41:8,19 42:4,6
59:11,22 60:6,8	filtered 129:11	171:2,3 176:4,5	95:11 96:13	42:6,14 43:9,14
60:9,9,9,11,14	filtering 32:9	firsthand 105:2	97:6 102:12	44:11 45:11
62:2,5 63:8,19	financially	106:20 107:7	105:5 108:3,5	46:17 47:10,20
65:18,20,21	183:18	Fish 3:4 6:13	131:1 132:8	48:3,11,17
66:5,6,13,16,21	find 73:2 114:15	184:2	149:17 151:18	49:17,21 51:5
67:1,22 68:1,12	128:1 132:10	five 59:1 128:1	158:5 161:9,15	52:19 53:4 55:3
68:15 69:11	133:1,13 134:2	fixed 110:5,12	161:17 162:2	55:18 57:4,9,14
70:15 71:3,6	140:7 141:15	111:13,22	162:22 163:12	57:18 58:4,8,11
72:21,21 73:4	143:21 151:14	Floor 3:14	164:21 166:13	58:19 60:15,19
80:14,14 84:1	finder 52:16	flow 169:18	178:4 180:15	61:7,8,12,13
84:17,17 86:13	finding 128:9	focused 176:15	forms 153:10	62:1,12,15,16
89:7,8 91:17	133:18	folder 99:18	forth 10:16	62:19,22 63:4
92:8,9,16 93:19	fine 119:19 128:2	following 46:16	forward 184:13	63:13,17,18
93:20 95:19	147:12	48:10 71:16	found 104:19,21	68:19,19,22
97:7,7 137:18	finger 148:2,14	116:6 132:21	108:2,2 140:21	69:1,2,3,5,6,8
139:4,4	150:12 155:21	follows 6:18	142:5 148:3	69:12,13,14,15
figures 14:17,21	first 14:4,16,19	Fontaine 98:21	150:19 151:7	69:17 70:14,21
15:13 16:3,13	14:22 15:3,22	100:12	152:4 154:4	71:2,4,10,12
17:1 18:4 19:3	16:10,21 17:1	Fontaine's 105:6	four 9:10 32:12	72:2,5,7,20
24:7 30:18 32:7	17:22 19:13	forbidden 184:21	76:12,16,18,20	73:1 74:4,6,6
35:19 65:9 79:3	20:4,19 21:18	forego 177:9	76:21 77:7 78:4	74:15,20,21
79:5,14 82:18	22:6,13,19	foregoing 185:10	78:8 120:18	75:5,11,18 76:2
84:1 88:8,11	23:20 24:4	forget 109:2	fourth 5:5 93:13	76:11 77:12,14
93:17 96:20	25:11 26:7,16	forgotten 161:1	93:16,18 94:2	77:17,22 78:5,8
138:1,13	26:21 27:3,17	form 38:15 82:11	94:10 95:6,8	80:15 83:7
file 9:9,10 99:7	30:14,18 31:4	109:9 113:13	96:2,10,12	84:18 85:7,10
files 130:20 133:4	31:14 32:20	113:21 114:19	97:14 144:20	90:9 93:1 94:4
133:5	33:15 34:9	117:13 119:9	145:19 146:14	96:9 98:4
filter 15:15,16	35:14 36:12,18	120:4 121:22	147:17	frame's 42:20
16:5,6,15,16	37:9,19 39:11	142:15 143:14	frame 15:17,22	frames 19:18
17:2 19:5,6	39:15 40:10	146:10,13,19	16:7,10,17,21	free 10:22
21:3 22:1,2	41:8 42:4,14	148:9 173:10	17:3,22 19:7,13	Friday 2:3
24:9,10,15	43:9 44:12	174:2	19:19 20:4,11	friend 115:18,21

116:7,13 friends 109:20,20 110:14,16 113:6,9 front 127:17 frozen 17:14,15 135:10 full 182:9 fully 7:11 122:3 123:18 155:9 function 38:18 41:10,21 43:2 80:6 81:11,22 89:2 90:1 95:3 95:16 179:16 functionality 38:2 48:22 56:3 91:13 162:12 165:15 174:2 177:4 179:6,8 179:21 180:6 180:20 functioning 166:15 fundamentally 169:5 further 24:13 43:22 178:8 181:5 182:19 183:16	91:11 97:9 geometries 80:17 geometry 81:3,10 83:10,13 87:4 89:6 90:22 91:10 92:20 98:3 Georgia 103:22 getting 160:19 170:5 172:10 give 19:11 20:2 26:3 36:6 40:19 68:13 133:7 173:11 178:9 given 44:2,3 51:12 55:8 100:22 162:13 185:13,15 gives 53:10 55:22 giving 50:1 114:2 114:6 133:20 134:5 145:13 go 23:10 35:2 49:6 54:19 63:4 65:3 66:10 75:20 80:20 98:10 107:3 109:16 119:18 120:17,19 122:19 125:14 125:21 127:22 132:9,19 147:11 148:19 152:13 159:3 171:11 178:16 goals 160:12 goes 24:13 70:11 91:6 120:14 168:20 going 10:10,12 10:16,18 11:14 13:11 26:2 37:7 39:17 47:13 49:5,14 52:16 54:19,20 65:2 69:18 71:14 79:22 98:7	106:18 107:5 128:7 141:10 146:9 152:11 156:10 160:10 gold 121:8,9,11 121:13,14,17 122:19 good 6:21 58:14 59:2 70:3 78:14 98:8 117:3 119:22 146:21 147:5,13 163:1 goodness 107:5 governing 184:14 grace 144:12 greater 63:3 greatest 136:7 ground 122:9,20 123:4,15 Group 1:20 184:19,20 185:1 186:1 groups 159:11 guarantee 162:20 guess 63:15 67:12,21 70:2 73:7 78:10 122:3,14 123:17 160:10 guidance 170:1 guide 142:5,6,14 142:22 148:4 150:18,19 152:3,4 154:8	hear 36:5 99:3,4 99:9 135:13 heard 36:4 170:10,12 hearing 157:5 height 78:2 held 2:3 85:15,16 86:8 help 40:19 41:22 56:2 61:5 73:8 85:20 helped 104:19,21 helpful 22:17 helping 83:14 hereunto 183:19 Heritage 4:21 5:4 129:16 130:13 132:5 143:3,7 144:20 145:16 146:16 154:5 hesitate 184:15 Hey 106:3 168:5 high 70:6 114:12 116:12 121:1 155:17,22 160:11 higher 160:17 highlight 27:4 41:20 136:15 136:20 137:18 151:16 highlighted 86:16 highlighting 81:6 87:1 highlights 21:6 Highly 156:15 hit 10:3 177:20 hold 70:9 145:13 holder 6:11 80:2 80:9,14,22 81:15,19 82:8 82:22 84:4,8,10 85:3,21,22 86:5 86:10,12,16,20 87:1,6,14,16,19 88:20 89:3,6,11	89:20 91:2,3,22 92:15 94:21 95:5,9,12,19 96:3,16 97:2,8 97:10,12,18,19 97:21 98:5 holding 86:18 87:7,11,12 149:1 holds 85:7,10,12 85:19,22 hole 69:5 home 133:12,16 horizontal 61:2 69:4 hospital 160:8 hour 98:7 183:11 hull 76:14,15 human 159:9 humanity 164:14 167:22 170:18 172:5 humanity's 164:15 hundred 155:5 156:12 hypothetical 115:16 121:6 156:8 hypoxia 169:21
G		H		I
gained 105:19 gap 90:8 94:5 98:4 160:22 gender 159:10 168:22 general 21:14 22:9 103:9 156:10 163:3 generally 155:12 generate 142:6 142:22 150:20 152:5,21 153:1 154:9 174:21 generates 148:4 geometrical		H 4:8 5:2 hand 105:12 handler 146:16 happened 103:8 happens 106:8 happy 125:20 hard 75:17 78:13 128:9 head 28:18 139:20 healthy 155:14		identical 13:7 identified 104:6 108:7,10,12 identify 108:4 illegible 137:12 illuminating 152:11 illustrated 15:13 16:3,13 19:3 24:6,14 59:11 82:18 84:1 91:16 96:19 illustrates 14:16 79:2,13 88:7 93:16

illustrative 32:14	information	IPR2024-00243	Iwamiya's 37:17	135:20 136:16
impact 174:4	105:19 169:18	1:11 9:1 10:19	37:20 38:18	137:5 139:16
177:2	inner 67:12,14	10:20 12:19	43:13 65:19	141:10,16
impacted 167:9	68:4 77:21	13:4		142:14 143:11
impacts 173:3,4	91:19 92:11	IPR2024-00244	J	144:10,18
implement 38:4	137:16,19	1:11 9:5 12:20	jewelry 148:1	147:18 148:3
implementation	138:16	174:7	150:12 151:22	148:22 149:3,7
38:1	innermost 67:4	IPR2024-0244	jewels 148:13	149:15 150:5,8
implementing	67:10	13:5	join 77:3	150:9 151:16
38:17	inside 68:17	IPRs 65:10	journal 102:20	152:10 155:8
improve 41:22	70:17 77:5	IR 176:6,6	102:22	155:12,16,18
43:2 120:8,21	86:17,19 92:17	IRP2024-00241	judge 141:3	156:10 159:17
170:3	97:11	1:11	judged 26:2	160:4,15
improvement	insists 38:4	irrespective		161:14,15
42:22	instances 136:14	161:21	K	162:7,13 163:1
improvements	intended 37:21	Irvine 3:15	keep 10:16 31:6,7	163:3,8 166:4,7
38:12	48:18 49:21	ISO 170:1	31:10,10	166:10,16,20
improves 120:13	50:4 57:9 60:4	isometric 78:14	141:10 145:8	169:17 171:12
120:14	intention 40:18	issue 75:2	155:22	174:10 182:1,2
include 9:9 33:7	42:20	issues 131:12	kind 69:22 73:10	knowing 168:5
101:5 176:1	intentionally	167:21 168:13	74:17 159:18	knowledge 40:6
included 126:22	50:8	172:3 174:1	kit 109:17	102:15 103:3
includes 18:1	interested 183:18	ITC 156:21 157:4	knew 161:10	104:7 105:3,12
20:9 25:1 27:10	interface 165:19	157:5	164:16 166:2	106:13,20
28:2,7 32:7,8	interrupt 23:15	item 64:2	169:5 170:21	107:8 139:16
32:16 36:16	interrupting 30:4	Iwamiya 13:13	176:22 177:6	142:18 173:6
70:10 109:17	54:13,14,15,18	13:16 14:5,8,12	177:11,22	173:14 181:4
149:16 150:3	intimate 106:13	14:16,19,22	Knobbe 3:12	181:10 182:4
154:10	invention 21:9	15:21 16:9,20	6:10	
including 60:17	88:9 93:18	17:21 19:12	know 9:22 11:15	L
126:7 169:19	inventive 21:14	20:3,18 21:17	11:16 12:22	L.L.C 185:1
172:6 184:21	inventor 14:4	22:12 23:19	13:15 20:18	lab 103:2
incorrect 118:3,6	inverted 63:15	24:5 25:10 26:6	21:17 22:12	labeled 73:5 75:8
increase 64:13	investigation	26:15 27:16,22	23:19 34:7,13	76:8
independently	156:21	30:13,17 31:13	41:14 49:12	Land 157:11
108:6,9	involved 183:18	32:18 33:14	69:14 78:13	large 159:17
indication 101:14	IPR 8:15 9:9	35:13 36:11	81:6,7 82:4	160:4
individual 117:1	12:12 65:1,8	37:15,22 38:6	87:3 90:5 98:17	larger 70:5
118:15,20	124:3 158:18	40:14 42:10	103:7 106:16	layer 68:3
119:2 121:11	IPR-2024-00244	43:8 48:18,20	106:22 107:3	layout 91:11 94:3
121:13 123:8	10:20	51:4 59:9 68:2	108:6,9,13,16	lead 173:8
individuals 105:7	IPR2024-0024	78:17,22 79:2	110:19 113:18	leading 171:4
116:20,22	10:21	79:10,13,17	114:4,9,12	179:11 180:10
118:11 158:6	IPR2024-00241	82:6 88:7,13	118:8 120:10	181:1
158:11	8:18 9:11 10:9	93:14,16 94:10	120:16 122:2	learned 167:10
influence 24:20	10:18 13:12	96:1 138:11	125:9 130:19	176:3,6
59:16	98:15	171:4	133:3,5 135:11	LEDs 68:19 69:7

170:2 176:5	24:17,19,21	74:22 75:1,5,11	78:18,20 79:11	long 37:7 49:6,15
left 62:7 63:2,5	25:1,10 26:6,15	75:18,22 76:1,1	79:12,18,19,20	54:20 58:22
63:17 71:5	26:20 27:1,1,10	76:2,11 77:3,13	79:22,22 84:9	169:9,14,17
legible 127:12	27:16 28:2,3,4	78:8 80:2,3,6,8	84:13 85:2 86:3	170:8,15 172:1
130:8 145:18	28:4 30:13,20	80:9,15,22	88:1,3,14,14	172:19 173:11
145:20	30:21 31:2,13	81:12,15,19,20	93:7,15 94:11	173:17
length 136:3,5,15	32:7,8,9,9,16	82:1,9,13,15,19	94:12,13	longer 44:16
136:16,19	32:19 33:5,7,14	82:20,21 83:1,3	100:18,20	look 10:22 22:17
137:2,3,21,22	35:13,20,21,22	83:4,7,15,16,16	101:9 146:19	28:19,20 29:15
138:10,12	36:1,11,16,16	83:19,19 84:2,3	148:10 159:14	30:9,10,11 39:7
lengths 136:14	37:9,10,17,17	84:8,10,11,14	174:17,18,22	39:13 40:2,8
136:21 137:8,9	37:20,21 38:2,4	84:18,21 85:2,4	175:16,17,20	41:1 65:2 77:21
lens 64:13	38:7,17 39:11	85:7,10,12,15	186:11	78:16 86:12
let's 23:10 37:12	39:14,16 40:10	85:16,18,21	lines 15:7,10,12	87:21 91:14
37:14 69:3 70:1	40:11,15,18	86:4,6 87:17	58:6 59:10,10	93:13 106:10
75:7,7,9 78:16	41:8,9,11,19,21	88:20,21 89:4	64:8,10 70:12	123:7,10
79:4 82:16	42:3,4,6,7,13	89:12,13,17,18	70:17,18,20	124:10 125:1
87:21 93:13	42:14,19,20	89:20,21 90:2,9	73:22 74:12,13	128:10 132:9
98:10 109:1,16	43:8,9,13 44:11	90:20,21 91:4,5	74:19 75:3,13	132:19 133:8
113:2,22	44:12,21 45:10	91:6,17,21 92:1	76:4 77:22	144:2,6 178:10
115:16 117:4,5	45:12 46:17,18	92:3,4,6,6,10	79:16 80:1	looked 69:11
118:14 123:21	47:9,20,21 48:3	92:13,17,18	82:17,18 88:17	127:16,21
123:22 124:2	48:11,12,17,18	93:1,5,8 94:4	88:19 91:14,16	130:17,21
124:19 125:1	49:16,17,20,22	94:21,22 95:3,6	94:14,19,20	131:6,7,15,19
125:18 135:4	50:4 51:4,6	95:12,13 96:1,3	96:17,19 97:21	132:6 133:2
148:19 152:13	52:19,20 53:4,5	96:4,8,10,11,14	101:6 179:10	143:19 144:10
175:15	53:7 55:3,4,18	96:15,21,22,22	lips 99:8	looking 28:18
letters 43:5,6	55:19 56:2 57:3	97:3,4,5,11,14	list 124:18 126:6	29:11,12 31:6,7
level 121:1	57:4,8,9,14,15	97:17,19,21,22	listed 59:22	31:10,11 34:14
160:12 162:16	57:18,19 58:3,4	98:4 142:4,7,8	105:22 147:19	52:17 77:1,7
162:19 170:3,5	58:8,10,11,19	142:14,15,22	170:17	78:7 112:16
170:6 172:7	58:20 59:12,14	142:22 143:1	Listen 29:8	124:9 130:12
levels 122:6	59:15,17,20	148:4,5,6	listing 172:3	131:13,17,18
libraries 104:13	60:1,2,4,15,18	150:14,19,20	literally 22:22	131:21 132:3,4
life 173:11	61:7,7,13,22	150:21 152:2,4	literature 171:16	144:4 155:1,21
light 15:13,14,17	62:12,15,16,19	152:5,7 153:2,6	little 18:9 52:7	170:4,6
15:18,21 16:3,4	62:22 63:4,12	153:17,19	118:15 119:12	looks 12:1 71:13
16:7,7,9,14,14	63:20 64:1,5,12	154:9 165:16	119:14 139:1,6	74:17 77:18
16:17,20 17:2,3	64:14,15,20	166:17 167:5,6	152:10,22	129:11
17:4,21 18:5	65:13,15 66:8,9	light-absorbing	155:20 160:9	lost 116:5
19:4,4,7,8,12	66:11,14,17,18	38:15 43:1	171:19	lot 37:11 46:11
19:17,19 20:3,9	67:19 68:3,4,5	liked 152:14	living 105:11	103:10 122:1
20:10,11,12,19	68:7,9,11,14,20	limited 21:10	LLC 186:1	144:7
20:22 21:2,3,14	70:13,21 71:1,3	line 14:12,13,14	LLP 3:12	lots 36:4 171:16
21:18,22 22:1,3	71:9,11 72:20	15:1,2,4,5,9	loaded 13:8	low 116:15
22:7,13 23:20	74:3,5,6,7,10	27:5 70:8 73:14	located 8:5	173:11
24:7,8,11,12,15	74:14,14,20,21	73:18,20 76:5	location 123:10	lower 15:16 16:6

16:16 17:2 19:7 20:10 22:3 24:11 57:17 58:3,8,10,18 69:13 72:19 74:5 82:19 84:2 84:21 93:5 96:20 97:2,13 97:18	Marsh 134:15 Martens 3:12 6:10 Masimo 1:8 3:11 6:11 184:5 185:7 186:8 Massachusetts 8:8 material 37:18 38:1,3,15 43:1 48:20 53:8 61:8 61:17,20 72:4 157:1 materials 40:16 126:6 179:8 180:6,19 182:14 math 117:19 139:18 140:21 mathematically 139:18 140:9 mathematics 140:19 141:16 matter 114:2,8 114:11 173:12 174:3 184:8 matters 8:15 12:13 mean 25:9 70:16 76:13,22 100:15 120:11 120:13 122:2 139:13,17 144:1,3 163:4 167:7 174:4 176:21 means 156:6 measure 112:15 113:6 114:1,16 117:1 122:12 159:22 161:3 161:20 163:15 163:19 164:4 164:16,19 165:3,7 173:2 measurement 24:20 59:16	110:21 111:12 111:14,19,20 111:21 112:1,2 112:12,20 113:8 114:1 116:4 118:10 118:16,20 120:9,22 121:3 123:4,5,6,14,16 136:6 163:5,9 166:21 167:7 168:6 174:21 175:3,4 176:9 measurements 111:19 116:2 116:22 119:1 120:15,16,18 120:19 121:18 121:19 122:21 123:9,11,13 159:16 160:4 161:11 163:20 164:2 165:10 165:17,18 166:3,5,8,11 167:5,11,15 168:17 169:6 170:22 175:6 175:11 176:7,8 177:1,7,11 178:1 measures 110:1 116:1,8,9,14,15 121:10,12 measuring 111:8 111:11 113:4 118:9 121:16 168:10 169:7 169:12 170:13 171:22 172:18 173:16 mechanism 53:8 103:11 104:22 mechanisms 103:19 104:2,3 104:5 meet 169:22	meeting 8:12 Mehra 157:18 Mellon 107:13 memorize 25:15 memorized 25:6 182:11 Mendelson 100:20 101:9 101:16 mental 117:19 mention 150:2 151:4 mentioned 68:22 69:1 105:17 175:22 Merit 2:6 183:6 merits 43:21 met 83:8 metal 80:3 81:20 82:13 84:11 88:21 89:12,21 91:4 92:18 94:22 95:13 96:4 97:22 148:13,18 method 101:3 methods 101:1 mild 169:21 mind 78:11 miniaturization 177:21 miniaturize 173:10 Minneapolis 3:7 184:4 Minnesota 3:7 184:4 minor 140:1,10 140:11,13 141:14,14,15 141:18,18 minus 117:17 minutes 23:5 59:1 128:1 135:7 178:10 misled 154:4 missed 101:22	misspoke 88:4 mistaken 11:19 misunderstand... 54:2 misunderstood 81:13 90:13,18 110:9 MIT 8:7 103:15 104:10,14,20 104:21 105:13 106:14,19 107:1,8,11,14 modern 100:10 101:1,2 modifications 21:8,12 modified 139:1 moment 130:19 133:6,12 134:2 135:9 138:8 momentarily 10:22 motion 159:17 160:4,14 162:21 164:1 165:1 167:6 168:18,20 170:19 173:3 175:22 176:2,7 176:10,14 177:2 182:16 motions 160:7 motivation 42:9 48:19,21 56:1 motive 42:8 mounted 15:16 16:6,16 19:6 22:3 24:10 57:17 58:7,10 58:18 84:20 93:4 97:13 move 72:17 82:16 movement 166:21 172:8 175:11 moving 71:22
M				
M 1:20 185:2 186:2 main 3:14 65:20 66:4 104:8 major 140:2,10 140:11,13 141:14,15,18 141:18 making 17:15 35:1,4 111:13 111:21,22 112:12,20 153:9 160:16 167:15 168:14 Mannheimer 157:9 manufacturing 177:19 March 1:15 2:3 130:4,15 131:5 134:10,20 183:10,19 184:6 185:8 186:10 mark 129:14 marked 4:10,11 4:12,13,14,15 4:16,17,18,19 5:6 10:6 11:2,3 11:4,5,6 13:10 13:14 98:18 126:18 129:17 144:17,21 145:7 156:19 157:1 174:8 marketing 179:8				

99:8 160:9	166:13	111:13,22	118:2,7	146:17 147:9
161:14 164:20	need 10:3 29:11	114:2 120:15	objects 148:1	148:19 159:1
165:8 166:5,12	29:18 41:13	124:3 145:8	151:22	174:16,16
167:3,12 168:2	49:4 67:7,8	174:16	observation	178:12
168:11 169:9	90:11 115:3	numbers 4:20	117:3	Oldham 3:13 4:4
169:14 170:15	122:2,12,14	5:3 8:20 13:1,1	obtained 102:6	4:6 6:4,9,9,20
172:1,17,19	123:17 161:7	13:2,19 116:5	obvious 38:17	9:17 10:7 11:10
173:17 175:4	162:3 176:9	117:14,17	142:6 148:3	11:22 12:5,9,17
multiple 19:2	needs 40:1	129:15 144:19	150:19 152:4	17:12 19:10
20:16 21:5 29:6	111:20	NUS 103:20	occur 21:8	20:1,14 22:21
30:19 34:2,6	negative 44:15	NW 1:20 185:2	office 1:1 8:7	23:2,6,8,12,14
55:8 76:17	156:6	186:2	184:9,15	23:16 25:3
120:19 136:14	never 157:8,11		oh 10:3 13:21	26:13 27:12
137:7 146:4	157:14,17,20		107:5 112:2	28:8,17 29:2,5
166:16	158:1,7,13	O	129:21 156:8	29:8,10,14,21
Mulvenna 1:17	new 2:8 6:17	o'clock 23:4	174:15	30:7 31:5,9,20
2:5 6:16 183:5	153:11 171:11	object 39:17	okay 9:21 10:4	33:9,13,18 34:3
183:22	183:1,9	54:16 77:2	10:12,15 11:14	34:11,15,22
mumbling 99:6	nobody's 107:3	146:19 148:9	11:16 12:5,8	35:3,7,10 36:3
mute 99:2	noes 33:2	objection 17:10	13:8 14:7,15	36:9,21 37:6
	noise 155:20	18:19 19:15	15:11 20:15	38:21 39:4,5,10
N	noisy 119:14	20:6 22:15	23:6 25:8 27:15	40:4,7,21 41:3
N 4:1	120:21 122:7	23:22 26:9,17	30:8 31:6 34:22	43:3,15 44:19
name 6:22 9:9,10	non- 133:21,22	27:19 28:13,22	35:6 37:7 44:20	45:16 46:4 47:1
101:6 185:8	non-corrupted	30:5,15 31:8,15	46:5,14 47:8,12	47:7 48:4 49:1
186:9	133:9 134:2,7	31:16 32:21	47:18 48:8	50:6 51:8,16
named 14:4	nonresponsive	33:12,16 35:6	52:12 59:2 62:7	53:3 54:1,4,8
names 105:16	34:4	35:15 36:7,13	65:4 67:13,18	54:13,18 55:1
106:6	nonuse 114:4	37:2 39:9 40:3	68:6 69:21	55:11,13 56:12
nanometers	normal 108:3	40:12 41:2	70:20 72:11	57:13 58:21
24:16,18 59:13	155:13	42:16 43:10	73:2,6 74:5,11	59:2,8 98:9,15
59:14,21 60:2,3	Notary 2:8 6:17	44:14,15 45:13	75:16 76:3,11	98:19 99:10,14
60:4	183:8 185:22	45:22 46:19	77:6,14 78:21	100:1 110:7
narrower 60:20	note 93:22	47:4,22 48:14	79:10 82:16	111:15 112:5
61:15 63:6 71:9	noted 185:14	49:18 53:1,20	87:10,21 88:12	113:1,17
77:15,19	notes 94:7 183:13	55:5,6 56:10,11	94:18 99:8,14	114:14 115:1
nature 30:5	183:15	57:5 110:2	99:20,21 116:7	115:13 117:20
31:16 32:15	noticing 184:13	111:9 112:4,10	116:11,17	118:5,13
76:16 90:6,7	noting 17:14	113:12,13,20	117:3 118:14	119:17 121:4
94:1 118:12	135:9 184:13	113:21 114:18	125:1,2 126:12	122:16 123:20
150:7 154:17	notion 110:21	114:19 115:8	126:19 127:19	124:14 126:20
necessarily	112:21	117:9,10,12,13	128:4,14,22	128:2,5,15
142:13 163:12	noun 146:4,10,13	119:8,9 120:3,4	129:8,21 131:3	129:20 135:17
163:17,20	146:18 150:2	121:21,22	132:9,19 133:7	139:9 141:2
164:21	NTU 103:20	123:2 161:5,22	134:4 135:16	144:16 145:1,4
necessary 161:16	number 9:9,11	162:9 179:11	136:1 140:4,22	145:7,11 159:2
163:1,11	13:22 14:2	180:9 181:1	145:10,14	161:18 162:6
		objections 55:12		

163:7 172:15 174:6,9 178:8 178:12 179:11 180:9 181:1,6,8 181:16,19 182:19 OLSON 3:12 on-demand 176:12 once 107:3 129:2 one-word 54:9 55:2,17 57:3 ones 125:8 opaque 38:14 open 8:11 10:1 13:16 64:22 65:1 98:17 99:10,13 126:19 135:6 144:18 145:12 158:17 174:11 opening 68:19 69:20,21 75:19 75:22 76:5 77:4 77:12 99:7 operating 138:22 opine 161:7 162:3 163:12 163:21 171:13 opining 84:16 85:6 91:9,12 93:10 opinion 89:9 90:12 159:21 161:2,19 163:14 164:3 164:18 165:6,9 168:3,8,15 169:7,12 170:13 171:1 171:21 172:4 172:17 173:5 173:15 176:19 opinions 25:15 41:18 42:9 50:2 82:12 83:5,12 83:22 85:6 87:2	89:16 90:15 92:21 95:11 96:14 102:12 108:3,5 132:8 137:5,5,6 138:9 153:15 158:5 158:11 161:10 161:15,17 162:3,22 163:13 164:22 166:14 167:9 167:13,17 169:2 171:12 176:18 177:14 177:17 178:4,7 179:3,17,22 180:3,15,19 181:13,13 182:4,13 opposed 120:22 optical 15:15,16 16:2,5,6,15,16 17:2 19:5,6 21:2 22:1,2 24:9,10,14 26:22 28:3 30:20 35:21 57:17 58:7,9,18 59:11,20 63:9 63:12 82:22 84:3,20 85:3,8 85:11,12,17,19 85:22 86:2,4,11 87:18,19 92:2 93:4,8 97:1,13 97:17 167:5 optically 80:7 82:2 84:14 90:3 91:7 95:4 option 184:11,12 order 115:2 157:1 177:20 orientation 71:8 78:1 oriented 175:7 original 11:8 12:11 37:20	125:18 131:10 133:2,4 171:13 171:17 184:13 originally 131:16 outer 64:14,19 65:12,15 67:18 67:20 68:4 69:15 137:17 137:19 138:17 outline 71:11 output 142:4,7 142:22 148:5 150:14,20 152:2,5 153:17 outside 70:12,19 179:12 outward 67:3 oval 138:22 139:14,17,21 140:1,1,2,3,3,7 140:9,16 141:6 142:1,11,15 143:1,5,9 148:5 149:18,19 150:2,7 151:1,5 151:15 153:1 153:10,18 154:1,1,11,11 154:13 oval-shaped 142:8 150:11 150:21 151:19 151:21 152:6 153:6 154:10 ovals 139:12 140:6 141:4 142:12,13,17 142:19 overall 61:12 72:5 ovular 152:12 153:2 154:17 Owner 1:9 3:11 38:4 ox 163:19 164:17 oximeter 98:22 100:3	oximetry 180:5 180:18 oxygen 154:18,21 155:1,4,13 156:1,13 159:22 161:3 161:20 163:15 164:4,11,19 165:4,7 166:2,8 166:11,18,18 167:11 168:10 169:8,13 170:14 171:7 171:22 172:18 173:16 174:21 176:2,8 oxygenated 155:2,9 <hr/> P <hr/> P.C 3:4 184:2 p.m 1:16 2:4 182:22 183:11 packaging 169:20 page 4:2,9 37:15 65:3,8 78:2 80:13 84:5 86:13 100:15 100:18 101:18 124:15,21 135:19,21,21 137:7,8,18 139:4 145:22 146:1 157:3 160:11 164:7 171:5,14 174:12,13 175:15 184:13 185:6 186:11 pages 93:3 185:10 paper 9:15 10:10 11:1 94:6 112:17 124:10 124:11 144:8 paragraph 18:1	19:1 21:1,22 27:5 37:12,16 81:18 136:2,10 136:15 137:13 138:14 141:20 142:3 147:21 149:8 151:11 157:4 159:3,5 159:15 164:7 165:5 168:16 169:18 171:5 171:14,15 paragraphs 81:5 parallel 74:1 parameter 164:11 165:3 part 15:22 16:10 16:21 17:1,22 19:13 20:4,19 21:18 22:13 23:20 25:11 26:7,16,21 27:2 27:17 30:14 31:14 32:19 33:15 35:13 36:2,12,19 70:21 71:9 72:19 74:13,19 75:4,13,14 96:2 126:2 128:19 176:2 particular 83:6 125:19 156:9 parties 183:17 pass 76:1 passing 77:13 patent 1:1,3,9 3:11 6:10 8:18 9:1,6 13:1,7,9 13:12,22 14:1,2 14:7,8 25:12 38:3 124:5,6,13 135:8,18 149:7 149:11 151:9 151:11 158:22 patent's 171:10 patents 25:6 94:6
--	--	--	--	---

Patrick 3:5 6:12 99:11 135:10 pattern 142:7,8 142:15 143:1,2 148:5,6 150:14 150:20,21 152:2,5,7 153:6 153:17,19 154:9,10 Paul 157:8 PDF 131:10 133:9,12,14 134:3,7,14 137:12 138:7 146:16 peer-review 106:8,16 peer-reviewed 101:20 102:18 peers 103:1 pending 18:6 23:13,15 people 105:16,22 106:1,6,11,12 107:5 168:1 percent 155:6 156:6 169:22 percentage 155:5 percentages 156:11 perfect 98:9 154:13,14,16 perfectly 120:7 120:20 152:21 153:3,21 154:12 performance 42:1 163:22 170:6 performed 171:9 179:15 perimeters 76:15 period 184:14 Perry 3:13 6:9 perry.oldham... 3:17 person 114:3	140:4 141:21 142:9 149:7,9 154:3 155:14 156:13 160:9 173:14 183:18 personal 104:7 personally 108:12 petitioner 1:6 2:2 3:3 6:14 phenomenon 122:12 phone 128:8 photodiodes 37:22 physical 144:2,6 144:11 physically 8:5 41:15 42:12 physiology 159:9 pick 125:3,6 126:21 136:11 137:2 picked 127:3,6 137:1 152:14 piece 70:8,10 110:4,20 111:21 112:17 pieces 28:7 place 125:19 places 19:18 20:17 84:6 93:2 plan 65:20 77:1 planer 153:21 planes 78:5,9 planetary 148:1 151:22 planets 150:11 plastic 110:5,11 110:16,20 111:3,4,7,21 112:7,17 please 6:6,21 7:10 9:22 11:16 13:3,15 14:11 15:7 17:20 23:14 28:20	29:10,15 30:4,8 30:11 39:13 40:4,8,9 41:1,6 47:8 51:19 52:21 55:11 59:9 64:7 79:21 80:21 88:17 94:14 96:17 98:16 174:10 180:11 184:8 184:12,13,14 plus 117:17 point 11:13 34:1 58:13 66:8 67:5 67:21 71:15 73:20 92:17 108:18 118:16 125:19 128:12 140:15 177:20 179:5 pointed 18:1 21:1 21:15 22:5 24:2 34:8 68:16 69:4 69:19 168:12 pointing 25:16 55:21 67:16 70:5,7 72:10 74:8 82:3 173:20,21 points 73:9 74:22 portion 62:12,14 64:15 65:21 66:4 69:12,13 69:22 72:16,22 80:2,9,15,22 81:15,19 82:8 83:1 84:4,9,10 85:4,21,22 86:5 86:10,12,16,20 87:1,7,14,16,20 88:20 89:4,6,11 89:20 91:2,3,18 91:20,22 92:11 92:13,15 94:21 95:5,9,12,19 96:3,16 97:2,8 97:10,12,18,20	97:21 98:5 pose 175:5 POSITA 22:8 38:9,14 42:21 83:8 93:11 137:9,21 138:9 139:17,22 141:17 142:3,5 142:18 143:15 149:17 150:13 150:18 151:6,7 151:11,13,18 152:1,3,9 153:13,22 154:6 161:10 161:14 162:13 163:3 164:16 166:2,15,20 169:5 170:21 173:6 176:22 177:6,10,22 181:4 182:4 POSITAs 173:1 positioned 83:1 85:4 86:6 87:17 91:18 92:11 97:2,18 possible 49:3 161:11 164:16 164:16 165:3 166:2 167:2 173:2 post 9:16 posted 126:12,14 126:14 posture 175:6 power 169:20 173:11 174:3 practice 38:20 155:10 precious 148:13 148:18 precise 176:9 precision 122:6 predictable 38:11 prefer 144:8	prepare 7:14 prepared 12:12 176:18 preparing 177:14 179:3,17,22 present 160:8 presumptively 42:7 82:14 103:1 123:9 presupposes 112:11 pretty 176:15 Previously 4:10 4:11,12,13,14 4:15,16,17,18 4:19 5:6 10:6 11:2,3,4,5,6 13:10,14 98:18 126:17 174:8 price 177:20 primary 7:18 printouts 9:13 prior 93:12 102:11 108:19 109:7,8 130:16 130:18,22 131:1,7,7 132:7 132:15 134:20 160:5 168:18 171:16 182:16 183:11 priority 171:10 probably 7:5 67:5 71:15 72:22 105:21 problem 127:14 176:14 problems 130:11 Procedure 184:14 proceeding 156:20 process 102:16 102:22 103:4,7 103:9,14 104:9 104:18,20 105:18,19
--	---	---	--	--

106:3,13,17 107:2 108:3 processing 169:19 produce 175:3 product 159:12 164:7 165:2,11 165:22 167:21 168:4,14 170:20 172:10 173:7 177:8,10 177:18 professional 103:16 107:13 Professor 100:20 101:9,16 profile 77:22 86:18 projected 153:1 154:15 projection 77:11 152:10 prominently 175:3 property 80:3 81:20 82:14 84:11 88:22 89:13,21 91:5 92:19 95:1,14 96:5,15 98:1 proposed 81:8 protected 80:7 82:2 84:15 90:3 91:7 95:4 protective 157:1 provide 7:6 17:5 17:8,18 18:7 36:22 38:22 42:2 45:3 47:19 52:14 53:15 54:9 56:4 105:16 106:6 127:20 153:8 provided 39:2 105:8 106:7 107:17,21 125:11 126:1	Public 2:8 6:17 183:8 pull 106:10 pulling 139:20 pulse 98:22 100:3 163:19 164:17 180:5,18 purchased 184:10 purely 137:14 purged 133:4 purposes 38:6 146:8 pushed 104:13 put 121:7 128:6 139:4 puts 34:20 Putting 170:2 pyramid 63:15 <hr/> Q quality 120:21 162:16,20 166:21 quantified 155:9 question 7:12 16:19 17:6,7,9 17:19,20 18:6,8 18:10,13,14,15 18:22 19:12 20:3 21:20 22:10,19 23:5 23:11,13,17 25:4,9,13,17,18 25:22 26:5,12 26:12,14 27:14 27:18 28:10,21 29:7,22 30:3,9 31:12,19 32:3,4 32:18 33:2,10 33:20 34:1,10 35:12 36:10 37:5 39:7,8,14 40:3,9,22 41:5 41:6,16 42:13 42:19 43:4,7,16 43:17,21 44:8	44:11,17,18 45:7,9,10,15,19 46:16,22 47:6 47:17,17 48:10 48:17 49:11,14 50:11,13,14,18 51:1,14,18,20 51:22 52:1,4,5 52:6,12,13,18 54:7,10,12,21 55:8,16 57:2 70:3 75:12 79:9 80:20 81:14 82:8 83:3 90:18 92:3 95:5 97:4 101:22 107:20 110:10,18 114:21 116:6 118:12 119:19 119:20 122:4 122:15 126:3 153:16 161:1 165:17 170:12 171:19 174:17 174:19,22 175:16,18,20 178:2 180:12 181:17 question's 23:15 questions 7:10 30:4 39:1,19 49:5 52:10,13 52:15,17 54:14 54:14,15,19 55:9 68:7 178:8 178:16 181:5 182:19 184:14 185:13,15 quick 58:14 quote 136:10 140:17 144:14 157:4 159:15 168:13 177:15 quoted 159:15 178:5 <hr/> R	radii 139:13,14 139:21 140:6,7 140:8,11,16 141:5,7,11,15 141:19 radius 137:16,17 137:19,19 138:16,17 139:7,10,11,12 140:2,14,20 154:15 radiuses 139:14 ratio 120:17 155:2,8,11 166:18 reaching 37:22 read 25:11 27:21 29:19 30:1,1 39:21 64:11 127:8 130:6 135:2 138:3,8 143:18,22 145:5 146:3,12 148:11 174:18 175:18 178:3 181:16,18,22 182:9,15 185:9 readily 21:8 reading 22:8,11 23:18 25:5,19 26:7 27:14 28:11,15,18 29:12,22 30:3 40:6 110:5,12 151:4,9 154:6 readings 111:4 reads 29:20 115:19,19,22 116:19 ready 178:16 184:8 really 68:6 102:6 122:3,14 182:2 realtime 2:7 22:18 23:9 183:7 reask 79:8	reason 7:6 105:4 105:13 106:4 106:14 107:9 107:15 reasonable 176:13 reasons 154:10 reassociating 80:18 recall 108:1,11 108:19 109:2 109:12,14 125:7,16 127:5 130:12 131:9 131:13,17,21 132:4,6,16 144:7 182:18 receive 131:3,7 received 128:20 129:17,22 132:10 134:15 134:16 144:21 receivers 69:7 receiving 15:14 15:18 16:4,8,14 16:17 17:4 19:4 19:8 20:9,12,16 21:3,4,22 24:7 24:12,19 27:2 28:2,5 30:20,21 32:7,10 35:20 36:17 57:15,19 58:5,11,20 59:15 64:6 74:7 74:22 76:1 80:2 80:7 81:19 82:1 82:19,20 83:1,4 83:17,20 84:2 84:10,14 85:4 86:6 87:17 88:20 89:12,20 90:2 91:4,7,17 91:21 92:1,4,7 92:10,14,18 93:8 94:21 95:3 95:13 96:4,15 96:21,22 97:3,5
---	---	--	--	---

97:11,19,22 reception 64:14 Recess 59:5 98:12 178:14 recognize 38:9 recognized 38:14 42:21 record 6:8,22 29:11 34:17 35:1 39:21 40:5 59:4,5,7 67:7 98:10,11,12,14 128:1,3,16 133:19 134:4 134:17,19 158:12 174:19 175:14 178:3 178:11,13,14 178:19 181:18 182:21 recorded 185:13 185:16 records 132:20 rectangle 70:5 71:13 76:16 77:21 78:1 rectangular 69:8 76:15 77:14,18 149:4 red 69:7 74:9 84:5 86:15 176:5 redirect 178:11 refer 14:7 129:6 reference 9:16 14:21 65:11 98:21 108:2 109:15 110:22 111:2,4,5 113:8 115:4,5,19,22 116:8,14 117:7 117:21 118:18 118:21 119:4 119:13 121:9 121:10,12,13 129:5 140:17 144:14 171:4	referenced 109:3 184:8 references 7:18 32:5 79:5 88:11 93:19 108:4 109:8 115:11 122:20 125:18 131:19,20 171:6 182:5 referencing 67:22 80:12 referred 98:21 referring 60:22 64:4 96:13 173:14 Reflectance-ba... 98:22 100:3 reflection 68:3 80:6 81:22 89:1 90:1 92:12 95:2 95:16 reflective 38:3 refrain 52:12 refuse 174:20 175:2 refusing 50:8,22 regarding 8:15 8:18 9:1,5 180:4,17 region 68:17 Registered 2:6,7 183:6,7 reinforce 153:15 rejecting 160:7 168:20 relationships 106:2 relative 76:9 155:2,8,10 161:9 165:18 166:18 167:5 183:16,17 relevance 110:2 111:9 112:4,10 113:12,20 114:18 115:8 117:9,13 119:8	120:3 121:21 123:2 relevant 147:6 149:11 164:8,9 165:2 166:1 167:17 168:5 178:6 reliable 169:21 relied 143:3,7 181:21 rely 102:11 136:2 137:14 138:5 149:10 relying 87:2 remain 154:16 remember 8:20 126:8 131:15 131:18 132:14 132:18 REMOTE 1:14 2:1 remotely 6:3 repeat 17:20 41:6 55:15 65:14 66:15 107:19 repeated 118:10 repeatedly 171:9 report 22:11 23:18 25:12 165:1 reported 1:17 183:9 reporter 2:6,6,7 2:8 6:1,6 39:3 51:7,15 59:3,6 98:11,13 135:15 144:22 145:3,6,10 178:13,18 183:6,6,7,8 reporting 156:11 reports 29:19 repository 102:7 represent 6:7 70:20 125:9 165:21 representative	27:8 28:5 31:1 32:14 36:18 125:4 representing 6:10,13 request 183:15 requests 39:18 required 168:5 177:5 requirement 29:18 40:1 164:10 176:1 requirements 165:19 180:4 research 107:2 resent 99:16 resolution 119:16 120:9 122:11 129:10 respect 87:18 92:21 96:6 117:17 173:15 responded 22:20 23:7 response 112:14 responsive 153:16 restrict 175:6 restriction 176:1 resulted 38:11 return 123:21 135:4 review 38:13 102:22 103:1,3 103:7,9,14 179:6 183:15 184:10 reviewed 7:16 180:19 reviewing 179:7 Richardson 3:4 6:13 184:2 right 7:2 10:9 12:13 13:20 14:18 15:2,22 16:11,21 17:22 19:14 20:5	25:12 26:3 27:13 32:20 37:1,10 39:12 39:16 40:11 41:9 42:4 44:7 45:12 47:2 53:16 57:4,15 57:20,21 58:1,8 58:21 59:3,21 60:7,12,15 62:12 63:3,5,9 63:18 64:20 65:13,16,19 66:3,7,14,17,18 67:9 68:7 69:9 69:13 70:1,9,22 71:5,6,14 72:16 72:16,20 73:13 73:17 74:4,12 74:18,20 75:4,5 75:12 76:5,12 76:18,20 77:9 77:15,19 78:6,9 79:3,14,19 80:10 81:1,2,16 82:9 83:4,17,20 84:22 85:8,11 85:13,19,22 86:1,10,21 87:15 88:8,15 89:4,18 90:21 92:7 93:5,17 94:12 95:7 96:2 96:11 97:5,15 99:1 100:4,6,8 100:13,20 101:16,21 102:19 103:8 103:18 104:14 106:17 107:11 107:18,22 108:7,10,14,17 109:6,13 110:8 110:13 112:3 114:17 115:4 116:4,19 117:8 118:1 120:2
--	---	---	---	--

121:9 124:19 125:13 126:2 126:11 129:7 130:9 132:13 132:20 134:20 135:2 136:4 137:12 138:4 138:17,20 139:10 140:8 141:5 142:20 143:6,9,18,22 144:12 147:14 148:8,16,20 149:12,13,18 150:5 151:2,5 152:18 153:10 153:11 154:19 154:22 155:6 156:2,7,14 157:6,9,12,15 157:18,21 158:2,8,15 159:6 163:10 173:21 175:11 177:14 178:4 181:11 182:10 182:17 ring 91:20 92:13 141:8,22 142:10 143:5 146:2,3,10,13 146:18,22 147:19,21,22 148:7,8,15 149:2,2,4,10,11 149:17,18,19 149:21,22 150:1,4,5,9,10 151:18,19,20 152:9,21 154:8 154:16 ring-shaped 154:14 rings 142:12,13 142:17,20 149:2 150:11 150:11 151:21	robust 42:11 167:2 room 8:9 170:18 root 120:14,18 roughly 15:5 round 153:3 Rules 184:14 running 74:1 159:17 160:1,5 161:4,9,16,21 162:5,8 163:2 163:10 164:9 168:18 <hr/> S S 4:8 5:2 Sahil 157:17 sample 120:11,11 120:13 176:6 sampling 120:10 Sarantos 38:11 38:16 40:19 41:22 42:10 43:2 48:22 50:3 53:9 56:1 57:11 82:5 84:19 87:5 89:15 90:17 93:11 137:22 138:11 sat 166:18 saturation 154:19,22 155:1,4,13 156:1,4,5,13 159:22 161:3 161:20 163:15 164:4,11,19 165:4,7 166:3,8 166:11,19 167:11 168:10 169:8,13 170:14 171:7 171:22 172:18 173:16 saving 144:12 saw 28:18 69:11 71:3 99:8	108:14,16,19 saying 47:16 72:8 76:6 86:7,8 102:2 104:12 139:19 142:16 144:11,13 159:15 says 13:18 22:22 34:21 64:11 86:7 87:8 100:19 139:21 152:15 175:1 scandium 160:12 scattered 15:14 16:4 17:2 19:4 20:10 22:1 24:8 28:3 32:8 63:20 64:12,15,19 65:12,15 74:10 75:1 82:21 84:3 85:2 86:4 96:22 97:16 scattering 16:14 35:21 scenario 112:8 117:4 scenarios 162:21 163:18,21 scope 21:13 179:12 screen 17:15 65:4 67:22 127:13 135:10 search 140:6 141:4 searched 144:3 searching 134:6 134:8 140:18 second 54:21 67:3,3,10 78:16 78:22 79:2,4,10 79:13,17 81:2 82:1 84:21 85:1 87:3 94:1 108:8 116:13 146:4 seconds 23:5 Section 28:6	sections 178:6 sedentary 160:13 see 9:15 10:2 12:2 15:19,20 22:20 23:2,8 37:12,14 48:7 59:18 61:14,21 62:4,5,7,8,10 62:13,15,17,21 63:5,19 64:17 66:20 67:10 68:21 69:3 70:14 71:11,19 72:1,2,15,16 73:9,10,15,19 73:22 75:7,8,9 79:4 85:14 109:1,4 115:4 115:12 124:19 125:18 126:13 129:21 132:1 132:20 134:21 145:15 146:6 159:12,19 178:11 seeing 11:20 68:18 133:9 141:4 seeks 51:7,15 selected 181:22 184:12 send 10:3 104:12 sense 44:2 67:4 72:5 sensitive 176:7 sensitivity 64:14 sensor 110:20 112:13,18,19 112:22 113:5 114:10,13 115:15 119:11 119:14 120:21 120:22 122:7 123:7,16 155:18 156:6 sensors 122:5 155:18 156:10	sent 127:10 128:11 146:15 separate 8:15 83:14 145:9 series 66:20 serving 41:21 81:11 91:13 set 103:19 183:19 sets 133:11 shadow 153:10 shape 64:13,19 65:12,15 69:9 139:2 142:1,4,4 142:11 143:1,5 143:9 148:6 149:18 150:14 150:15 152:2,3 153:19,22 154:2 shaped 149:16 151:17 shapes 147:22 shaping 64:1 share 127:13,15 128:21 shared 130:11 sheet 184:13 185:14 186:6 shield 24:17 40:18 41:21 42:20 43:9 47:20 48:12 49:17,21 50:4 53:5 55:4,18 57:9 59:13 60:2 60:4 80:10 81:1 81:16 82:9,15 83:3,16,19 84:21 85:12,15 85:16,18,21 89:4,17 90:20 92:3,6 93:5 95:6 96:1,10 97:4,14 shielding 15:17 15:21 16:7,10 16:17,20 17:3
--	---	--	---	--

17:21 19:7,13 19:17,19 20:4 20:11,19,22 21:14,18 22:3,7 22:13 23:20 24:11 25:1,10 26:6,16 27:1,10 27:17 28:4 30:14,21 31:3 31:13 32:9,16 32:19 33:5,7,15 35:13,22 36:1 36:12,16 37:9 37:17,18,20 38:5,7,18 39:11 39:15 40:10,15 41:8,11,19 42:3 42:6,7,13,19 43:8,13 44:11 44:21 45:11 46:17,18 47:10 47:20 48:3,11 48:17 49:16,20 51:5 52:19 53:4 55:3,18 56:2 57:3,9,14,18 58:4,8,11,19 60:15,19 61:7,8 61:13,22 62:12 62:15,16,19,22 63:4,13 70:13 70:21 71:1,4,10 71:12 72:20 74:4,6,6,14,14 74:20,21 75:5 75:11,18 76:2 76:11 78:4,8 80:3,15 81:20 82:14 83:7 84:11,18 85:7 85:10 88:21 89:13,21 90:9 91:5,13 92:19 93:1 94:4,22 95:14 96:5,9,15 98:1,4 shields 37:10	39:12,15 40:11 41:9 42:4,14 44:12 45:11 51:5 52:20 53:7 57:4 89:18 90:21 96:11 shorthand 2:6 183:13,15 show 34:18 39:1 48:7,9 68:2 109:22 110:16 111:6,17 133:14 173:14 176:20 showing 114:8,10 shown 21:11 69:15 71:10 75:6,7,15 77:5 77:10 138:1,13 shows 49:13 60:6 60:11,14,16,19 63:8,11,14,19 67:18 111:13 140:16 shrinking 169:19 Shui 158:1 sic 130:14 side 15:17 16:6 16:16 17:3 19:7 20:10 22:3 24:11 57:18 58:3,8,10,19 60:6,11,14 62:8 62:13,16,18 63:8 67:12,14 74:5 77:7 82:19 84:2,21 91:19 92:12 93:5 96:20 97:2,14 97:19 136:8,17 sides 61:21 71:4 76:12,16,21 77:2 78:4,8 sign 101:12 184:9 184:10 signal 176:9 signal-to-noise	120:17 signature 100:20 101:5,6,8,17 183:19 184:8 184:13 185:6 185:17 186:22 signatures 100:14 signed 100:10,16 100:22 102:6 109:4 132:15 184:13 signing 184:12 silent 40:14 48:20 53:7 similar 65:9,9 90:6,6 94:1 95:17 104:4,20 105:1 130:10 simple 34:16 35:12,17 36:5,6 37:1 43:22 52:15,15 164:10 Sincerely 184:18 Singapore 103:21 104:21 single 34:17,18 34:19 35:3 43:5 47:19 139:7,10 sir 53:17 56:6 sits 76:9 six 12:10 Sixth 3:6 184:3 size 61:12 167:22 sizes 169:20 skill 141:21 142:10 149:9 154:3 173:15 skilled 21:9 skimmed 182:12 skin 153:20 154:15 159:10 160:17 164:1,8 164:8 167:2,22 168:22 172:6 173:3 177:2	skip 126:4 Skoltech 103:22 104:19 small 148:12,17 160:7 168:20 169:20 173:10 174:2 snippets 181:21 solid 70:17 71:10 solving 176:14 somebody 140:22 141:3 soon 58:13 sorry 10:3 13:2 13:17,21,21 46:9 50:16 51:20 55:15 57:22 64:2 65:5 65:14 66:10 73:20 74:14,16 74:22 76:19 77:16 79:12 80:8 81:18 82:17 83:18 85:9,15 88:2,4 92:4 94:16 99:2 107:19 117:12 118:12 129:4 132:21 140:9 143:6 145:1 146:16 147:11 154:20 156:16 169:11 171:15 174:15 sort 40:19 53:10 63:14 70:8 83:8 86:14 138:22 147:22 153:3 154:13,14 155:7,8,8,21 156:11 164:13 167:5 178:6 182:5 Sounds 59:2 source 139:15 140:15 142:16 South 3:6 184:3	Sp02 170:3 space 73:10,13 74:18 93:1 95:20 speaking 55:12 99:4 speaks 175:14 specific 21:10 24:16 59:12 60:1 specifically 172:12,16 173:13 specification 24:5 154:7 spend 179:20 spent 140:18 spherical 64:3 spirit 21:13 spoke 105:7 spoken 157:8,11 157:14,17,20 158:1,6,7,13 square 69:22 74:8 120:14,18 squares 69:7 70:2 74:9 ss 183:2 stable 119:12 stamps 39:1 standard 121:8,9 121:12,13,14 121:18 122:20 170:1 start 9:11 67:2 79:22 starting 171:5 state 2:8 6:6,17 6:21 15:12,15 16:2,5,15 19:6 22:2 24:9 59:10 66:13,16 80:1 82:18 88:19 91:16,20 92:13 94:20 96:19 138:14 141:21 183:1,8
---	--	--	--	---

stated 14:17 141:13 177:5	subtracting 137:16 138:16	surfaces 76:17,18 76:20 77:8	14:9 24:4 61:17 67:15 69:2 72:3	114:16 115:4
STATES 1:1	subtraction 137:20	surprised 107:3	76:4,13 83:5	ten 34:1 178:10
stationary 176:13,15	successfully 171:9	surround 15:17 16:7,17 17:3	90:16 109:5	terms 94:2
stay 49:11,14 51:1 128:3	suffering 131:11	surround 15:17 16:7,17 17:3	132:2 141:11	103:11 107:14
Stephen 157:14	sufficient 121:2	19:8 24:12	146:10 147:7	138:9 140:19
stipulate 6:2	sufficiently 53:9	57:18 58:11	169:4	144:13 167:14
stop 30:4 54:13 54:14,15,18	suggested 38:10 125:8,9	150:4	talks 27:5	test 40:5 115:3,21
store 109:16	Suite 1:20 3:6 184:3 185:2	surrounding 20:11 21:3 66:9	Tao 158:1	117:22 118:21
stored 91:22 92:15	186:2	66:11,19 68:5	taper 71:5,7	119:6,7 120:1
Street 1:20 3:6 3:14 184:3	sunlight 59:17	84:7	tapered 71:4 72:22	121:15,19
185:2 186:2	sunshine 24:21	surrounds 57:14 58:4,19 83:4,16	target 160:11	122:17,21
stretched 139:6	supplemental 7:17 12:11	83:19 92:4,6	targeting 170:7	123:1,5,17
strike 39:12 70:1 78:6 79:1,12	37:13,15 65:6,7	97:5	taught 38:16 43:1 83:9 87:4	testified 6:18
80:5,8 85:11	66:7 81:4 84:5	suspicion 114:12	137:9 166:16	134:11 181:9
92:4 102:1	86:14 93:3	swear 6:1	167:14	testify 8:15,18
143:6 156:17	123:21 125:12	sworn 6:3,16 183:12	teach 93:12 103:21	9:1,5 183:12
166:6,9	125:17 135:4	T	teaches 57:11 82:6 84:19	testimony 7:7
stringent 165:18	141:20 156:18	table 53:13 176:15	138:11	25:20,21 140:8
strong 42:9	158:15 171:18	tackle 159:11,16 160:3 168:17	teaching 21:16 22:9	142:9 151:1
structural 75:11 94:3	supplementary 11:9 12:21	take 32:1 42:9 58:14,21 78:16	teachings 36:19 40:19 41:22	153:8,11
structure 75:13	80:12 171:15	110:14 113:8	42:10	156:20 157:4
stuck 52:10 113:3	supported 160:14	115:17,20	teardowns 179:9 179:15	158:4,5,10,14
student 106:5,15 107:12	supposed 34:8	117:15 118:16	Tech 103:22	159:6,8 167:16
students 103:21	sure 17:15 62:3 68:8,10 72:9,12	118:19 121:17	technique 120:7	175:9,10
stuff 35:1,4	72:14 73:7	128:10 152:8,9	techniques 160:6 168:18	176:17 177:13
stuffed 174:2	78:10,12 79:6	163:9 166:8,11	Technology 103:22 104:22	177:16 178:3,7
subjected 80:4 81:21 89:1,22	82:7 84:6 87:6	167:11 174:1	tell 32:2 49:7	180:7,21 181:3
95:2,15	87:10 119:20	175:4 177:13	144:8	181:9,12,14,20
submission 100:10 101:1	121:3 124:19	178:2	telling 47:14	182:7,9,16
104:10	127:20 130:3	taken 183:15	tells 120:10	testing 118:17 169:22
submitted 102:20 104:11	151:3 156:9	takes 175:11	temperature 109:19 110:1	text 112:19 127:11
subscribed 82:10	surface 63:17 68:3,20 69:16	talk 12:16 20:21 37:11,14,16	110:14 111:8	Thank 39:4 45:6
substrate 91:22 92:14	77:3,8 80:4	90:14 104:1	113:5,6 115:5	145:6 182:20
	81:21 88:22	126:15,16	115:18,21	theory 120:10
	89:22 92:1 93:7	139:8 141:1	116:1,18	thermometer 109:17,18,19
	95:1,15 152:11	150:17 172:13	temperatures	109:21 110:1,4
	153:1,20	talking 13:21		110:12,13,16

116:3,8,8,14,15 116:19 118:17 118:18,21,22 119:3,5,7 120:1 121:9,10 122:18 theses 100:9,11 101:4,5,12 102:5 104:8 105:3,9,11 107:14 thesis 100:11,16 100:22 102:7,8 102:16,21 104:9,11 105:5 105:14 106:5 106:15 107:9 107:15,16 thick 84:16 thickness 61:9,11 61:18,19 71:12 72:6,7,7 thing 69:18 70:11 95:9 105:11 112:14 114:8 114:11 140:13 143:13 159:18 things 16:22 18:9 19:2 20:13 27:6 30:19 33:7,8 35:20 69:4 77:3 86:15 140:20 159:10 164:15 168:22 169:16 170:8 173:4 think 18:15 21:20,21 23:9 34:1 44:2 52:6 62:20 75:14,21 79:20 81:13 90:13,18 99:2 110:9 111:18 115:14 124:20 127:3 141:12 154:6 155:15 170:10,12 thinking 77:17	third 4:22 87:22 88:7,9,13 89:3 89:18 90:21 91:1 94:2 129:16 thought 85:15 three 8:15 11:8 12:12 43:5 95:18 109:19 110:14,15 113:6,9 124:18 124:22 three-dimensio... 77:2 tilted 152:10 time 7:9 10:14 22:19 34:9,17 38:22 98:8,9 108:13 121:11 123:10,12 128:9 133:7 134:9 140:18 144:3 160:22 169:9,14 170:4 170:9,15 172:2 172:20 173:9 173:18 174:1,4 179:5,20 182:20 183:15 184:14 times 7:4,5 29:6 30:1 34:1,2,6 52:2 53:17 55:8 121:16 timing 131:18 titled 98:22 100:2 today 7:7 12:13 14:8 26:3 31:17 44:4 124:8 143:20 144:5 146:9 179:5 180:17 182:16 today's 7:14 told 48:6 51:2 182:3 tone 164:1,9 167:2 172:6	173:3 177:2 tones 159:10 168:22 top 60:19 61:3,14 61:18,19 62:22 63:3,6 71:5,7 77:15,18 174:16 tough 126:3 toy 109:16,17,22 110:8,11 111:4 111:7 112:7,9 track 116:5 TRADEMARK 1:1 tradeoffs 90:10 173:8 trample 40:4 transcribed 183:13 transcript 38:22 183:14,16 184:8,9 185:10 transcription 183:14 185:13 185:15 transducer 112:13 transmit 24:15 59:12,22 treated 80:18 treatment 80:5 81:22 89:1 90:1 95:2,15 TRIAL 1:3 tries 163:9 true 138:21 183:14 185:12 185:14 truth 122:9,20 123:4,15 183:12,12,12 truthful 7:7 try 27:13 120:8 159:11 trying 29:2 30:2 34:6 41:21	44:18 49:2 54:3 68:10 71:17,19 73:2 75:3,16 112:15 117:1 118:9 122:13 122:17 123:6 123:18 140:4 141:9 153:16 159:8,9,16 160:3,20 164:13 167:1 167:20 168:17 170:20 172:4,7 182:7 tube 77:15,18 turn 14:11 15:7 59:9 64:7 78:17 79:21 87:22 88:17 93:14 94:14 96:17 124:15 135:19 145:22 163:22 174:11 175:15 twice 12:1 two 11:9 12:7,7,8 43:6 61:21 73:22 74:12,13 74:19 75:3 76:4 116:2,20,22,22 117:15,16 118:10 119:2,4 120:16,18,19 121:17,19 122:5 137:20 139:13,14,14 139:18,21 140:6,7,16 141:5,7,7,10 147:7 152:15 152:17 153:3 154:14 167:4,5 type 155:17 160:13,17 typewriting 183:13 typewritten 183:14	U U.S 8:18 9:1,5 13:9 Ueyn 158:7 ultimately 122:11 UMass 103:20 unable 28:10 42:2,12 unclear 76:7 undergraduate 107:12 underlying 122:12 underneath 162:21 underscore 171:6 understand 7:9 7:12 8:14,17,22 9:4 14:8 22:8 25:8 26:1 28:9 32:1,4,5 33:18 43:20 45:4 46:10,12 50:7 50:12,12,19 51:10,11,17,21 52:3 56:9,13,15 56:18,20,22 61:5 68:8 72:8 78:12 82:8 83:8 93:11 114:20 122:15 123:18 137:9,21 138:10 143:15 149:13 151:8 152:9 154:1,7 154:18,21 158:10 understanding 12:15,18 18:12 44:6 50:19 56:5 62:3 68:11,14 105:9 106:7 119:10 120:6 122:4 143:5,9 143:11,15 147:21 150:9
---	--	--	--	---

151:20 153:12 173:3 182:6 understood 141:22 142:3 142:10 149:17 150:13 151:8 151:12,19 152:1 173:1 unexpected 136:9 unfavorable 175:5 unfortunate 156:3 uniform 61:9 unit 15:14,15,18 16:4,4,8,14,14 16:18 17:2,4 19:4,5,8 20:9 20:10,12 21:2,3 21:4 22:1,1 24:8,8,12,19 26:20 27:2 28:2 28:3,5 30:20,21 32:7,8,10 35:21 35:21 36:17 57:15,19 58:5 58:12,20 59:15 63:21 64:6,12 64:16,20 65:13 65:16 66:12,14 66:17 67:19 68:5,9,12,14,20 74:7,10 75:1 76:1 77:13 80:2 81:19 82:21 83:17 84:3,8,10 85:2 86:4 88:20 89:12,20 91:4 91:17 92:2,4,10 93:8 94:21 95:13 96:4,16 97:1,11,17,19 97:22 142:5,6 150:18 152:3 UNITED 1:1 universities	101:2 103:10 103:13 104:3,6 104:15,17 105:4,8,17 106:9,17,21 university 101:19 102:4 103:18 103:21 104:21 107:4 unknown 173:4 unsigned 100:6 unspecified 164:10 unusual 136:9 unwanted 37:21 upload 9:8 10:12 10:13,18,22 13:11 129:9,13 uploaded 11:12 11:22 12:5 98:15 uploading 144:16 174:6 upper 62:11 69:12 use 32:17 38:19 50:2 109:19 110:13,22 111:2 113:4 114:13 115:17 122:22 123:14 136:12 150:10 159:9 163:18 166:17 176:11 176:12 useful 122:7,10 user 160:1,17 161:4,21 162:7 162:12,18,19 163:9,16 164:1 164:5,20 165:8 165:14,19 166:5,9,12 167:3,11 168:1 168:11 169:8 169:13 170:14 172:1,16,19	173:17 175:4 176:13 uses 151:14 165:1 Usman 128:11 usually 148:12 148:17 <hr/> V <hr/> v 1:7 184:5 185:7 186:8 vacant 146:20 148:10 valid 105:14 106:5,15 107:16 109:22 119:6 validity 105:5,13 107:9 value 154:19,22 155:13 156:5 values 117:7 119:2,4 variability 119:16 159:12 160:17 172:5 173:8,22 variable 141:8 159:10 164:8 variation 103:11 120:12 variety 159:9 175:2 177:1 various 21:12 27:7 83:14 95:21 131:19 177:15 vary 155:20 Venugopal 157:21 verb 146:5 verification 101:2 version 10:11 125:15 127:10 127:15,21 130:17 131:14	132:3 133:2 134:3 135:1 143:19 144:4 145:4 147:2,15 147:16 160:12 164:22 180:5 180:17 versions 133:4 134:22 179:21 vertical 61:1 73:13,18,22 74:12,13,19 75:3,13 76:4 view 60:6,11,13 60:14,16,18 61:10,22 63:8 63:10,11,20 65:18,20 66:1 69:16,17 77:1,7 77:10,17 78:7 86:18 93:21 visualization 78:11,12 Vivek 157:20 <hr/> W <hr/> W 1:14 2:1 4:3 7:1 183:10 184:1,6 185:8 186:9 wait 18:3 127:19 waive 184:11 walking 159:17 160:5 163:16 168:18 want 22:10 23:17 27:13 39:7 44:7 44:8 48:7 58:22 61:16 62:2 63:15 68:8 82:7 126:16 128:5 129:6 130:3 151:2 155:22 162:14,15 178:10 wanted 162:20 168:14 173:1	wanting 160:16 162:13 Washington 1:21 185:3 186:3 wasn't 31:22 75:16 104:14 163:20 166:13 watch 159:13,22 161:3,20 163:8 163:15,19 164:4,19,22 165:7 166:4,7 166:10,15 167:10 168:9 169:10,15 170:2,11,16 172:2,20 173:18 174:20 175:5,7,10 176:4,5 179:6,9 179:16,22 180:5,7,18,20 wavelength 24:16,17 59:13 59:14 60:1,3 wavelengths 59:21 166:17 167:6 way 18:14 23:14 32:3,4 41:17 42:11 44:2 50:13 52:5 54:20 55:10 73:3,3 106:19 107:6 109:22 111:6 113:10 114:15 115:6,9 115:12 119:6 119:22 120:8 120:20 121:7 Waydo 157:15 159:6,15 167:16 Waydo's 159:8 182:16 ways 115:14 168:22
--	---	---	--	---

We'll 129:14	witness 2:2 4:2	75:17 78:15	106:2 117:1	129:14,15
we're 12:13 24:3	6:2,3 11:7 12:2	153:13,14	119:18 121:5	144:22 145:3,4
33:21 44:4 49:6	12:7 18:21	work 67:3 105:6	124:12,21,21	146:19 147:5
50:15 54:2,20	19:17 20:8 24:2	111:19 160:19	128:16 130:8	148:7,9
59:3,6 62:3	26:2,11,19	164:13	138:7,22 149:9	10 4:10 14:17,21
67:6,6,15 68:8	27:21 28:15	working 99:16	168:13	15:4 37:15 81:5
68:18 72:13	29:1,11 30:17	138:20 156:7	years 100:16,22	10,687,743 8:19
76:22 98:11,13	31:18 33:1 34:4	160:2 162:4	108:18,22	10,722,159 9:2,6
121:13 129:2	34:7 35:17	works 106:17	109:5,13	13:9
132:2,3 141:11	36:15 37:4	138:19 161:8	Yep 11:18	100 171:5
144:4 146:9,9	40:13 42:18	162:7 163:2	yes-or-no 16:19	1001 4:16 13:8,10
147:7 178:13	43:12 44:16	world 52:17	17:5,8,18 18:7	1003 4:10,12,14
178:18	45:14 46:2,21	worn 148:13	18:17,22 19:11	9:12,21 10:6,8
we've 98:6	47:5 48:2,16	155:22 170:19	20:2 26:14	10:19,21 11:3,5
103:19	49:20 53:2,21	worthwhile	27:18 33:11	12:3,3
wearing 169:1	54:17 55:7	163:6	35:4 37:1 39:6	1004 4:17 13:12
wears 167:3	56:11 57:7 59:1	wouldn't 121:16	42:3 43:4 44:6	13:14,19 14:1
168:1	99:20 110:3	149:10	44:12 45:3,9,17	101.6 115:20
weeks 99:17	111:10 112:11	WPI 102:7,13,16	45:20 46:2,8,9	116:9,11 117:7
well-known	113:14,22	103:4,6,8,12	46:11 47:2,6,9	118:18 121:10
38:17 171:8	114:20 115:9	wrist 99:1 100:4	48:10 49:4,5	103 12:3
went 167:1	117:14 118:3,8	160:16 161:12	51:22 52:4,11	1042 4:18 98:16
169:16	119:10 120:5	164:2,17 165:4	52:22 53:15	98:18 100:2,6,8
weren't 143:21	122:1 123:3	166:3 167:15	54:22 56:4	101:14,20
176:17	124:9 126:19	167:22 168:6	yeses 33:2	102:18 107:18
WESTCHEST...	128:13 129:18	168:10 169:6,8	York 2:9 6:17	107:22 108:7
183:3	135:14,16	169:13 170:14	183:1,9	108:10,14,17
WHEREOF	159:1 161:7	170:22 171:7		1079 4:11,13,15
183:19	162:2,11	171:22 172:18	Z	10:19,20,21
wide 159:8	172:14 179:13	173:2,16	zero 155:5 156:2	11:2,4,6,21
wider 60:19	180:11 181:3	177:12 178:1	156:4,11,14	12:4,4,6,19,19
61:14 63:5	183:10,11,19	wristwatch 14:20	zoom 8:12 9:8	13:4,5 64:22
69:12 70:5	184:10 185:8	65:21 88:10	72:12	65:7 123:22
77:15,18	185:17 186:9	93:19	zooming 146:17	135:5 156:19
widest 70:21	witness' 40:5	written 67:7		158:17
width 61:19 72:2	witnesses 39:20	80:19 112:3	0	1095 4:19 126:15
72:3,4,4 78:3	39:20	158:12 184:22	1	126:17,22
136:3,7,17,19	wondering	wrong 48:6 113:3		127:9 129:5,8
137:1,3,15,20	128:10		1 4:20 13:17	138:3 143:4,8
137:22 138:10	word 34:5 47:19	X	14:17,21 28:6	143:17 145:5,9
138:12,15	53:19,19 54:5,5	X 4:1,8 5:2	65:21 66:5 83:6	11 4:11,12,13,14
139:2,5	56:7,8,14,17,19	Y	84:17 89:7,15	4:15 15:5 79:3
widths 136:14,21	56:21 57:1		90:16 91:3	79:5,14 81:6
137:8,9	146:2,3,10	yeah 13:6,18 34:3	92:22 94:4	1198 145:22
willing 36:22	151:14	34:22 70:16	95:10,19 96:8	12 7:5 15:5 23:4
wire 113:3	words 36:4 42:5	71:1 78:13	97:7 98:3	81:6 147:6,13
withhold 55:11	43:5 46:12 73:4	79:20 99:12,15	109:21 110:15	148:19 152:13
			111:5 113:7	

12:00 1:16 2:4 183:11	17:3,22 19:13 20:4,19 21:18	2023 10:8 109:4,6 109:10	63:8,19 68:1 69:11 71:3,6	82:8 83:1 84:4 84:9,10 85:4,21
12:15:43 22:18 23:4	22:13 23:20 24:11 25:10	2025 1:15 2:3 134:20 183:10	72:21 80:14 84:17 89:8 90:6	85:22 86:5,12 88:20 89:4,6,11
12:43 23:2,3	26:6,16 27:17 30:14 31:14	183:19 184:6 184:20 185:8	95:17 116:12 116:15 148:22	89:20 91:2,3 92:1,15,17
126 4:19	32:19 33:15 35:13 36:12	186:10 2040 3:14	30 14:17,21 79:3 79:5,14 88:8,11	94:21 95:5,9,12 96:3,16 97:2,18
129 4:20	37:21 38:7,18 57:18 58:4,11	2078 5:6 174:7,8 174:11	88:12 171:14 174:15	97:20,21 98:5 45 157:4
13 4:16,17 15:5 80:14 82:18	60:15,17,19 62:1,8,11,12,15	21 1:15 2:3 94:12 94:13 97:21	31 88:14 93:14,17 93:20 94:11	47 59:10 48 21:6 27:5
84:1 86:13 96:18	62:16,19,22 63:13 69:4,9,10	184:6 185:8 186:10	32 88:1 3200 3:6 184:3	30:22 88:14 94:11,13
14 7:5 15:1,5,6 78:18,20 79:3,5	69:19 70:4,7,10 70:13,16,21	21st 183:10 22 175:17	33 80:2 81:19 88:20 89:20	49 79:12,19 159:3 159:15 168:16
79:11,14,15,18 82:19 84:1 93:3	71:1 73:5 74:4 74:5,6,6,15,20	23 94:15,19 174:17,22	91:17 92:2,10 93:8 94:21	<hr/> 5 <hr/>
144 5:3	74:21 75:5,10 76:11 78:5,8	232-0646 1:21 185:4	95:13 96:4 33a 80:7 82:20,21	5 14:11,13 15:1,4 50 64:9 93:15
14th 3:14	79:21 81:18,18 82:17 84:9 85:1	23rd 183:19 24 96:20 174:22	83:2,4,17,20 84:2,14 85:5	94:11 169:18 51 82:17
15 13:6 23:5 68:1 68:3 80:13 84:5	86:3 96:9 181 4:6	241 11:20 12:3,6 65:1,8 135:5	86:6 91:21 92:7 92:14 96:21,22	52 14:12,14 15:1 15:2,5 88:3,14
86:13 88:8,11 88:11 93:3	19 96:20 175:16 175:20	241s 12:7 243 11:22 12:3,4	97:3,5 33b 91:22 92:14	91:14 164:7 165:5
150:1	<hr/> 2 <hr/>	37:20 38:8 243s 12:8	97:3,5 35 91:20 92:13	53 85:2 86:3 157:3
159 13:7 37:13,15 68:2 124:1,4,6	2 5:3 65:18,20 66:6,13,16,21	244 12:3,4 124:2 158:18,19	92:14 96:21,22 38 15:7,10,11,12	54 78:18,20 79:11 79:18 85:2 86:3
124:12 157:2 158:19,21	67:1,22 68:15 70:15 90:7	244s 12:7 25 65:3,8 171:14	97:3,5 39 94:14,17 96:17	55 64:8,10 79:20 82:17 86:3
171:3,10,15	95:17 96:6 97:7 137:18 139:4	171:15 174:18 175:1	97:3,5 3A 95:3	55402 3:7 184:4 56 79:16 93:7
159s 12:21	144:17,19 145:12,15	26 79:11,18,20 87:22 88:3,14	3D 77:7,17 78:7	57 64:8,10 58 79:16 91:14
15th 130:4,15 131:5 134:10	148:11,15 2-4 13:1	96:20 171:15 28 88:17 91:1,15	<hr/> 4 <hr/>	<hr/> 6 <hr/>
134:15,20	20 94:14,19 97:21 200 156:6	93:7 29 93:17,20	24:7 30:18 32:7 35:19 60:9	6 4:4 37:16 60 3:6 184:3
16 88:8,11,11 91:17 92:8,9	20036 1:21 185:3 186:3	<hr/> 3 <hr/>	93:21 95:17 149:2	61 79:22,22 84:9 612-337-2510 3:8
17 15:15 16:5,15 19:5 24:9,15	202 1:21 185:4 202)-232-0646	3 15:13 16:3,13 17:1 18:4 19:3	4:40 182:22 40 58:6	62 15:4 64 84:13 88:17
59:11 63:9,12 75:8 76:9 82:22	184:15 202)232-0646	24:7 30:18 32:7 35:19 60:6,8,9	3A 95:3 3D 77:7,17 78:7	65 79:22 160:11 66 164:7
84:4 85:3 86:3 86:5,11,14 92:2	186:4	60:9,11,14 62:5	97:3,5 3A 95:3	67 88:18
93:8,17,19,20 97:1,17			3D 77:7,17 78:7	
1730 1:20 185:2 186:2			<hr/> 4 <hr/>	
174 5:6			4 15:13 16:3,13 17:1 18:4 19:3	
179 4:5			24:7 30:18 32:7 35:19 60:9	
18 15:17,22 16:7 16:10,17,21			93:21 95:17 149:2	
			4:40 182:22 40 58:6	
			41 58:6 42 15:8,10,12	
			59:10 43 23:5 80:2,9,15	
			80:22 81:15,19	

68 136:15	57:15,19 58:5			
7	58:12,20 59:15			
7 15:4 64:7,9,10	74:7 96:17			
142:5 150:18	900 24:16,18			
152:3	59:13,14,21			
70 136:2,10	60:2,3,4			
137:13 138:14	90s 155:17,22			
169:22	926 174:12,14,16			
71 141:20 142:3	92614 3:15			
147:21 149:8	927 175:15			
151:11	949-760-0404			
74 137:7,18 139:4	3:16			
743 8:21 80:13	95.6 116:1,15			
81:5 84:6 86:14	117:7 118:22			
93:3 124:1,5,21	121:12			
125:19 135:8	98 4:18			
135:18 149:11	98.6 109:18			
158:20	110:12 112:3			
75 135:19,22	113:4 115:19			
136:1 137:8	115:22 116:4,8			
76 171:5	116:11,14,19			
8	117:6,8,15,16			
8 15:4,7,9,12,15	117:18,18,22			
19:5 21:1,2	118:1,17,21			
24:3,8,14 26:20	119:3,5 121:16			
57:17 58:6 59:9				
59:11 63:21				
64:5,5,12,16,20				
65:13,16 66:14				
66:17 67:19				
68:5,9,12,14				
73:9,12 74:9,13				
74:17,22 75:4				
76:5 82:21 84:3				
85:2 86:4 97:1				
124:15,21				
81 13:17				
812 1:20 185:2				
186:2				
819 13:17,18,18				
14:2,2,19				
9				
9 10:8 15:4,14,18				
16:8,18 19:4				
24:8,12,19 28:5				