

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BOE TECHNOLOGY GROUP	:	IPR2024-01131
CO., LTD.,	:	
Petitioner,	:	
v.	:	
OPTRONIC SCIENCES, LLC,	:	
Patent Owner.	:	
_____	:	

VIDEOTAPED DEPOSITION OF

DEAN NEIKIRK, PH.D.

CONDUCTED REMOTELY

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1 (All appearing via videoconference.)

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22	(None.)	
23	* * * * *	
24	QUESTIONS WITNESS INSTRUCTED NOT TO ANSWER	
25	(None.)	

1 P R O C E E D I N G S

2 THE VIDEOGRAPHER: Okay. Good morning,
3 everyone. We are now on the record. This is the
4 beginning of Media Number 1 in the deposition of
5 Dr. Dean Neikirk in the matter of BOE Technology
6 Group Co., Ltd., versus Optronic Sciences, LLC, Case
7 Number IPR2024-01131, held virtually on Zoom.

8 This deposition is being taken on behalf of
9 patent owners Optronic Sciences on April 18th, 2025,
10 at 7 -- excuse me. 9:58 a.m.

11 The court reporter is Theresa Williamson. I
12 am Marcus Campbell, the videographer, on behalf of
13 First Legal Depositions located in Los Angeles,
14 California.

15 This deposition is being videotaped at all
16 times unless specified to go off the video record.

17 Would all present please identify themselves,
18 beginning with the noticing attorney.

19 MR. TONG: This is Peter Tong from Russ
20 August & Kabat, here on behalf of the patent owner.
21 With me is Jefferson Cummings.

22 MR. LONEY: Zachary Loney with DLA Piper on
23 behalf of Petitioner BOE Technology Group. With me
24 today is Brian Erickson.

25 THE VIDEOGRAPHER: Thank you so much. Will

1 the court reporter please swear in the witness.

2 THE STENOGRAPHER: Yes. First, let me state
3 that my name is Theresa Williamson, and my California
4 CSR number is 14545.

5 (Whereupon the deponent was duly sworn.)

6 EXAMINATION

7 BY MR. TONG:

8 Q Good morning, Dr. Neikirk.

9 A Good morning, Mr. Tong.

10 Q So we just had a deposition yesterday. The
11 same rules will apply today. Do you understand that?

12 A I do.

13 Q Okay. Are you on any drugs, alcohol or
14 medication today that may affect your ability to
15 provide complete and truthful testimony?

16 A No, I am not.

17 Q Okay. Since we are doing this as a remote
18 deposition, could you tell me who, if anyone else, is
19 in the room with you?

20 A No one else is in the room with me.

21 Q Do you have any notes or papers with you?

22 A I have a clean paper copy of the '801 patent
23 and a clean paper copy of my declaration in this
24 matter. Neither copy has any annotations, no post-it
25 notes. All the windows on my computer, exclusive of

1 this Zoom window, are closed.

2 Q Okay. Do you have any copies of the prior
3 art that is relied upon in your declaration?

4 A I do not.

5 Q Before we begin with questioning about the
6 specific statements in your declaration, are there
7 any corrections or retractions that you wish to make
8 to your declaration regarding the '801 patent?

9 A No, nothing that I'm aware of.

10 Q Okay. Now, you've been retained by BOE to
11 provide an opinion in this IPR matter; is that
12 correct?

13 A That is correct.

14 Q For \$800 an hour?

15 A That is correct.

16 Q When were you retained?

17 A I noticed that the dates on my report are
18 July 12th. I think the other day I said I couldn't
19 recall correctly so something like six months ago.
20 If I do the arithmetic, it's probably more like ten
21 or 11 months ago. It was early 2024.

22 Q Okay. And after you were retained, you had
23 reviewed, at some point, the '801 patent; is that
24 correct?

25 A Yes, it is.

1 Q Okay. Did you personally search for and find
2 the prior art that is relied upon in your
3 declaration?

4 A I believe that the prior art that I have
5 relied upon was already determined before I was
6 engaged. So no, I don't believe I did.

7 Q Okay. And did you read the prior art before
8 you read the '801 patent or did you read the '801
9 patent first before you read the prior art?

10 A I believe I read the patent first so I would
11 have some idea of what the case was about.

12 Q And by "the patent," you mean you read the
13 '801 patent first?

14 A Yes, sir, the '801 patent.

15 Q Okay. Have you read the IPR petition for the
16 '801 patent?

17 A No, I don't believe I have a copy of that.

18 Q Have you read the patent owner's preliminary
19 response regarding the '801 patent?

20 A No, I don't believe I have seen that either.

21 Q Have you read the board's institution
22 decision regarding the '801 patent?

23 A No, I have not.

24 Q Have you -- has -- are you at all aware that
25 the board instituted -- strike that.

1 Do you have any understanding of the
2 reasoning in the institution decision?

3 A No. I -- I have not reviewed anything from
4 the board, and -- other than I probably have been
5 made aware that there has been something from the
6 board. Other than that, I don't know anything about
7 it.

8 Q Okay. I'm going to go ahead and introduce
9 two exhibits. I will be putting these in the chat.
10 The first exhibit is a copy of U.S. Patent Number
11 7,226,801. This is the same Exhibit 1001 that was
12 filed in the IPR proceeding.

13 (Exhibit Number 1 marked as an exhibit to
14 this deposition.)

15 BY MR. TONG:

16 Q Dr. Neikirk, when you have a chance, could
17 you please open up this file and let me know when you
18 have it open.

19 A And I do have the file, and I have opened it.
20 I see that it is a copy of the '801 patent.

21 Q And this is the same copy that you have,
22 printed out, in front of you?

23 A Yes. I -- well, let me double-check, but it
24 certainly appears to be.

25 Yes, this is the same as the paper copy I

1 have.

2 Q Okay. And I'm going to mark another exhibit
3 and introduce it in the chat. This will be Exhibit
4 2. It is the -- the declaration of Dean Neikirk in
5 IPR 2024-01131 regarding U.S. Patent Number
6 7,226,801.

7 Dr. Neikirk, when you have a chance, could
8 you please open it up and let me know when you have
9 it open.

10 A And I do have the file. It is open now.

11 Q Okay. Can you confirm that this is the same
12 copy of your declaration that you have in front of
13 you?

14 A And I'm just looking through the two to make
15 sure they correspond to one another.

16 Yes, these certainly appear to be exactly the
17 same: the paper copy and this electronic copy.

18 Q Okay. So just a little bit about your
19 background section. You are currently a professor at
20 UT Austin; is that right?

21 A I am currently an emeritus professor at UT
22 Austin. I retired at my normal teaching position and
23 administrative positions in January of 2001 [as
24 stated], I think.

25 Q And do you live in the Austin area?

1 **A I do live in the Austin area. I live in**
2 **Dripping Springs, Texas.**

3 Q Okay. And did you grow up in Texas?

4 **A No. I grew up in Oklahoma.**

5 Q When did you move to Texas?

6 **A I moved to Texas in January of 1984.**

7 Q Would you prefer to root for the Longhorns or
8 for OU?

9 **A I went to Oklahoma State University, so of**
10 **course I root for the Longhorns.**

11 Q Okay. All right. I'd like to turn your
12 attention to paragraph 34 through 36 of your
13 declaration.

14 **A I have that in front of me.**

15 Q Okay. And you'll see that this is the part
16 of your declaration that addresses the level of
17 ordinary skill in the art; is that right?

18 **A Yes, that's correct.**

19 Q And if we turn to paragraph 36, you define a
20 PHOSITA as someone having, quote, "A Bachelor's
21 degree in electrical or mechanical engineering or a
22 comparable field of study, plus approximately two to
23 three years of professional experience with
24 electronic and optoelectronic device design or other
25 relevant industry experience."

1 Do you see that?

2 A I do.

3 Q In your opinion, would a PHOSITA need to have
4 any experience with LCDs in order to be competent in
5 understanding and forming an opinion regarding the
6 '801 patent?

7 A Well, inasmuch as LCDs, I believe, fall
8 within the broad range of optoelectronic device
9 design, that they would have the specific experience
10 in LCDs, no. I believe they could understand the pri
11 -- the related art, prior art, and understand how to
12 apply it.

13 Q If a -- if someone lacked experience with
14 LCDs, how would they understand any LCD-specific
15 problems?

16 A Well, I -- I think the problems that are
17 identified in the '801 patent are ones that, looking
18 at the prior art, they would understand what the
19 prior art taught and understand that they relate, in
20 some cases, beyond just LCDs.

21 So knowledge of optoelectronic device design,
22 along with their educational backgrounds and industry
23 experience, I think would be sufficient to -- to
24 appreciate and understand some of the issues to be
25 solved that are identified.

1 Q So I believe yesterday, for example, we had
2 talked about -- or not us, but at least you had
3 talked about a flashlight being a potential example
4 of an optoelectronic device; is that right?

5 A Well, I don't think I brought up the
6 flashlight, but I think the -- counsel did, and then
7 we discussed it, yes.

8 Q So is it your opinion that an engineer with
9 an electrical engineering degree who has worked on
10 flashlight design for two to three years would have
11 the necessary background and understanding to
12 appreciate the problems with LCD design?

13 A Well, if that's the only thing they had ever
14 done, no, not necessarily; but as I've specified, it
15 requires more than just that. It requires education.

16 I do believe flashlights have hermeticity
17 issues to be dealt with, multiple parts that have to
18 be assembled that can't leak, so there are certainly
19 some similarities.

20 But if someone had no educational background,
21 as I've described there, and only worked on
22 flashlights -- well, actually, they might -- if they
23 have done all aspects of the flashlight, might very
24 well still be able to understand; but I'm not sure
25 that meets my definition or my understanding of what

1 I think a POSITA would be.

2 Q I'd like to get some clarification on that.
3 You had mentioned that it requires education as part
4 of your answer. In my question, that PHOSITA would
5 have an electrical engineering degree and two to
6 three years of working on flashlight design. What
7 other questions or qualifications would this PHOSITA
8 need?

9 A Well, I -- I -- I apologize. I misunderstood
10 that you were assuming, as a predicate, that they
11 have this Bachelor's degree in electrical engineering
12 or mechanical engineering.

13 I'm not sure that they would really need
14 anything.

15 The design and construction of a flashlight
16 is, actually, far from a trivial exercise. We'll --
17 many people may think of them as commonplace and
18 trivial, but then they think of display panels as
19 commonplace and might think of them as trivial.

20 Q In your opinion, is the design of display
21 panels trivial?

22 A No, I don't think the design of virtually any
23 product that will work for any length of time is
24 trivial.

25 Q If display panels -- if the design of display

1 panels are not trivial, then how is it that someone
2 with a Bachelor's in electrical engineering and
3 experience in flashlight design could appreciate the
4 non-trivial aspects of display-panel design?

5 A Well, because a person with that level of
6 experience has non-trivial experience. They have
7 non-trivial knowledge.

8 In working on their Bachelor's degree, they
9 -- certainly at our university and many of the
10 universities I'm familiar with, in doing design they
11 would have CAD coursework that would lead them to
12 appreciate the many things that have to be put
13 together and have to function together, just as one
14 who designs a flashlight has to understand that.

15 Again, I don't think a flashlight design is
16 trivial.

17 Q What classes do you teach at UT?

18 A Well, when I was still actively teaching, I
19 taught courses in computer-aided design of circuitry.

20 I taught courses in how integrated circuits
21 are designed and fabricated, both lecture and
22 laboratory courses.

23 I taught courses in electromagnetics, in
24 optics, in the electromagnetics of packaging.

25 I taught courses in semiconductor device

1 physics and microwave engineering.

2 Those are the ones that pop to my head. I
3 taught there for almost 40 years, so there was a lot
4 of things covered in that time.

5 Q Did you teach any courses that were
6 specifically about the design of LCDs?

7 A No, I don't think I taught anything that was
8 specific to LCDs.

9 Q As far as you know, are any classes on the
10 design of LCDs a required part of the electrical
11 engineering curriculum as part of the Bachelor's
12 program there?

13 A Well, the physics of liquid crystals is, I
14 believe, discussed in our device physics course. I
15 don't recall anything that is specific to the design
16 of, for instance, an LCD panel.

17 There are certainly things that are taught
18 that apply to that, but I don't know whether anybody
19 uses that as their example.

20 Q I would like to turn your attention to
21 paragraph 40 of your declaration.

22 A I have paragraph 40 -- excuse me. Paragraph
23 40 in front of me.

24 Q Okay. And the second sentence here says,
25 "The patent describes forming these openings using

1 techniques and methods that were well-known in the
2 art, such as etching and photolithography." Do you
3 see that?

4 **A I do.**

5 Q Can you describe and explain: What is
6 etching?

7 **A "Etching" is a term used to refer to the**
8 **removal of a material, either by physical or chemical**
9 **or a combination of physical and chemical effects.**

10 Q So you mentioned physical as part of your
11 answer, but typically a physical abrasion technique
12 for removing material would not be considered
13 etching; is that correct?

14 **A No, I wouldn't agree with that.**

15 Q You would agree that using a chemical to
16 dissolve a portion of a surface would be an example
17 of etching; right?

18 **A That would be an example of etching.**

19 Q What type of physical process -- can you give
20 an example of a physical process that you believe is
21 an example of etching?

22 **A I can.**

23 Q Please describe it.

24 **A Sputtering is a classic example. In my**
25 **course, I always taught, both chemical etching and**

1 sputtering, as the simple example of a non-chemical
2 physical method of removal. Those -- both of those
3 topics fall -- fell within the segment of the course
4 entitled "etching."

5 Q Would you consider using a mechanically
6 abrasive tool, such as, just, you know, rubbing stuff
7 together, for example, a knife or some pattern,
8 rubbing a surface, would you consider that to be
9 etching?

10 A It might be. It's usually discussed -- just
11 like sputtering is discussed, as an example, or laser
12 ablation. All of those: sputtering, the polishing or
13 scraping example, laser ablation, are all physical
14 methods of removing material and are generally and, I
15 think, broadly viewed as examples of etching
16 techniques.

17 Of course, that term might be used in a given
18 context in a narrower fashion. Certainly in the
19 context of the '80 -- '801 patent or -- I was going
20 to say the 802. '801 -- I didn't see anything that
21 called out a specific characteristic that one would
22 limit etching to.

23 Q Could you explain what photolithography is?

24 A Photolithography is the term usually re --
25 used to refer to a technique of producing a pattern

1 on a surface, usually involving a deposition first of
2 a photosensitive material. Then exposure to some
3 form of radiation to expose that photosensitive
4 material, followed by another step to develop that.

5 Now, that's the usual, and that -- all of
6 those together are usually referred to as a
7 photolithographic process.

8 Q And what do you mean by that last step, "to
9 develop"?

10 A Well, you can, in some cases, directly remove
11 the material using the light that you used to expose
12 the material. Again, an example of that would be
13 laser ablation. And that would generally fall within
14 a lithographic process, or a photolithographic
15 process.

16 But in many, many cases, the light is used to
17 physically alter the material that's already present,
18 and a separate step is used to cause the different
19 regions of the material to be removed. That's
20 broadly referred to as "development."

21 Q And the material that is ultimately removed
22 at the end, would that typically be the deposited
23 material that is exposed to radiation or would that
24 be the deposited material that is not exposed to
25 radiation?

1 A It could be either. I wouldn't -- wouldn't
2 want to characterize either as the typical. One is
3 referred to as positive resist; and in that case, the
4 regions exposed to radiation are removed.

5 The other type of situation is referred to as
6 negative resist. In a negative resist, the material
7 that's exposed to radiation remains. Both of those
8 are common.

9 Q So we've covered, I guess, several different
10 techniques for forming openings, as you mentioned, in
11 paragraph 40 of your declaration.

12 Do different techniques have different
13 advantages?

14 A They certainly may. In some cases, there are
15 a variety of techniques that, in many ways, they are
16 equivalent to one another; and any -- any of them
17 could be selected in a -- in a given application.

18 In some cases, there may be more direct
19 advantages. Over the years, for instance, the
20 smallest thing you could make has, sort of,
21 ping-ponged back and forth as to whether that would
22 use a positive resist or a negative resist; but there
23 is nothing universal there, necessarily.

24 Q If a PHOSITA were to pick a particular
25 technique for forming an opening, that PHOSITA would

1 need to consider a lot of different -- I guess a lot
2 of different restrictions for a particular
3 application. Would that be -- would that be
4 accurate?

5 A Well, I would certainly agree that they
6 should look at their application to try to determine
7 whether the lithographic techniques that they were
8 considering were compatible. Again, as I think I
9 just indicated, they might conclude that they have
10 many choices, all of which are compatible, but they
11 should look at the use.

12 Q And one of the considerations that a PHOSITA
13 would look at would be the type of material that an
14 opening would be formed in; correct?

15 A Well, that's -- if we're talking about the
16 lithographic process, the type of material in which
17 you form the opening is part of that lithograph
18 process.

19 Q And again, in selecting which technique to
20 use to form an opening, the PHOSITA would need to
21 consider the size of the opening that is desired to
22 be formed; is that correct?

23 A It would be appropriate to -- you -- you
24 better have some idea of the size because all of the
25 lithographic process, if you will, from beginning to

1 end, will have impacts on -- typically it's minimum
2 feature size, but it may have impacts on even larger
3 feature sizes.

4 Q And it's true that different techniques
5 performing openings have different minimum feature
6 sizes ranging, for example, from nanometers up to
7 micrometers, at least; right?

8 A I would certainly agree that the choice of
9 exposure system, resist and development, assuming
10 that's the style you use, certainly all that has
11 impacts on the smallest feature you can make, which,
12 getting down to a nanometer, is rather challenging
13 and, at sizes that can certainly impact things, up to
14 many microns.

15 I personally have worked over enough years
16 that I've seen minimum feature sizes shrink from a
17 couple microns down to less than a hundred
18 nanometers, and things have changed over that time.

19 Q So -- and around late 2005, what was the
20 state-of-the-art minimum feature size that a PHOSITA
21 would be able to make?

22 A By 2005 I think we were probably down around
23 a hundred nanometers. Might have been a couple
24 hundred nanometers, depending on the production
25 environment. But I think that -- certainly in my own

1 research labs and the other research labs at the
2 University of Texas at the time, by 2000 -- I'm
3 sorry. 2005; correct? About 2005 we used?

4 Q 2005, that's right.

5 A 2005. I know we were doing 250 nanometers,
6 and I think some people were doing a hundred
7 nanometers.

8 In 1983, I personally did some work at about
9 250 nanometers. It was a lot harder then than it was
10 in 2005, but people were doing it.

11 Q And around that 2005 time frame, what
12 technique was being used to make features around the
13 250-nanometer size?

14 A Well, at that particular point in time, I
15 believe there were both positive and negative resists
16 that were capable of resolution at that level.

17 The exposure radiation was typically mid to
18 deep ultraviolet.

19 There were both contact and projection and
20 step-and-repeat exposure tools available at the time,
21 I believe, in 2005.

22 So there were a whole host of techniques and
23 combinations that could be used to do that.

24 Q Would you generally agree that the
25 state-of-the-art techniques for creating the smallest

1 features would be more expensive than older
2 techniques that could only create larger features?

3 MR. LONEY: Objection. Form.

4 THE DEPONENT: Not necessarily. For relevant
5 -- I mean, at -- in our research labs, we were using
6 equipment in 2005 that we had had for ten to 15
7 years, and we were doing 250-nanometer,
8 quarter-micron, features.

9 There were certainly tools available in 2005
10 that cost a great deal more than ours that were doing
11 quarter-micron features. So depends on what you're
12 trying to do.

13 BY MR. TONG:

14 Q If a PHOSITA were to select a technique for
15 creating an opening, would cost be a relevant
16 consideration to the PHOSITA?

17 A Well, certainly in a production environment,
18 it would. It might not be so much the cost of the
19 tools, but it might very well be the cost of the
20 consumables.

21 Q Can you tell me: What is a via?

22 A That's a term that's used rather broadly.
23 It, again broadly, refers to a -- and depending on
24 the context, it can either be the hole through things
25 or the filling of that hole, but usually it indicates

1 a method that -- or some thing -- it's a physical
2 object usually -- that penetrates through one or more
3 layers, or one or more films, that allows access from
4 above to below. I use those two words cautiously
5 since "above" and "below" might also have meaning in
6 a specific context.

7 But if you picture multiple coatings of paint
8 on a wall and you poke a thumbtack through that and
9 pull that thumbtack out, the hole that you leave
10 behind goes all the way through the paint to the
11 sheetrock below it; and that hole, in some
12 circumstances, would be what someone would refer to
13 as the via.

14 In other circumstances, imagine leaving the
15 thumbtack in there. They might refer to the shaft,
16 the metal shaft of the thumbtack as being the via.
17 It depends on the context; but roughly speaking,
18 that's what a via is.

19 Q Let me ask you about the photolithography
20 process that is mentioned in paragraph 40 of your
21 declaration. Does photolithography allow a PHOSITA
22 to form a via with a specific angle? Actually,
23 strike that. That's a bad question.

24 Does photolithography allow a PHOSITA to form
25 a wall in a material that has a specific angle?

1 **A Yes, it can.**

2 **Q For example, angles ranging from 30 to 60**
3 **degrees?**

4 **A I believe it could, yes.**

5 **Q What parameters of the photolithography**
6 **process would allow a PHOSITA to select either the**
7 **60- or the 30-degree angle?**

8 **MR. LONEY: Objection. Form.**

9 **THE DEPONENT: Well, things that you would**
10 **select to alt -- to achieve a certain angle would**
11 **include the type of photoresist used, the exposure**
12 **tool, the numerical aperture of the exposure tool,**
13 **step-to-focus, exposure time, the type of developer,**
14 **the selectivity of the resist itself. All of those**
15 **affect the profile of a wall through a photoresist.**
16 **BY MR. TONG:**

17 **Q Okay.**

18 **A And I think the other obvious thing I left**
19 **out of that is the type of mask that's used, in**
20 **combination -- that's part of the exposure. I'll --**
21 **I'll -- so that's part of the exposure tool.**

22 **So all of those things can be selected to**
23 **achieve a variety of angles.**

24 **Q I would like to turn -- I would like to turn**
25 **to the section of your declaration that is titled**

1 "State of the Art." This is on page 42, as numbered
2 in the bottom middle. It is on page 51, as numbered
3 in the bottom right.

4 A Yes, I'm there. So I think it starts at
5 paragraph 80 in my declaration, I believe; correct?

6 Q Yes, paragraph 80.

7 A I do have that.

8 Q Do you see that paragraph 80 begins with a
9 sentence about Shigeno, S-H-I-G-E-N-O?

10 A Yes, I see that.

11 Q And do you see that paragraph 81 begins with
12 a sentence about Yamazaki 496, Y-A-M-A-Z-A-K-I?

13 A Yes. I see that.

14 Q Do you see that paragraph 82 begins with a
15 sentence about Shimada 722, S-H-I-M-A-D-A?

16 A Yes, I see that.

17 Q And do you see that paragraph 84 begins with
18 a sentence about Shimada 376?

19 A Yes, I see that.

20 Q And do you see that the next paragraph begins
21 with a sentence about Kim 935?

22 A Yes, I see that.

23 Q And do you see that the next paragraph 86
24 begins with a sentence about Vaganov, V-A-G-A-N-O-V?

25 A Yes, I see that.

1 Q And just for clarification, the word Shimada
2 is spelled S-H-I-M-A-D-A.

3 A Yeah.

4 Q And do you see that in paragraph 88, the
5 first sentence is about the Tanaka reference,
6 T-A-N-A-K-A?

7 A Yes, I see that.

8 Q And do you see in paragraph 89 this talks
9 about the Miyoshi reference, M-I-Y-O-S-H-I?

10 A Yes, I see that.

11 Q And I believe we skipped one. If you go back
12 up to paragraph 87, in the -- after the first
13 sentence in paragraph 87, do you see the words, "See
14 Exhibit 1015"?

15 A Yes, I do.

16 Q And if we go to the table of exhibits in
17 paragraph 14 of your declaration, Exhibit 1015 refers
18 to the Sasagawa reference; is that correct?
19 S-A-S-A-G-A-W-A.

20 A I'm just trying to find my table of exhibits.

21 Q Paragraph 14.

22 A Yes, Exhibit 1015 is the Sasagawa reference.

23 Q And if you could turn to paragraph 16 for me.
24 Let me know when you're there.

25 A I am there.

1 Q Okay. So here, in paragraph 16, you set
2 forth the grounds that you -- the grounds of
3 invalidity that you are presenting opinions on; is
4 that right?

5 A That is correct.

6 Q And you present eight different grounds?

7 A Yes.

8 Q The first five grounds use Kwak, K-W-A-K, as
9 a primary reference?

10 A Yes, that is correct.

11 Q And the last three grounds, which are grounds
12 6 through 8, use the Zhang, Z-H-A-N-G, reference as a
13 primary reference?

14 A Yes, that is correct.

15 Q And in some of the grounds, you also rely on
16 Vaganov, V-A-G-A-N-O-V, Kim or Yamazaki as a
17 secondary reference. Do you see that?

18 A I do.

19 Q But as we had walked through the state of the
20 art, you had referenced many other references,
21 including Shigeno, Yamada, Kanaka, Sasagawa, Miyoshi,
22 and I'm not sure if there was a different Yamazaki,
23 but do you recall that there are other references
24 that are not explicitly listed in your grounds here
25 in paragraph 16?

1 A Yes, that's correct.

2 Q So in your grounds of invalidity -- strike
3 that.

4 I'm -- I'm going to refer to these other
5 references as "the state-of-the-art references." Can
6 we agree on that shorthand so I don't have to list
7 them every time?

8 A Yes, that's fine.

9 Q Okay. Are you relying on these
10 state-of-the-art references in forming your opinion
11 in any of these grounds of invalidity?

12 A No, I am not. I'm relying on the knowledge
13 of one of ordinary skill, and I cited the
14 state-of-the-art references simply as examples of
15 what, in my opinion, a POSITA would know.

16 Q Okay. Are -- in grounds 1 through 5, which
17 have Kwak as a primary reference, are you asserting
18 that a PHOSITA would modify Kwak's embodiments in
19 view of any of the state-of-the-art references that
20 are not explicitly listed in this table in paragraph
21 16?

22 MR. LONEY: Objection. Form.

23 THE DEPONENT: No, because I am relying on
24 the knowledge of one of ordinary skill; and so, for
25 instance, ground 1 is a 102, an anticipation. So I

1 mean, obviously one of ordinary skill has to be able
2 to read it and understand it; but they have to make
3 no inferences, if you will. It's based on explicit
4 teachings, to what Kwak would teach them.

5 Ground 2 is an obviousness argument, where I
6 have set forth opinions that one of ordinary skill
7 could use their own knowledge to, if necessary, make
8 certain modifications or changes to Kwak.

9 The state-of-the-art references are not
10 referenced there because I believe that, in my ground
11 2, it would be the knowledge of one of ordinary skill
12 that would be sufficient.

13 The state-of-the-art references, again, were
14 simply ones that I wanted to have to help indicate
15 the types of things that, in my opinion, one of
16 ordinary skill would know.

17 So no, I did not formally use any of those
18 state-of-the-art references in the combination, for
19 instance, for ground 2.

20 And where I did have a combination, I did
21 explicitly list the reference where a combination
22 with another piece of prior art was required.

23 BY MR. TONG:

24 Q So, for example, in ground 2, you are not
25 proposing that Kwak's -- that any embodiment of Kwak

1 be modified in view of a teaching from Shigeno; is
2 that correct?

3 A Yes, that's correct. It may be modified in
4 view of the knowledge of one of ordinary skill, but
5 not specifically with one of those other references.

6 Q Okay. And the same question for grounds 3, 4
7 and 5. It is your position that a PHOSITA may modify
8 a -- Kwak in view of Vaganov, Kim and Yamazaki and
9 perhaps further in view of the ordinary skill and
10 knowledge of a PHOSITA, but you are not proposing to
11 modify Kwak any further based on the state-of-the-art
12 references that are not listed in this table;
13 correct?

14 A Yes, I --

15 MR. LONEY: Object. Form. Sorry.

16 THE DEPONENT: Yes, that is correct. It's
17 not a modification based on any specific teaching
18 from one of those other state-of-the-art references.
19 It's based on either the explicitly-stated
20 combination of art, if we can call it -- if I can
21 call it that way.

22 And of course, in all cases, the knowledge of
23 one of ordinary skill comes into play. Just making
24 the combination requires some knowledge from the one
25 of ordinary skill.

1 But no, no combination with an unspecified --
2 no. If -- if I depended on the reference, I have
3 said it. If I didn't say it, I'm not depending on
4 some unidentified reference -- or unreferenced
5 reference. Excuse me for that poor choice of words.

6 BY MR. TONG:

7 Q Sure. To clarify, if you depended on the
8 reference, you would have said it in this table in
9 paragraph 16 if you relied on it for a modification
10 to either Kwak or Zhang; is that correct?

11 A Yes. Now, in my declaration, if there was a
12 place where it depended on the skill -- one of
13 ordinary skill, I may have -- as an indication of
14 what I believe one of ordinary skill would know, I
15 might have referenced something from the prior-art
16 section.

17 But again, it wasn't to indicate that you're
18 going to that art and seeing an element and combining
19 that. It might have been there as an example to help
20 illustrate what one of ordinary skill knows, but it
21 should -- it is based on what one of ordinary skill
22 knows. Not on that reference.

23 Q Okay. Similar line of questioning for
24 grounds 6 through 8; okay? I just want to confirm
25 that the state-of-the-art references that are not

1 listed in this table in paragraph 16 are not being
2 relied upon for providing a technique that a PHOSITA
3 would use to modify the teaching of Zhang; is that
4 correct?

5 MR. LONEY: Objection. Form.

6 THE DEPONENT: So yes, I -- I would say -- I
7 would agree with that characterization. Here again,
8 for instance, ground 6 is an obviousness argument. I
9 usually call that a single-reference obviousness
10 argument because only Zhang is the basis, but of
11 course the basis of the knowledge of one of ordinary
12 skill.

13 If, in my declaration there is a citation to
14 one of the prior-art references, it was only to
15 indicate the general knowledge that one of ordinary
16 skill would have, not to -- to suggest a specific
17 combination from that reference.

18 BY MR. TONG:

19 Q I would like to turn your attention to
20 Section D, "Claim Construction," beginning at
21 paragraph 26, page number 11 at the bottom middle,
22 page number 20 at the bottom right.

23 A I -- I have that.

24 Q Okay. So paragraph 26 begins your opinion
25 about claim construction, and it goes on through

1 paragraph 32; correct?

2 A Yes, that's correct.

3 Q Okay. And here -- let's see. This is your
4 understanding of the law of claim construction; is
5 that right?

6 A Yes, this is my understanding from counsel of
7 the -- yes, the law or, I was going to say, the
8 patent board's procedures. I suppose there should be
9 -- they are consistent, I think.

10 But yes, this is the law, as I understand it.

11 Q And you applied that in paragraph 50 through
12 54, which is the next section on claim construction;
13 is that right?

14 A Yes, that is paragraph 50 through 54. Yes, I
15 did.

16 Q Okay. And in paragraphs 50 to 54, the only
17 term that you explicitly construe is a "predetermined
18 angle"; is that right?

19 MR. LONEY: Objection. Form.

20 THE DEPONENT: So the only term I discussed
21 was a "predetermined angle"; but I believe that my
22 conclusion is that this term would have its plain and
23 ordinary meaning. And what I was discussing is that,
24 in my opinion, its plain and ordinary meaning would
25 not be limited to any specific angle or range of

1 angles. That's in paragraph 51.

2 When a term is interpreted under its plain
3 and ordinary meaning, I've forgotten whether you
4 actually call that a construction. In my own mind, I
5 tend to think of that as the default. If there is no
6 construction, then it's plain and ordinary, so --

7 BY MR. TONG:

8 Q Yeah. And as stated in paragraph 50, for all
9 the other claim terms, you gave those their plain and
10 ordinary meaning, as well; correct?

11 A Yes, that's correct.

12 Q Are you aware that there is a dispute between
13 the parties about the meaning of the phrase "formed
14 on" in the context of the '801 patent?

15 MR. LONEY: Objection. Form.

16 THE DEPONENT: I -- maybe in the most general
17 terms. I -- I -- I haven't been involved in any --
18 at least to date, on anything specific about such a
19 dispute.

20 BY MR. TONG:

21 Q Are you aware of whether or not there is a
22 dispute between the parties about the meaning of the
23 word "layer" in the context of the '801 patent?

24 A Again, I may have -- have some general idea
25 that there is potentially a dispute, but I haven't

1 been involved, at least to date, in any such
2 discussions, so I haven't had -- that -- that's
3 nothing that's influenced my declaration.

4 Q Okay. If you could turn to Exhibit 1 which
5 is the '801 patent, to the last page for me.

6 A Okay. I have the '801 patent in front of me.
7 The last page that contains the claims, I assume --

8 Q Yes.

9 A -- by "last page."
10 Yes, I have that.

11 Q And do you see in claim 9, starting around
12 line 30?

13 A Okay.

14 Q It says, "A predetermined material layer
15 formed on the first substrate." Do you see that?

16 A I do.

17 Q Do you have any opinion as to how "formed on"
18 should be construed in accordance with its plain and
19 ordinary meaning?

20 MR. LONEY: Objection. Form.

21 THE DEPONENT: Well, as -- as I have
22 understood it in the context of the patent and used
23 it in my declaration, I believe the plain and
24 ordinary meaning of "formed on" says -- I hate to use
25 a counterexample, but it -- it does not necessarily

1 require it to be directly touching two different
2 materials.

3 So if I could use a figure in the '801
4 patent, and without checking the numbers to see if
5 they map to the rest of the requirements of the
6 claim, but we see -- in Figure 2A we see something
7 labeled 244, and we see something labeled 242 and
8 something labeled 232.

9 It -- I believe plain and ordinary meaning,
10 244 would be formed on 242, certainly; but I also
11 believe 244 is formed on 232, if you imagined these
12 being made, if you will, from bottom to top.

13 So I don't think the plain and ordinary
14 meaning imports more than it's formed on, and the
15 simplest way I think of that is: Doesn't require it
16 to be formed directly on.

17 I just didn't see anything in the patent that
18 requires that one of ordinary skill, I don't think,
19 reads that into the phrase "formed on." At least not
20 necessarily. It requires something in the context of
21 the application to narrow it like that.

22 MR. LONEY: Let's take a break and go off the
23 record real quick.

24 Dean, if you don't mind, if you can jump out
25 of the room, I'd like to have a discussion with

1 counsel. You don't need to be here to hear it.

2 THE DEPONENT: Should I check back in in five
3 minutes?

4 MR. LONEY: Yeah, five minutes.

5 THE DEPONENT: Okay.

6 THE VIDEOGRAPHER: Off the record at 10:55
7 a.m.

8 (Off the record.)

9 THE VIDEOGRAPHER: All right. We're back on
10 record at 11:05 a.m.

11 BY MR. TONG:

12 Q Dr. Neikirk, during the break, did you hear
13 any of the discussion between me and Mr. Loney?

14 A No, I did not.

15 Q Did you receive any communications at all
16 directly or indirectly from your counsel during the
17 break?

18 A No, I did not.

19 Q So as part of your answer to my previous
20 question about "formed on," you said, quote, I also
21 believe 244 is formed on 232, end quote, and I'm
22 reading off the realtime here.

23 Can you point me to anywhere in the '801
24 patent where it describes 244 as being, quote, formed
25 on 232?

1 A Let me look. You asked -- I -- and I will
2 note that when I used this, I said I'll use Figure 2A
3 just to point to, and I didn't look to see what it
4 said about various layers, but the only thing it -- I
5 think the only place in the specification that refers
6 to layer 244, there is column 2 at line 56 and 57,
7 and it does not say that 244 is formed on 232.

8 Q And we looked at line 56 and 57. That says,
9 "An organic material layer 244 is formed on the
10 silicon nitride layer 242"; is that right?

11 A Yes, absolutely, that is what it says. I was
12 just -- and sorry. I didn't mean to leave that out.
13 I'm just looking to see where other references to 244
14 happen to be.

15 There is a couple others in that paragraph
16 that don't refer to anything about "formed on."

17 The next paragraph, similarly I don't believe
18 makes any reference to what it is or is not formed
19 on. "Formed on" doesn't occur.

20 Column 3 at line 5 and 6 says -- refers to
21 organic material pattern layer 244a, which doesn't
22 happen to be a figure I used.

23 And I think that's the only reference in the
24 specification about layer 244 and what it may or may
25 not be formed on.

1 Q Now, if we look at column 3, line 5, it says,
2 "An organic material pat" -- "pattern layer 244a is
3 formed on the silicon nitride layer 242 after
4 etching." Do you see that?

5 A I do.

6 Q And if we turn to Figure 2B and 2C.

7 A I have those in front of me.

8 Q You see that layer 244a is directly above and
9 touching layer 242?

10 A Yes. That's how it's illustrated.
11 Absolutely.

12 Q And if we turn to figures -- Figure 2A. Are
13 you there?

14 A Oh. I'm sorry. Yes, I am.

15 Q And there, do you see that the layer 244 is
16 formed directly above and touching the layer 242?

17 A That certainly appears to be how it's
18 illustrated, yes.

19 Q Okay. I'd like to direct your attention to
20 column 2 of the '801 patent, line 27. So -- 28.
21 Line 28. Please let me know when you're there.

22 A I -- I believe I'm there. I'm not sure. Are
23 you referring to the sentence that starts, "As shown
24 in Figure 1C," or the next sentence?

25 Q The next sentence.

1 **A Okay. I have it in front of me.**

2 **Q I'm going to read the next two sentences.**

3 Please follow along with me and let me know if I get
4 this right. "A predetermined material layer such as
5 a silicon nitride layer 142 is formed on the TFT
6 array substrate 132, serving as a passivation layer.

7 "An organic material layer 144 is formed on
8 the silicon nitride layer 142." Do you see that?

9 **A I do.**

10 **Q If we turn to Figure 1C, do you see that the**
11 layer 142 is formed directly on and directly above
12 and touching the layer 132?

13 **A It certainly appears that way in the figure,**
14 **yes.**

15 **Q And do you also see that the layer 144 is**
16 formed directly on and directly touching the layer
17 142?

18 **A Again, it certainly appears that way.**

19 **Q So based on this, would you agree that as far**
20 as the explicit use of the words "formed on" in the
21 '801 patent, all of the examples are layers that are
22 formed directly on and directly above and touching
23 the layer below?

24 **A Based on the sections of the text that we --**
25 **of the specification that we just looked at, in**

1 conjunction with the figures, yes, I would agree with
2 that.

3 Q Based on our review of the specification and
4 figures of the '801 patent, does this change your
5 understanding of how "formed on" should be construed?

6 A Well, again, I interpreted "formed on" in its
7 plain and ordinary sense. So inasmuch as that's a
8 construction, no, it doesn't change my understanding
9 of what "formed on" would mean in a plain and
10 ordinary sense.

11 I -- I'm not sure that's a construction, but
12 I'll -- I'll admit my imperfect understanding of
13 terminology in the law.

14 Q Would it be accurate to summarize your
15 construction of "formed on" as merely being formed
16 above but not necessarily directly touching?

17 MR. LONEY: Objection. Form.

18 THE DEPONENT: Well, I -- I -- now we have
19 another word in there, which is "above." So
20 provisionally, de -- as we look at these and
21 interpret the "above" as being, if you will, when it
22 is formed, then, yes, my application of the claim
23 language and my -- my opinion as to its plain and
24 ordinary meaning is that it doesn't require that it
25 directly touch, but it -- but clearly, it is formed

1 -- and I'll -- I'll -- I'll use that word "above,"
2 sub -- I mean, you know, there is always that issue
3 about what does "above" mean, but formed above the
4 layers below.

5 BY MR. TONG:

6 Q Could you please explain the reasons that you
7 have the construction of "formed on" that you do?

8 MR. LONEY: Objection. Form.

9 THE DEPONENT: Again, I want to be clear that
10 I'm interpreting it as to how I believe one of
11 ordinary skill would understand it in its plain and
12 ordinary sense. I don't know whether that should
13 properly be called a construction or not.

14 But as one of ordinary skill would understand
15 it, in the pro -- in the process of making multiple
16 layer -- multiple films in a structure, I believe
17 that they view "formed on" as any additional layer is
18 formed on everything below that and, hence, on any
19 layer below that. It's on everything below.

20 And if it means that it must directly touch,
21 that I believe one of ordinary skill would expect
22 some direction that says, "Formed directly on."

23 So again, I -- I'm using what I believe one
24 of ordinary -- in my opinion, what one of ordinary
25 skill would understand from the plain words.

1 BY MR. TONG:

2 Q And do you have any evidence to support that
3 position?

4 A I don't -- I didn't cite anything specific.
5 Again, I would -- I would say this is based on
6 teaching this material over the course of 40 years to
7 undergraduate students in the areas in which I
8 identified as having -- would be appropriate for
9 their definition of one of ordinary skill and the way
10 that those kind of words would be used when we're
11 talking about stacking films in a multi-film
12 structure.

13 Q What is the plain and ordinary meaning of the
14 word "layer" in the context of the '801 patent?

15 A So in the '801 patent, obviously "layer,"
16 that word is used frequently. So, for instance, in
17 claim 4 it discusses the predetermined material
18 layer, and it states, "The predetermined material
19 layer comprises a passivation layer."

20 My understanding of what "comprises" means is
21 that it is that and it may have more elements to it.

22 So certainly the use in the claim, I believe,
23 would indicate to one of ordinary skill that a layer
24 does not necessarily require it to be made all of the
25 same material, if you will. It could be made up of

1 multiple, other layers of material. If you want to
2 call that a composite, something like that.

3 But the "comprising" language, I think would
4 require that.

5 Q I'm going to introduce Exhibit 3. This is a
6 non-confidential excerpt. It has been annotated with
7 highlighting from the transcript of Dr. Baker.
8 Please let me know when you have it open.

9 A Give it just a moment while it finishes
10 downloading.

11 I have the document open.

12 Q Do you know who Dr. Baker is?

13 A Well, I -- I know Dr. Baker.

14 Q How do you know him?

15 A I've worked with him in other cases, and I
16 know his work from -- I believe he's at the
17 University of -- now I've forgotten whether he's in
18 Nevada or Utah. Nevada, I think, but I was familiar
19 with some of his work from there.

20 Q Are you aware that he has been retained as an
21 expert for BOE?

22 A In general terms, I believe. Yes, I am aware
23 of that.

24 Q Did you speak with him at all in the
25 preparation for this deposition?

1 **A No, I did not.**

2 Q Did you review any of his deposition
3 testimony in preparation for your deposition today?

4 **A No, I did not.**

5 Q Okay. Can you please turn to page 164 of
6 this exhibit.

7 **A I have that in front of me.**

8 Q Could you please take a minute to read the
9 highlighted portions, beginning on line 21 of page
10 164 through line 11 of page 165?

11 **A I do see that.**

12 Q What is your opinion of Dr. Baker's answer,
13 that a material -- in response to the question, "When
14 you used the word 'layer' in these sentences, what is
15 your understanding of what a layer means in this
16 context?"

17 ANSWER: "A material that's deposited and
18 patterned on the substrate at the same time; and then
19 if you have other layers, there might be an insulator
20 above one layer, and then you pattern the next layer,
21 maybe, like, the same floor of a house."

22 MR. LONEY: Objection. Form.

23 THE DEPONENT: I have no opinion about it. I
24 don't know the context from beginning to end. I --
25 I've never seen this before, so I'm not going to

1 render an opinion on the fly, regardless.

2 BY MR. TONG:

3 Q Do you think his answer was accurate in that
4 a layer is, quote, "a material that's deposited and
5 patterned on the substrate at the same time"?

6 MR. LONEY: Objection. Form.

7 THE DEPONENT: Again, I haven't seen this
8 before. I don't know the total context that a layer
9 could be that. It certainly could be. I don't have
10 any idea whether he meant that is the only -- that --
11 let's see. That it means that a layer could not
12 consist of multiple materials. I simply don't know.

13 BY MR. TONG:

14 Q So you have no opinion, then, as to whether
15 or not he is right or wrong?

16 A No. I -- I can't -- I don't know the context
17 here. The word "layer" is context-specific. I don't
18 know what the rest of this discussion was about; and
19 having never seen it before or not knowing the
20 context, I can't possibly render an opinion.

21 Q And do you have any opinion on his answer to
22 the next question, starting at line 165; line 5, "If
23 two different features are part of the same layer,
24 that would mean that they would be made of the same
25 material; correct?"

1 ANSWER: "Yes."

2 A Again, I don't know the overall context, so I
3 couldn't possibly render an opinion.

4 Q Is his answer consistent with your
5 understanding of what "layer" means?

6 A Not necessarily. I -- I -- again, if we're
7 talking about the layer, and the only layer that I
8 have an understanding of is -- that's relevant here,
9 is the understanding of "layer" within the '801
10 patent, which specifically gives examples where a
11 layer comprises another layer, which clearly
12 indicates it could be multiple materials.

13 As to this question and answer, I -- I can
14 imagine situations where this might indeed be true,
15 and other situations where it might not, but I don't
16 know the context. I can't give an opinion.

17 BY MR. TONG:

18 Q With respect to the '801 patent, it is your
19 opinion that the word "layer" is used in accordance
20 with its plain and ordinary meaning; correct?

21 A Plain and ordinary meaning as used in the
22 patent and its claims. It's always context --
23 context-specific. One of ordinary skill reads the
24 terms in the claims, all of the claims, in the
25 specification in reaching even a point in ordinary

1 **understanding.**

2 Q Is it --

3 A **So in context of the patent, yes, plain and**
4 **ordinary.**

5 Q Is it your opinion that based on the con --
6 strike that.

7 Is it your opinion that based on the claims
8 of the '801 patent, the word "layer" has a meaning
9 that is at all different from its plain and ordinary
10 meaning?

11 A **No.**

12 MR. LONEY: Objection. Form.

13 THE DEPONENT: It's not different at all.
14 It's plain and ordinary meaning within the context of
15 the patent. No, it certainly -- it has its plain and
16 ordinary meaning.

17 BY MR. TONG:

18 Q Is it your opinion that any of the claims of
19 the '801 patent define the meaning of the word
20 "layer"?

21 MR. LONEY: Objection. Form.

22 THE DEPONENT: Well, I'm not sure what you
23 mean by "define." Claim 4, as an example, certainly
24 says that the predetermined material layer comprises
25 a passivation layer.

1 And my understanding is, and one of ordinary
2 skill would understand, that the word "comprises"
3 means that the predetermined material layer would
4 contain a passivation layer but may contain other
5 layers. I -- I don't know how -- any other way to
6 read that claim.

7 BY MR. TONG:

8 Q To be clear, claim 4 does not actually state
9 that the predetermined material layer comprises two
10 different layers; is that right?

11 A Well, I'm not sure I agree with that. To be
12 clear, "comprises" means one or more. And "more" is
13 absolutely included within "comprises." So I would
14 say that claim does say it is a passivation layer and
15 may be another layer, or even more.

16 Q But that other layer is not explicitly
17 recited in claim 4; correct?

18 A Well, certainly the words "and another layer"
19 are not in there. The word "comprises" is, and to me
20 I think that's an explicit statement about the
21 allowance of other layers.

22 Q In your opinion, is it necessary for the
23 predetermined material layer to have a passivation
24 layer and another layer in order for claim 4 to be
25 either infringed or met by the prior art?

1 MR. LONEY: Objection. Form.

2 THE DEPONENT: If I understood your question
3 properly, no, it's not necessary, but it is not
4 excluded.

5 BY MR. TONG:

6 Q And claim 4 can certainly be met if the
7 predetermined material layer comprises only a
8 passivation layer; correct?

9 A Yes, I would agree with that. My
10 understanding of the word "comprises" is that
11 passivation layer or that layer, plus others. So
12 it's an "or," as I understand it.

13 Q I'd like to turn your attention back to
14 Exhibit 3.

15 A So just for clarity, that's the Baker
16 excerpt? I just want to make sure that I understand.

17 Q Yes, that is the Baker excerpt.

18 A Okay. I have that PDF document open.

19 Q If you turn to page 165, lines 9 through 11,
20 I'll read it aloud when you're ready to follow along
21 with me.

22 A I have that open in front of me.

23 Q QUESTION: "So a conductor and an insulator
24 would be considered different layers; right?"

25 ANSWER: "Yes."

1 Did I read that part correctly?

2 A You did.

3 Q Would you agree that in general a conductor
4 and an insulator would be considered different
5 layers?

6 A In general, no, I wouldn't agree with that in
7 general.

8 Q Okay. So Dr. Baker is wrong about this;
9 right?

10 A No, I didn't --

11 MR. LONEY: Objection. Form.

12 THE DEPONENT: I'm sorry; I didn't say that.
13 You asked me in general. I don't know the context of
14 this discussion. Without that context, I can't
15 possibly render an opinion to agree or disagree with
16 Dr. Baker.

17 BY MR. TONG:

18 Q If the context were that Dr. Baker were
19 providing his understanding of the plain and ordinary
20 meaning of the word "layer," would you agree or
21 disagree with his statement as read in lines 9
22 through 11?

23 MR. LONEY: Objection. Form.

24 THE DEPONENT: You've got to show me the
25 context, please. What context? And then I would

1 have to study it. Just saying that he's doing it in
2 a context doesn't tell me what that context is.

3 In the '801 patent, I can read what the
4 context is. Here, I simply don't know what's being
5 discussed, in Dr. Baker's deposition transcript.

6 BY MR. TONG:

7 Q So I gave you the context that he was
8 providing a plain and ordinary meaning of the word
9 "layer." Is that sufficient context for you?

10 A No, that's no context at all. The context is
11 what's around the word, what -- how is it used?
12 That's the context. "Plain and ordinary" is not
13 context.

14 Q Okay. If you could turn to page 166 of this
15 exhibit.

16 A Okay. I have page 166 open in front of me.

17 Q I'm going to read from lines 1 through 12.

18 QUESTION: "So if there is a protective layer
19 on top of a metal layer, would you consider those to
20 be two different layers?"

21 ANSWER: "I don't know what you mean by
22 'protective layer.' I'd need to know the particular
23 context of what you're talking about, but --"

24 QUESTION: "Let me give you a context so --"

25 ANSWER: "-- if it's the same material, then

1 generally I would call them different layers. I
2 would call an insulator and a metal different layers;
3 but again, you don't pattern insulators, at least not
4 that I know of."

5 Do you see that?

6 A I do.

7 Q Would you agree that generally an insulator
8 and metal are different layers?

9 MR. LONEY: Objection. Form.

10 THE DEPONENT: No, not without the context of
11 the use of the word "layer.

12 BY MR. TONG:

13 Q I'm going to read, starting at line 17.

14 QUESTION: "Okay. So would you consider a
15 protective layer and the metal layer underneath to be
16 two different layers?"

17 ANSWER: "They are two different materials.
18 Again, when you say 'layer' -- I know you don't want
19 me to use 'pattern.' But when you talk about layers
20 and semiconductors or processing, that's something
21 you pattern. You could use and say I put a layer of
22 glass over it and I would understand that. But if
23 they're different materials, they're different
24 layers, if you would like."

25 Do you see that?

1 **A I do.**

2 Q Do you have any opinion as to whether you
3 agree or disagree with Dr. Baker's answer?

4 **A No, I do not.**

5 Q And continuing from line 3 of page 167.

6 QUESTION: "Again, if -- a layer of glass was
7 just put over as a planarization layer to planarize
8 the whole thing without any particular pattern on it,
9 would it still be understood that a glass layer would
10 be a different layer from, say, like a metal lay" --
11 "a metal underneath the glass; correct?"

12 ANSWER: "Yes."

13 Do you see that?

14 **A I do.**

15 Q Would you agree that generally a layer of
16 glass would be considered a different layer from a
17 metal that is underneath the glass?

18 MR. LONEY: Objection. Form.

19 THE DEPONENT: You used the word "generally."
20 I need context. I can't discuss the word "layer" out
21 of context. So I don't even understand what you mean
22 by "generally."

23 BY MR. TONG:

24 Q Okay.

25 **A So I -- I couldn't agree with that**

1 **characterization.**

2 Q Do you think that Dr. Baker's answer's with
3 respect to the meaning and application of the word
4 "layer" can be appropriately applied to the word
5 "layer" as used in the '801 patent?

6 MR. LONEY: Objection. Form.

7 THE DEPONENT: I don't know. I haven't seen
8 this before. I certainly haven't tried to read this
9 and see whether it applies to the '801 patent. I
10 have no idea of the context of this discussion. So I
11 couldn't render an opinion one way or the other.

12 BY MR. TONG:

13 Q Do you think his -- strike that.

14 Do you think Dr. Baker's answers that we have
15 just read are consistent with your understanding of
16 the plain and ordinary meaning of the word "layer" as
17 you understand it to be used in the '801 patent?

18 MR. LONEY: Objection. Form.

19 THE DEPONENT: Well, inasmuch as in the '801
20 patent, one possibility, for instance, for a claim 4
21 or a claim 5 is that there is a single layer. Then
22 that would be consistent.

23 But both claim 4 and 5, 4 requiring
24 "comprises a passivation layer," and 5 requiring
25 "comprises a metal electrode layer," that those don't

1 limit it to a single material, but certainly a single
2 material would be consistent with those claims. But
3 again, seeing the word "comprising," I don't believe
4 it's limited to a single material.

5 BY MR. TONG:

6 Q So we've talked about the use of "layer," at
7 least with respect to some of the claims, such as
8 claim 4, that contain the word "comprising." Are
9 there any other reasons that you have interpreted the
10 word "layer" to mean what it does?

11 A Well, certainly to one of ordinary skill, and
12 you used the word "generally," there are known
13 instances outside of the '801 patent where something
14 labeled as a layer consisted of a stack of different
15 materials. So that is certainly something that
16 anyone who took my class would have seen. So there
17 is just general knowledge that's outside the context
18 of the patent.

19 Within the bounds of the patent itself,
20 column 2, there is an example of a predetermined
21 material layer using silicon nitride, suggesting that
22 that's a passivation layer, whereas claim 5 now has a
23 metal electrode layer in it. If you wanted both,
24 obviously you have to add both materials.

25 Let's see. In column 2, it's a paragraph

1 that starts at line 46, but let me go to line 50
2 where it says, "Alternatively, the passivation layer
3 can comprise silicon oxynitride, silicon oxide,
4 organic dielectric, or a combination thereof," which
5 certainly I believe, to one of ordinary skill, would
6 take that as indication that multiple materials have
7 been used.

8 It follows that with, "The predetermined
9 material layer may further comprise molybdenum,
10 titanium, aluminum, tantalum, metal oxide, metal
11 nitride or a combination thereof, serving as a metal
12 electrode."

13 I believe that that -- so column 2 -- really,
14 the whole paragraph, from 46 to 55, would again
15 indicate to one of ordinary skill that it is
16 contemplated that this predetermined metal layer
17 might well consist of multiple materials.

18 Q Now, in using those multiple materials, would
19 it be your understanding that these materials would
20 be mixed and fabricated in a single step, or would
21 they be kept separate and fabricated in distinct
22 steps?

23 MR. LONEY: Objection. Form.

24 THE DEPONENT: Well, it -- in principle, I
25 suppose it could be either way, but I would -- in the

1 most common version, I would expect these would be
2 done as separate films, so separate layers combined
3 to be considered one layer, the predetermined
4 material layer made up of multiple layers.

5 BY MR. TONG:

6 Q Okay. Would you like to take a lunch break
7 now or later?

8 A I'm okay either way. If this is the best --
9 if this is a good spot for you to break, that's fine
10 with me. If you would like to go on, I'm fine.

11 MR. TONG: This is a good spot for our break
12 so let's go off the record.

13 THE VIDEOGRAPHER: Off the record at 11:41
14 a.m.

15 (Off the record.)

16 THE VIDEOGRAPHER: All right. We are back on
17 the record at 12:31 p.m.

18 BY MR. TONG:

19 Q Dr. Neikirk, did you speak with your counsel
20 during the break?

21 A I did not.

22 Q Okay. I would like you to turn to your
23 declaration, please, if you would --

24 A Okay. I have it in front of me.

25 Q -- to ground 1 which I believe is on page 53.

1 **A Yes, I have that open.**

2 Q And if we could further scroll down to
3 element 9b, paragraph 95.

4 **A I'm at paragraph 95.**

5 Q Okay. Do you see there is a picture, 2D,
6 right above -- right above that?

7 **A Yes.**

8 Q And there is also Figures 2D, 3A, 3B and 4A
9 on the next page, on page 56. Do you see those?

10 **A I do.**

11 Q And paragraph 95, that begins, "Kwak
12 discloses, quotes, a predetermined material layer,
13 open square brackets, interlayer 160, gate insulating
14 layer 140 and/or, slash, buffer layer 120, close
15 square bracket, formed on the first substrate," and
16 then you have in square brackets, "Substrate 110."

17 Do you see that?

18 **A I do.**

19 Q Could you clarify which of these three -- or
20 which combination of the interlayer 160, gate
21 insulating layer 140, and/or buffer layer 120 you
22 contend meets the elements "a predetermined material
23 layer"?

24 **A Well, so first in -- the square brackets is**
25 **my added text, of course, and if we, for instance,**

1 turn to the next page, page 56, and one of those
2 figures is Figure 2D. As I have explained, it is my
3 opinion that the predetermined material layer may be
4 made up of multiple layers.

5 In Figure 2D, layers 160, 140 and 120 would
6 constitute the required predetermined material layer,
7 which is on -- or formed on -- let me look at the
8 claim. We're doing the predetermined material layer
9 at this point.

10 The next claim element -- or actually, no.
11 It is this claim element, just to get the entire
12 element in front of us, requires that this be formed
13 on the first substrate. I've identified the
14 substrate as 110 there. So the layer constituting or
15 comprising 160, 140, 120 would be on, and, in that
16 example, would be directly on 110.

17 If we look at -- at the bottom of page 56,
18 there are three figures side by side. So I'll start
19 with the figure to the left. That's Figure 3A from
20 Kwak.

21 Well, I'm sorry; before I do that, in Figure
22 2D, in my opinion the three layers, 160, 140, 120,
23 would constitute a predetermined material layer on
24 substrate 110.

25 Alternatively, in my opinion, layer 160,

1 standing on its own, would be a predetermined
2 material layer. And as we discussed before the
3 break, I -- it is my opinion that that is still
4 formed on 110.

5 So there is an example in my statement -- in
6 the bracket, I said, "Interlayer layer 160, gate
7 insulating layer 140 and" -- "and/or buffer layer."
8 So for embodiment in 2D, there are two things that
9 would satisfy "predetermined material layer" on the
10 substrate: 160 alone or a layer comprising 160, 140
11 and 120.

12 If we go down to Figure 3A, in Figure 3A, so
13 that's the leftmost of the three, substrate is still
14 110; and in my opinion, the layers 160, 140 and 120,
15 combined, would still satisfy the requirement for a
16 predetermined material layer.

17 In the alternative, layer 160 alone could
18 satisfy that, or 160 and 140 would satisfy the
19 requirements.

20 So there, I gave you three different -- what
21 this teaches, there are at least -- there are those
22 three -- I think that was three; right? 160 alone,
23 160 plus 140, and 140 alone. Sorry. I'm trying to
24 get all the combinations. And 140 and 120, another
25 combination that would satisfy it. And actually 160,

1 140 and 120 would still satisfy it.

2 When we move on to Figure 3B, the one in the
3 middle, the substrate is still red, 110. For that
4 one, 160 alone would satisfy it; 160 and 140 combined
5 would satisfy the requirement for the predetermined
6 material layer; 160, 140 and 120 would; and in that
7 example, it's my opinion that 120 standing alone
8 would also satisfy it.

9 I think I covered all the things that teaches
10 that would, in my opinion, meet the claim limitation.

11 The last figure is Figure 4A. And that one,
12 in many ways, is quite similar to Figure 2D. So the
13 layer 160, 140, 120 would satisfy the requirement.
14 160 alone would satisfy the requirement. I think --
15 so when I did 2D, I should have done 160, 140 and
16 120, and 160. So the same for Figure 2D and 4A.

17 So in my bracket, back in paragraph 95, I was
18 trying to indicate those combinations.

19 The wording there, I think, is correct; but
20 to answer your question, there is exactly what I had
21 intended to indicate would satisfy a predetermined
22 material layer formed on the first substrate.

23 Q So I just want to be clear because it sounds
24 like you went back to clarify Figure 2D and Figure
25 4A. The theory is that it is the combination of 160,

1 140 and 120. That's one example for Figures 2D and
2 Figure 4A. And do you have another reading of what
3 is the predetermined material layer for Figure 2D and
4 4A?

5 A I believe you just mentioned as I was trying
6 to indicate, 160 and 140 and 120; correct? I think
7 you -- that was -- we -- we -- I was clear on that
8 one; right?

9 Q Yes.

10 A Okay.

11 Q Those collectively.

12 A Collectively. And then the other one I
13 identified was 160 by itself.

14 Q And that applies to both Figure 2D and Figure
15 4A; correct?

16 A Yes.

17 Q And in forming these opinions, you had
18 applied the constructions of both "formed on" and
19 "layer" that you had previously testified about;
20 correct?

21 MR. LONEY: Objection. Form.

22 THE DEPONENT: So, again, I think, as we
23 talked about before, I'm not sure it's appropriate to
24 call it a construction.

25 I applied what I believe one of ordinary

1 skill would read, as the plain and ordinary meaning
2 in the context of the claim in the patent, to all of
3 those; and yes, it involves the understanding of what
4 a predetermined material layer may comprise, and it
5 un -- it also involved the understanding of what one
6 of ordinary skill would understand that a layer
7 "formed on" would mean.

8 So yes, and I believe we discussed both of
9 those earlier, and I have applied those -- the
10 versions -- the examples I gave you, I believe, all
11 satisfy those plain and ordinary reads. That's, in
12 some sense, why there can be multiple. The teachings
13 -- there are many -- there are multiple teachings
14 here.

15 BY MR. TONG:

16 Q Okay. And you did not apply a construction
17 of "formed on" that requires a -- any type of direct
18 contact; is that correct?

19 MR. LONEY: Objection. Form.

20 THE DEPONENT: Well, to be clear, let's just
21 use Figure 2D, and I identified 160, 140, 120, that
22 combination. That, as the predetermined material
23 layer, is certainly directly on 110. So it does meet
24 even that view of what "formed on" -- again, "formed
25 on" in my opinion would include that, but it could

1 also include layer -- a situation where the layer is
2 further away from what it's formed on.

3 So either way, 160, 140, 120 would meet the
4 under -- an understanding of what "formed on" is.

5 BY MR. TONG:

6 Q Okay. And with respect to the example that
7 you just gave me, that does not imply -- sorry.
8 Strike that.

9 With respect to the example that you just
10 gave me, you did not use a construction of "layer"
11 that would preclude the collection of interlayer 160,
12 gate-insulating layer 140 and buffer layer 120 from
13 being considered as a single layer; correct?

14 MR. LONEY: Objection. Form.

15 THE DEPONENT: So if I understood your
16 question, I -- it is my opinion that 160 and 140 and
17 120, with "and"s, combined, would meet the plain and
18 ordinary meaning of "predetermined material layer."

19 Now, I gave you another teaching, which was
20 160 by itself; but I think you asked about in
21 combination.

22 No, I didn't preclude that because I just
23 explicitly said that is one of the teachings.

24 BY MR. TONG:

25 Q And you would agree that interlayer 160 is

1 not directly formed onto substrate 110; correct?

2 A I -- I -- I would agree with that. I -- I
3 think "directly formed" is meaningful to me; and yes,
4 160 shown there is not directly formed on 110. I
5 would agree with that.

6 Q And you would further agree that the gate
7 insulating layer 140 is also not directly formed onto
8 substrate 110; correct?

9 A I would agree with that.

10 Q Okay. And in these figures, you understand
11 300 to be a metal; is that correct?

12 A I would have to double-check. That's my
13 recollection. I believe 300 is described as being
14 the metal.

15 Q And in forming such a structure, for example,
16 such as shown in Figure 2D, when fabricating it,
17 someone would start off with a substrate, fabricate
18 buffer layer 120, then fabricate gate-insulating lay
19 -- I'm sorry. Could we take a break? I've got a
20 quick five-minute -- I've got a call coming in. I
21 think I need to take this.

22 A Okay.

23 MR. TONG: Can we go off the record for five
24 minutes real fast?

25 THE STENOGRAPHER: Mr. Campbell, are you with

1 us?

2 THE VIDEOGRAPHER: Off the record at 12:47
3 p.m.

4 (Off the record.)

5 THE VIDEOGRAPHER: All right. We are back on
6 the record at 12:48 p.m.

7 BY MR. TONG:

8 Q Okay. Apologies, Dr. Neikirk.

9 So if we look at Figure 2D, in terms of the
10 order of fabricating, from the bottom up, would it be
11 correct that, first, we would have substrate 110, and
12 then we put buffer layer 120 on top of it, and then
13 we put gate-insulating layer 140 on top of that, and
14 then we would somehow fabricate or pattern the metal
15 300 before covering it up with interlayer 160?

16 MR. LONEY: Objection. Form.

17 THE DEPONENT: So that would certainly be a
18 way to put down blanket layers. So yes, I would put
19 -- one way would be to put down blanket layer 120,
20 followed by blanket layer 160, although we would need
21 to look. I think that there may well be an
22 intervening layer that was -- that would have been
23 made and patterned before even 140 goes down.

24 Likely, 300 would be a blanket deposition,
25 followed by lithography and etch, followed by 160.

1 We would need to really go back and look at
2 other cross sections to determine whether there might
3 well have been other layers or other films, blanket
4 deposited, patterned and etched -- or etched and
5 patterned. Get that in the right order.

6 BY MR. TONG:

7 Q In Figure 2D, we see that the metal layer is
8 sitting in between interlayer 160 and the
9 gate-insulating layer 140; is that right?

10 MR. LONEY: Objection. Form.

11 THE DEPONENT: Certainly that's the layer --
12 that is where it is illustrated, yes.

13 BY MR. TONG:

14 Q What material would --

15 A To -- well, let me -- I'm sorry. Let me --
16 to be clear, of course, that's the way it's
17 illustrated in this part of the cross section, is
18 that -- what you're trying to allude to.

19 Looking at other cross sections might
20 indicate there had been layers or sheet -- films
21 formed, pattern perhaps removed, in this area.

22 But there, 300 is on -- is sitting in contact
23 with 140.

24 Q What would interlayer 160 typically be made
25 out of, in terms of material?

1 MR. LONEY: Objection. Form.

2 THE DEPONENT: Well, you know, it would be
3 best to see -- Kwak may very well have identified
4 material choices, but it's described as an interlayer
5 -- well, let's see. 160.

6 And I don't -- I honestly don't recall if
7 Kwak always just called 160 "interlayer" with no
8 other word associated with it, that it might well be
9 or commonly would be an insulator. That wouldn't
10 surprise me.

11 BY MR. TONG:

12 Q Let me direct you to column 7, line 16, and
13 see if that helps you at all.

14 A Yeah, I'm not sure I have -- I'm not sure I
15 have Kwak. We have three exhibits.

16 Q Let me introduce that as an exhibit, then.

17 A Okay. Thank you.

18 Q I'm marking as Exhibit Number 4 the Kwak
19 reference which is filed in this IPR as Exhibit 1005.
20 Dr. Neikirk, when you have a moment, please open it
21 up and turn to column 7, line 16.

22 A Okay. I have Kwak open now. And I'm sorry;
23 it was column 7 you were referring me to?

24 Q Correct.

25 A Okay. Let me get there. We're discussing

1 layer -- or the -- the -- we're discussing 160. So
2 in Kwak, he says, "An interlayer 160, which can be a
3 single layer or a double-layered structure, is formed
4 of a material such as SiO₂ or SiN_x."

5 So actually, in Kwak, even 160 is described
6 as being either single- or double-layered. The
7 example materials he gives there are insulators:
8 silicon dioxide and silicon nitride.

9 Q And silicon oxide and silicon nitride are not
10 metals; correct?

11 A No, they are not.

12 Q In paragraph 95 of your declaration, you had
13 colored several of these layers in blue;
14 specifically, layers 120, 140 and 160 in Figure 2D.
15 Do you see that?

16 A Yes, I do. Sorry.

17 Q Why did you exclude the metal layer 300 from
18 being blue?

19 A Well, in this paragraph, I was discussing
20 what Kwak discloses in terms of things that would
21 meet the requirement of the claim for a predetermined
22 material layer formed on the first substrate. And as
23 we just went over, that's the regions in which I
24 identified possible -- or teachings that meet this.

25 The metal itself -- actually, I don't think

1 that there is anything in the '801, since it says
2 that this comprises and in column -- in limitation 5,
3 it says it can comprise a metal electrode layer.

4 So I suppose 300 could have been included;
5 but to meet this claim limitation, based on the
6 teachings of Kwak, I didn't need it. It teaches it
7 in multiple ways, even without it.

8 Q Would you agree that in each of these
9 figures: 2D, 3A, 3B, and 4A, the layer 180 is formed
10 directly on the interlayer 160?

11 MR. LONEY: Objection. Form.

12 THE DEPONENT: Well, so certainly as
13 illustrated, I see that 180 appears to directly touch
14 160, yes.

15 BY MR. TONG:

16 Q And in Figures 3A, 3B and 4A, the layer 180
17 can also be said to be formed directly on the metal
18 300; is that right?

19 UNIDENTIFIED SPEAKER: Section 4.

20 THE DEPONENT: So again, as drawn there, it
21 certainly appears that 180 is directly touching 300.
22 And I'd have to go back and see. 300 itself is
23 described as a driving power supply line in Kwak. I
24 was just looking to see if it identifies material or
25 materials.

1 And to be clear, 300 itself, in column 8,
2 line 49, indicates that line 300 can include one or
3 more conductive layers -- plural -- so that 180
4 directly touches at least one of potentially multiple
5 conductive layers making up 300. It -- it -- I would
6 agree it does.

7 BY MR. TONG:

8 Q And in Figures 2D, 3A, 3B and 4A, you would
9 agree that 180 does not directly touch the
10 gate-insulating layer 140; is that right?

11 MR. LONEY: Objection. Form.

12 THE DEPONENT: 140. So give me a moment
13 while I look at what Kwak teaches about those
14 numbers.

15 So I'm just looking to see. Certainly as
16 drawn, I would agree -- I believe you asked about 180
17 and whether it directly touches 140. I'm sorry; was
18 that not the question?

19 BY MR. TONG:

20 Q That's right.

21 A Okay. As drawn, I would agree with that. I
22 was just looking: 140 in Kwak is described as being
23 SiO₂ in column 7 at line 12, for instance.

24 160 -- I think we -- is referred to as being
25 an interlayer, and I'm trying to remember whether

1 it's the material -- well, yes, it is.

2 So in column 7, lines -- I think it's, 16
3 through 17 -- it indicates that that interlayer may
4 also be SiO₂.

5 Without going through all the cross sections,
6 I can't say with certainty that these weren't
7 deposited in one step, that they are indicating
8 distinctive regions having different purposes, for
9 sure.

10 BY MR. TONG:

11 Q In --

12 A As -- as drawn, I agree with you that 180 is
13 not shown directly touching 140. It's just I'm not
14 sure that in the process steps, because I don't
15 believe -- Kwak gives only one process step, it might
16 well be possible to deposit a single SiO₂ layer that
17 would constitute -- that would comprise 140 and 160.

18 Q If we look at Figures 2D and 4A on page 56 of
19 your report, do you see that there is a metal -- I --
20 I guess that power supply line 300 that is sitting on
21 the gate-insulating layer 140?

22 A Yes, I see that.

23 Q And in order to deposit or create that power
24 supply line 300 that is sitting on top of
25 gate-insulating layer 140, we would need to

1 separately fabricate or deposit interlayer 160 from
2 interlayer -- or from the gate-insulating layer 140;
3 is that correct?

4 **A For Figure --**

5 MR. LONEY: Objection to form.

6 THE DEPONENT: Excuse me. For figures 2D and
7 4A, I think that is a reasonable inference, yes.

8 BY MR. TONG:

9 Q Do any of -- strike that.

10 You did not provide any opinions that meet
11 both of the following criteria: First, "formed on"
12 means formed directly on; and, number two, "layer"
13 precludes an interpretation where you can take
14 multiple layers and call them one layer; is that
15 correct?

16 MR. LONEY: Objection. Form.

17 THE DEPONENT: I -- I'm sorry; I really
18 didn't understand the question. Could you either
19 repeat it or rephrase?

20 BY MR. TONG:

21 Q Yes. Let me try the opposite of that.

22 **A Okay.**

23 Q Your opinions rely on what you believe to be
24 the proper interpretation or construction of at
25 least, one of the phrase: "formed on" or "layer";

1 correct?

2 MR. LONEY: Objection. Form.

3 THE DEPONENT: So I -- I -- I'm not sure that
4 all of my opinions in the entirety of my declaration
5 depend on that. If -- are -- are you asking about
6 what I've set forth here in 9b, to be a little bit
7 more specific so I can think about this?

8 BY MR. TONG:

9 Q Yes. In 9b and the example Figures 2D, 3A,
10 3B and 4A that we have looked at.

11 A Okay. And -- and -- so now, if you would
12 repeat the question one more time. I know
13 specifically which opinion we're -- you're asking
14 about. Go ahead. I'm sorry.

15 Q All of these rely on at least one of what you
16 believe to be the correct construction of either
17 "formed on" or "layer"; correct?

18 A I --

19 MR. LONEY: Objection to form.

20 THE DEPONENT: I believe that is correct
21 because in the -- the -- I -- I -- I went through the
22 material layer here, "formed on." And I explained
23 that Kwak teaches multiple different things that, in
24 my opinion, would all satisfy this claim limitation.
25 And I believe one of those combinations, I

1 was applying what I believe is the correct
2 construction for a layer, which involved, for
3 instance, Figure 2D and all of 120, 140 and 160.

4 There was at least one other that I presented
5 to you: for instance, just 160 standing on its own.
6 That would be only one material layer; but I believe
7 that that still satisfies "formed on," even though
8 it's not in direct contact with substrate 110.

9 BY MR. TONG:

10 Q Do you have -- have you read the Kwak
11 reference in its entirety?

12 A I believe I have.

13 Q At a high level, could you describe what Kwak
14 discloses as being what Kwak considers to be
15 inventive?

16 MR. LONEY: Objection. Form.

17 THE DEPONENT: I -- I would have -- let me --
18 let me go back to the Kwak reference.

19 There is a great many things Kwak teaches.
20 Let's see. I just am quoting from Kwak, column 2.
21 It looks like lines 50 -- 53 through 56. Under
22 "Summary of the Invention," it states, "The present
23 invention provides a display, and more particularly,
24 an organic electroluminescent flat panel display, in
25 which a panel, parenthesis, substrate, close

1 parenthesis, size is reduced and a sealing function
2 is simultaneously improved."

3 Now, certainly my recollection of Kwak is
4 that many of his teachings are clearly directed to
5 those issues.

6 The next paragraph talks about sealing
7 portions. Clearly, much of it is directed to that.

8 Without going back through the whole thing
9 again, I wouldn't wish to state that there were no
10 other portions of it that he viewed as inventive,
11 inasmuch as a claim in its entirety, I think, is
12 viewed as inventive. All of those aspects and the
13 combination provided, I would take to be inventive.

14 BY MR. TONG:

15 Q Is it your understanding that a PHOSITA would
16 have believed that Kwak's design suffered from
17 sealing problems?

18 MR. LONEY: Objection. Form.

19 THE DEPONENT: Well, Kwak's design is to try
20 to improve the sealing function. That there might
21 not be -- or that there might be other changes that
22 potentially could improve it in a similar manner,
23 improve it more, I wouldn't preclude that.

24 BY MR. TONG:

25 Q In your opinion, would a PHOSITA have

1 understood that Kwak's designs would have resolved
2 sealing problems?

3 A Well, I -- I haven't formulated an opinion
4 directly about whether Kwak solves all sealing
5 problems. I certainly haven't put that forward, nor
6 would I expect the POSITA to conclude that. That it
7 presents things that, in Kwak's wording, provides a
8 sealing function that is improved, I believe that's
9 what Kwak says, and I think that one of ordinary
10 skill would understand that.

11 Now, I wouldn't conclude that one of ordinary
12 skill would necessarily never consider looking beyond
13 Kwak. In particular, I have grounds 3, 4 and 5,
14 where I have put forward what I believe is a
15 motivation to combine other references with Kwak.

16 Clearly, I don't believe that a POSITA would
17 conclude that Kwak is the last word and there would
18 never be any reason to look to any other reference.

19 Q Could we turn to paragraph 145 of your
20 declaration?

21 A Okay. I'm at paragraph 145. I believe it's
22 on page 80. Make sure we're at the same page.

23 Q That's right.

24 A Okay. I have it in front of me.

25 Q And this begins, "Kwak teaches angled

1 openings in the sealant region to increase the
2 contact area between the sealant and the various
3 layers, thus increasing the bond strength and
4 improving reliability by preventing moisture
5 infiltration." Do you see that?

6 **A I do.**

7 Q And do you see the next sentence says, "Kwak
8 explains adhesion can be improved by implementing one
9 or more holes that extend through the organic
10 protective layer to the underlying inorganic layer."
11 Do you see that?

12 **A I do.**

13 Q Given Kwak's teaching, do you think it would
14 be obvious that if a PHOSITA wanted to increase the
15 bond strength of the seal, that they would just
16 increase the contact area by making the opening
17 wider?

18 **A Well, so by "increasing the opening area" --**
19 **I'm sorry. You -- your hypothetical was by making**
20 **the opening wider and nothing else? I'm trying to**
21 **understand the hypothetical.**

22 Q Let me -- let's go back to Figure 2D that we
23 were looking at so I can -- this is on page 56.

24 **A Okay. I have -- I have -- I've got that**
25 **open, as well.**

1 Q So do you see the opening between the two
2 structures 180?

3 A So the -- the thing that sort of looks like a
4 triangle with the bottom cut off or whatever. I
5 think I understand what you're saying.

6 Q Yeah, in fact, let's start at page 59. I
7 think you explicitly show that in dark purple.

8 A I do. Yes, yes. I understand what you're
9 pointing to.

10 Q So I'm going to refer that to the opening,
11 that part in dark purple. Can we understand that?

12 A Okay. And I -- I believe that Kwak may have
13 actually given that a number, "811," and a name, "a
14 via hole," yes.

15 Q We can call it a via hole.

16 A Okay. Fine.

17 Q Do you think it would be obvious that if a
18 PHOSITA wanted to increase the sealing strength, that
19 they could just make that via hole wider, such that
20 the contact area in the via hole with 160 is
21 increased?

22 MR. LONEY: Objection. Form.

23 THE DEPONENT: So in my paragraph 145, I
24 actually identify that that is -- let's see. I even
25 make -- point specifically -- oh, that quotation is

1 from column 10, lines 50 to 53 in Kwak.

2 But if you look at my paragraph 145, last
3 sentence on page 80, it said exactly that. "Widening
4 and/or deepening increases adhesive strength."

5 So that is an effect that relates, in that
6 case, to increasing the contact area to the
7 inorganic. That would be true.

8 Obviously if you make that too big, then at
9 some point, the organic begins to disappear
10 completely.

11 BY MR. TONG:

12 Q Do you have any evidence that Kwak's designs
13 suffered from sealing problems and moisture
14 intrusion?

15 MR. LONEY: Objection. Form.

16 THE DEPONENT: Well, I think Kwak's invention
17 related to trying to improve that, which suggests
18 that if one of ordinary skill saw a combination that
19 could further improve it, beyond the shapes, for
20 instance, given in Kwak, they would be motivated to
21 do it.

22 BY MR. TONG:

23 Q I'd like to turn to paragraph 111 in your
24 declaration.

25 A Okay. I'm at paragraph 111.

1 Q And I just want to confirm something that you
2 said earlier. Do you see that at the end of
3 paragraph 111, it cites to Yamazaki?

4 A Yes, I see that.

5 Q And paragraph 111 is part of ground 2, which
6 you can see on page 61, which is "Obviousness [as
7 stated] Over Kwak."

8 A Yes.

9 Q Okay. In paragraph 111, can you confirm that
10 you are not proposing to modify the design or
11 teachings of Kwak, in view of any technique that is
12 disclosed in Yamakazi -- sorry. Yamazaki.

13 A Yes, I would agree with that. I am not
14 proposing that this is a combination where there are
15 teachings directly from Yamazaki that would be
16 incorporated into Kwak. I pointed to Yamazaki there
17 merely as a general indication of things known to one
18 of ordinary skill.

19 Q Okay. And similar question for paragraph
20 112. Do you see that paragraph 112 mentions the
21 Vaganov, Sasagawa and Kim prior-art references?

22 A I do.

23 Q And can you confirm that you are only relying
24 on these references for an indication of the ordinary
25 skill of a PHOSITA and that you are not relying on

1 these to propose a modification to the teachings of
2 Kwak?

3 MR. LONEY: Objection. Form.

4 THE DEPONENT: For ground 2, and this
5 paragraph is in ground 2 discussion, yes, I confirm
6 that.

7 BY MR. TONG:

8 Q And the same question for paragraph 113 which
9 mentions Vaganov. Can you confirm that you are
10 relying on Vaganov, in this paragraph, only as
11 evidence of the ordinary skill of the PHOSITA and not
12 to propose a modification to the teachings of Kwak?

13 A Yes, I would -- I confirm that, in this
14 ground 2 discussion, I am not formally combining with
15 Vaganov. There is another ground for that, but not
16 here.

17 Q Okay. And if we scroll down a little bit
18 more, past claim 10, and we go to paragraph 116, do
19 you see that, again, this paragraph mentions Vaganov,
20 Kim and Yamazaki?

21 A Yes, I see that.

22 Q And can we confirm that in this paragraph,
23 you are relying on these references only as evidence
24 of the ordinary skill of a PHOSITA and not to propose
25 a modification to the teachings of Kwak?

1 **A Yes, I confirm that.**

2 Q And a similar question for paragraph 118.
3 Here, do you see that this paragraph mentions the
4 Vaganov and Miyoshi references and the Tanaka
5 reference?

6 **A Yes, I do see that.**

7 Q And can we confirm that in this paragraph,
8 you are relying on these references only as evidence
9 of the ordinary skill of a PHOSITA and not to propose
10 a modification to the teachings of Kwak?

11 **A Yes, I do confirm that.**

12 Q Okay. And if we scroll down to paragraph 137
13 in the same ground.

14 **A Yes, I have paragraph 137 in front of me.**

15 Q At the very end of this paragraph, you again
16 refer to Vaganov, Kim and Yamazaki. Do you see that?

17 **A I do.**

18 Q And can we similarly confirm that in
19 paragraph 137, you are relying on these references
20 only as evidence of the ordinary skill of a PHOSITA
21 and not to propose a modification to the teachings of
22 Kwak?

23 **A So, yes, certainly here, that is correct.**

24 **I would note that at the very end of that**
25 **paragraph, I pointed to grounds 3 through 5, which**

1 involve those same three references. There, I point
2 to specific combinations; but here, these are
3 indicative of what I believe one of ordinary skill
4 would know from the art.

5 Q What is a wafer?

6 MR. LONEY: Objection. Form.

7 THE DEPONENT: Again, a term that is quite
8 sensitive to context. In different situations,
9 people refer to very different objects as being a
10 wafer.

11 In a very generalized sense, it is an object
12 which frequently is used to support the fabrication
13 of other -- of devices of many, many types.

14 BY MR. TONG:

15 Q If we look at the Kwak reference -- well, we
16 -- we can turn, for example, to Figure 2D. It's in
17 your declaration. We -- we could go back, for
18 example, to page 56.

19 A Yes, I have 56 open.

20 Q And the bottom -- the bottom element 110 that
21 is shaded in red, that's a substrate; right?

22 A So that is, in the claim of the '801, the
23 portion -- the teaching of Kwak that, in my opinion,
24 corresponds to substrate.

25 Kwak itself uses -- for 110, I was going to

1 to look in Kwak itself to see what word choice.

2 Kwak also calls 110 a substrate. So yes, I
3 think it's fair to use that word.

4 Q And a wafer may very well serve as a
5 substrate; right?

6 MR. LONEY: Objection. Form.

7 THE DEPONENT: So in some contexts, a wafer
8 might correspond to a claimed substrate. In other
9 contexts, it might not.

10 BY MR. TONG:

11 Q And in Figure 2D, as we're looking at, on
12 page 56 of your declaration, you had labeled "Buffer
13 Layer 120." Do you see that?

14 A I do.

15 Q Would a buffer layer usually be a wafer?

16 A Again, depending on how it's used. I have
17 seen situations where it was quite clear that the
18 word "wafer" included multiple layers.

19 I've seen other situations where it clearly
20 excluded them and situations where it might or might
21 not be multiple layers. So depends on the context.

22 Q What about interlayer 160? Would that be a
23 wafer?

24 MR. LONEY: Objection. Form.

25 THE DEPONENT: So, again, I have seen

1 situations where the word "wafer" was used to
2 describe a multi-layer situation in which 160,
3 perhaps, would have been included in that context as
4 part of a wafer. I have seen other situations where
5 it would not.

6 Context-sensitive, I couldn't say based on
7 the context of the '801, which I don't think talks
8 about wafers. Kwak certainly, I'm pretty confident,
9 doesn't talk about wafers.

10 BY MR. TONG:

11 Q Do you know what wafer-to-wafer bonding is?

12 A I do.

13 Q What is wafer-to-wafer bonding?

14 A Well, in wafer-to-wafer bonding, you're
15 usually talking about taking two objects and finding
16 a way of having those two objects attach to one
17 other, to become mechanically attached.

18 If it's referred to as wafer bonding, then,
19 again, subject to context, I would expect it refers
20 -- well, no. I don't know what else it refers to.
21 It's a very broad term.

22 Q And those two objects that would be attached
23 to one another, in the context of wafer-to-wafer
24 bonding, those would be wafers; right?

25 A Again, if it's called wafer-to-wafer bonding,

1 then it's called wafer-to-wafer bonding.

2 The use of the term "wafer" in a claim or a
3 patent, I would look to the context to try to
4 understand what was being included in that,
5 whether -- there might be another context where
6 different words were selected, yeah, I can easily
7 imagine that. I've seen examples of that.

8 Q I'd like to turn your attention to page 85 of
9 your declaration. This has the heading toward the
10 bottom "Ground 4."

11 A Yes.

12 Q And this section is "Kwak in View of Kim."
13 Do you see that?

14 A I do.

15 Q And if we turn to paragraph 158 shortly
16 thereafter. Let me know when you're there.

17 A I'm at paragraph 158.

18 Q It begins, "A POSITA would have been
19 motivated to implement Kwak using the methods of Kim,
20 at least as they pertain to Kim's methods for
21 creating an opening in the organic layer at specific
22 angles." Do you see that part of the first sentence?

23 A I do.

24 Q And in fact, the first sentence goes on, and
25 it ends with a period. And there is no particular

1 citation to any part of -- any passage of Kim at the
2 end of this sentence. Do you see that?

3 A Are we -- you're still asking about the very
4 first sentence of paragraph 158?

5 Q Yes.

6 A Yes, there is no cite -- specific citation
7 there.

8 Q You mean --

9 A This is a general discretion -- discussion of
10 motivation on bonds. So no, there is no specific
11 site.

12 Q So when you use the phrase "the methods of
13 Kim," what disclosure in Kim are you referring to
14 here?

15 A Well, that would be discussed, if we look
16 forward in my declaration -- let me look here. So
17 for instance, in paragraph 161, I have specific cites
18 to Kim that identifies specific angles.

19 And that's what I'm discussing in "motivation
20 to bind" that Kim discusses angles, which I have
21 earlier agreed that Kwak and explicit disclosures
22 shows an angle but doesn't put a number to it.

23 Let's see -- find other.

24 In paragraph 164, I point to a specific Kim
25 -- identification of a particular material, which I

1 simply pointed out is similar or of the same kind of
2 organic classes like Kwak uses but a bit more
3 specific -- let's see.

4 No, I think those are examples of specific
5 references -- or references to specific parts of Kim
6 that I believe one of ordinary skill would have been
7 motivated to look to.

8 Q Okay. I just want to clarify which parts of
9 Kim are we looking to? Can you give me any type of
10 citation to a particular paragraph or column of Kim?

11 MR. LONEY: Objection. Form.

12 THE DEPONENT: I -- I think -- I tried to
13 just do that; but if you would -- could you put Kim
14 in front of me, please?

15 BY MR. TONG:

16 Q I certainly can.

17 A Thank you.

18 Q Give me one moment. I am now uploading what
19 is being marked as Exhibit 5. This is Exhibit 1008,
20 from the IPR filings. It is U.S. Patent Number 2 --
21 Patent Publication Number 200300076452 to Kim.

22 A If you will give me just one moment while it
23 downloads.

24 I -- I have -- I have Kim open in front of
25 me, and I think I pointed a few moments ago to par --

1 in my declaration to paragraph 161.

2 And let me take a -- take my -- specifically
3 citations that I referenced there, let's see. I
4 think I have reference -- let me find these. There
5 are several given in my paragraph 161. I have just
6 got to find these in Kim directly.

7 So the first of those citations, for
8 instance, is to paragraph 10; and if you look in
9 paragraph 10, the last sentence towards the end, it
10 talks about "wall of the organic insulating layer
11 defining the contact holes bearing an inclination
12 angle of about 30 to 60 degrees." So there is
13 discussion specifically about insulating layers and a
14 specific, let's call it, taper to the sidewall of the
15 holes.

16 The next specific cite I made was to
17 paragraph 72. And if we skip forward to 72, 72
18 discusses an organic insulating layer and talks about
19 a reflow, temperatures for doing that. There is a
20 reference to Figure 9.

21 Let me see if this particular paragraph ends
22 up giving -- yes, at the very end of paragraph 72,
23 which again makes reference to sidewall or -- of
24 organic insulating layer 75 at the contact area bears
25 a tapering structure with an inclination angle of 30

1 to 60.

2 That paragraph 72 is even -- is identifying,
3 I believe, a process that could be used to help
4 produce such an angle, in particular the reflow.

5 Paragraph 106 is the next cite. If we go to
6 paragraph 106, again discussion of this organic
7 insulating layer 75 and talking about how the
8 sidewall of that layer then ends up with a tapering
9 structure with an inclination of 30 to 60 degrees. I
10 think my -- that was 106.

11 I also pointed to 119. And, again, talks
12 about some processes that could be followed, leading
13 to this tapering angle of 30 to 60 degrees.

14 I also referenced claim 20. So there is at
15 least one claim that is specific to claiming contact
16 holes with an inclination degree of 30 to 60 degrees.

17 So one of ordinary skill, as I have explained
18 earlier, would be motivated to look beyond Kwak,
19 would be motivated to look to Kim, seeing actual
20 angles and indications of techniques or processes
21 that could be followed to produce those angles.

22 Q And -- and just to clarify, these paragraphs
23 and the claim that you had mentioned in your previous
24 answer, these are the parts of Kim that provide a
25 technique that could be used to modify Kwak; is that

1 correct?

2 A Well, they are certainly indications of that.
3 Let's see. In paragraph 164, there is reference to
4 materials used. That's paragraph 62 is what I cited
5 to specifically. Let me go to that.

6 And in paragraph 62, it talks about the
7 contact hole in layer 72, 74, 76, 78 being this 30 to
8 60 degrees. It indicates that the boundaries of an
9 organic insulating 75 outline contact holes and so
10 on.

11 So, again, indicating materials, including
12 organic materials, and methods that could be used to
13 produce tapered sidewalls.

14 Q Okay. So, again, going back to that sentence
15 in paragraph 158 of your declaration, where you refer
16 to "using the methods of Kim," but you did not
17 provide a citation in paragraph 158.

18 A No, I didn't, because I present -- presented
19 it when I was talking about claim elements in
20 paragraph 161.

21 Q Okay. So to know what methods of Kim you're
22 refer -- would be used, those -- the -- a PHOSITA
23 would be able to look at the parts of Kim that you
24 cited in paragraph 161; is that correct?

25 MR. LONEY: Objection. Form.

1 THE DEPONENT: Well, certainly those are
2 specific examples. One of ordinary skill is assumed
3 to be aware of the entirety of the art, I believe.
4 They would read the entirety. Not just those
5 paragraphs in isolation.

6 But I pointed to those as more specific
7 examples of teachings within Kim.

8 BY MR. TONG:

9 Q Okay. Other than what is explicitly cited in
10 paragraph 161 of Kim, do you believe that there are
11 any other methods in Kim that are disclosed that a
12 PHOSITA would have used to modify Kwak?

13 MR. LONEY: Objection. Form.

14 THE DEPONENT: Well, I certainly believe a
15 POSITA would look to the figures. Figure 9, as an
16 example. Figure 11, Figure 12.

17 Sorry. I'm going through all the figures.
18 There are a large number of figures in Kim.

19 So I believe in understanding Kim, a person
20 of ordinary skill would certainly look to Figure 20.
21 They would look to Figure 21A which helps illustrate
22 -- or does illustrate different sidewalls. 21B, 23,
23 24B, all of these. Figure 27.

24 And then within the written descriptions,
25 certainly what I just pointed you to, other portions

1 of the written description --

2 BY MR. TONG:

3 Q Sorry. Let me narrow my question so you
4 don't have to read the whole thing.

5 Is there anywhere else in your declaration in
6 ground 4 where you cite to the methods of Kim that
7 you intend to refer to in paragraph 158?

8 MR. LONEY: Objection. Form.

9 THE DEPONENT: So I already pointed you to
10 references in paragraph 161. Pointed you to
11 references -- or a reference in paragraph 164. And
12 if we look in paragraph 157, you'll see on page 86 of
13 my declaration, it says, "See e.g." So, "See, for
14 example, Exhibit 1008." Well, that's Kim.

15 And I give you paragraph 10, paragraphs 55
16 through 65, paragraph 72, paragraph 106, paragraph
17 119, Figures 3, 9, 11, 12 and 21A.

18 Subsequent to that, I point to also Kim,
19 paragraph 62, which actually is already included in
20 that; paragraph 74; paragraph 85.

21 So those are the direct citations regarding
22 Kim in this -- in my ground about the combination of
23 Kim in -- of Kwak in view of Kim.

24 BY MR. TONG:

25 Q Okay. Now, we've been going for a little

1 over an hour. Would you like to take a short break
2 right now?

3 **A If now is a good time for you, that would be**
4 **fine.**

5 MR. TONG: All right. Let's go off the
6 record.

7 THE VIDEOGRAPHER: Off the record at 1:45
8 p.m.

9 (Off the record.)

10 THE VIDEOGRAPHER: We are back on the record
11 at 1:56 p.m.

12 BY MR. TONG:

13 Q Dr. Neikirk, during the break, did you speak
14 at all with your counsel?

15 **A I did not.**

16 Q I would like to introduce the next exhibit
17 which is going to be the Zhang reference. I am
18 marking as Exhibit Number 6 the Zhang reference which
19 was filed in the IPR as Exhibit 1006. This includes
20 both the translation and the original.

21 Dr. Neikirk, when you have it open, could you
22 please let me know?

23 **A And I do have the document, and I do have it**
24 **open.**

25 Q Okay. Could you please turn to what is

1 stamped on the bottom right-hand corner as page 5?

2 A Okay. And just to confirm, so below the
3 Bates number, I have page 5 and the -- along the top,
4 it says "page 1 of 8."

5 Q That is correct.

6 A Okay.

7 Q I will be referring to the page numbers at
8 the bottom right-hand corner --

9 A Okay.

10 Q -- of this document.

11 A I understand.

12 Q And do you see Section 2 is titled
13 "Background Art"?

14 A I do see that.

15 Q And in the second and third paragraphs of the
16 "Background Art" disclosure, it refers to Figure 1A
17 and then it refers to Figure 1B. Do you see that?

18 A I do.

19 Q And it's your understanding now, at least,
20 that these are considered background technologies, at
21 least as described by Zhang?

22 A Yes.

23 Q Okay. And if we turn to the next page, which
24 is numbered page 6 in the bottom right-hand corner --

25 A I am there.

1 Q -- do you see in the third paragraph, begins
2 with "Refer to Figure 2A"?

3 A I do see that.

4 Q And it continues, "Which is a side view of a
5 conventional reflective liquid crystal display
6 panel." Do you see that?

7 A I do.

8 Q So it's also your understanding that 2A shows
9 what is a conventional or background technology, at
10 least as characterized by Zhang; is that right?

11 A Yes.

12 Q Will you turn to page 7? Again, as numbered
13 in the bottom right-hand corner.

14 A I have page 7 in front of me.

15 Q The first paragraph begins with, "Figure 2B
16 is a side view of another conventional reflective
17 liquid crystal display panel." Do you see that?

18 A I do.

19 Q And so this is yet another background or
20 conventional technology that is being described by
21 Zhang; is that right?

22 A As characterized by Zhang, yes, it is.

23 Q Okay. And if you'll read along with me,
24 toward the very bottom paragraph, on page 7, it says,
25 "However, the bonding strength of the assembled

1 liquid crystal display panels 100, 200A and 200B is
2 insufficient. During reliability tests or drop
3 tests, the panels are prone to developing cracks at
4 the contact interface between the TFT substrate and
5 the CF substrate due to impact or vibrational forces.
6 This results in damage to the display panel,
7 significantly affecting the quality of the display
8 panel." Do you see that?

9 A I do.

10 Q Okay. And it's your understanding that this
11 description applies to the technology disclosed in
12 the "Background Art" section; correct?

13 A I would certainly read this as an indication
14 that the structures described as conventional may not
15 be adequate; and in particular, the ones that they
16 tested were not. To use Zhang's words, the bonding
17 strength was insufficient. Yes.

18 Q And if we turn to the next page, which is
19 page 8 of Zhang, again, to the bottom right stamped
20 page number?

21 A Yeah.

22 Q Do you see toward the top there is Section 3
23 which is "Summary of the Invention"?

24 A Yes, I see that.

25 Q And is it your understanding that from

1 paragraph 3, onward, Zhang teaches several
2 embodiments that overcome the deficiencies that we
3 had previously read?

4 MR. LONEY: Objection. Form.

5 THE DEPONENT: Well, I would certainly agree
6 that Zhang is presenting. He says specifically,
7 "Increasing contact area of the frame adhesive, more
8 frame adhesive can penetrate into grooves or opening,
9 thereby increasing bonding strength."

10 So yes, he's teaching modifications that one
11 might consider to the -- what he characterized as
12 conventional, that can provide improvement, yes.

13 BY MR. TONG:

14 Q And if you will turn to Figure 3B of Zhang
15 for me.

16 A I have Figure 3B in front of me.

17 Q In Figure 3B, do you see the layer 380a?

18 A I do see 380a.

19 Q Do you have an understanding of whether 380a
20 is disclosed in Zhang to be an organic material or an
21 inorganic material?

22 MR. LONEY: Objection. Form.

23 THE DEPONENT: So I believe 380a is
24 repeatedly referenced, and let me check.

25 So first of all, this figure -- and I'm

1 sorry; you wanted to look at Figure 3B; correct?

2 BY MR. TONG:

3 Q That is right.

4 A Okay. So give me just a moment to find --
5 I'm sorry. Give me just a moment while I split the
6 screen on this document because I want to look at
7 figures and text at the same time.

8 I think this is Figure 3B, which I do have
9 discussion of in my declaration at pages 96 and 97.
10 Your question was specifically layer 308a?

11 Q 380a.

12 A I'm sorry. My apologies. 380a. I did -- I
13 misspoke. Let me find the citations. So 380a.

14 It just takes me a moment because there are
15 many references in Zhang to 380a of different
16 sublayers. 380a is frequently described as being
17 made of more than one layer and, for Figure 3B, which
18 I believe is the one you referenced me to, if we look
19 on page 10, the second paragraph, it identifies, in
20 the second sentence, that second covering layer 380a
21 consists of four layers in total: the first metal
22 layer, dielectric layer, second metal layer and
23 protective layer.

24 The protective layer -- let's see. That
25 doesn't give sub-numbers for those layers.

1 As I discussed in my paragraph 187 in my
2 declaration, I pointed back -- so in the discussion
3 of Figure 2A, there is a protective layer 224 and
4 photoresist layer 225B.

5 Inasmuch as Zhang discusses 380a as
6 containing a protective layer, as I stated in my
7 paragraph 187 in my declaration, I believe there is a
8 disclosure where it renders obvious that that 225B
9 could be included -- or would be included in 380a.

10 So 380a is multiple layers, of which, in my
11 opinion, Zhang either -- he teaches or renders
12 obvious that one of those is an organic photoresist
13 layer.

14 Q Is a metal an organic photoresist layer?

15 A No.

16 Q What about silicon dioxide? Is that an
17 organic photoresist material?

18 A No.

19 Q And what about silicon nitride? Is that an
20 organic photoresist material?

21 A No. I'm sorry. Silicon nitride, no, no,
22 it's not.

23 Q If we turn to Zhang -- sorry. Strike that.

24 If we turn to paragraph 187 in your
25 declaration, you said you believe there is a

1 disclosure where it renders obvious that 225 could be
2 included or would be included in 380a.

3 A Yes.

4 Q Where is that disclosure?

5 A So Zhang discusses the -- in the conventional
6 section; and just because it's labeled "convention"
7 -- "conventional" doesn't mean it's not a teaching.

8 It teaches that a photoresist layer is used
9 in reflective LCD panels or -- and here, in this
10 discussion of Figure 3B for second covering layer
11 380a, it identifies that it's made of multiple
12 layers; and for a reflective TFT, that would, as
13 taught earlier, include photoresist layer 225B.

14 Q Is there a page of Zhang that is informing
15 that opinion?

16 A Well, there are several places in Zhang. We
17 were just discussing the discussion of Figure 3B,
18 which is on page 10, but I would include the entire
19 section about first embodiment, as well as the
20 discussions related to layer 225B. Well, 225B is
21 discussed on page 7, for instance. Page 7. Give me
22 just a moment.

23 I think I mentioned page 7.

24 Pages 6 and 7. Layer 225A is identified on
25 page 6. 225B on page 7. Both -- 225A is there on

1 page 6. And 225B, also identified as being
2 photoresist on page 7. The associated figures for
3 those would be Figure -- certainly Figure 2B. I
4 think Figures 2A and 2B, but 2B.

5 So all of those are portions of Zhang that
6 relate to this specific topic.

7 Q Is it your understanding that Zhang
8 explicitly discloses that material 380a in Figure 3B
9 is an organic photoresist material?

10 A Give me just one moment. Exhibit 106.

11 In my declaration, this is discussed at --
12 well, some of the discussion. It's all broadly, I
13 think, under section -- or Heading 4, element 9c; but
14 if we look to paragraph 188, there is a citation
15 there in Zhang, Zhang's Exhibit 1006. And the
16 citation is -- I believe that's to page 8. Let me
17 check and --

18 Oh, there is another cite plug. Pages 8 to
19 9. And that's -- really I was looking to pages 8 and
20 9.

21 And yes, for a reflective system, Zhang
22 teaches that there should be photoresist there. He
23 teach -- Zhang teaches that 380a can be multiple
24 layers; and for a reflective system, there would be a
25 photoresist layer.

1 It's not drawn in Figure 3B; but in its
2 earlier discussion of reflective systems, it
3 explicitly discloses the use of a photoresist layer
4 as part of 380a.

5 That particular topic is discussed in my
6 paragraph 189.

7 So, yes, it is my opinion that in these
8 paragraphs -- so paragraph 187 through 192, there is
9 discussion and citations to Zhang that indicate the
10 explicit disclosure of a photoresist layer; and in
11 paragraph 192, pointing out that, to the extent it's
12 not explicitly disclosed, it's obvious.

13 Q Sorry. Your answer was kind of long and
14 covered a lot of points.

15 A Yeah. My apologies. Would you repeat the
16 question? I'll try to be more --

17 Q Yes.

18 A -- specific.

19 Q Is it your understanding that Zhang
20 explicitly discloses that material 380a in Figure 3B
21 is an organic photoresist material?

22 MR. LONEY: Objection. Form.

23 THE DEPONENT: Not the entirety of 380a. The
24 entirety is not photoresist. No, that's not my
25 understanding.

1 BY MR. TONG:

2 Q Is it your understanding that Zhang
3 explicitly discloses that a part of 380a in Figure 3B
4 is an organic photoresist material?

5 A So it is my opinion that he does disclose
6 that or renders it obvious, as I have discussed in
7 paragraphs 186 through 192 in my declaration.

8 Q Okay. I want to make sure that I accurately
9 understand your answer. The question was solely
10 about explicit disclosure and not about obviousness.

11 So with that clarification, is it your
12 understanding that Zhang explicitly discloses that a
13 part of 380a in Figure 3B is an organic photoresist
14 material?

15 MR. LONEY: Objection. Form.

16 THE DEPONENT: So given Zhang's teachings
17 about the use of photoresist, yes, I believe there is
18 sufficient teaching there. So this would be
19 paragraphs 187 through 191. And this is in view of
20 the POSITA's knowledge, so it's still -- this ground,
21 to be clear, is an obviousness ground, not an
22 anticipation ground.

23 So as I've stated in paragraph 187, this does
24 depend on the knowledge of one of ordinary skill
25 looking at the entirety of these disclosures from

1 Zhang, but Zhang does explicitly disclose the use of
2 photoresist, and I believe one of ordinary skill
3 would understand that to include the use of
4 photoresist as part of layer 380a.

5 BY MR. TONG:

6 Q Would it surprise you if Zhang explicitly
7 taught that 380a did not consist of organic
8 photoresist materials?

9 A Well, I believe Zhang presents a number of
10 different possibilities for 380a, and it wouldn't
11 surprise me if some of those didn't include
12 photoresist.

13 Q Would it surprise you if the board ruled that
14 380a was not explicitly disclosed to include a
15 organic photoresist material?

16 MR. LONEY: Objection. Form.

17 THE DEPONENT: I -- I wouldn't have -- I
18 don't -- I don't know what the board has said or what
19 their analysis is, so I don't know whether I would be
20 surprised or not.

21 BY MR. TONG:

22 Q Is it your opinion that the -- if Zhang does
23 not teach that 380a includes an organic photoresist
24 material, that it would be obvious to modify 380a to
25 include an organic photoresist material?

1 MR. LONEY: Objection. Form.

2 THE DEPONENT: Well, I believe that I made
3 that explicit in my paragraph 192. I stated, "To the
4 extent that Zhang does not explicitly disclose the
5 second covering layer would include organic
6 photoresist, POSITA would have understood that the
7 teachings of Zhang would be applied to conventional
8 reflective LCDs, with an organic photoresist layer."

9 So that is my opinion, that to the extent
10 it's not explicitly disclosed, it is certainly
11 obvious. I've discussed that clearly in paragraph
12 192 of my declaration.

13 BY MR. TONG:

14 Q And can you give me a paragraph in --
15 actually, strike that.

16 I would like to turn your attention to
17 paragraph 189 in your declaration.

18 A Okay. I have that in front of me.

19 Q Do you see the first sentence says, "As noted
20 above, Zhang explains that conventional reflective
21 LCD panels may include an organic layer such as
22 photoresist layers 225A and 225B." Do you see that?

23 A I do.

24 Q And then three sentences later, do you see it
25 says, "Thus Zhang discloses a second covering layer

1 380a that, when implemented in a conventional
2 reflective LCD, would comprise at least organic layer
3 225B." Do you see that?

4 A I do.

5 Q When you used the phrase "conventional
6 reflective LCD" here, are you referring to the
7 background LCDs that Zhang described or are you
8 referring to some other figure?

9 A Well, it -- it -- I -- I am referring to the
10 "Background" section where it expressly states that
11 conventional reflective LCDs have a photoresist
12 layer, or may have.

13 The invention that then proceeds is about the
14 sealing around the edges. Not about the rest of the
15 panel.

16 So I would -- one of ordinary skill would
17 take the teaching that you would maintain the
18 photoresist layer that -- that Zhang explicitly
19 discloses for a reflective LCD, a conventional LCD.
20 You would retain that while implementing improvements
21 to the sealing region, which, as we discussed
22 earlier, Zhang identifies in his discussion of
23 bonding strength. So that was at the bottom of page
24 7, the last paragraph.

25 The discussion hence from that, so for

1 instance the introductory paragraph on page 8, is
2 talking about improvements to the peripheral region
3 or of the bonding. That would not then say, "Don't
4 do what you do in a conventional reflective panel,"
5 which Zhang teaches as there is a photoresist layer,
6 an organic layer.

7 Q Sorry. Could you repeat that last sentence?
8 You used the -- a couple of negatives, and I can't
9 keep track of how that all resolves out at the end.

10 A Okay. And I -- and I apologize. Let's see
11 if I can remember what I was trying to say.

12 Zhang teaches the use of photoresist layer in
13 reflective -- he calls them conventional reflective
14 LCDs.

15 Zhang further points out that a problem that
16 needs to be solved relates to improved -- pardon me.
17 Let's see. He uses "greater bonding strength."

18 Then teaches things to create that greater
19 bonding strength. Those changes are not ones that
20 would tell one of ordinary skill to remove what is in
21 a conventional LCD panel -- or a conventional
22 reflective LCD panel.

23 It would be teaching one of ordinary skill
24 what to do in the periphery. The conventional
25 reflective LCDs have, as taught by Zhang, or may

1 have, an organic layer, photoresist.

2 So I believe one of ordinary skill would
3 understand that that would be maintained, while then
4 implementing the specific improvements that Zhang
5 points to, to improve bonding strength.

6 Q And if Zhang disclosed the use of a inorganic
7 protective layer as one of the improvements, would
8 that change your opinion at all that you have
9 rendered in your declaration?

10 A No.

11 Q Can we turn to paragraph 190 of your
12 declaration?

13 A Okay. I have paragraph 190 in front of me.

14 Q The first sentence, again, says, "A POSITA
15 would have understood Zhang to teach that the second
16 covering layer 380 [as stated] would, when
17 implemented in conventional reflective LCDs, consist
18 of or comprise organic photoresist layer 225B." Do
19 you see that?

20 A I do.

21 Q So the phrase "in conventional reflective
22 LCDs," is that, again, referring to, for example,
23 LCDs that Zhang discloses as part of its "Background
24 Art" section?

25 A Yes, it is, prior to the -- well, again, the

1 teachings then relate to improving this -- I'm trying
2 to make sure I use Zhang's -- "great bonding
3 strength," Zhang provides other modifications around
4 the periphery. But the base of that would be the
5 conventional reflective LCDs, as described in Zhang's
6 "Background" section.

7 Q So part of your -- strike that.

8 Ground 6 is an obviousness ground over Zhang
9 alone; is that right?

10 A Yes. Wait. Ground 6.

11 Q Yes, ground --

12 A Yes, it's -- it's an obviousness ground based
13 on Zhang, yes, it is. Sorry.

14 Q Okay. And are you proposing that to meet the
15 claims, that a PHOSITA would start with a particular
16 teaching of Zhang and further modify it somehow?

17 A Well, in some sense, it -- Zhang teaches
18 structures for reflective and non-reflective LCD
19 panels. He explicitly states that for the reflective
20 panels, there would be a photoresist layer.

21 In his improvements to the bonding or
22 adhesive strength, which is about the periphery, I'm
23 not sure he explicitly states which of the two:
24 transmissive or reflective. He may.

25 Let's see. I've forgotten now; but if he is

1 discussing ones that are explicitly transmissive, one
2 of ordinary skill would look to his "Background"
3 section to understand what the difference is between
4 transmissive and reflective and see the inclusion of
5 the photoresist layer, or reflective.

6 And again, I am -- looking here, I'm not sure
7 whether in the descriptions of modifications to --
8 that would lead to better bonding, whether he does
9 that in the context of transmissive, whether he does
10 it in the context of both, or whether he just talks
11 in general. I -- I've forgotten now. Where is that?

12 So just as an example, on page 9, for his
13 first embodiment, the opening paragraph talks about
14 liquid crystal display panels; and in that opening
15 paragraph, at least -- I'm not sure that there is any
16 indication of whether this is transmissive or
17 reflective. It's just, I think, a liquid crystal
18 display panel.

19 Q If a PHOSITA -- let me see if I can provide
20 some context. So you understand that traditionally,
21 in some obviousness arguments, it is typically argued
22 that a PHOSITA would start with a particular
23 embodiment and then modify it somehow in an obvious
24 manner to reach what is taught in the claims. Do you
25 understand that principle?

1 A I do.

2 MR. LONEY: Object to the form.

3 THE DEPONENT: Excuse me. I do understand
4 that general approach, yes.

5 BY MR. TONG:

6 Q Is that the general approach that you used
7 here in your obviousness position for Zhang?

8 A Well, it -- I mean, in some cases, a
9 reference in and of itself will actually teach all of
10 the required elements; but for instance, it may not
11 explicitly teach -- I'm going to use -- I think I'm
12 using the word "specifically" too many times.

13 It may not -- it may have an explicit
14 disclosure of each and every element; but of course
15 you also have to arrange the elements in the manner
16 the claim arranges things, and that arrangement may
17 not be taught in a given reference; but if it is
18 obvious to one of ordinary skill to make that
19 arrangement, then I would conclude that reference and
20 the skill of one of ordinary skill would make --
21 would render the claim obvious.

22 So there is a situation where it's not
23 anticipation because -- but it's also -- it may or
24 may not be a modification. It could be the reference
25 didn't actually say, "Arrange them this way," and I

1 have to arrange them a different way. It may say,
2 "Use these elements," and really tell you nothing
3 about arrangement.

4 Zhang has told me about arrangement for
5 reflective. He's done some general discussion --
6 well, it's not general, but some discussions about
7 improving adhe -- bonding strength, where I think
8 he's open to either reflective or transmissive.
9 That's what I was checking for.

10 That would be an example where there are two
11 separate sections, which do, in fact, teach
12 everything, but have not specifically arranged them
13 in the required manner.

14 One of ordinary skill would take their
15 knowledge to do the arrangement.

16 Q Okay. So, I mean, you understand this --
17 this can be formulated as there is a particular
18 disclosure in the prior art, and you need to modify
19 the arrangements of certain elements to reach the
20 claims?

21 MR. LONEY: Objection. Form.

22 THE DEPONENT: So my understanding is that
23 would be a valid, or could be a valid obviousness
24 argument, where a reference gives an arrangement but
25 there is a reason to modify that, and that

1 modification does match the claimed arrangement.

2 I was -- I think I was trying to explain for
3 Zhang a slightly different situation where the
4 elements are taught but, in fact, in the example for
5 the improved bonding, it's, I think, essentially
6 silent as to the arrangement of a layer that would be
7 present in a reflective panel.

8 That is taught, however, in the section of
9 "Background."

10 Of course, in the section for "Background,"
11 the modifications made to improving bond strength,
12 those are not present. That's the improvement that
13 Zhang is teaching.

14 So one of ordinary skill, it would be obvious
15 to put those two teachings together.

16 BY MR. TONG:

17 Q So when putting those two teachings together,
18 what would a PHOSITA start with?

19 A Well, I -- I -- I -- I mean, I'm not really
20 sure. You could start with the conventional
21 reflective and then -- with the photoresist, and then
22 take the teachings that Zhang provides, to improve
23 that bonding strength or adhesion strength.

24 On the other hand, you could take the
25 teachings that improve the bonding strength, which

1 are either silent as to what kind of panel or are for
2 transmissive, and apply it to reflective panel that
3 would have the photoresist.

4 So I'm -- I'm not really disting -- I think
5 either starting point leads to the same result.

6 Q If we turn to paragraph 203 of your
7 declaration; okay?

8 A Okay. I'm at paragraph 203.

9 Q And do you see the two pictures there in
10 paragraph 203?

11 A I do.

12 Q Is it your opinion that after all the
13 modifications or rearrangements that are supposedly
14 obvious, that this would be the final resulting
15 device that a PHOSITA would make?

16 MR. LONEY: Objection. Form.

17 THE DEPONENT: Well, in -- in -- in paragraph
18 201, the claim language that I was looking at was
19 predetermined material layer sidewall having --
20 forming a predetermined angle, and I pointed out that
21 in Figure -- I've got it on page 110. Figure -- the
22 annotated 3B, there is such a predetermined angle;
23 and in that example, it is -- 90 degrees is drawn.
24 One of ordinary skill would recognize that that is
25 likely somewhat less than 90.

1 Furthermore, at paragraph 203 -- so that
2 would already satisfy it because the requirement is
3 that there be a predetermined angle; and as I've
4 discussed in paragraph 201, I believe that what Zhang
5 shows is nominally a 90-degree angle.

6 In paragraph 203, there is a further
7 potential modification to make that a V-shaped
8 opening, which is different than the opening shown on
9 page 110.

10 Given that Zhang said -- let me find that --
11 that the objective is to increase the contact area of
12 the frame adhesive -- that's back on page 8. The
13 second sentence, under "Summary of the Invention,"
14 begins with, "By increasing the contact area frame
15 adhesive," I believe one of ordinary skill would
16 recognize that that "V" shape has more contact area
17 than the one shown on my page 110 above paragraph
18 202. So that is an obvious modification.

19 BY MR. TONG:

20 Q Would a potential technique, for increasing
21 the contact area, to just be to increase the width of
22 that opening?

23 MR. LONEY: Objection. Form.

24 THE DEPONENT: Well, if you increase -- so in
25 those two figures, there is a space labeled "340."

1 And in order to increase that, you either have to use
2 up surface area that used to be panel, or increase
3 the size of, for instance, 320, so that the global
4 surface area goes up.

5 So either you reduce -- in some sit -- either
6 you reduce value by throwing away part of the active
7 display, or you increase costs by requiring a larger
8 global outline; however, if you look at the "V," in
9 the same amount of space, you get more contact area.

10 So I think one of ordinary skill -- yes, you
11 could increase the area. I believe that was your
12 question. So yes, I would agree, that would do it.
13 But it would come at a penalty that you avoid by
14 using the "V" shape.

15 BY MR. TONG:

16 Q If we turn to paragraph 205 of your
17 declaration.

18 A Okay. I'm at paragraph 205.

19 Q Do you see this contains a reference to
20 Yamazaki?

21 A Yes, it does.

22 Q And like we did before, can you confirm that
23 you are using Yamazaki only as evidence of the level
24 of skill of a person of ordinary skill in the art and
25 not to use as a reason for further modifying the

1 Zhang reference?

2 A Yes, I confirm that.

3 Q And a similar question for paragraph 206. Do
4 you see that that contains a reference to Vaganov?

5 A I do.

6 Q And can you confirm that you are using
7 Vaganov only as evidence of a level of skill of a
8 PHOSITA and not as a reason to further modify the
9 teachings of the Zhang reference?

10 A Yes, I confirm that.

11 Q If we turn to paragraph 211.

12 A I have 211 in front of me.

13 Q And you see this paragraph mentions Vaganov,
14 Kim, Yamazaki and generally the state of the art. Do
15 you see that?

16 A I do.

17 Q And can you confirm that these references are
18 being used only as evidence of the skill level of a
19 PHOSITA and not as a reason to further modify the
20 teachings of the Zhang reference?

21 A Yes, I confirm that in -- in this ground.

22 I just simply would like to note that there
23 is a separate ground 7, where I did do a combination
24 of Zhang and Vaganov, as well as ground 8 where I did
25 do a combination.

1 But here at paragraph 211, no. I -- well,
2 yes, I confirm it's only to be indicative of the
3 knowledge of one with ordinary skill.

4 Q Thank you. And I appreciate the
5 clarification.

6 The same question for paragraph 212. Can you
7 confirm that, at least in paragraph 212, the Vaganov
8 and Kim references mentioned there are again only
9 being used to provide evidence of the skill level of
10 a PHOSITA and not as a reason to further modify the
11 teachings of the Zhang reference?

12 A Yes, I confirm that.

13 Q Okay. And can you confirm the same for
14 Vaganov, Tanaka and Miyoshi as are mentioned and used
15 in paragraph 213?

16 A Yes, I confirm that.

17 Q I'd like to -- I'd like to turn your
18 attention to paragraph 56 of your declaration.

19 A I have my declaration open to paragraph 56.
20 Is that correct?

21 Q Yes. This should be under the heading,
22 "Exhibit 1005 - Kwak."

23 A Yes. I have that in front of me.

24 Q Okay. The second sentence, if you'll follow
25 along with me, says that, "Kwak improves adhesion by

1 creating holes that extend through the organic
2 protective layer to the underlying inorganic layer."
3 Do you see that?

4 A I do.

5 Q And if you could turn to paragraph 76 with
6 me.

7 A And I'm at paragraph 76.

8 Q I'm sorry. I have the wrong paragraph. If
9 you could turn to paragraph 137 for me.

10 A I'm at paragraph 137.

11 Q Okay. So on page 76, about halfway through,
12 it says, "Kwak does not explicitly disclose the
13 precise technique for creating the sawtooth pattern."
14 Do you see that?

15 A I do.

16 Q Kwak does teach creating holes using vias;
17 right?

18 A I think Kwak calls them vias. I'm not sure.
19 We'd have -- I'd have to go back and look at Kwak to
20 see if he identifies the technique for the formation
21 of that via.

22 Q Okay. But whatever the technique is, it's
23 not explicitly disclosed that that technique can make
24 a sawtooth pattern; right?

25 MR. LONEY: Objection. Form.

1 THE DEPONENT: As I stated there on page 76,
2 I don't believe he discloses an explicit technique,
3 and I really need to go back to Kwak, itself, for
4 making holes in general.

5 I would not expect the technique used for
6 making holes would be incapable of making a sawtooth
7 pattern. Most techniques can form a large range of
8 patterns, certainly a -- with a graphic process
9 scheme, but there might be some techniques where it
10 would be difficult to make a sawtooth pattern, but
11 there are many techniques where it would not.

12 BY MR. TONG:

13 Q Can we turn back to Figure -- page 56 of your
14 declaration. We had looked at these figures before.

15 A Yes, I'm at page 56.

16 Q And you see, again, Figures 2D, 3A, 3B and
17 4A?

18 A Yes, I see the figures.

19 Q Do you have an understanding as to whether or
20 not these figures are to scale?

21 A I would not assume that figures in a patent
22 or in a -- an application are necessarily to scale.
23 Unless it explicitly states it is, I don't assume it
24 is to scale. It might be, but I don't assume that.

25 Q So the angles of the sidewalls, as

1 illustrated here, would not necessarily be to scale;
2 correct?

3 A I would agree that they are not necessarily
4 to scale. They might be and, hence, finding that
5 angle could serve as some guidance, but I would view
6 it only as guidance, at most. It's not necessarily
7 the actual angle.

8 Q I would like to turn back to Exhibit 6, which
9 is the Zhang reference.

10 A And I have Exhibit 6 open in front of me.

11 Q And I'm also going to refer to the
12 declaration portion that discusses Zhang. So if you
13 could, please turn back with me to paragraph 203 of
14 your declaration.

15 A Okay. I have my declaration open where I can
16 see paragraph 203.

17 Q Okay. Those V-shaped groove -- or openings
18 that are drawn in purple; do you see those?

19 A I do.

20 Q Does Zhang -- is there any portion of Zhang
21 that provides a technique for making those V-shaped
22 groove or openings?

23 A I -- let me look at Zhang again.

24 So if I recall correctly, I don't believe
25 Zhang identifies specific processes or exemplary

1 processes or depositions or etches. So no, I don't
2 believe so.

3 Q Would micromachining be an appropriate
4 technique for making that V-shaped groove or opening?

5 MR. LONEY: Objection. Form.

6 THE DEPONENT: Well, I don't know exactly
7 what you mean by "micromachining." That is usually
8 -- that term is usually used quite broadly to
9 encompass a whole host of different techniques for
10 creating small mechanical objects.

11 I did a great deal of research in the
12 micromachining area. I never used that to refer to
13 any single explicit type of process. It was a much
14 broader category.

15 Now, could it? There are processes used to
16 make -- this, in some sense, is a mechanical
17 structure. It's angled sidewalls. So sure, there
18 are techniques that we used to make angled sidewalls
19 in micromachines.

20 BY MR. TONG:

21 Q Have you also heard micromachining referred
22 to as micro-profiling?

23 A Well, that micro-profiling is a species
24 encompassed by micromachining, I would agree with. I
25 wouldn't flip it around. Not all micromachining is

1 **micro-profiling.**

2 Q Can you under -- can you explain what your
3 understanding of micro-profiling is?

4 A Well, broadly, it would be a process -- a pro
5 -- a profile, when you machine anything, is a surface
6 shape, usually most easily observed in cross-section,
7 as opposed to plan view, and that's profiling.

8 Micro-profiling is attempting to do that kind
9 of shape modification at a small scale where "small"
10 is very context-sensitive. What is micro to one
11 person may not be to another.

12 Q I'm going to introduce as the next exhibit,
13 Exhibit 7, the Vaganov reference, which is filed in
14 the IPR as Exhibit 1007. It is U.S. Patent Number
15 6,406,636. Could you please let me know when you
16 have it open?

17 A I have Vaganov open in front of me.

18 Q And you've read this patent; correct?

19 A I have.

20 Q Could you turn to column 4 for me and look
21 toward the bottom, where it says, "Detailed
22 Description"?

23 A And I am there, yes.

24 Q And do you see the heading, "Micro-profiling
25 the Bonding Area"?

1 A I do see that.

2 Q And then the next paragraph is discussed with
3 respect to Figure 4. Do you see that?

4 A The next -- I'm sorry -- paragraph? So the
5 next page, then?

6 Q No. Starting on line 50, right underneath --

7 A Oh, I'm sorry. My apologies. Yes, I see
8 that at line 50.

9 Q Okay. And then starting on line 63, do you
10 see the sentence beginning, "For example"?

11 A Yes. I'm sorry. I was just doing my line
12 counting. Yes, I see it.

13 Q Could you read that aloud for me?

14 A "For example, for silicon (100) crystalline
15 orientation wafers, if this ridge profile is
16 fabricated by anisotropic etching along crystalline
17 <110> directions, the gain in the active bonding
18 surface is about 1.7 times w."

19 Q And for the reporter, that is
20 A-N-I-S-O-T-R-O-P-I-C.

21 Is it your understanding that the numbers
22 "110" and "100" indicate an orientation or a
23 structure of the crystal?

24 A They indicate orientation. So when it says,
25 "Silicon, open parenthesis, 100, close parenthesis,

1 crystalline orientation wafers," that means the
2 surface of the silicon wafer has a specific
3 crystalline orientation, specifically 100.

4 The face of a cube makes up the zinc -- the
5 diamond crystal structure here.

6 Then, when it next mentions, it's a less-than
7 sign, 1-0-0, greater-than sign. Those are called
8 kets, and that indicates a direction. That's a
9 direction along one edge of the 1-0-0 cube. This is
10 all standard crystallography nomenclature.

11 Q Right. And what is anisotropic etching?

12 A So in any etch, the etched rate, the removal
13 rate, may depend on the direction of the etch
14 relative to something else.

15 Broadly speaking, when it's not the same
16 removal rate in all directions, it's referred to as
17 anisotropic. When it is the same in all directions,
18 it's referred to as isotropic.

19 So anisotropic means you use a removal
20 process that removes material at different rates in
21 different directions.

22 Q So here, when it says "anisotropic etching
23 along crystalline 110 directions," what does that
24 mean?

25 A So, if you placed this 1-0-0-oriented wafer

1 into a crystalline anisotropic etch, with no masking
2 pattern, so you just throw it in, the whole thing
3 just etches.

4 But if there is a mask pattern on the surface
5 that allows the etching to proceed in that window,
6 the edges of the mask will, if it's -- let's say it's
7 a -- a polygon.

8 Those different edges will correspond to
9 different crystalline directions, and then the
10 appropriate etching chemicals, those different
11 directions will be removed at different rates.

12 When somebody tells me this, they are talking
13 about a straight edge to a mask that is aligned with
14 a 1-0-0 direction.

15 There are multiple directions on the surface
16 that are all equivalent to 1-1-0. So it may be one
17 edge of a mask; it may be two orthogonal edges; but
18 the shape you get depends on the shape of the hole,
19 if you will.

20 Q I'd like to turn back to your declaration so
21 we can -- we can set Vaganov aside. If you can turn
22 to page -- paragraph 76 for me?

23 A Okay. Yes, I'm at paragraph 76.

24 Q And here begins your, I guess, summary of
25 Yamazaki, and paragraph 77 begins, "Yamazaki

1 discloses an LCD device with sealant (28) between two
2 opposing substrates." Do you see that?

3 **A I do.**

4 Q What LCD device is -- I guess by "LCD
5 device," you're referring to a pixel; is that
6 correct?

7 MR. LONEY: Objection. Form.

8 THE DEPONENT: We would have to look at
9 Yamazaki to -- to see whether he's restricting this
10 to a single pixel or a panel. I -- I need to look at
11 Yamazaki again to see whether -- for instance, on the
12 previous page, I have Figure 2A.

13 BY MR. TONG:

14 Q Uh-huh.

15 **A Whether he intended that to mean there is one**
16 **and only one pixel in the whole thing or whether this**
17 **is just meant to illustrate. I -- we would have to**
18 **open the -- I would have to look at the reference.**

19 Q Okay. And in Figures 2A and 2B, on page 39
20 of your declaration, do you see the -- the part that
21 is colored in yellow and labeled with numeral "16"?

22 **A I do.**

23 Q And that is a high thermostability
24 planarizing film; correct?

25 **A Let me check. So this is layer 16. I**

1 mention layer 16 on page 40 of my paragraph 77.

2 So I did provide citations that indicate
3 planarizing film 16 is an organic material.

4 If you provide me with a copy of Yamazaki, I
5 can look to see if he's more specific. The
6 description you just provided me is a pretty specific
7 description that I don't have here in my report.

8 Q I am marking as Exhibit 8 and uploading it
9 into the chat window. It is Exhibit 1009 from the
10 IPR, U.S. Patent Number 7,446,362, Yamazaki.

11 A Hang on. I do have Yamazaki open.

12 Q If you can turn to column 11, line 15 for me.

13 A I have already gone there, yes.

14 Q Okay. Does this refresh your recollection of
15 what 16 is?

16 A It certainly is described there as being a
17 planarized -- a high thermostability planarizing
18 film, without question. It then states some things
19 about its skeletal structure.

20 Q And if we look at Figure 1A through 1D, could
21 you turn there for me?

22 A So I have the page with Figures 1A through 1D
23 on the screen. Yes, I can see those.

24 Q And do you see where element 16 is in Figure
25 1A?

1 A **Element --**

2 Q It's the top layer.

3 A **Yes, prior to any patterning being done, I**
4 **see it.**

5 Q And then between Figure 1A and Figure 1B,
6 some parts of layer 16 are removed or patterned?

7 A **Yes.**

8 Q Is that right? And let me turn to Figure 6.

9 A **I'm at Figure 6, the -- it's a version of a**
10 **flow chart with subsets; right?**

11 Q That's right. Do you remember reading this
12 flow chart?

13 A **Well, I've scanned through all of these. I**
14 **-- I'd have to go -- I mean, do I remember every word**
15 **in that flow chart? Honestly, I don't recall.**

16 Q At a high level, do you know what process is
17 completed by the steps of this flow chart?

18 A **I'd need to look at the written description**
19 **to see what process this is referring to.**

20 Q Okay. If we turn to column 8, line 55.

21 A **So there is a description of Figure 6.**

22 Q And it says, "Figure 6 is a view showing a
23 formation flow of a high thermostability planarizing
24 film"; is that right?

25 A **I see that description. I'm somewhat**

1 confused, since Figure 6 doesn't seem to be a view of
2 anything; it was a flow chart. But that's certainly
3 what it says.

4 Q Right. And if you turn to column 11, line
5 15.

6 A Let's see.

7 Yes, I see that.

8 Q And the paragraph on line 15 discusses the
9 high thermostability planarizing film; and in the
10 paragraph immediately following, on line 20 says,
11 "Here, a formation procedure of the high
12 thermostability planarizing film is described in
13 detail with reference to Figures 5A to 5C and Figure
14 6." Do you see that?

15 A I do see that. At this point it's saying
16 what the material is made out of. So, yes, I see
17 that.

18 Q Does this refresh your memory that Figure 6
19 shows a procedure for forming the high-temperature --
20 high thermostability planarizing film 16?

21 A For forming that blanket-coated film that was
22 shown in Figure -- let me go back -- 1A, yes, I
23 understand that. Not the pattern being produced but
24 the film in 1 -- or the -- the blanket coating that's
25 shown in Figure 1A, yes, I do understand that.

1 Q If we continue down in column 11 at line 61,
2 and let me know when you're there.

3 A I am there.

4 Q If you could follow along with me, please.
5 It says, "Edge removing treatment is performed by an
6 edge remover equipped in the spinning applying
7 apparatus shown in Figure 5A." Do you see that?

8 A I do.

9 Q What is an edge-removing treatment?

10 A When you spin-coat a substrate or a wafer,
11 and spin-coating is referring to a process where you
12 place a liquid on the surface and then you use what's
13 called a spinner, to make the whole thing rotate.
14 That forces then -- the fluid flows outwards.

15 The balance between centripetal forces and
16 viscous forces tends to produce, at the edge, a
17 upward bump, a thickening.

18 That thickened edge will cause you problems
19 later on when you're doing lithography, and it is
20 very common to use a piece of -- a process or a piece
21 of equipment to strip the layer you just applied off
22 of the outer edge. I used to do it with a Q-tip; but
23 there is a much nicer piece of equipment that does it
24 automatically. That's edge removal. The machine is
25 called an edge remover.

1 Q Okay.

2 A It's -- if you wish, you can see the
3 description at the top of column 12, "Thereby
4 removing the film formed by the application step in
5 the circumference of the substrate edge face by
6 exhausting liquid and gas in the arrow direction
7 shown in the figure," just as an example.

8 This has little to do with producing a
9 desired pattern in that film, although it does make
10 it easier to do contact lithography later on.

11 Q If we could turn back to your declaration,
12 paragraph 79.

13 A Okay. I'm at paragraph 79.

14 Q At the top of page 42, the first full
15 sentence says, "The angle of Yamazaki's angled
16 sidewall -- between 30 degrees and 75 degrees --
17 helps facilitate doping the sidewall with the inert
18 elements." Do you see that?

19 A I do.

20 Q And then it continues, "For example, a
21 sidewall with a lower angle, such as 30 degrees would
22 allow for the doping to be more easily applied and
23 reduce areas having too little or too much of the
24 inert element." Do you see that?

25 A I do.

1 Q And traditionally when we think of doping in
2 the semiconductor process, we think of doping a
3 material that have electrons or holes; right?

4 A If you --

5 MR. LONEY: Objection. Form.

6 THE DEPONENT: Excuse me. If you are talking
7 about doping a semiconductor, yes. This is obviously
8 not doping a semiconductor.

9 BY MR. TONG:

10 Q That's correct. So could you explain the
11 purpose of the doping here?

12 A Well, it's -- it's given -- just above that
13 is -- it's to -- where is it here.

14 So if you look at the quoted sentence that
15 begins at the bottom of page 41 and then extends into
16 the top of 42, which is column 12, lines 34 to 63,
17 the quotation is, "Further, intrusion of moisture or
18 oxygen is prevented by forming the edge portion of
19 the high thermostability planarizing layer to have a
20 tapered shape and adding an inert element there to
21 highly densify."

22 So let's go to, for instance, in the
23 reference itself. Actually, you know, what, the
24 citation should be column 12. So let me go to column
25 12, starting at line 34. It talks about, "Doping

1 treatment with an inert element is formed" -- "is
2 performed to form a highly densified part 20 on the
3 surface of the high thermostability planarizing film
4 16."

5 And it goes on to say that could be done with
6 ion implantation using argon. The point is to render
7 the surface of this organic layer more inert.

8 That's the purpose. It's adding impurities
9 to do that; and, in particular, they are specifying
10 using ion implant, with the implanted species being
11 argon. Given that it's identified as ion
12 implantation, that goes along with: The flatter the
13 sidewall, the greater the doping will be in an ion
14 implant process.

15 MR. TONG: All right. Let's take a short
16 break. I'm almost done. So we can go off the
17 record.

18 THE VIDEOGRAPHER: Off the record at 3:23
19 p.m.

20 (Off the record.)

21 THE VIDEOGRAPHER: We are back on the record
22 at 3:30 p.m.

23 BY MR. TONG:

24 Q Dr. Neikirk, I'd like to turn to paragraph 18
25 of your declaration.

1 A I'm sorry; paragraph 18. Not page 18. I'm
2 sorry.

3 Q Paragraph 18.

4 A Yes, I'm at paragraph 18.

5 Q And this paragraph sets forth your
6 understanding of what is required for a claim to be
7 anticipated; correct?

8 A Yes, it does.

9 Q So you understand that to anticipate a claim,
10 the prior art must teach each and every element of
11 that claim; correct?

12 A Yes.

13 Q I'd like to ask some specific cases of this.
14 Is it your understanding that a prior-art reference
15 must teach each and every element of a claim with it,
16 within a single embodiment in order to anticipate the
17 claim?

18 MR. LONEY: Objection. Form.

19 THE DEPONENT: So my understanding, that it
20 must teach all of the elements arranged in the same
21 fashion as the claim. Whether they all have to be in
22 one embodiment, I -- my understanding would depend on
23 the specific reference.

24 Certainly, I -- I would agree that there are
25 circumstances where it would be inappropriate to

1 combine elements from multiple embodiments, but I
2 believe I have seen other situations where it was
3 appropriate, so I don't recall that that is an
4 absolute test.

5 Q I want to give you an exemplary case. So
6 assume there is a "prior art" reference, and there is
7 a claim with five elements: elements 1 through 5.
8 Are you with me so far?

9 A Okay.

10 Q And the "prior art" reference has a first
11 embodiment that teaches elements 1 through 4 of the
12 claim?

13 A Okay.

14 Q And the prior art has a distinct, separate
15 embodiment that teaches elements 2 through 5 of the
16 claim.

17 A Okay.

18 Q Is it your understanding that the prior art
19 anticipates the claim?

20 MR. LONEY: Objection. Form.

21 THE DEPONENT: I mean, my understanding,
22 again, not a lawyer, but I think it would depend on
23 how the reference taught the first and second
24 embodiments.

25 If the reference was clear -- explicitly --

1 it was written in such a fashion that 1 through 5 and
2 2 through 6 -- I think that's the example you used.

3 BY MR. TONG:

4 Q No. 1 through 4 and 2 through 5.

5 A Okay. 1 through 4 and 2 through 5 were
6 incompatible with one another, then certainly it
7 would be inappropriate to -- just because you saw
8 element 1 in one embodiment, and 2 through 5 in the
9 other, it would be inappropriate to say that that
10 reference anticipates.

11 I believe I have seen references where, the
12 way it was written, it was in, say, the written
13 description, clear that the overlap of the 2 through
14 4, that 1 did not prevent you doing 2 through 5, 5 in
15 some sense was an add-on, and they just didn't cover
16 1. So I think it would depend on how it's written.

17 I certainly agree that there are
18 circumstances where that should -- that is not, that
19 combination could not anticipate; but I believe there
20 are others where it could.

21 MR. TONG: Okay. All right. Pass the
22 witness.

23 MR. LONEY: I have no questions for the
24 witness.

25 MR. CUMMINGS: All right. Thank you, Dr.

1 Neikirk.

2 THE DEPONENT: Thank you, Mr. Chung -- pardon
3 me. Mr. Tong.

4 THE VIDEOGRAPHER: All right. This concludes
5 the deposition of Dr. Dean Neikirk on April 18th,
6 2025. Off the record at 3:34 p.m.

7 (Off the record.)

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1 ACKNOWLEDGMENT OF DEPONENT

2 I, DEAN NEIKIRK, PH.D., do hereby acknowledge
3 that I have read and examined the foregoing testimony
4 and the same is a true, correct, and complete
5 transcription of the testimony given by me and any
6 corrections appear on the attached errata sheet
7 signed by me.

8

9

10 DEAN NEIKIRK, PH.D.

(DATE)

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1 E R R A T A S H E E T

2 DEPONENT: DEAN NEIKIRK, PH.D.

3 CASE NO.: IPR2024-01131

4 U.S. Patent and Trademark Office

5 STENOGRAPHER: Theresa Williamson, CA CSR No. 14545

6 DATE TAKEN: April 18, 2025

7 PAGE LINE IS SHOULD BE

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1 REPORTER'S CERTIFICATE

2 I, THERESA WILLIAMSON, RPR, RMR, CRR, CA CSR NO. 14545,
3 DO HEREBY CERTIFY THAT THE FOREGOING DEPOSITION OF DEAN
4 NEIKIRK, PH.D., WAS TAKEN ON APRIL 18, 2025 VIA ZOOM
5 CONFERENCE BEFORE ME AT 09:58 A.M. FOR THE PURPOSE IN THE
6 CAPTION STATED; THAT THE WITNESS WAS FIRST DULY SWORN TO
7 TELL THE TRUTH, THE WHOLE TRUTH, AND NOTHING BUT THE TRUTH;
8 THAT THE DEPOSITION WAS TAKEN BEFORE ME STENOGRAPHICALLY
9 AND AFTERWARDS TRANSCRIBED UNDER MY DIRECTION; THAT THE
10 FOREGOING IS A FULL, TRUE, AND CORRECT TRANSCRIPT OF THE
11 SAID DEPOSITION SO GIVEN; THAT COUNSEL FOR ALL PARTIES WERE
12 PRESENT AT THE TIME OF THE DEPOSITION; THAT THERE WAS A
13 REQUEST THAT THE WITNESS READ AND SIGN THE TRANSCRIPT.

14 I FURTHER CERTIFY THAT I AM NEITHER OF COUNSEL NOR
15 OF KIN TO ANY OF THE PARTIES TO THIS ACTION, AND AM IN
16 NO WAY INTERESTED IN THE OUTCOME OF SAID ACTION.

17

18

19 WITNESS MY SIGNATURE ON APRIL 24, 2025.

20

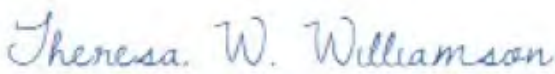
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THERESA WILLIAMSON,
RPR, RMR, CRR, CA CSR NO. 14545

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