

1 UNITED STATES PATENT AND TRADEMARK OFFICE
2 BEFORE THE PATENT TRIAL AND APPEAL BOARD

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4 ALIGN TECHNOLOGY, INC., :

5 Petitioner, : Case No.

6 v. : IPR2024-00052 and

7 DENTAL MONITORING SAS, : IPR2024-00110

8 Patent Owner. :

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11 REMOTE STENOGRAPHIC DEPOSITION OF

12 HASSAN FOROOSH, PHD

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1	W I T N E S S I N D E X	
2		
3	Witness Page	
4		
5	HASSAN FOROOSH, PHD (sworn)	5
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7	Examination by ALLYSON PARKS	5
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1 P R O C E E D I N G S

2 COURT REPORTER: Dr. Foroosh, please raise
3 your right hand.

4 Do you swear to tell the truth, the whole
5 truth, and nothing but the truth?

6 THE WITNESS: I do.

7 COURT REPORTER: Okay. We can start.

8 HASSAN FOROOSH, PHD
9 having been duly sworn testified as follows:

10 EXAMINATION BY ATTORNEY PARKS:

11 Q. Good morning, Dr. Foroosh. I'm
12 Allyson Parks. I think we met before, but I'm
13 representing Dental Monitoring today.

14 Do you understand that you are under oath
15 for today's deposition?

16 A. Good morning. Yes.

17 Q. Is there anything that would prevent you
18 from testifying truthfully today?

19 A. No.

20 Q. Where are you located for today's
21 deposition?

22 A. I am in my home, in a space I use as my
23 office also.

24 Q. Is there anyone else in the room with you?

25 A. No.

1 Q. And apart from the computer that you are
2 using to connect to today's deposition, do you have
3 any devices at arm's reach?

4 A. No.

5 Q. Do you have any notes or documents in
6 front of you?

7 A. No notes or documents, other than the
8 clean copy of the exhibits.

9 Q. Okay. So do you have -- do you have your
10 reply declaration and the IPR2024-00052 and
11 IPR2024-00110 in front of you?

12 A. Yes. I have the whole set of clean copies
13 of my declarations and exhibits. Yes.

14 Q. Okay. So you have both your original
15 declarations and your reply declarations in front of
16 you?

17 A. I do --

18 Q. And their exhibits?

19 A. Yeah. They are in a folder. I mean a
20 binder.

21 Q. Okay. Great. Do you have any notes or
22 annotations on any of those documents?

23 A. No. They are clean copies.

24 Q. Apart from the Zoom application we are
25 using right now, do you have any other applications

1 open on your computer?

2 A. No other applications are open?

3 Q. Did you do anything to prepare for today's
4 deposition?

5 A. Yes.

6 Q. What did you do to prepare?

7 A. I went over my reply declaration and the
8 exhibits and references. Also, on Wednesday, I had
9 some preparation with attorneys, Patrick Medley and
10 Matthew Argenti.

11 Q. How long did you meet with Mr. Medley and
12 Mr. Argenti?

13 A. I think about five hours, probably.

14 Q. Did you speak with anyone else to prepare
15 for today's deposition?

16 A. No.

17 Q. And did you review any documents that are
18 not exhibits to your declarations?

19 A. Nothing unrelated to my reply declaration.
20 No.

21 Q. Okay. I think my question is a little bit
22 different.

23 Were there any documents you reviewed
24 yesterday, or in preparation for this deposition,
25 that are not exhibits to your declarations?

1 A. No.

2 Q. Did you do anything else to prepare for
3 your deposition?

4 A. No.

5 Q. All right.

6 ATTORNEY PARKS: So today, I'm going to
7 use the chat for exhibits. So it sounds like you
8 should have all of these in front of you already.
9 But I'm going to put both of your reply declarations
10 into the chat.

11 And for the record, these are Exhibit 1048
12 in the IPR2024-00052, and Exhibit 1048 in the
13 IPR2024-00110. So take your time to download those
14 and confirm if those are your reply declarations
15 whenever --

16 THE WITNESS: I'd rather --

17 ATTORNEY PARKS: -- you're ready.

18 THE WITNESS: I'd rather use my clean
19 copies here.

20 ATTORNEY PARKS: Okay.

21 THE WITNESS: I mean the printed hard
22 copies.

23 ATTORNEY PARKS: Yeah. Of course, you are
24 free to use your clean copy. And I'm sure Patrick
25 will let me know if I introduce the wrong exhibits.

1 BY ATTORNEY PARKS:

2 Q. Okay. So do you have Exhibit 1048 in
3 IPR2024-00052 in front of you?

4 A. I can take it out right away.

5 Q. Okay. Great.

6 A. I do now.

7 Q. Okay. And on page 20 in this declaration,
8 is that your signature?

9 A. Yes.

10 Q. Are you aware of any errors in this
11 declaration?

12 A. Yes. I think I noticed one error. A
13 typo. So if we go to page four, paragraph 11,
14 towards the end of that paragraph -- excuse me -- it
15 says:

16 "Properly understood, the combination of
17 the three references would have been operable."

18 It should really read four, you know.
19 Four references.

20 Q. And --

21 A. As you can see, in the title of that
22 section, I'm referring to four references.

23 Q. Okay. So the three references should be
24 four references, referring to Kim, Invisalign, Salah
25 and Maninis?

1 A. Yes.

2 Q. Okay. Are you aware of any other errors
3 in your declaration?

4 A. No.

5 Q. Okay. And now, if you could pull up your
6 other reply declaration? So that would be
7 Exhibit 1048 in the IPR2024-00110.

8 Do you have that one as well?

9 A. Yes. I have it. Is it okay if we refer
10 to them by the patent numbers, so I know --

11 Q. Oh, sure.

12 A. I'm more used to saying --

13 Q. Yes.

14 A. -- the '248 and '945.

15 Q. Yes. That's easier for me too. Happy to
16 do that. Sorry for talking over you. Will do.

17 Okay. So in your '945 Patent reply
18 declaration, on page 11, is that your signature?

19 A. Yes.

20 Q. Are you aware of any errors in this
21 declaration?

22 A. No.

23 Q. Okay. So now, I'd like to go back to the
24 '248 Patent reply declaration and look at paragraph
25 three together.

1 Do you have that in front of you?

2 A. Yes.

3 Q. So on paragraph three, you write:

4 "In preparation for this declaration, I
5 have reviewed the declaration of Dr. John Mongan and
6 the declaration of Dr. Budi Kusnoto."

7 And then you also refer to your list of
8 exhibits. Did you review any other materials to
9 prepare this declaration?

10 A. No.

11 Q. Okay. And then in your '945 Patent reply
12 declaration, I believe also in paragraph three, you
13 have the same statement.

14 Apart from -- in connection with your
15 '945 Patent reply declaration, other than the
16 declarations of Dr. Mongan and Dr. Kusnoto, and your
17 list of exhibits, did you review any other materials
18 to prepare your '945 Patent reply declaration?

19 A. No.

20 Q. And am I correct that in neither your
21 '945 Patent declaration, nor your '248 Patent
22 declaration, you do not disclose any conversations
23 with Dr. Valley?

24 ATTORNEY MEDLEY: Objection. Form.

25 THE WITNESS: No. I had no discussions or

1 anything. I did not -- as I said, the only things I
2 considered are the -- are the references I put in
3 that line that we just talked about.

4 ATTORNEY PARKS: Okay.

5 BY ATTORNEY PARKS:

6 Q. So if you could pull up the '248 Patent
7 reply declaration again, and this time turn to
8 paragraph 20?

9 A. Yes.

10 Q. Okay. So paragraph 20 continues for
11 several pages, and you present a number of image
12 analyses using Canny edge detection. Correct?

13 A. Yes.

14 Q. And do you recall that in your earlier
15 declaration, in the '248 Patent IPR, you presented a
16 different image analysis, also using Canny edge
17 detection, but on a photograph from the Invisalign
18 reference?

19 A. I do remember. Yes.

20 Q. To create these analyses in paragraph 20
21 of your reply declaration, did you apply the same
22 techniques that you used for the Invisalign
23 photograph in your earlier declaration?

24 A. I did. Yes.

25 Q. Were there any differences in the

1 techniques that you applied?

2 A. The techniques -- the technique was the
3 same, but I adjusted the parameters differently.

4 Q. How did you need to adjust the parameters
5 differently to prepare the images in your reply
6 declaration?

7 A. Canny edge detection comes with a set of
8 parameters. You can either manually adjust them or
9 automate the process. I didn't want to take my time
10 to automate it.

11 So it's a low-dimensional optimization
12 problem. I did manually adjust it and report the
13 results in my reply declaration.

14 Q. Did you say low-dimensional optimization?

15 A. Yeah. It's just a few parameters. That's
16 what I mean by low-dimensional. So a user can
17 manually adjust and get results.

18 Q. So when you are adjusting these
19 parameters, what are you changing about how the
20 algorithm is run?

21 A. I'm not changing anything how the
22 algorithm is running. I mean, Canny, like many
23 other edge detection algorithms -- even the ones
24 that were used at the priority date -- they all are
25 dealing with a set of scale parameters.

1 So I was manually adjusting those scale
2 parameters.

3 Q. And can you give me some examples of scale
4 parameters.

5 A. Sure. Canny, for instance, is using
6 standard deviation of a Gaussian filter as a means
7 of adjusting the scale. So it's relying on a
8 Gaussian filter, and there is one parameter there to
9 adjust.

10 Q. Are there any scale parameters relating to
11 the contrast of the image?

12 A. Well, you could argue that scale -- I
13 mean, contrast is one aspect of scale. You know,
14 scale is basically saying that what is the strength
15 of the edge at a given pixel.

16 So you can adjust to either manually, or
17 it can be done automated so that it detects the
18 scale locally at a given pixel, what that scale
19 should be to produce the edges.

20 Q. So when you adjusted the parameters
21 manually to create the images in paragraph 20, were
22 you adjusting to detect contrast in the images?

23 A. I did not think about it as a contrast
24 adjustment. I've been using Canny edge detection
25 for over 30, 35 years, or so. So, by experience, I

1 was just manually adjusting, but I didn't think
2 about contrast in particular. Because scale is a
3 much broader concept than just contrast.

4 Q. Okay. But you manually adjusted the scale
5 parameter. Correct?

6 A. Correct.

7 Q. And part of the scale parameter is
8 contrast. Correct?

9 ATTORNEY MEDLEY: Objection. Form.

10 THE WITNESS: As I said earlier, scale is
11 a broader concept than contrast. It may manifest
12 itself as contrast. It may not. It just covers a
13 lot of different aspects in the image.

14 ATTORNEY PARKS: Okay.

15 BY ATTORNEY PARKS:

16 Q. So I'm just going to ask my question
17 again. You testified earlier that part of the scale
18 parameter is contrast. Correct?

19 ATTORNEY MEDLEY: Objection. Asked and
20 answered.

21 THE WITNESS: As I said, scale is a
22 broader notion than just contrast. So I didn't
23 particularly say, "Look, that's the image. What is
24 the contrast here or there." I just -- I went with
25 this, my -- as I said, I've been using Canny for

1 over 30 or maybe 35 years, so I just manually adjust
2 it and produce the results.

3 Again, as I said, I could have automated
4 that but I didn't want to spend a lot of time in
5 program. My goal was just to show that contrary to
6 what Dr. Kusnoto says, those additional images that
7 I have in paragraph 20 would have been easy to get
8 the edges for those -- for those images also.

9 BY ATTORNEY PARKS:

10 Q. Part of the scale parameter is contrast.
11 Yes or no?

12 ATTORNEY MEDLEY: Objection. Asked and
13 answered.

14 THE WITNESS: As I said, it may be part of
15 it, you know. And scale has been studied widely --
16 I mean, vastly in my community, in computer vision.
17 And it's not just contrast. It may play a role or
18 it may not. It depends on the image.

19 And it's a lot of factors that determine
20 the -- I mean, determine the scale.

21 BY ATTORNEY PARKS:

22 Q. Is sharpness also part of the scale
23 parameters.

24 A. Again, it's image dependent. You know, an
25 image might seem sharp but the scale might be not --

1 I mean, let's say two images may be considered both
2 sharp but they may not be in the same scale.

3 So scale is a broader concept than
4 sharpness or contrast. It covers a whole range of
5 different aspects of the image.

6 Q. But even if it covers broader aspects, you
7 would agree that the scale parameter includes
8 sharpness and contrast. Correct?

9 ATTORNEY MEDLEY: Objection. Form.

10 THE WITNESS: It may. As I said, that's
11 two images from the point of view of POSA may
12 look -- have the same level of sharpness doesn't
13 mean that they are at the same scale from different
14 points of view.

15 So it's -- it's not -- I mean,
16 sharpness -- those concepts are rather subjective.
17 So scale is a more -- is more related to -- you
18 know, it's a broader definition than just sharp or
19 by contrast. And it's kind of subjective
20 descriptions.

21 Q. But when you are adjusting the scale of an
22 image, you can be adjusting it for sharpness and/or
23 contrast. Correct?

24 A. No. That's incorrect. The scale is not
25 adjusting for the sharp -- I mean, it's not

1 adjusting the sharpness of the image. That
2 parameter -- you know, like for instance, the scale
3 parameter that Canny is using, the standard
4 deviation of Gaussian is adjusting how Canny
5 operates on the image.

6 It does not adjust -- it does not modify
7 the image. So I might have misunderstood your
8 question. But if you are saying that I'm adjusting
9 the contrast of the image, no. The image -- the
10 input image was not touched.

11 It's just that, you know, you can either
12 automatically estimate the scale of the image or,
13 you know, in my case, I was not interested to spend
14 a lot of time on this. I just wanted to get the
15 results, and to show that Dr. Kusnoto is wrong. So
16 I manually adjusted and produced some results.

17 I could have manually adjusted to slightly
18 different. It wouldn't even make much difference.
19 It would give similar -- similar results.

20 Q. Okay. I think maybe I misunderstood. So
21 the scale is -- is it about how you interpret the
22 output of the analysis?

23 A. No.

24 ATTORNEY MEDLEY: Objection to form.

25 THE WITNESS: No. It doesn't interpret

1 the output of the algorithm. Scale is basically
2 measuring -- in this case, we are dealing with edge
3 detection. It's measuring the strength of the edge.

4 BY ATTORNEY PARKS:

5 Q. So the scale, is that how you decide with
6 what competence you are going to call something an
7 edge or not an edge?

8 A. You could interpret it that way. Like
9 what is the probability that there is an edge at a
10 given pixel. Because it's related to the strength
11 of that -- that pixel being an edge or not.

12 Q. Okay.

13 So in order to analyze the images in
14 paragraph 20 of your reply declaration, you had to
15 apply a different scale to interpret whether there
16 were edges or not?

17 A. I didn't interpret anything. If you mean
18 I interpreted, no -- yes. But I did manually adjust
19 the scale parameter of the Canny edge detection,
20 which is, as I said -- is, for instance, one of
21 those scale parameters is the -- is the standard
22 deviation of the Gaussian filter that Canny is
23 using.

24 Q. Okay.

25 And none of the images shown in paragraph

1 20 of your declaration were taken with a cellphone.

2 Correct?

3 ATTORNEY MEDLEY: Objection. Foundation.

4 THE WITNESS: I have no idea whether --

5 what device they were taken with. I read

6 Dr. Kusnoto's opinion that in two of the references

7 that he referred to, that I also referred to them.

8 He said that these are more represented --

9 these would have been more represented in images

10 that the orthodontist would have seen at the

11 priority date -- actually postdated the priority

12 date, these documents.

13 And I said okay. I mean, I was looking at

14 them from the point of view of a computer revision

15 or image processing expert, and I said there are no

16 problems. I can do -- I can apply even a very

17 old-fashioned edge detection algorithm like Canny

18 and detect those edges, in contrast to what -- to

19 my -- the way I read is that Dr. Kusnoto was just

20 claiming that it's not possible to do.

21 I just looked at them. I said yeah. It's

22 possible. I mean, based on my experience. So I

23 applied and I see that I was right.

24 I just -- I don't know -- I mean coming

25 back to your question, what device was used to take

1 them. I don't know. I mean, it doesn't matter,
2 because Dr. Kusnoto said those are the type of
3 images that people would have seen. I mean, rather
4 not people -- orthodontists, would have been seeing
5 in -- at the priority date of the '248 Patent.

6 Q. So was it your understanding that
7 Dr. Kusnoto said these are the images orthodontists
8 would have seen?

9 A. We can -- we can directly refer to -- I'm
10 saying off the top of my head and I'm using my own
11 words, but you know, we can either refer to my
12 declaration. And here in this paragraph, it says
13 Dr. Kusnoto is -- if you don't mind I read it, it
14 says:

15 "Dr. Kusnoto is mistaken in the assertion
16 that the photos he describes as more representative
17 could not be used to detect separations. In fact,
18 detecting edges of teeth and aligners in the images
19 is straightforward, even with very old edge
20 detection methodology."

21 And as I described in my original
22 declaration.

23 Q. In connection with your declaration, did
24 you perform any image analyses on cellphone images?

25 A. I did not perform any image analysis,

1 other than the ones that I have in my reply
2 declaration.

3 Q. Okay. And so, I'm also correct that you
4 did not perform any image analyses on cellphone
5 images taken in 2017. Correct?

6 A. I'm not sure if I understand your
7 question. Have I ever personally done any image
8 analysis on cellphone images? Or are you saying
9 that for this particular case, I have done any image
10 analysis on cellphone images?

11 Q. For this case, have you performed any
12 image analyses on pictures taken with a cellphone
13 from 2017 or prior?

14 A. As I said, the only images are the ones
15 that you see in paragraph 20. Those are the only
16 ones that I used to perform image analysis.

17 Q. Do you recall in your earlier declaration,
18 you said a reference called "fray?"

19 A. I vaguely remember.

20 Q. And do you remember that your declaration
21 says that fray includes images of a liner seated on
22 teeth?

23 ATTORNEY MEDLEY: Objection. Scope.

24 THE WITNESS: Again, I don't see it
25 anywhere in my reply declaration. So I can vaguely

1 remember off the top of my head. Can you point me
2 where in my reply declaration I'm referring to that?

3 BY ATTORNEY PARKS:

4 Q. Did you ever attempt to do image analyses
5 of the type you presented in paragraph 20 of your
6 reply declaration, using the images of fray?

7 ATTORNEY MEDLEY: Objection. Form.

8 THE WITNESS: Again, I think the answer
9 is -- I mean, the question seems to me the same
10 question coming back to me. As I said, I did not do
11 any image analysis on other images, other than the
12 ones that are in paragraph 20 of my reply
13 declaration.

14 BY ATTORNEY PARKS:

15 Q. And in paragraph 20 of your reply
16 declaration, the annotations shown in green, blue,
17 and red are all applied by hand. Correct?

18 A. That is correct.

19 Q. Turning to paragraph 24 of your
20 '248 Patent reply declaration, you state here that
21 Maninis could have accounted for variation in
22 contrast level. Correct?

23 A. Correct.

24 Q. Okay.

25 And if you could turn to your '945 Patent

1 declaration? And paragraph 17. So in paragraph 17
2 of your '945 Patent reply declaration, again, you
3 are discussing contrast. But for the '945 Patent,
4 you do not rely on Maninis to account for variation
5 in contrast. Correct?

6 ATTORNEY MEDLEY: Objection. Form.

7 THE WITNESS: Can you repeat that
8 question? I'm not sure. Can you rephrase that
9 question? I'm not sure if I understand that
10 question.

11 ATTORNEY PARKS: Sure.

12 BY ATTORNEY PARKS:

13 Q. So in your reply declaration for the
14 '945 Patent, you are not relying on Maninis to
15 account for variation in contrast. Correct?

16 A. I am not relying on Maninis. No.

17 Q. Okay.

18 And still looking at your '945 Patent
19 reply declaration, the images shown in paragraph 13
20 at the Canny edge detection analyses, are these the
21 same images and analyses that were presented in your
22 '248 Patent reply declaration?

23 A. They are. Yes.

24 Q. Okay. So now, I'd like to look at the
25 '248 Patent together, which is Exhibit 1001 in the

1 '248 Patent IPR.

2 A. Yes.

3 Q. Okay. I'd like to look at the claims to
4 start. Specifically claim one. That's column 32.

5 A. Yes.

6 Q. Claim one of the '248 Patent refers to a
7 analysis tooth zone. Correct?

8 A. Yes.

9 Q. The analysis tooth zone is the region
10 defining the location of the tooth in the image;
11 right?

12 ATTORNEY MEDLEY: Objection. Scope.

13 THE WITNESS: It says what it says. I
14 mean, I can read it for you. It says that it could
15 include or represent a portion of a teeth -- a
16 tooth. Do you want me to read that for you?

17 ATTORNEY PARKS: No. I'm fine.

18 BY ATTORNEY PARKS:

19 Q. But as you are applying the language of
20 claim one in your opinion, are you applying the
21 understanding that the analysis tooth zone defines
22 the location of the tooth in the image?

23 ATTORNEY MEDLEY: Objection. Scope.

24 Form.

25 THE WITNESS: I don't know what you mean

1 is location of it. It's -- I mean, I don't see --
2 just related to location of a tooth? I mean, again,
3 as I said, I can read that. It says for at least --
4 I'm not sure even which line.

5 Can you tell me which line of claim one
6 you want me to look at?

7 ATTORNEY PARKS: Sure.

8 BY ATTORNEY PARKS:

9 Q. So like analysis tooth zone is on line 17
10 of column 32.

11 A. Yes.

12 Q. And my question is whether your
13 understanding that you applied is that the analysis
14 tooth zone is the region defining the location of
15 the tooth in the image?

16 A. Let's --

17 ATTORNEY MEDLEY: Objection. Scope.

18 THE WITNESS: Let's read that. It says:

19 "At least one tooth attribute of an
20 analysis tooth zone, representing at least partially
21 a tooth on said analysis image. The tooth attribute
22 relating to suppression between the tooth
23 represented by the analysis tooth zone and the
24 aligner represented on the analysis image."

25 And in the next line, it says, in the

1 step (a), "A cellphone is used to acquire the
2 analysis image."

3 I mean, I don't see the word "location."
4 That's what I mean. It says that -- it's not saying
5 the word "location" up there. Unless I'm
6 misunderstanding.

7 What do you mean by "location of the
8 tooth?"

9 BY ATTORNEY PARKS:

10 Q. Yeah. What I'm trying to get at is the
11 analysis tooth zone in the claim, that is the
12 region -- if you are going to practice the claims,
13 that's the region you are going to look at for the
14 tooth attribute. Correct?

15 But you are going to look at --

16 ATTORNEY MEDLEY: Objection. Sorry. Go
17 ahead.

18 ATTORNEY PARKS: It was a terrible
19 question.

20 ATTORNEY MEDLEY: Yeah. Form.

21 ATTORNEY PARKS: Let me get to the real
22 question.

23 BY ATTORNEY PARKS:

24 Q. So claim one, line 17, says that the
25 analysis tooth zone represents at least partially a

1 tooth on said analysis image. Correct?

2 A. Correct.

3 Q. So the analysis tooth zone defines the
4 region in which you are going to look for at least
5 that portion of the tooth in the analysis image.
6 Correct?

7 ATTORNEY MEDLEY: Objection. Scope.
8 Form.

9 THE WITNESS: Again, it says what it says.
10 It doesn't say define location or where you are
11 looking for. It says what it says. It says,
12 "Analysis tooth zone representing at least partially
13 a tooth on said analysis image." It's just saying
14 it's representing.

15 I mean, it's location you are looking for,
16 or place in the image you are looking for. I mean,
17 it doesn't say it in those words. It says that
18 analysis tooth zone is representing at least
19 partially a tooth on said analysis image.

20 BY ATTORNEY PARKS:

21 Q. And does the tooth attribute need to
22 relate to the tooth found within the analysis tooth
23 zone?

24 ATTORNEY MEDLEY: Objection. Scope.

25 THE WITNESS: Maybe. I guess so. Maybe;

1 maybe not. Tooth attributes relate to tooth. But
2 maybe.

3 BY ATTORNEY PARKS:

4 Q. You don't have a view, one way or the
5 other, whether the tooth attribute must relate to
6 the tooth that appears in the analysis tooth zone?

7 ATTORNEY MEDLEY: Objection. Scope.
8 Form.

9 THE WITNESS: Again, as I said, here it
10 says the tooth zone is representing a tooth
11 partially as a tooth, and it doesn't talk about -- I
12 mean, the tooth attributes, I'm assuming if it's
13 related to the tooth.

14 And so, you may argue that, yes, if that
15 analysis tooth zone is partially representing a
16 tooth, there might be a relation between that tooth
17 zone and the tooth attribute.

18 I mean --

19 BY ATTORNEY PARKS:

20 Q. But there doesn't need to be a
21 relationship between the tooth zone and the tooth
22 attribute?

23 ATTORNEY MEDLEY: Objection. Scope.

24 THE WITNESS: As I said, I assume yes,
25 there is. But here, it says that, you know -- that

1 it's related to the separation of the tooth and --
2 or it says -- but in other parts in specifications,
3 the patent -- the '248 Patent actually refers to a
4 collection of various different tooth attributes.

5 BY ATTORNEY PARKS:

6 Q. Is it your understanding that the tooth
7 attribute need not relate to the tooth that's shown
8 in the analysis tooth zone?

9 ATTORNEY MEDLEY: Objection. Scope.
10 Foundation.

11 THE WITNESS: I mean, again, you are
12 asking a very general question. So a tooth
13 attribute as, you know, in the specifications, was
14 covering a broad -- broad list of, you know, what
15 tooth attribute could be. But here, it says that
16 it's related to the separation.

17 So, I mean, some of those tooth attributes
18 may not be directly related, but rather indirectly
19 related to the separation.

20 BY ATTORNEY PARKS:

21 Q. In the confines of claim one, is it your
22 understanding that the tooth attribute may not
23 relate to the tooth that's shown in the analysis
24 tooth zone?

25 ATTORNEY MEDLEY: Same objection.

1 THE WITNESS: Again, I read -- I can go
2 and read again. It's that it says analysis of the
3 analysis image by means of a deep learning device
4 [Indiscernible] by means of the learning base, so as
5 to determine a value for at least one tooth
6 attribute on an analysis -- of an analysis tooth
7 zone, representing at least partially a tooth on
8 said analysis image.

9 So it says that -- it says what it says.
10 It says that for at least one tooth attribute of an
11 analysis tooth zone. So that tooth attribute is --
12 is with analysis tooth zone, is of analysis tooth
13 zone. But the analysis tooth zone may contain a lot
14 of other information.

15 So I don't know. In the analysis tooth
16 zone, it may say that there is some other part of
17 the anatomy displayed like it was saying in the
18 specifications. Tongue. Other things. I don't
19 know.

20 But it says that for at least one tooth
21 attribute of an analysis tooth zone. Yes. So I'm
22 not sure if I understand your question. It says
23 what it says. It says that "tooth attribute of an
24 analysis tooth zone."

25 BY ATTORNEY PARKS:

1 Q. And that tooth attribute has to relate to
2 a tooth that's within the analysis tooth zone.
3 Correct?

4 ATTORNEY MEDLEY: Same objection.

5 THE WITNESS: It may directly relate or
6 indirectly relate. And as I said here, it says that
7 the tooth attribute relating to a separation between
8 the tooth represented by the analysis tooth zone and
9 the aligner represented on the analysis image.

10 So it may be -- so it says -- here it says
11 in the claim that it's related to the separation
12 between the tooth and the aligner, but in other
13 places in the specifications, it's talking about
14 various different possible tooth attributes.

15 And many of them, as I also said in my
16 reply declaration, show that they are indirectly
17 related to that separation between the two.

18 BY ATTORNEY PARKS:

19 Q. Can the tooth attribute ever be outside of
20 the analysis tooth zone?

21 ATTORNEY MEDLEY: Objection. Scope.
22 Form.

23 THE WITNESS: I don't know the answer to
24 that question. Maybe if, you know, tooth attribute
25 is related to some metadata, for instance -- age, or

1 tooth -- you know, tooth shape, in general, for a
2 certain type of tooth.

3 So, you know, as I said, in this claim --
4 and that part of the claim, it says that it
5 specifically is the separation between the tooth
6 edge and the aligner. But other place in the
7 specifications, it actually was providing a whole
8 list of different tooth attributes.

9 Some of them, I can see that they are only
10 indirectly related to this separation that is
11 pointed out in claim one.

12 BY ATTORNEY PARKS:

13 Q. To practice claim one, can the tooth
14 attribute be outside of the attribute tooth zone --
15 I'm sorry. Strike that.

16 To practice claim one, can the tooth
17 attribute be outside of the analysis tooth zone?

18 ATTORNEY MEDLEY: Objection. Scope.

19 THE WITNESS: I'm not sure again what you
20 mean by "outside." I mean, I gave you an example
21 that, you know, it could be a metadata associated
22 with the tooth, as the specifications say, in like
23 age, shape, or other aspects. You know, tooth
24 number.

25 And so, I mean, I can only see that they

1 are indirectly related to the tooth attribute that
2 claim one is disclosing, which is separation between
3 the tooth and the aligner.

4 You know, is it -- you mean outside -- I'm
5 not sure what you mean by "outside." You know, is
6 tooth number outside the image? I mean, it's
7 associated -- it's an attribute associated with a
8 particular tooth. But --

9 BY ATTORNEY PARKS:

10 Q. Is it your view that age or the tooth
11 number can be a tooth attribute relating to a
12 separation between the tooth and the aligner?

13 ATTORNEY MEDLEY: Objection to scope.

14 THE WITNESS: Again, it's not -- it
15 doesn't matter what my opinion is here. Because
16 claim one is saying that the tooth attribute is that
17 separation. And another place in the
18 specifications, the patent -- the '248 Patent says
19 that for them, the tooth attribute could be a number
20 of different things.

21 And when I read through those number of
22 different things, I see that they can only be
23 indirectly related to what they disclose in claim
24 one.

25 BY ATTORNEY PARKS:

1 Q. To be clear, I'm only asking about claim
2 one and tooth attributes under claim one. Is it
3 your view that age or tooth number can be a tooth
4 attribute for purposes of claim one?

5 ATTORNEY MEDLEY: Objection. Scope.

6 THE WITNESS: I think the question, I'm
7 sorry to say, doesn't make much sense to me. Claim
8 one does not talk about anyone in one of those
9 attributes that you just mentioned. I said in
10 specifications that '248 is talking about anything
11 other than separation.

12 In claim one, it's only referring to
13 separation as being the tooth attribute. It says
14 that it's related to the separation. So one may
15 think that those additional attributes that in other
16 places in the specification that the '248 Patent is
17 referring to, they are indirectly related to the
18 separation.

19 Like, for instance, one may think shape of
20 the tooth, it may be indirectly related to the
21 separation.

22 BY ATTORNEY PARKS:

23 Q. For purposes of claim one, does the tooth
24 attribute related to the separation need to be
25 within the analysis tooth zone?

1 ATTORNEY MEDLEY: Counsel, at this point,
2 this is getting to be an improper line of
3 questioning. You have been repeatedly asking him
4 about aspects of the claim he didn't testify about
5 in his reply declaration.

6 This is still outside the scope. I'm
7 lodging a continuing objection on this line of
8 questions.

9 ATTORNEY PARKS: Are you instructing the
10 witness not to answer?

11 ATTORNEY MEDLEY: I'm not instructing the
12 witness not to answer, but these -- this line of
13 questioning is continuing to be improper. You
14 already had --

15 ATTORNEY PARKS: Okay. So --

16 ATTORNEY MEDLEY: -- an opportunity -- on
17 his original declaration, which is where he
18 addressed this.

19 BY ATTORNEY PARKS:

20 Q. Okay, Dr. Foroosh. I'm going to ask my
21 question again. For purposes of claim one, does the
22 tooth attribute related to the separation need to be
23 within the analysis tooth zone?

24 A. As I said earlier, as I answered, it says
25 the analysis of the -- the analysis of the analysis

1 image by a means of a deep learning device. And
2 then it says, "for at least one tooth attribute of
3 an analysis tooth zone."

4 So it says the tooth attribute of an
5 analysis tooth zone, representing at least partially
6 a tooth on said analysis image. It says what it
7 says. It says that the tooth attribute of an
8 analysis tooth zone, representing at least partially
9 a tooth.

10 Q. All right. So am I correct in
11 understanding that you don't have a view, one way or
12 the other, of whether the tooth attribute in claim
13 one needs to be within the analysis tooth zone?

14 A. That's incorrect. I said that my view is
15 that -- it's that tooth attribute is of an analysis
16 tooth zone. That's exactly what it refers to.

17 But you know, as I said, in
18 specifications, it says that tooth attribute could
19 be a number of different things. Here, it says that
20 it's related to the separation between the tooth
21 edge and the aligner.

22 So, I mean, it looks like in the -- in the
23 specification of the patent, it's looking at it in a
24 broader sense, whereas here, it's more specific. It
25 says that it's related -- it's of the analysis tooth

1 zone, and it's related to that separation.

2 BY ATTORNEY PARKS:

3 Q. Okay. Turning to claim eight, claim eight
4 refers to an image attribute and an image attribute
5 value. Correct?

6 ATTORNEY MEDLEY: Objection. Scope.

7 THE WITNESS: Can you tell me -- can you
8 point me where in my declaration I'm looking at
9 this?

10 BY ATTORNEY PARKS:

11 Q. Counsel hasn't instructed you not to
12 answer the question, so I am going to ask the
13 question again.

14 In claim eight, it refers to a image
15 analysis -- I'm sorry -- an image attribute and an
16 image attribute value. Correct?

17 ATTORNEY MEDLEY: Objection. Scope.
18 Form.

19 THE WITNESS: Well again, can you point me
20 where in my reply declaration I'm talking about this
21 that would make it easier for me to look at my
22 declaration?

23 BY ATTORNEY PARKS:

24 Q. Are you refusing to answer my question
25 about what claim eight says plainly?

1 ATTORNEY MEDLEY: Objection. Form.
2 Scope.

3 THE WITNESS: I'm not refusing anything.
4 I'm just saying that can you please show me where in
5 my reply declaration I'm referring to any part of
6 claim eight, so I can read through that.

7 So if you can please show me where in my
8 declaration I'm talking about that, I can go ahead
9 and answer your question.

10 BY ATTORNEY PARKS:

11 Q. So if you turn to page 97 of your reply
12 declaration in the '248 Patent IPR, you refer to the
13 exhibits you relied on for purposes of your reply
14 declaration. The very first exhibit is
15 Exhibit 1001, which is the '248 Patent. Correct?

16 ATTORNEY MEDLEY: Objection.
17 Mischaracterizes.

18 THE WITNESS: I'm sorry. Can you
19 mention -- can you say again -- can you tell me
20 again which exhibit are we talking about? Did you
21 say 1048?

22 BY ATTORNEY PARKS:

23 Q. No. Well, so if you -- maybe I do have
24 the wrong exhibit. On page -- yes. Sorry. On page
25 21 of Exhibit 1048, do you see the reference to

1 Exhibit 1001?

2 A. Yes.

3 Q. Okay.

4 So the '248 Patent is listed among the
5 exhibits that you relied on for purposes of
6 preparing the opinions set forth in your reply
7 declaration. Correct?

8 A. Yes.

9 Q. Okay.

10 So let's look at Exhibit 1001 together.
11 Claim eight, in column 33, refers to an image
12 attribute and an image attribute value. Correct?

13 ATTORNEY MEDLEY: Objection. Scope.

14 THE WITNESS: Again, can you show me where
15 I expressed in my opinion on claim eight in my reply
16 declaration, so we can go through that together?

17 I mean, if you refer to a specific point
18 where I am referring to claim eight of '248 Patent
19 in my reply declaration, we can go over that and I
20 would be more than happy to discuss that.

21 ATTORNEY PARKS: Okay.

22 BY ATTORNEY PARKS:

23 Q. So are you refusing to discuss the
24 '248 Patent with me today? Isn't that the substance
25 of your reply declaration?

1 ATTORNEY MEDLEY: Objection. Form.

2 THE WITNESS: I'm not refusing to answer
3 your question. I mean, you are not giving me where
4 in my reply declaration I am referring to that claim
5 eight. So I would be more than happy to discuss
6 that.

7 But I believe I'm here to reply questions
8 on my reply declaration. You know, that based on
9 the scope of this, you know, deposition. So if you
10 can show me -- if you can please point me to where
11 in my reply declaration I'm talking about this, I
12 would be more than happy to discuss it.

13 BY ATTORNEY PARKS:

14 Q. Your reply declaration cites Exhibit 1001
15 as an exhibit to the reply declaration, and I am
16 asking you a question about what is stated in
17 Exhibit 1001.

18 Why did you include Exhibit 1001 as an
19 exhibit to your reply declaration?

20 A. Because I am referring to some parts of
21 Exhibit 1001 in my reply declaration, but that's why
22 I'm asking you please show me where I am referring
23 to claim eight, so that I can go over that.

24 If you show me where in my reply
25 declaration, I am expressing any opinion on claim

1 eight. So if you show me where I am expressing any
2 opinion on claim eight, I would be more than happy
3 to look at it and discuss it.

4 Q. Okay.

5 ATTORNEY PARKS: I'm just going to let the
6 record show that the witness is refusing to confirm,
7 one way or the other, whether claim eight uses the
8 language, "image attribute" or "image attribute
9 value."

10 ATTORNEY MEDLEY: Objection.

11 ATTORNEY PARKS: Dr. Foroosh --

12 ATTORNEY MEDLEY: That's not a question.

13 BY ATTORNEY PARKS:

14 Q. Dr. Foroosh, have you ever conducted an
15 analysis of aligner fit?

16 A. What do you mean have I conducted analysis
17 of aligner fit? You mean as an orthodontist? A
18 dentist? I'm not an orthodontist. I'm not a
19 dentist.

20 Q. Have you ever assessed whether an aligner
21 fits on a patient's mouth?

22 ATTORNEY MEDLEY: Objection. Form.

23 THE WITNESS: Again, I'm not a dentist or
24 orthodontist. I cannot judge whether an aligner
25 fits properly or not. However, if you are referring

1 that, you know, I've read the prior art references
2 and the discussions there, yes.

3 I have looked at them -- and I've looked
4 at, for instance, Invisalign that is discussing
5 that. I've looked at Kim that is discussing that.

6 I'm not sure, your question means -- do
7 you mean that I have personally practiced as an
8 orthodontist? No, I have not. I have personally
9 analyzed, you know, as an orthodontist? No.

10 Have I looked at the prior references that
11 I mentioned? Yes. I've looked at what they
12 discussed. You know, what is proper fit or proper
13 seating, and so on, and so forth.

14 BY ATTORNEY PARKS:

15 Q. Have you ever personally analyzed whether
16 an aligner fits?

17 ATTORNEY MEDLEY: Objection. Form.

18 THE WITNESS: Again, can you be more clear
19 what do you mean by "personally analyzing?" You
20 mean as an orthodontist? You mean from the point of
21 view of a dental expert? Or you mean as a POSA
22 reading the prior art?

23 You know, what do you mean by that?
24 Because prior art, that I am disclosing in my
25 combination, they discuss that. So I have looked at

1 them and -- what do you mean by "personally
2 analyzing?" I guess I'm confused about that.

3 BY ATTORNEY PARKS:

4 Q. My question is whether you, in any
5 capacity, have ever analyzed whether an aligner
6 fits.

7 A. I, in the capacity of a POSA, have read
8 the prior arts, and the disclosure that what is
9 proper fit and how it is measuring, and what is not
10 a proper fit or proper seating. And I'm just, you
11 know, using those disclosures.

12 I personally have not analyzed, as an
13 expert in dentistry, say, that whether, you know, in
14 a particular example, for instance, is properly
15 seating or not. But, again, as I told you, I have
16 the right references. I understand the references.
17 They provide examples. So I have done that.

18 Q. Have you, as a human being in the world,
19 ever assessed whether an aligner is properly seating
20 or not?

21 ATTORNEY MEDLEY: Objection. Form.

22 THE WITNESS: As a human being? I'm not
23 sure what you mean by that. But however, as I said,
24 you know, I'm looking at this from, you know, the
25 different points of view we can look at this.

1 From my point of view, it's a POSA's point
2 of view. From a POSA point of view, I'm using a
3 combination that relies on a set of references, and
4 I've looked at it from that point of view, and that
5 point of view only.

6 I mean, I'm not looking at it from any
7 different point of view. I look at the obviousness
8 of the claims in the '248 Patent. Based on a set of
9 prior arts that I'm using in my combination, in the
10 way that I'm using in my combination.

11 So in those references -- in those prior
12 arts, they talk about these proper seating or proper
13 fit, or not. And they give examples. I just looked
14 at it from a POSA point of view.

15 Q. Have you ever looked at an aligner, in an
16 image or in person, and made a determination of
17 whether it is seating well or poorly?

18 A. It is not my job to do that. I mean, I
19 was looking at it as I said, as a POSA. So if a
20 reference is referring to an image and says that,
21 for instance, in this example, there is not properly
22 seating, I take that reference that that disclosure,
23 and I say that, okay, that reference is disclosing
24 that.

25 So I'm not -- I'm not judging myself.

1 I'm -- I'm relying on the prior arts as a POSA.

2 That's -- if that answers your question.

3 Q. I think so, but let me make sure.

4 So when you say you are not judging
5 yourself and you are relying on prior art as a POSA,
6 is it your testimony that you have not ever made a
7 determination about an aligner is seating well or
8 poorly without referring to someone else's
9 determination in a prior art reference?

10 ATTORNEY MEDLEY: Objection. Form.

11 THE WITNESS: Again, so I relied on those
12 prior arts if they gave examples, saying that this
13 is an example of poorly seating. So that's a
14 disclosure that I used.

15 I didn't make -- myself saying, I didn't
16 make a judgment call whether that's true or not.
17 That's a disclosure. That's a teaching that that
18 prior art is setting forward. So I used that as a
19 POSA.

20 ATTORNEY PARKS: Okay.

21 BY ATTORNEY PARKS:

22 Q. And outside of your work for this case,
23 have you ever had an occasion to look at an aligner
24 and make a judgment call of whether an aligner is
25 seating well or not?

1 ATTORNEY MEDLEY: Objection. Scope.

2 THE WITNESS: I'm not a dentist. I'm not
3 an orthodontist. So, therefore, I have not been
4 involved in making those judgment calls. But I have
5 been -- you know, been a patient myself, and my
6 relatives. I've heard about it. About proper
7 seating as a lay person or a patient.

8 But as I said, I don't think how it
9 affects, you know -- how it affects the combination
10 that I'm proposing here, I said that again -- I'm
11 repeating -- that I am relying on the prior arts,
12 disclosures, and teachings, in terms of whether in
13 one example is proper seating, or poorly seating, or
14 not.

15 So that's the only thing I can tell you.
16 As a POSA, I'm relying on that -- on the prior arts
17 that I'm using in my combinations.

18 Q. Did you ever assess whether any of your
19 relatives' aligners were well or poorly seating?

20 ATTORNEY MEDLEY: Objection. Form.
21 Scope.

22 THE WITNESS: I think that's not affecting
23 in any way, or related to, you know, the combination
24 that I'm providing -- I'm supporting here. As I
25 said, I'm just relying -- only relying on the

1 disclosures and the teachings of the prior arts. So
2 in terms of those notions of properly fitting, or
3 poorly seating, I'm relying on the prior art.

4 If a prior art is disclosing that or
5 teaching that, I'm just relying on the examples that
6 they provide.

7 ATTORNEY PARKS: Okay.

8 BY ATTORNEY PARKS:

9 Q. So for purposes of your combination and
10 your opinions, you are not relying on your lay
11 experiences with aligners.

12 Is that right?

13 ATTORNEY MEDLEY: Objection.
14 Mischaracterizes.

15 THE WITNESS: I've heard about those terms
16 of properly fitting. And so, as a lay person, I
17 knew about it.

18 But for the combination I'm providing,
19 I'm -- you know if, for instance, I'm using an
20 example, as an example that it's poorly seating
21 aligner, I'm just relying on the -- I'm relying on
22 the prior arts disclosure there. I'm not relying on
23 my personal experience.

24 For particular examples that I've used and
25 demonstrated, let's say with even edge detection

1 algorithms in the paragraphs that we discussed
2 earlier.

3 So, I'm relying on the disclosure of the
4 prior arts. Yes.

5 BY ATTORNEY PARKS:

6 Q. Does your lay experience with aligners
7 factor into your opinions in this case?

8 A. I just -- I think I answered that
9 question. I was familiar with these notions, but I
10 did not use anything other than the disclosures of
11 the prior arts in demonstrating the obviousness of
12 the claims in the '248 Patent.

13 ATTORNEY PARKS: Okay. Dr. Foroosh, thank
14 you for your time. I don't have any further
15 questions today, subject to recross.

16 ATTORNEY MEDLEY: Okay. Could we take a
17 break for 10 minutes and then we come back? That's
18 all right to go off the record?

19 COURT REPORTER: Okay.

20 (Short break.)

21 ATTORNEY MEDLEY: Nothing more from us,
22 Dr. Foroosh. Thank you for your time.

23 COURT REPORTER: Can I get the orders for
24 the transcript, please. I think I have one order
25 already.

1 ATTORNEY PARKS: I think ours is in.

2 COURT REPORTER: Okay. Thank you.

3 And Mr. Medley?

4 ATTORNEY MEDLEY: We can take a rough and
5 regular for the full transcript.

6 COURT REPORTER: Okay. Thank you.

7 (Whereupon, the deposition adjourned at
8 11:42 a.m. Eastern Time)

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REPORTER'S CERTIFICATE

I, GISELLE MITCHELL-MARGERUM, the undersigned, a Registered Professional Reporter, Certified Reporting Instructor, Licensed Court Reporter, and Certified Court Reporter, do hereby certify:

That the witness, HASSAN FOROOSH, before examination was remotely duly sworn to testify to the truth, the whole truth, and nothing but the truth.

That the foregoing deposition was taken remotely stenographically by me on Friday, November 8, 2024, and thereafter was transcribed by me, and that the deposition is a full, true, and complete transcript of the testimony, including questions and answers, and objections, motions and exceptions made by counsel.

That reading and signing was not requested; and that I am neither attorney nor counsel for, nor related to or employed by, any of the parties to the action in which this deposition was taken; and that I have no interest, financial or otherwise, in this case.

IN WITNESS WHEREOF, I have hereunto set my hand this 12th day of November, 2024.

GISELLE MITCHELL-MARGERUM, RPR, CRI, CCR, LCR, ACCR, CSR
CALIFORNIA CSR 14424

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CERTIFICATE OF DEPONENT

I, HASSAN FOROOSH, hereby certify that I have read the foregoing pages, numbered 1 through 50, of my deposition of testimony taken in these proceedings on Friday, November 8, 2024 and, with the exception of the changes listed on the next page and/or corrections, if any, find them to be a true and accurate transcription thereof.

Signed:
Name: HASSAN FOROOSH
Date:

1	ERRATA SHEET	
2	Case Name:	ALIGN TECHNOLOGY, INC., Petitioner v. DENTAL MONITORING SAS
3	Witness Name:	HASSAN FOROOSH
	Date:	
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17	____/____	_____
18	____/____	_____
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20	____/____	_____
21	Subscribed and sworn to before	
22	me this date	day of month, 2024.
23	_____	
24	HASSAN FOROOSH	
25		

A a.m 1:14 50:8 account 24:4,15 accounted 23:21 ACCR 1:24 2:15 51:22 accurate 52:6 acquire 27:1 action 51:12 additional 16:6 35:15 addressed 36:18 adjourned 50:7 adjust 13:4,8,12 13:17 14:9,16 16:1 18:6 19:18 adjusted 13:3 14:20 15:4 18:16,17 adjusting 13:18 14:1,7,22 15:1 17:21,22,25 18:1,4,8 adjustment 14:24 age 32:25 33:23 34:10 35:3 agree 17:7 agreement 2:9 ahead 27:17 39:8 Alabama 2:15 algorithm 13:20 13:22 19:1 20:17 algorithms 13:23 49:1 ALIGN 1:4 53:2 aligner 26:24 32:9,12 33:6 34:3,12 37:21 42:15,17,20,24 43:16 44:5,19 45:15 46:7,23 46:24 48:21	aligners 21:18 47:19 48:11 49:6 Allyson 3:17 4:7 5:12 Alto 3:6 analyses 12:12 12:20 21:24 22:4,12 23:4 24:20,21 analysis 12:16 18:22 21:25 22:8,10,16 23:11 25:7,9 25:21 26:9,13 26:20,21,23,24 27:2,11,25 28:1,3,5,12,13 28:18,19,22 29:6,15 30:8 30:23 31:2,3,6 31:6,8,11,12 31:12,13,15,21 31:24 32:2,8,9 32:20 33:17 35:25 36:23,25 36:25,25 37:3 37:5,6,8,13,15 37:25 38:15 42:15,16 analyze 19:13 analyzed 43:9 43:15 44:5,12 analyzing 43:19 44:2 anatomy 31:17 and/or 17:22 52:6 annotations 6:22 23:16 answer 23:8 32:23 36:10,12 38:12,24 39:9 41:2 answered 15:20 16:13 36:24 49:8	answers 46:2 51:9 apart 6:1,24 11:14 APPEAL 1:2 appears 29:6 application 6:24 applications 6:25 7:2 applied 13:1 20:23 23:17 26:13 apply 12:21 19:15 20:16 applying 25:19 25:20 Argenti 3:3 7:10 7:12 argue 14:12 29:14 arm's 6:3 art 43:1,22,24 46:5,9,18 48:3 48:4 arts 44:8 45:9,12 46:1,12 47:11 47:16 48:1,22 49:4,11 Asked 15:19 16:12 asking 30:12 35:1 36:3 41:16,22 aspect 14:13 aspects 15:13 17:5,6 33:23 36:4 assertion 21:15 assess 47:18 assessed 42:20 44:19 associated 33:21 34:7,7 assume 29:24 assuming 29:12 attempt 23:4 attorney 5:10	8:6,17,20,23 9:1 11:24 12:4 12:5 15:9,14 15:15,19 16:9 16:12,21 17:9 18:24 19:4 20:3 22:23 23:3,7,14 24:6 24:11,12 25:12 25:17,18,23 26:7,8,17 27:9 27:16,18,20,21 27:23 28:7,20 28:24 29:3,7 29:19,23 30:5 30:9,20,25 31:25 32:4,18 32:21 33:12,18 34:9,13,25 35:5,22 36:1,9 36:11,15,16,19 38:2,6,10,17 38:23 39:1,10 39:16,22 40:13 40:21,22 41:1 41:13 42:5,10 42:11,12,13,22 43:14,17 44:3 44:21 46:10,20 46:21 47:1,20 48:7,8,13 49:5 49:13,16,21 50:1,4 51:11 attorneys 7:9 attribute 26:19 26:21 27:14 28:21 29:5,17 29:22 30:7,13 30:15,22 31:6 31:10,11,21,23 32:1,7,19,24 33:14,14,17 34:1,7,11,16 34:19 35:4,13 35:24 36:22 37:2,4,7,12,15 37:18 38:4,4	38:15,16 40:12 40:12 42:8,8 attributes 29:1 29:12 30:4,17 32:14 33:8 35:2,9,15 automate 13:9 13:10 automated 14:17 16:3 automatically 18:12 Avenue 3:11,19 aware 9:10 10:2 10:20 B back 10:23 20:25 23:10 49:17 base 31:4 based 20:22 41:8 45:8 basically 14:14 19:1 BEHALF 3:2,16 believe 11:12 41:7 binder 6:20 bit 7:21 blue 23:16 BOARD 1:2 break 49:17,20 broad 30:14,14 broader 15:3,11 15:22 17:3,6 17:18 37:24 Budi 11:6 C C 3:1 5:1 CA 2:15 3:6 CALIFORNIA 1:25 51:23 call 19:6 46:16 46:24 called 22:18
---	---	--	--	--

calls 47:4	clear 35:1 43:18	18:9 20:18	10:24 11:4,5,6	describes 21:16
Canny 12:12,16	collection 30:4	23:22 24:3,5	11:9,12,15,18	descriptions
13:7,22 14:5	column 25:4	24:15	11:21,22 12:7	17:20
14:24 15:25	26:10 40:11	conversations	12:15,21,23	detect 14:22
18:3,4 19:19	combination	11:22	13:6,13 19:14	20:18 21:17
19:22 20:17	9:16 43:25	copies 6:12,23	20:1 21:12,22	detecting 21:18
24:20	45:3,9,10 47:9	8:19,22	21:23 22:2,17	detection 12:12
capacity 44:5,7	47:23 48:9,18	copy 6:8 8:24	22:20,25 23:2	12:17 13:7,23
case 1:5 18:13	combinations	correct 11:20	23:6,13,16,20	14:24 19:3,19
19:2 22:9,11	47:17	12:12 15:5,6,8	24:1,2,13,19	20:17 21:20
46:22 49:7	come 49:17	15:18 17:8,23	24:22 32:16	24:20 48:25
51:13 53:2	comes 13:7	20:2 22:3,5	36:5,17 38:8	detects 14:17
CCR 1:24 51:22	coming 20:24	23:17,18,22,23	38:20,22 39:5	determination
cellphone 20:1	23:10	24:5,15 25:7	39:8,12,14	45:16 46:7,9
21:24 22:4,8	community	27:14 28:1,2,6	40:7,16,19,25	determine 16:19
22:10,12 27:1	16:16	32:3 37:10	41:4,8,11,14	16:20 31:5
certain 33:2	competence	38:5,16 39:15	41:15,19,21,25	deviation 14:6
CERTIFICA...	19:6	40:7,12	declarations	18:4 19:22
51:1 52:2	complete 51:9	corrections 52:6	6:13,15,15	device 20:5,25
Certified 2:11	computer 6:1	counsel 36:1	7:18,25 8:9,14	31:3 37:1
2:12,12,13,13	7:1 16:16	38:11 51:10,11	11:16	devices 6:3
2:14,15,16	20:14	course 8:23	deep 31:3 37:1	difference 18:18
51:3,4	concept 15:3,11	Court 2:11,12	define 28:10	differences
certify 51:4 52:4	17:3	2:12,13,15,16	defines 25:21	12:25
changes 52:5	concepts 17:16	5:2,7 49:19,23	28:3	different 7:22
changing 13:19	conducted 42:14	50:2,6 51:4,4	defining 25:10	12:16 15:13
13:21	42:16	covering 30:14	26:14	17:5,13 18:18
chat 8:7,10	confines 30:21	covers 15:12	definition 17:18	19:15 30:4
cites 41:14	confirm 8:14	17:4,6	demonstrated	32:14 33:8
claim 25:4,6,20	42:6	create 12:20	48:25	34:20,22 37:19
26:5 27:11,24	confused 44:2	14:21	demonstrating	44:25 45:7
30:21 32:11	connect 6:2	CRI 1:24 51:22	49:11	differently 13:3
33:3,4,11,13	connection	CSR 1:24,25	dental 1:7 5:13	13:5
33:16 34:2,16	11:14 21:23	51:22,23	43:21 53:2	directly 21:9
34:23 35:1,2,4	considered 12:2		dentist 42:18,19	30:18 32:5
35:7,12,23	17:1	D	42:23 47:2	disclose 11:22
36:4,21 37:12	contain 31:13	D 4:1 5:1	dentistry 44:13	34:23
38:3,3,14,25	continues 12:10	date 13:24 20:11	dependent 16:24	disclosing 34:2
39:6 40:11,15	continuing 36:7	20:12 21:5	depends 16:18	43:24 45:23
40:18 41:4,23	36:13	52:13 53:3,22	DEPONENT	48:4
41:25 42:2,7	contrary 16:5	day 51:15 53:22	52:2	disclosure 44:8
claiming 20:20	contrast 14:11	dealing 13:25	deposition 1:11	45:22 46:14,17
claims 25:3	14:13,22,23	19:2	2:1 5:15,21 6:2	48:22 49:3
27:12 45:8	15:2,3,8,11,12	decide 19:5	7:4,15,24 8:3	disclosures
49:12	15:18,22,24	declaration 6:10	41:9 50:7 51:7	44:11 47:12
clean 6:8,12,23	16:10,17 17:4	7:7,19 9:7,11	51:9,12 52:4	48:1 49:10
8:18,24	17:8,19,23	10:3,6,18,21	described 21:21	discuss 40:20,23

41:5,12 42:3 43:25 discussed 43:12 49:1 discussing 24:3 43:4,5 discussions 11:25 43:2 displayed 31:17 documents 6:5,7 6:22 7:17,23 20:12 download 8:13 Dr 5:2,11 11:5,6 11:16,16,23 16:6 18:15 20:6,19 21:2,7 21:13,15 36:20 42:11,14 49:13 49:22 duly 5:9 51:6 DUNN 3:18	41:5,23 42:1,2 42:7 either 13:8 14:16 18:11 21:11 else's 46:8 employed 51:12 ERRATA 53:1 error 9:12 errors 9:10 10:2 10:20 ESQ 3:3,9,17 estimate 18:12 exactly 37:16 examination 4:7 5:10 51:6 example 33:20 44:14 45:21 46:13 47:13 48:20,20 examples 14:3 44:17 45:13 46:12 48:5,24 exception 52:5 exceptions 51:10 excuse 9:14 exhibit 8:11,12 9:2 10:7 24:25 39:14,15,20,24 39:25 40:1,10 41:14,15,17,18 41:19,21 exhibits 6:8,13 6:18 7:8,18,25 8:7,25 11:8,17 39:13 40:5 experience 14:25 20:22 48:23 49:6 experiences 48:11 expert 20:15 43:21 44:13 expressed 40:15 expressing 41:25 42:1	F fact 21:17 factor 49:7 factors 16:19 familiar 49:9 Fifth 3:11 filter 14:6,8 19:22 financial 51:13 find 52:6 fine 25:17 first 39:14 fit 42:15,17 43:12 44:9,10 45:13 fits 42:21,25 43:16 44:6 fitting 48:2,16 five 7:13 folder 6:19 follows 5:9 foregoing 51:7 52:4 form 11:24 15:9 17:9 18:24 23:7 24:6 25:24 27:20 28:8 29:8 32:22 38:18 39:1 41:1 42:22 43:17 44:21 46:10 47:20 Foroosh 1:12 2:1 4:5 5:2,8 5:11 36:20 42:11,14 49:13 49:22 51:5 52:4,12 53:3 53:24 forth 40:6 43:13 forward 46:18 found 28:22 Foundation 20:3 30:10 four 9:13,18,19	9:22,24 fray 22:18,21 23:6 free 8:24 Friday 1:13 51:8 52:5 front 6:6,11,15 8:8 9:3 11:1 full 50:5 51:9 further 49:14	happy 10:15 40:20 41:5,12 42:2 hard 8:21 HASSAN 1:12 2:1 4:5 5:8 51:5 52:4,12 53:3,24 head 21:10 23:1 heard 47:6 48:15 held 2:1 hereunto 51:15 home 5:22 hours 7:13 human 44:18,22
E E 3:1,1 4:1,1 5:1 5:1 earlier 12:14,23 15:10,17 22:17 36:24 49:2 easier 10:15 38:21 Eastern 1:14 50:8 easy 16:7 edge 12:12,16 13:7,23 14:15 14:24 19:2,3,7 19:7,9,11,19 20:17 21:19 24:20 33:6 37:21 48:25 edges 14:19 16:8 19:16 20:18 21:18 eight 38:3,3,14 38:25 39:6 40:11,15,18			G G 5:1 GA 2:12 Gaussian 14:6,8 18:4 19:22 general 30:12 33:1 getting 36:2 GIBSON 3:18 Giselle 1:24 2:9 51:3,22 give 14:3 18:19 45:13 given 14:15,18 19:10 giving 41:3 go 9:13 10:23 27:16 31:1 39:8 40:16,19 41:23 49:18 goal 16:5 going 8:6,9 15:16 19:6 27:12,13,15 28:4 36:20 38:12 42:5 Good 5:11,16 GOODRICH 3:4,10 Great 6:21 9:5 green 23:16 guess 28:25 44:2	I idea 20:4 image 12:11,16 14:11 15:13,23 16:18,24,25 17:5,22 18:1,5 18:7,9,9,10,12 20:15 21:24,25 22:4,7,9,12,16 23:4,11 25:10 25:22 26:15,21 26:24 27:2 28:1,5,13,16 28:19 31:3,8 32:9 34:6 37:1 37:6 38:4,4,14 38:15,16 40:11 40:12 42:8,8 45:16,20 images 13:5 14:21,22 16:6 16:8 17:1,11 19:13,25 20:9 21:3,7,18,24 22:5,8,10,14 22:21 23:6,11 24:19,21 improper 36:2 36:13 include 25:15

41:18 includes 17:7 22:21 including 51:9 incorrect 17:24 37:14 indirectly 30:18 32:6,16 33:10 34:1,23 35:17 35:20 Indiscernible 31:4 information 31:14 input 18:10 instance 14:5 18:2 19:20 32:25 35:19 43:4 44:14 45:21 48:19 instructed 38:11 instructing 36:9 36:11 Instructor 2:11 51:4 interest 51:13 interested 18:13 interpret 18:21 18:25 19:8,15 19:17 interpreted 19:18 introduce 8:25 Invisalign 9:24 12:17,22 43:4 involved 47:4 IPR 12:15 25:1 39:12 IPR2024-00052 1:6 6:10 8:12 9:3 IPR2024-00110 1:7 6:11 8:13 10:7	John 11:5 judge 42:24 judging 45:25 46:4 judgment 46:16 46:24 47:4	line 12:3 26:4,5 26:9,25 27:24 36:2,7,12 liner 22:21 list 11:7,17 30:14 33:8 listed 40:4 52:6 little 7:21 locally 14:18 located 5:20 location 25:10 25:22 26:1,2 26:14 27:3,5,7 28:10,15 lodging 36:7 long 7:11 look 10:24 15:23 17:12 24:24 25:3 26:6 27:13,15 28:4 38:21 40:10 42:3 44:25 45:7 46:23 looked 20:21 43:3,3,5,10,11 43:25 45:4,13 45:15 looking 20:13 24:18 28:11,15 28:16 37:23 38:8 44:24 45:6,19 looks 37:22 lot 15:13 16:4,19 18:14 31:13 low-dimensio... 13:11,14,16	15:4 16:1 18:16,17 19:18 materials 11:8 11:17 matter 21:1 34:15 Matthew 3:3 7:10 mean 6:19 8:21 13:16,22 14:13 16:16,20 17:1 17:13,15,25 19:17 20:13,22 20:24 21:1,3 23:9 25:14,25 26:1,2 27:3,4,7 28:15,16 29:12 29:18 30:11,17 33:20,20,25 34:4,5,6 37:22 40:17 41:3 42:16,17 43:7 43:19,20,20,21 43:23 44:1,23 45:6,18 means 14:6 31:3 31:4 37:1 43:6 measuring 19:2 19:3 44:9 Medley 3:9 7:9 7:11 11:24 15:9,19 16:12 17:9 18:24 20:3 22:23 23:7 24:6 25:12,23 26:17 27:16,20 28:7 28:24 29:7,23 30:9,25 32:4 32:21 33:18 34:13 35:5 36:1,11,16 38:6,17 39:1 39:16 40:13 41:1 42:10,12 42:22 43:17 44:21 46:10	47:1,20 48:13 49:16,21 50:3 50:4 meet 7:11 mention 39:19 mentioned 35:9 43:11 met 5:12 metadata 32:25 33:21 methodology 21:20 Mill 3:5 mind 21:13 minutes 49:17 Mischaracteri... 39:17 48:14 mistaken 21:15 misunderstan... 27:6 misunderstood 18:7,20 Mitchell-Mar... 1:24 2:10 51:3 51:22 modify 18:6 Mongan 11:5,16 Monitoring 1:7 5:13 53:2 month 53:22 morning 5:11,16 motions 51:10 mouth 42:21
J job 1:21 45:18	K Kim 9:24 43:5 kind 17:19 knew 48:17 know 8:25 9:18 10:10 14:13 16:15,24 17:18 18:2,11,13 20:24 21:1,11 25:25 29:25 30:13,14 31:15 31:19 32:23,24 33:1,3,21,23 34:4,5 37:17 41:8,9 43:1,9 43:12,23 44:11 44:13,24,24 47:5,9,23 48:19 Kusnoto 11:6,16 16:6 18:15 20:19 21:2,7 21:13,15 Kusnoto's 20:6	L language 25:19 42:8 lay 47:7 48:10 48:16 49:6 LCR 1:24 51:22 learning 31:3,4 37:1 let's 17:1 26:16 26:18 40:10 48:25 level 17:12 23:22 Licensed 2:11 51:4	M making 47:4 manifest 15:11 Maninis 9:25 23:21 24:4,14 24:16 manually 13:8 13:12,17 14:1 14:16,21 15:1	N N 3:1 4:1,1 5:1 Name 52:12 53:2,3 need 13:4 28:21 29:20 30:7 35:24 36:22 needs 37:13 neither 11:20 51:11 New 3:20 NJ 2:13 NM 2:16

notes 6:5,7,21	22:3 23:24	9:13 10:18	50:1	4:5 5:8
noticed 9:12	24:17,24 25:3	39:11,24,24	part 15:7,17	photograph
notion 15:22	36:15,20 38:3	52:6	16:10,14,22	12:17,23
notions 48:2	40:3,9,21 42:4	Page/Line 53:4	31:16 33:4	photos 21:16
49:9	45:23 46:20	pages 1:22 12:11	39:5	pictures 22:12
November 1:13	48:7 49:13,16	52:4	partially 26:20	pixel 14:15,18
51:8,15 52:5	49:19 50:2,6	Palo 3:6	27:25 28:12,19	19:10,11
number 12:11	old 21:19	paragraph 9:13	29:11,15 31:7	place 28:16 33:6
33:24 34:6,11	old-fashioned	9:14 10:24	37:5,8	34:17
34:19,21 35:3	20:17	11:3,12 12:8	particular 15:2	places 32:13
37:19	ones 13:23 22:1	12:10,20 14:21	22:9 34:8	35:16
numbered 52:4	22:14,16 23:12	16:7 19:14,25	44:14 48:24	plainly 38:25
numbers 10:10	open 7:1,2	21:12 22:15	particularly	play 16:17
NY 3:20	operable 9:17	23:5,12,15,19	15:23	please 5:2 39:4,7
O	operates 18:5	24:1,1,19	parties 51:12	41:10,22 49:24
O 5:1	opinion 20:6	paragraphs 49:1	parts 30:2 41:20	point 17:11
oath 5:14	25:20 34:15	parameter 14:8	patent 1:1,2,8	20:14 23:1
objection 11:24	40:15 41:25	15:5,7,18	3:16 10:10,17	36:1 38:8,19
15:9,19 16:12	42:2	16:10 17:7	10:24 11:11,15	40:17 41:10
17:9 18:24	opinions 40:6	18:2,3 19:19	11:18,21,21	43:20 45:1,1,2
20:3 22:23	48:10 49:7	parameters 13:3	12:6,15 21:5	45:4,5,7,14
23:7 24:6	opportunity	13:4,8,15,19	23:20,25 24:2	pointed 33:11
25:12,23 26:17	36:16	13:25 14:2,4	24:3,14,18,22	points 17:14
27:16 28:7,24	optimization	14:10,20 16:23	24:25 25:1,6	44:25
29:7,23 30:9	13:11,14	19:21	30:3,3 34:18	poorly 45:17
30:25 32:4,21	order 19:13	Park 3:19	34:18 35:16	46:8,13 47:13
33:18 34:13	49:24	Parks 3:17 4:7	37:23 39:12,15	47:19 48:3,20
35:5 36:7 38:6	orders 49:23	5:10,12 8:6,17	40:4,18,24	portion 25:15
38:17 39:1,16	original 6:14	8:20,23 9:1	45:8 49:12	28:5
40:13 41:1	21:21 36:17	12:4,5 15:14	patient 47:5,7	POSA 17:11
42:10,22 43:17	orthodontist	15:15 16:9,21	patient's 42:21	43:21 44:7
44:21 46:10	20:10 42:17,18	19:4 23:3,14	Patrick 3:9 7:9	45:2,14,19
47:1,20 48:13	42:24 43:8,9	24:11,12 25:17	8:24	46:1,5,19
objections 51:10	43:20 47:3	25:18 26:7,8	people 21:3,4	47:16
obviousness	orthodontists	27:9,18,21,23	perform 21:24	POSA's 45:1
45:7 49:11	21:4,7	28:20 29:3,19	21:25 22:4,16	possible 20:20
occasion 46:23	output 18:22	30:5,20 31:25	performed	20:22 32:14
office 1:1 5:23	19:1	32:18 33:12	22:11	postdated 20:11
Oh 10:11	outside 32:19	34:9,25 35:22	person 45:16	practice 27:12
okay 5:7 6:9,14	33:14,17,20	36:9,15,19	47:7 48:16	33:13,16
6:21 7:21 8:20	34:4,5,6 36:6	38:2,10,23	personal 48:23	practiced 43:7
9:2,5,7,23 10:2	46:22	39:10,22 40:21	personally 22:7	preparation 7:9
10:5,9,17,23	Owner 1:8 3:16	40:22 41:13	43:7,8,15,19	7:24 11:4
11:11 12:4,10	P	42:5,11,13	44:1,12	prepare 7:3,6,14
15:4,14 18:20	P 3:1,1 5:1	43:14 44:3	Petitioner 1:5	8:2 11:9,18
19:12,24 20:13	page 3:5 4:3 9:7	46:20,21 48:7	3:2 53:2	13:5
		48:8 49:5,13	PHD 1:12 2:1	preparing 40:6

present 12:11	put 8:9 12:2	22:18 39:25	relatives' 47:19	represent 25:15
presented 12:15	Q	45:20,22,23	relied 39:13	representative
23:5 24:21	question 7:21	46:9	40:5 46:11	21:16
prevent 5:17	15:16 18:8	references 7:8	relies 45:3	represented
printed 8:21	20:25 22:7	9:17,19,22,23	rely 24:4	20:8,9 26:23
prior 22:13 43:1	23:9,10 24:8,9	9:24 12:2 20:6	relying 14:7	26:24 32:8,9
43:10,22,24	24:10 26:12	43:1,10 44:16	24:14,16 46:1	representing
44:8 45:9,11	27:19,22 30:12	44:16 45:3,11	46:5 47:11,16	5:13 26:20
46:1,5,9,12,18	31:22 32:24	referred 20:7,7	47:25,25 48:3	28:12,14,18
47:11,16 48:1	35:6 36:21	referring 9:22	48:5,10,21,21	29:10,15 31:7
48:3,4,22 49:4	38:12,13,24	9:24 23:2	48:22 49:3	37:5,8
49:11	39:9 41:3,16	35:12,17 39:5	remember 12:19	represents 27:25
priority 13:24	42:12 43:6	40:18 41:4,20	22:19,20 23:1	requested 51:11
20:11,11 21:5	44:4 46:2 49:9	41:22 42:25	REMOTE 1:11	results 13:13,17
probability 19:9	questioning	45:20 46:8	remotely 2:2	16:2 18:15,16
probably 7:13	36:3,13	refers 25:6 30:3	51:6,7	18:19
problem 13:12	questions 36:8	37:16 38:4,14	repeat 24:7	review 7:17 11:8
problems 20:16	41:7 49:15	40:11	repeatedly 36:3	11:17
proceedings	51:9	refusing 38:24	repeating 47:11	reviewed 7:23
52:5	R	39:3 40:23	rephrase 24:8	11:5
process 13:9	R 3:1 5:1	41:2 42:6	reply 6:10,15	revision 20:14
processing	raise 5:2	region 25:9	7:7,19 8:9,14	right 5:3 6:25
20:15	range 17:4	26:14 27:12,13	10:6,17,24	8:5 9:4 20:23
produce 14:19	reach 6:3	28:4	11:11,15,18	25:11 37:10
16:2	read 9:18 20:5	Registered 2:10	12:7,21 13:5	44:16 48:12
produced 18:16	20:19 21:13	51:3	13:13 19:14	49:18
Professional	25:14,16 26:3	regular 50:5	22:1,25 23:2,6	Road 3:5
2:10 51:3	26:18 31:1,2	relate 28:22	23:12,15,20	role 16:17
program 16:5	34:21 39:6	29:1,5 30:7,23	24:2,13,19,22	room 5:24
proper 43:12,12	43:1 44:7 52:4	32:1,5,6	32:16 36:5	ROSATI 3:4,10
44:9,10,10	reading 43:22	related 17:17	38:20 39:5,11	rough 50:4
45:12,12 47:6	51:11	19:10 26:2	39:13 40:6,15	RPR 1:24 51:22
47:13	ready 8:17	29:13 30:1,16	40:19,25 41:4	run 13:20
properly 9:16	real 27:21	30:18,19 32:11	41:7,8,11,14	running 13:22
42:25 44:14,19	really 9:18	32:17,25 33:10	41:15,19,21,24	S
45:21 48:2,16	recall 12:14	34:1,23 35:14	report 13:12	S 3:1 4:1,1 5:1
proposing 47:10	22:17	35:17,20,24	REPORTED	Salah 9:24
provide 44:17	record 8:11 42:6	36:22 37:20,25	1:23	SAS 1:7 53:2
48:6	49:18	38:1 47:23	Reporter 2:10	saying 10:12
providing 33:7	recross 49:15	51:11	2:11,12,13,13	14:14 18:8
47:24 48:18	red 23:17	relating 14:10	2:14,14,15,16	21:10 22:8
pull 10:5 12:6	refer 10:9 11:7	26:22 32:7	5:2,7 49:19,23	27:4 28:13
purposes 35:4	21:9,11 39:12	34:11	50:2,6 51:3,4,4	31:17 34:16
35:23 36:21	40:17	relation 29:16	REPORTER'S	39:4 46:12,15
39:13 40:5	reference 12:18	relationship	51:1	says 9:15 16:6
48:9		29:21	Reporting 2:11	21:12,14 22:21
Pursuant 2:9		relatives 47:6	51:3	

25:13,13,14 26:3,18,25 27:4,24 28:9,9 28:11,11,11,17 29:10,25 30:2 30:15 31:2,9,9 31:9,10,20,22 31:23,23 32:6 32:10,10 33:4 34:18 35:13 36:24 37:2,4,6 37:7,7,18,19 37:25 38:25 45:20 scale 13:25 14:1 14:3,7,10,12 14:13,14,18,18 15:2,4,7,10,17 15:21 16:10,15 16:20,22,25 17:2,3,7,13,17 17:21,24 18:2 18:12,21 19:1 19:5,15,19,21 scope 22:23 25:12,23 26:17 28:7,24 29:7 29:23 30:9 32:21 33:18 34:13 35:5 36:6 38:6,17 39:2 40:13 41:9 47:1,21 seated 22:21 seating 43:13 44:10,15,19 45:12,17,22 46:7,13,25 47:7,13,13,19 48:3,20 Seattle 3:12 section 9:22 see 9:21 20:23 22:15,24 26:1 27:3 33:9,25 34:22 39:25 seeing 21:4	seen 20:10 21:3 21:8 sense 35:7 37:24 separation 30:1 30:16,19 32:7 32:11,17 33:5 33:10 34:2,12 34:17 35:11,13 35:14,18,21,24 36:22 37:20 38:1 separations 21:17 set 6:12 13:7,25 40:6 45:3,8 51:15 setting 46:18 shape 33:1,23 35:19 sharp 16:25 17:2,18,25 sharpness 16:22 17:4,8,12,16 17:22 18:1 SHEET 53:1 Short 49:20 Shorthand 2:14 2:14 show 16:5 18:15 32:16 39:4,7 40:14 41:10,22 41:24 42:1,6 shown 19:25 23:16 24:19 30:7,23 signature 9:8 10:18 Signed 52:11 signing 51:11 similar 18:19,19 slightly 18:17 SONSINI 3:4,10 sorry 10:16 27:16 33:15 35:7 38:15 39:18,24 sounds 8:7	space 5:22 speak 7:14 specific 37:24 40:17 specifically 25:4 33:5 specification 35:16 37:23 specifications 30:2,13 31:18 32:13 33:7,22 34:18 35:10 37:18 spend 16:4 18:13 standard 14:6 18:3 19:21 start 5:7 25:4 state 23:20 stated 41:16 statement 11:13 STATES 1:1 STENOGRAPHER 1:11 stenographica... 1:23 51:8 step 27:1 straightforward 21:19 strength 14:14 19:3,10 Strike 33:15 studied 16:15 subject 49:15 subjective 17:16 17:19 Subscribed 53:21 substance 40:24 Suite 3:11 supporting 47:24 suppression 26:22 sure 8:24 10:11 14:5 22:6 24:8 24:9,11 26:4,7	31:22 33:19 34:5 43:6 44:23 46:3 swear 5:4 sworn 4:5 5:9 51:6 53:21 SY009941 1:21 T T 4:1 take 8:13 9:4 13:9 20:25 45:22 49:16 50:4 taken 20:1,5 22:5,12 51:7 51:12 52:5 talk 29:11 35:8 45:12 talked 12:3 talking 10:16 32:13 35:10 38:20 39:8,20 41:11 teaching 46:17 48:5 teachings 47:12 48:1 technique 13:2 techniques 12:22 13:1,2 TECHNOLOGY 1:4 53:2 teeth 21:18 22:22 25:15 tell 5:4 26:5 38:7 39:19 47:15 terms 47:12 48:2 48:15 terrible 27:18 testified 5:9 15:17 testify 36:4 51:6 testifying 5:18 testimony 46:6 51:9 52:5 thank 49:13,22	50:2,6 thereof 52:6 thing 47:15 things 12:1 31:18 34:20,22 37:19 think 5:12 7:13 7:21 9:12 14:23 15:1 18:20 23:8 35:6,15,19 46:3 47:8,22 49:8,24 50:1 three 9:17,23 10:25 11:3,12 time 1:14 8:13 12:7 13:9 16:4 18:14 49:14,22 50:8 title 9:21 TN 2:12 today 5:13,18 8:6 40:24 49:15 today's 5:15,20 6:2 7:3,15 told 44:15 Tongue 31:18 tooth 25:7,9,10 25:16,21,22 26:2,9,14,15 26:19,20,21,21 26:22,23 27:8 27:11,14,25 28:1,3,5,12,13 28:18,19,21,22 28:22 29:1,1,5 29:6,6,10,10 29:11,12,13,15 29:16,16,17,21 29:21 30:1,4,6 30:7,8,12,15 30:17,22,23,24 31:5,6,7,10,11 31:11,12,12,13 31:15,20,21,23 31:24 32:1,2,2
--	---	---	--	---

32:7,8,8,12,14 32:19,20,24 33:1,1,2,5,8,13 33:14,16,17,22 33:23 34:1,3,6 34:8,10,11,12 34:16,19 35:2 35:3,3,13,20 35:23,25 36:22 36:23 37:2,3,4 37:5,6,7,8,9,12 37:13,15,16,18 37:20,25 top 21:10 23:1 touched 18:10 TRADEMARK 1:1 transcribed 51:8 transcript 49:24 50:5 51:9 transcription 52:6 TRIAL 1:2 true 46:16 51:9 52:6 truth 5:4,5,5 51:6,6,6 truthfully 5:18 trying 27:10 turn 12:7 23:25 39:11 Turning 23:19 38:3 two 17:1,11 20:6 32:17 type 21:2 23:5 33:2 typo 9:13	26:13 30:6,22 37:11 understood 9:16 UNITED 1:1 unrelated 7:19 use 5:22 8:7,18 8:24 49:10 user 13:16 uses 42:7	widely 16:15 WILSON 3:4,10 witness 4:3 5:6 8:16,18,21 11:25 15:10,21 16:14 17:10 18:25 20:4 22:24 23:8 24:7 25:13,25 26:18 28:9,25 29:9,24 30:11 31:1 32:5,23 33:19 34:14 35:6 36:10,12 38:7,19 39:3 39:18 40:14 41:2 42:6,23 43:18 44:22 46:11 47:2,22 48:15 51:5,15 53:3 word 27:3,5 words 21:11 28:17 work 46:22 world 44:18 wouldn't 18:18 write 11:3 wrong 8:25 18:15 39:24	29:6,10,15,17 29:21 30:8,24 31:7,11,12,13 31:13,16,21,24 32:2,8,20 33:14,17 35:25 36:23 37:3,5,8 37:13,16 38:1 Zoom 6:24	24 23:19 248 10:14,24 11:21 12:6,15 21:5 23:20 24:22,25 25:1 25:6 30:3 34:18 35:10,16 39:12,15 40:4 40:18,24 45:8 49:12
	V			
	v 1:6 53:2 vaguely 22:19 22:25 Valley 11:23 value 31:5 38:5 38:16 40:12 42:9 variation 23:21 24:4,15 various 30:4 32:14 vastly 16:16 videoconference 2:2,5 view 17:11,14 20:14 29:4 34:10 35:3 37:11,14 43:21 44:25 45:1,2,2 45:4,5,7,14 vision 16:16			
	W			
	W 4:1 WA 2:13 3:12 want 13:9 16:4 25:16 26:6 wanted 18:14 way 19:8 20:19 29:4 37:11 42:7 45:10 47:23 Wednesday 7:8 went 7:7 15:24 WHEREOF 51:15			
		X		
		X 1:3,9 4:1		
		Y		
		yeah 6:19 8:23 13:15 20:21 27:10,20 years 14:25 16:1 yesterday 7:24 York 3:20		
		Z		
		zone 25:7,9,21 26:9,14,20,23 27:11,25 28:3 28:12,18,23		
			0	
			1	
			1 1:22 52:4 10 49:17 10:30 1:14 1001 24:25 39:15 40:1,10 41:14,17,18,21 10166-0193 3:20 1048 8:11,12 9:2 10:7 39:21,25 11 9:13 10:18 11:42 50:8 12th 51:15 13 24:19 14424 1:25 51:23 17 24:1,1 26:9 27:24	
			2	
			20 9:7 12:8,10 12:20 14:21 16:7 19:14 20:1 22:15 23:5,12,15 200 3:19 2017 22:5,13 2024 1:13 51:8 51:15 52:5 53:22 206-883-2529 3:13 21 39:25 212-351-4000 3:21	
				3
				30 14:25 16:1 32 25:4 26:10 33 40:11 35 14:25 16:1
				4
				5
				5 4:5,7 50 52:4 5100 3:11 53 1:22
				6
				650 3:5 650-354-4154 3:7
				7
				701 3:11
				8
				8 1:13 51:8 52:5
				9
				94303 3:6 945 10:14,17 11:11,15,18,21 23:25 24:2,3 24:14,18 97 39:11 98104-7036 3:12