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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MIANYANG BOE OPTOELECTRONICS TECHNOLOGY CO., LTD., WUHAN CHINA STAR OPTOELECTRONICS SEMICONDUCTOR DISPLAY TECHNOLOGY CO., LTD., TIANMAMICROELECTRONICS CO. LTD.,
and VISIONOX TECHNOLOGY, INC.,
Petitioner,

v.

SAMSUNG DISPLAY COMPANY, LTD.,
Patent Owner

IPR2024-00620
Patent 9,330,593 B2

RECORD OF ORAL HEARING

Record of Oral Hearing
Held: June 13, 2025

BEFORE: THOMAS L. GIANNETTI, TERRENCE W. MCMILLIN, and JOHN A. HUDALLA, *Administrative Patent Judges.*

APPEARANCES:

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The above-entitled matter came on for hearing on June 13, 2025, commencing at 10:30 a.m., via video teleconference.

P R O C E E D I N G S

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JUDGE HUDALLA: This is the oral hearing in IPR2024-00620. I'm Judge Hudalla. I have with me Judges Giannetti and McMillin. Why don't we start with appearances, and we'll start first with Petitioner, please.

MR. HERMAN: Good morning, Your Honors. This is Patrick Herman from Orrick Herrington & Sutcliffe here on behalf of Petitioners.

JUDGE HUDALLA: Thank you, Mr. Herman. And is there anyone with you today?

MR. HERMAN: Not on the video conference. A number of representatives of Petitioner, BOE, Tianma and Visionox are listening in on the public line.

JUDGE HUDALLA: Okay. Thank you, sir. And for Patent Owner, who do we have today?

MR. GARR: Yes. Good morning, Your Honors. This is David Garr for Patent Owner, Samsung Display Company. Also with me is my colleague, Derek Andros, who will be conducting the presentation today for Patent Owner, as well as Jared Frisch and Scott Weidenfeller, additional Counsel for Patent Owner. We also have representatives from Samsung Display, I believe, dialing in from Korea, so thank you very much for making the -- providing the option for the client representatives to participate remotely. And I believe we may also have a few summers watching this, as well.

JUDGE HUDALLA: Okay. Good morning to you and thank you. Per our trial hearing order, each side is going to have one hour to argue.

Because Patent Owner has a LEAP Practitioner, they will have up to an additional 15 minutes to argue. Petitioner will be going first and may reserve some rebuttal time, and then Patent Owner goes second and may reserve a brief surrebuttal.

We have a protective order in this case, so I caution the parties not to divulge any confidential information. If for whatever reason there's a need to talk about confidential information, please let us know and we'll make some sort of arrangement to close the public line and maybe talk about it in a different manner. And I do want to remind everybody that this is a hearing that's open to the public and a full transcript will become part of the record.

We are in a virtual environment today, except for me. I get to be here in person. So just keep that in mind and keep yourselves muted if you're not speaking. When you start speaking, maybe if you could introduce yourself for the purposes of the Court Reporter. And I think -- oh, one last thing. Just please make sure you're talking or let us know what slide you're talking about. We have the demonstratives, but it helps us both follow along and to look at the transcript later and follow along at that time. So with that, Mr. Herman, would you like to reserve some rebuttal time?

MR. HERMAN: Yes, Your Honor, 15 minutes.

JUDGE HUDALLA: Okay, all right. Mr. Herman, you can begin when you're ready.

MR. HERMAN: Good morning, Your Honors. We're here today to talk about the '593 patent and Petitioner submits that this is a straightforward case. Multiple prior art references teach the very type of stage circuit the claims at issue here require, and Petitioner has presented

extensive and comprehensive evidence showing this. This evidence includes not only annotated stage circuit diagrams, but also page upon page of expert testimony explaining exactly how a POSITA would have understood the circuits of the prior art to operate.

As I'll explain throughout my presentation today, in response, Patent Owner does little more than to try to create confusion. It offers little actual technical testimony. Instead, it and its expert ignore the vast majority of the art and the testimony of record. Indeed, much of what Patent Owner says is directly contradicted by the prior art, by what the '593 patent itself says, and Patent Owner's positions at other proceedings.

Now, before discussing these disputes further, I'll provide a very brief introduction to the patent at issue for context. So turning to Petitioner's Slide 3, as shown by the excerpts from the '593 patent here, the patent relates to a stage circuit. Now, stage circuits were well known components of displays that are meant to, as noted here, sequentially supply scan signals to the scan lines of a display with the proper timing, and the patent claims a particular stage circuit design.

Slide 4 reproduces Figure 3 in Claim 1 from the '593 patent. Figure 3 provides an example of one of the stages of the patent stage circuit. There will be one such circuit associated with each scan line in a display. As shown, the stage receives three input signals -- a start signal supplied to a first input terminal and clock signals applies to second and third input terminals. The circuit is also connected to a power supply that's labeled VDD and the circuit includes an output terminal.

As shown, this example circuit includes seven transistors and two capacitors. Two of those transistors, which are labeled M4 and M5 in the

figure, are part of what the claim calls an outputting unit. A node that's labeled N1 controls whether transistor M4 is on or off. When that transistor is on, the power supply voltage, VDD, is supplied to the output terminal. Another node that's labeled N2 controls whether transistor M5 is on or off, and when that transistor is on, the clock signal that's CLK2 is instead supplied to the output terminal.

Per the claim, the other transistors are grouped into what the patent calls a first driver and a second driver. The first driver transistors are meant to control the voltage of the node N2, and the second driver transistors are meant to control the voltage of the node N1.

Now, there's no dispute, again, that display stage circuits were known and in routine use in the art long before the '593 patent was filed. So during prosecution, the only thing that was identified as missing from those known stage circuits of the prior art was the final, unhighlighted limitation of Claim 1, which requires that there be a transistor in the first driver that is directly controlled by the third input terminal signal.

Turning on to Slide 5 of Petitioner's demonstratives, this slide includes an overview of the grounds across the proceeding we're here to discuss today and there are three primary combinations of art at issue. A reference to Kimura is at issue in Ground 1. A combination of Shin and Sasaki are at issue in Grounds 2 and 3, and a reference to Tobita is at issue in Grounds 4 and 5.

So I'll start with the Kimura reference. Slide 7 provides a brief overview of Kimura --

JUDGE HUDALLA: Mr. Herman?

MR. HERMAN: Yes.

JUDGE HUDALLA: Before we get into that, I'd like to ask you a little bit about the definition of a person of ordinary skill in the art. You know that Patent Owner has offered a competing definition, and I just wanted to ask a few questions about that. You, in your Petitioner reply, didn't address Patent Owner's argument at all; is that right?

MR. HERMAN: I believe that's right. We did not address the level of ordinary skill in the art. Petitioner's view as to what constitutes the level of ordinary skill in the art is set forth in the petition. And putting that aside, I don't believe that the different definition that Patent Owner has proposed here has any bearing whatsoever on the obviousness issue that confronts Your Honors.

The reason why Patent Owner is proposing that definition is they would like to challenge Dr. Foty's testimony. And it's Petitioner's view that Dr. Foty is more than qualified to talk about the stage circuits that are at issue here. He understands displays, he understands how circuits work, and that's all the claims require. The claims don't require any particular type of display. They don't require active matrix displays. So to say that that qualification is regarding active matrix displays are required in a patent that does not claim that and does not even mention that in its specification, Petitioner submits that that is not a credible argument that even needs to be addressed.

JUDGE HUDALLA: Well, it is an argument that we're definitely interested in. I can tell you that. I think the ITC was, as well. Why don't we talk about the possibility that we were to adopt Patent Owner's definition. First off, just a general question. Does your expert, Dr. Foty, have two to three years of experience in active matrix display design and

electroluminescence?

MR. HERMAN: So actually building them, making them, I don't believe that he has spent three years in a job designing active matrix displays. He has certainly known of active matrix displays and the features of active matrix displays for the majority of his recent career because he is a display expert and he is a circuit expert, so he is aware of the types of displays that exist in the art, including active matrix displays and passive matrix displays. And again --

JUDGE HUDALLA: Okay.

MR. HERMAN: -- I'll note for Your Honor that the '593 patent does not include the word "active" in it. So saying that it is required to have extensive design experience with respect to an active matrix display would be an error. There's nothing in this patent that -- the word does not even appear. It doesn't describe active matrix displays, it does not say circuits are limited to active matrix displays, it does not claim active matrix displays. It discloses --

JUDGE HUDALLA: Mr. Herman?

MR. HERMAN: Yes.

JUDGE HUDALLA: So here's the problem we're having as a panel. You're making a lot of arguments right now, but you never put that into any sort of paper to talk about, and so we're going to -- we have to make a decision as to whose definition we're going to pick. I guess the only other question I have is can you point to anything in the record that shows whether your expert, Dr. Foty, has this particular experience that's in Patent Owner's definition? And if you'd like to do it on rebuttal, that's fine.

MR. HERMAN: Sure, Your Honor. I'll refer Your Honors back to

Dr. Foty's discussion of his qualifications in his declaration and in his CV, but there he explains the information that he is aware of about how displays operate and the experiences and the interactions he's had over time with displays.

So he knows what stage circuits are, he knows the types of displays in which stage circuits are used and again, that's all that the patent here describes and that's all that the claims here require. So setting an elevated standard and requiring some sort of level of experience for which the '593 patent provides zero information whatsoever, Petitioner, once again, submits -- would not comport with the record that we have here. The level --

JUDGE HUDALLA: Okay. Thank you.

MR. HERMAN: -- of ordinary skill is what Petitioner sets forth in its original petition.

JUDGE GIANNETTI: Mr. Herman, Judge Giannetti. Just a follow-up question to Judge Hudalla's question. If we were to conclude that the Patent Owner's description of the person of ordinary skill in the art was correct and that your expert does not meet that, is that dispositive of the case? In other words, how can you win the case? Can you win the case if we go in that direction?

MR. HERMAN: It is not dispositive of the case, Your Honor.

JUDGE GIANNETTI: And why is that?

MR. HERMAN: Because your own rules, Your Honor -- the patent office's own rules specify that the expert in a particular IPR proceeding does not need to be one of ordinary skill in the art to provide opinions. It's in your trial practice guide.

JUDGE GIANNETTI: What about the case law that's come out of the Federal circuit?

MR. HERMAN: The Federal circuit is a question --

JUDGE GIANNETTI: I'm thinking of Kyocera and some of the other cases that have followed that. I thought they were rather strict on what the qualifications of a person of ordinary skill -- of an expert has to be when testifying about matters relating to persons of ordinary skill.

MR. HERMAN: My understanding of the law, Your Honor, is that an expert merely has to be able to provide relevant technical testimony. So whether that --

JUDGE GIANNETTI: That's not Kyocera, though, is it?

MR. HERMAN: I don't believe any particular party has cited that particular case. If Your Honor is --

JUDGE GIANNETTI: Well, I know you may not have cited it, but it's out there and the Board is certainly aware of it, and it is the law.

MR. HERMAN: So --

JUDGE GIANNETTI: What's your reaction to that? How do you reconcile your argument with the holding in Kyocera?

MR. HERMAN: So if Your Honors would like further briefing on that particular issue, which is not briefing that the parties have raised, but no party a strike --

JUDGE GIANNETTI: That is surprising in itself, that with all of the controversy over this that nobody cited Kyocera.

MR. HERMAN: So if Your Honors would like further briefing on this particular issue, we would be happy to supply it, but there is no briefing on this particular issue. It is not an issue that Patent Owner has raised.

Patent Owner has not said that you should substantively discard every single thing that our expert says because he's not one of ordinary skill in the art.

JUDGE GIANNETTI: Well, they certainly raise the issue of the expert's qualifications, and maybe they haven't said discarded. I'm not familiar enough with their argument, but certainly, they made the argument that we shouldn't grant it, we shouldn't give it much, if any, credit; haven't they?

MR. HERMAN: I believe they had made that argument, but I do not believe --

JUDGE GIANNETTI: Right.

MR. HERMAN: -- they have cited the case that Your Honors have cited and I do not believe they have taken the position that his opinions are not entitled to any weight because he is not one of ordinary skill of the art.

JUDGE GIANNETTI: All right. Well --

MR. HERMAN: And then as an initial matter, I'll just go back to the point that it would be error -- it would be factual error to say that the level of ordinary skill of the art here requires knowledge about active matrix displays when the patent here does not say anything about active matrix displays. If that's the case, then this patent is plainly invalid under 112 because it provides no information whatsoever about active matrix displays. It doesn't use the word, it doesn't say anything about it. It explains nothing about how this particular circuit is designed to work without an active matrix display. This is not a patent about active matrix displays. It's a patent about stage circuits that are usable in any type of display, be that an act of --

JUDGE GIANNETTI: But just to come back to my question, how do you win this case if we were to disagree with you and adopt the Patent

Owner's description of the person of ordinary skill?

MR. HERMAN: Your Honor, I believe we win the case because Dr. Foty is still able to provide relevant testimony about the circuits of the prior art and his testimony not only explains how those circuits work, but lines them up with the claims. There is no limitation in the claims that relates to active matrix display.

JUDGE GIANNETTI: All right. I think we have your position on that.

MR. HERMAN: To say that he was required to provide testimony about active matrix display when there's no limitation that requires that, I mean, that testimony is not relevant and it's not pertinent to any of the issues here.

JUDGE GIANNETTI: All right. Well, we have your position on that. Thank you.

MR. HERMAN: So Slide 7 provides a brief overview of Kimura. What does Kimura teach? Just like the '593 patent, it teaches a stage circuit for a display, which it calls a shift register. Figure 34 shows many such stages, one per display scan line. Kimura also discusses several design options for the circuit making up each individual stage. The petition focused on the circuit shown in Figure 27C. Why was that circuit the focus? Because it includes the very feature that serves to distinguish the '593 patent during prosecution. Transistor, which is labeled as 204 in Figure 27C, in the first driver, that's directly controlled by the third input signal terminal. That's line 112 in Kimura.

So turning to Slide 8, Slide 8 provides an overview of Patent Owner's arguments regarding Kimura. What does Patent Owner argue?

First, it argues that the description of Figure 27C in Kimura is very brief. Only a paragraph or two, and doesn't say anything about many of the figure's transistors. Patent Owner then argues that the petition improperly pointed to other portions of Kimura, relating to other figures, to explain how those transistors work.

Second, Patent Owner faults the petition for purportedly failing to explain how Figure 27C would operate. Third, Patent Owner argues that Kimura's timing diagrams are specific only to other circuits and provide no insight into Figure 27C's operation. And fourth, Patent Owner repeatedly characterizes the petition's arguments as new and there's a recurring theme to all this. Patent Owner wants the Board to ignore the bulk of Kimura, limit itself to just two paragraphs, specifically discussing Figure 27C and then simply throw up its hands in confusion.

It wants the Board to find that a person having ordinary skill in the art would similarly be confused and would be unable to reach any conclusions at all about Figure 27C and how it works. That is not how prior art in the petition is to be assessed. It is certainly not how the prior art is to be assessed when the art is as clear as it is here. It's the facts that matter and it's the arguments in the petition that matter, and Patent Owner's misrepresentations of the petition and failure to understand Kimura does not and cannot control the analysis.

Kimura simply cannot be read in the narrow, cadent way Patent Owner proposes, as I'll explain in a moment. Kimura itself makes plain that Figure 27C relates to everything else Kimura discloses before it. So accepting Patent Owner's arguments would require turning a blind eye to what Kimura actually says and what it actually teaches.

Now, turning to Slide 9. Before addressing the substance, I'll start by addressing Patent Owner's argument that the petition made a series of new arguments. It did not. Slide 9 includes an excerpt from page 15 of the petition. What did the petition say? It unambiguously says that Figure 27C of Kimura builds on and shares components from Kimura's earlier figures. This is not a new argument that popped up first in reply. This is the argument that Petitioner has been making all along. Figure 27C is the combination and culmination of many earlier figures in Kimura. Figure 27C simply adds together the teachings of these earlier figures. This is why the petition pointed to earlier portions of Kimura to explain Figure 27C's operation. That is what Kimura says one should do.

Turning to Slide 10, the petition also expressly stated that a person having ordinary skill in the art would understand all of Kimura's circuits to receive the same input signals with the same timing. You can see that here in the excerpt from page 19 of the petition on Slide 10. So pointing out that in all cases, Kimura's circuits receive the same inputs is not a new argument that appeared first in reply. It is the same argument Petitioner has been making all along.

Also, I'll briefly pause to note here that while Petitioner did make all of the arguments Patent Owner now labels as new, merely labeling what I say is a new argument does not somehow create pre-license to misinterpret the facts. Petitioners are and will always be permitted to point out Patent Owner's factual errors. Pointing out where --

JUDGE HUDALLA: Mr. Herman?

MR. HERMAN: Yes.

JUDGE HUDALLA: Could I ask you about this slide? I'd like to

know -- you say that, you know, you're pointing to this part of this petition and it is absolutely an excerpt of the petition. It says that the circuits are supplied with the same input signals in the same manner. Patent Owner pointed out that there are additional input signals that differ amongst the embodiments. Wouldn't that kind of take away the force of this argument?

MR. HERMAN: Respectfully, no, Your Honor, and there's two reasons for that. Number one, there are two input signals that are shared by all of the circuits. So IN1 and IN2, which are the two clock signals that Kimura's circuits receive, are received by every single one of the circuits in exactly the same form.

Now, certain of the circuits do add additional transistors that allow for further input signals. For instance, Figure 21A, which is the circuit diagram that underlies the timing diagram of Figure 21B adds another transistor that allows for the provision of a start signal, which is IN4. So each of Kimura's figures adds an additional transistor to what came before it and Your Honor is right that some of those additional transistors are meant to facilitate the provision of additional signals, such as an input signal, but then when that same transistor appears in a later figure.

So when the transistor that allows for the provision of the input signal in Figure 21A appears again in identical form in Figure 27C, the clear implication and what Kimura says is that you are to use that same input signal when using the same transistor that allows for provision of that input signal in later Figure 27C. Does that answer Your Honor's question?

JUDGE HUDALLA: Well, so with respect to Figure 27C, are there additional input signals beyond the IN1 and IN2?

MR. HERMAN: I believe so. I believe there's also a reset signal

between IN5, but in every single case, those signals are discussed in connection with earlier figures where the transistor that allows for the supply of that additional signal appears for the first time.

JUDGE HUDALLA: So I guess that's the concern I'm having here is that, you know, you're asking us to kind of overlook certain additional input signals and just assume that the 27C embodiment works in the same way, and that's the argument that Patent Owner is making. I'm not sure that just saying we're using IN1 and IN2 in the same way gets you there.

MR. HERMAN: So we're also using all the other input signals in exactly the same way. They appear earlier in Kimura. We're using IN4 in exactly the same way it appears earlier in Kimura. We're using IN5 in exactly the same way it appears earlier in Kimura. That signal will have the same timing and the same effect, and will be fed on the same signal line through the same transistor, regardless of whether IN4 appears in Figure 21A or in Figure 27C, but it's always the same, but there's no reason for that signal to be supplied at a different time or in a different way later in Kimura. I mean, it's --

JUDGE HUDALLA: Okay. I understand your position.

MR. HERMAN: The start signal has to be supplied at the appropriate time for the output to be generated at the appropriate time.

JUDGE HUDALLA: Okay, thank you.

MR. HERMAN: So turning on to Slide 11. So the petition simply followed Kimura's instructions when it cited to other earlier discussion to further elaborate on the functionality of Figure 27C's transistor. So as shown in paragraph 93 of Kimura, which is on Slide 11, Kimura says this is exactly what a person having ordinary skill in the art is to do. So according

to Kimura, the same portions or portions having similar functions are denoted by common reference numerals. Because of this, Kimura does not repeat a prior description of these elements.

So Figure 27C includes the same transistor of sound in figures preceding it. So how is a POSITA meant to understand Figure 27C? Well, according to Kimura, that POSITA is meant to look back at the earlier discussion of those same transistors and that's exactly what the petition did. So Patent Owner is wrong to fault the petition for that analysis. Indeed, it is Patent Owner that is wrong to ignore Kimura's instruction.

So turning to Slide 12, the rest of Kimura makes it abundantly clear how Figure 27C relates to and builds on the circuits that came before it. Slide 12 collects a number of passages from Kimura. Starting from the top left, Kimura begins by explaining that Figure 14A circuit is obtained by addition of transistor 201 to the circuit of embodiment 1. So Figure 14A is not a standalone embodiment. It builds on embodiment 1 from earlier in Kimura. So of course you understand how Figure 14A operates by looking at the earlier discussion of embodiment 1 on which Figure 14A builds.

Kimura goes on like this. Each successive figure builds on in Kimura -- or in Kimura's words, adds transistors to what came before. So to understand later figures, you must first look to discussion of earlier figures. Finally, as shown in the bottom right, Figure 27 simply adds all of transistors 201 and 207 as disclosed in earlier figures together. So Kimura explains again and again that the circuits are meant to be additive. A reader is not meant to consider Figure 27C in isolation as a completely unique standalone embodiment.

Instead, that figure, like all of Kimura's figures, builds on earlier

figures and uses the same transistors for the same purpose that were used in those earlier figures. It follows that Figure 27C is plainly meant to be understood by referring to the discussion of all of the figures that preceded it.

So turning to Slide 13, not only does Kimura say in words that its later figures add to and build on its earlier figures, but this should've been apparent from the figures themselves. This slide reproduces a figure flowchart from Petitioner's reply. As shown, Kimura starts with the five red transistors in Figure 1 because Kimura then proceeds to build on its earlier embodiments. Those same five red transistors are found in all the figures that follow.

As shown by the colored annotations, Kimura adds transistors one at a time, eventually arriving at Figure 27C which includes not only the original five red transistors, but seven new transistors that were added in the figures that proceeded Figure 27C. So what does this show? Just as Kimura explains in words, Figure 27C is the additive result of all the circuits that preceded it.

So once again, it is the petition that correctly read Kimura here. It recognized that Figure 27C is the culmination of what precedes it in Kimura. In contrast, Patent Owner invites error by asking the Board to ignore this figure to figure interrelation that is expressed throughout Kimura.

Turning to Slide 14, Patent Owner also wrongly argues that the petition did not explain how Figure 27C operates. In fact, the opposite of the case, is the case. This was explained in detail, so I've included excerpts from Dr. Foty's opening declaration, which accompanied the petition here. Dr. Foty walked through exactly how Figure 27C would be understood to

behave during each period of operation to ensure that it produces the appropriately timed output signal in period D, which is what every single one of Kimura's figures are intended to do. We used red and blue annotations to show which lines were subject to a high or low potential signal in every single period.

We showed what transistors would be turned on or off during each of those periods, as a result of the supplied input signals to generate that appropriately timed output signal, and Patent Owner addressed none of this. It asked Dr. Foty no questions about it, despite taking his deposition twice and Patent Owner's expert does nothing more than provide a conclusionary boiler plate response. He presents no alternative explanation as to how Kimura works. He points to no errors with Dr. Foty's step by step analysis, so there's no evidence to actually be weighed here. Only Petitioner provided a meaningful fact-based assessment of Kimura's operation.

Turning to Slide 15. The petition also properly pointed to Figure 21B's timing diagram when discussing the inputs that are to be supplied to Figure 27C's circuits. Why was this appropriate? Because Kimura supplies the same inputs to all its circuits and it does this despite adding transistors from circuit to circuit to circuit. So as I noted before, in all cases, Kimura uses the very same two clock input signals -- IN1 and IN2 in all of its circuits and you can see that in the four timing diagrams on this slide and it uses those same input signals, despite adding different transistors from circuit to circuit. The added transistor --

JUDGE HUDALLA: Mr. Herman?

MR. HERMAN: Yes.

JUDGE HUDALLA: So along the lines of this argument, when

you reproduce the timing diagram on Petitioner -- at page 19 of the petition, the Figure 21B timing diagram -- were we supposed to just completely ignore everything below IN1 and IN2? Is that what this argument suggested to us?

MR. HERMAN: No, Your Honor. I'm not suggesting that, and in fact, if you read the petition, the petition in Dr. Foty's testimony discussed the impact of not only signals IN1 and IN2 on circuit operation, but the petition in Dr. Foty in their opening materials also discuss the operation of signals IN4 -- that's the start signal -- and IN5 -- that's the percent signal.

The reason why the petition focused on Figure 21B is because that figure includes the three signals that are most pertinent to the operation of the stage circuit for purposes of generating output. Figure 21B depicts the two clock signals that turn various lines to a high or low potential and it also includes the start signal, which is IN4, which is what precipitates the output of the high signal, G-out, which is supplied to the scan line. So the petition focused on 21B because those three signals are depicted in the timing diagram -- IN1, IN2, and IN4. And again, IN1 --

JUDGE HUDALLA: So --

MR. HERMAN: Yes, Your Honor.

JUDGE HUDALLA: So then are we supposed to ignore everything below IN4? Is what you're saying?

MR. HERMAN: So what's below IN4 are internal node voltages. So the timing diagram signals that appear below IN4 in Figure 21B are internal node voltages, and those internal node voltages will vary from circuit to circuit to circuit. I mean, the whole point of Kimura's different circuits is to accomplish the same result using the same input in various

different ways. In some of the circuits --

JUDGE HUDALLA: I thought your expert acknowledged on cross-examination that V13 could be an internal -- what you're calling an internal node voltage -- could actually be an input signal, as well.

MR. HERMAN: In one of the figures. Yes, in Figure 17, but in Figure 17, a signal is directly supplied to node 13, but in only that figure. It is an internal voltage in Figure 21A. It's an internal voltage in Figure 27C. So his testimony and the question that was asked related to Figure 17. So yes, Your Honor was right, and Dr. Foty was right to note then in Figure 17, an input signal is directly supplied to node 13 instead of passing through transistor 205, like shown in Figure 21A. So in Figure 17, the signal gets directly supplied to node 13. So yes, in that figure, node 13 is supplied with an input signal, but in every other figure, node 13 is an internal voltage. I mean, that's what Dr. Foty said and explained to Patent Owner during deposition.

JUDGE HUDALLA: Mr. Herman, I'm going to kind of move you along to another point here because you're kind of running pretty short on time. You're at 14 minutes here.

MR. HERMAN: Sure.

JUDGE HUDALLA: Let's move on to the period D issue, which you've put into your Slide 17, I think. So we have a new diagram -- a new version of Figure 21B being presented in the reply brief where he's giving a long explanation about a boot strapping problem that allegedly exists in one of the circuits or maybe, I guess, it's 27C, and that is 27C alters the boot strapping process so that it's a different voltage in period D, and that results in this new diagram we have in the reply brief and also in the reply

declaration.

So again, you know, this is troubling me because you presented 21B as a timing diagram in the petition and now we're supposed to -- I don't know how we're supposed to reconcile the fact that you did that with the fact that you're now pulling back and telling us, oh wait, there's some other different timing diagram that really pertains to the circuit. Could you tell me how -- how could we go through that and say that's not a new direction in your argument?

MR. HERMAN: Respectfully, Your Honor, it's not -- Your Honor, it's not a new direction in our argument. As Petitioner explained in the petition, in one of the earlier slides, the reason why we were relying on the timing diagram is because the timing diagram provides the input signals that are relevant to Figure 27C and the output signal that's relevant to Figure 27C. So the relevant portions of Figure 21B that we cited to in the petition and that we directed Your Honors to are the input signals, IN1, IN2, and IN4, and the output signal, G-out. That's what we cited and that's what we are relying on, because that's what's important --

JUDGE HUDALLA: I don't -- see, I don't read the petition -- I'm not seeing any kind of disclaimer or, you know, specific wording in the petition that's saying, oh by the way, just ignore certain of these things in the timing diagram and save others. I mean, it seems almost a very ex-post rationale that you're coming up with here to try to, you know, maybe talk about things you didn't really discuss in the petition. And I guess my question to you is, you know, at some point, there's so much new explanation, there's so much more explanation of this boot strapping problem, which by the way, I don't see any reference to boot strapping in

your petition. How are we supposed to say that that's fair game here for a reply brief and something that we should allow to go forward in finding unpatentability?

MR. HERMAN: Because Your Honor, in our opening petition, we had diagrams of Kimura's circuit operation during every single phase of its operation during period A, during period B, during period C, during period D. We had drawings showing this is what happens during period A, this is what happens during period D, this is what happens during period C. We explained in words why that was happening in each period, but those arguments are there --

JUDGE HUDALLA: Well, you're --

MR. HERMAN: -- in the petition.

JUDGE HUDALLA: Your expert did a lot of that in the declaration. I will acknowledge that, but again, you know, how is it fair play here to just put a few -- you know, put a very superficial thing in the petition and then just rely wholly on this -- not only the opening declaration, but also a large new section of testimony in the reply declaration?

MR. HERMAN: So Your Honor, I disagree that the petition did not address this issue. We pointed to what constitutes the first driver and we explained why the transistors in the first driver control node voltage. We pointed to what constitutes the second driver, we explained why transistors in the second driver control the required node voltage, we explained why the output signal was generated at the appropriate time, we cited to what the input signals are, we provided a timing diagram, and then what Patent Owner did is Patent Owner attempted to mischaracterize the prior art in its response.

It said that the prior art is operating in a way that the prior art is simply not operating, and I'll stop here and note that simply labeling my arguments as new does not turn down into up, but the facts are still the facts. Kimura still operates the way it operates. Labeling my arguments as new does not allow you to arrive at a conclusion that is contradicted by the art itself, and Petitioner --

JUDGE HUDALLA: Is it incumbent upon you to explain that to us in the petition, though? I mean, that's kind of where I'm going here. I think there's a very superficial level, if this stuff is in Kimura, and I do agree with you, there's some inklings of, you know, hey you can go through these different figures and add a transistor. Those things are in Kimura to certain extents, but you didn't really do much to explain that to us in the petition and at some point, that doesn't feel fair to me.

MR. HERMAN: So we certainly did cite to paragraph 286, which is reproduced on this slide, and paragraph 286 explains exactly the difference that's occurring between Figure 21B and what I've shown in the demonstrative timing diagram in this slide. Paragraph 286 says that Figure 27C operates in period D to lower the potential of node 13 and that's cited in the petition. That's the reason why the petition was pointing to the transistors it did as being part of the first driver, but that passage is there in the petition and we pointed to it affirmatively in support of our grounds, but it's there in the petition. I mean, the fact that Patent Owner did not understand the import of that particular passage is not an issue that I should've foreseen in advance. It's there in words so it's understandable, and it was cited in the petition.

JUDGE HUDALLA: Okay.

MR. HERMAN: So our reply here was just trying to correct and explain the technical error that Patent Owner was inviting in response, but the timing --

JUDGE HUDALLA: I understand, Mr. Herman.

MR. HERMAN: Yes. Um-hum.

JUDGE HUDALLA: You've only got about eight minutes left, so I'd encourage you to move on to some of the other stuff here.

MR. HERMAN: Sure. Your Honor, I'll very briefly address Kimura and the dependent claims. So turning on to Slide 19, there are only three sets of claims that are at issue here. The other independent claims are not disputed. And as with the independent claims, Patent Owner's response here has a consistent theme. Time and time again, it faults Kimura for not anticipating the claims effectively. Yes, Kimura does not teach these dependent claim limits in a single figure, but it nonetheless presents each required feature as a design option, and it also explains why the design option is beneficial and that's what renders the claim obvious.

So turning on to Slide 20, the first set of dependent claims at issue are 6 and 20. Both of these require that the first driver include a first, a second, and a third transistor or range in a particular way. As shown on this slide, the petition pointed out that when Kimura's figure 27C is modified to include additional transistors of Figure 31C, the claim subject matter results. Patent Owner's first complaint is that the petition purportedly did not explain why Claim 1, on which Claim 6 depends, is satisfied by this particular circuit.

Respectfully, the petition did make this showing. Well, this was also done in words in the petition. This slide includes a figure that labels

every single element -- the inputs, the drivers, the nodes and the output required by Claim 1. So Patent Owner has pointed to nothing that is missing.

So turning to Slide 21, Patent Owner next argues that the petition is somehow inconsistent between Claims 1 and 6, so Patent Owner notes that in Claim 1, the petition pointed to transistors 201 and 203 as the outputting unit, while in Claim 6, the petition points to transistors 209 and 208. The reason for that is shown on this slide. In Figure 31C, Kimura includes a separate outputting input, including those transistors 209 and 208 and that separate outputting unit generates a second output, S-out, that is supplied to the next stage as a start pulse. And Kimura explains that this reduces delay and distortion.

This is the different between Claims 1 and 6. Further, because a new output has been added, transistor 201 from Figure 27C now serves a dual role. First, this part of the outputting unit connected to the original output line 211, and that's the role that was highlighted when discussing Claim 1. Second, transistor 201's output is also relayed back to node 13. That's the claim's second node, for purposes of controlling the new output transistor 208 and the signal that supplies the new output line 214. So that's what makes transistor 201 part of the first driver, at least with respect to that new output line 214. So there's nothing inconsistent about that. This recognizes that the new output transistor resulted in existing transistors in Figure 27C, having added roles.

So turning to Slide 22, Patent Owner also argues that the new output in Figure 31C isn't what the claims require because it's only provided to the next stage of the shift register and not the scan line, but there's nothing

about the claims that requires this. Patent Owner is reading in a limitation. You can see that on the slide here. Claim 1 just requires an output terminal and the supply of either the first power supply or the signal of the third input terminal to the output terminal. It says nothing about where the signal goes next after reaching the output terminal.

So turning to Slide 23, Patent Owner argues that a person having ordinary skill in the art would not be motivated to add new transistors 208 and 209 to Kimura because Figure 27C -- because this would incur additional space and manufacturing extents, to put it another way. According to Patent Owner, transistors are expensive and it's never obvious to add additional transistors to an existing circuit, but as shown in the passage on the left of this slide, even though the patent itself is able to make a working stage circuit with fewer transistors, the '593 patent itself adds two more transistors in Figure 7 because this allows the stage circuit to act bidirectionally. So the '593 patent itself concedes that it is acceptable to add transistors to a circuit. When doing so, it produces a beneficial result.

And what does Kimura teach here? It explains that adding transistors 208 and 209 improves its circuit. Moreover, as shown in the passage to the right, Patent Owner also points to a supposed commercial embodiment of the '593 patent that, in Patent Owner's own view, includes a completely unnecessary transistor that does nothing more than pass a signal through. So Patent Owner's motivation to combine arguments simply lack credibility.

The '593 patent itself adds unneeded transistors, despite the supposed cost to doing so to improve performance, and Patent Owner's own commercial embodiment includes what Patent Owner characterizes as a

completely unnecessary transistor. If there really were some strong motivation against including additional transistors, as Patent Owner argues, you wouldn't see either of the two things shown on the slide here, yet here they are.

Now, before stopping for now, I'd like to very briefly discuss the Tobita reference. And turning on to Slide 33, Patent Owner's sole argument is that Tobita lacks a transistor in its third driver that is directly controlled by the signal of the third input terminal. So this slide includes an annotated version to Figure 20 of Tobita. Tobita's first driver is shown in blue and there's no dispute that one of the blue annotated transistors -- in particular, transistor Q21 receives the signal of Tobita's third input terminal -- that's CLK -- supplied to the CK1 terminal.

The only dispute is whether that transistor contributes to the control of the voltage of the second node. That's N1. According to Patent Owner, there's no such control because transistor Q21 only turns transistor Q18 on and off, and it's the signal passing through transistor Q18 that actually controls the node voltage.

So, turning to Slide 34. Respectfully, this does not account for how the circuit actually operates. As shown on Slide 34, there's an overview of how the voltage of Tobita's node N1 is controlled. As shown by the timing diagram, the node's voltage changes during operation. Sometimes, it's high and other times, it's low, and all of the transistors of Tobita's first driver, including Q21 cooperate to allow that to happen.

The annotated versions of Figure 20 to the left show this. For instance, in the top figure, which relates to the time period T1 through T2. The node N1 is brought to high by a signal passing through Q3. As shown,

Q18 is closed. In the time period T5 to T6, Q18 now opens, changing the signal of node N1 to low. In the time period T7 to T8, Q21 opens, closing Q18 and preparing node N1 for later periods of operation when its voltage will shift back from low to high. This is why --

JUDGE HUDALLA: Mr. Herman?

MR. HERMAN: Yes.

JUDGE HUDALLA: I just want to let you know, you're into your rebuttal time. You can continue.

MR. HERMAN: Thank you, Your Honor. I'll just wrap this up and then reserve the rest of my time. So this, respectfully, is why Q21 is part of the first driver. It acts in concert with transistors Q18 through Q20 and Q3 through Q5 to affect changes to node N1's potential over time. And with that, Your Honor, I'll reserve the remainder of my time for rebuttal.

JUDGE HUDALLA: Okay, thank you. I'll give you 15 minutes --

MR. HERMAN: Um-hum.

JUDGE HUDALLA: -- at the end here. All right. So we'll turn now to Patent Owner. Mr. Garr, would you like to reserve some surrebuttal time?

MR. ANDROS: Your Honor, this is --

MR. GARR: Yes, sorry. I was on mute. Your Honors, we're going to have Mr. Andros lead the presentation, so I'll let him address that question.

JUDGE HUDALLA: Okay. Mr. Andros, would you like to reserve some surrebuttal time?

MR. ANDROS: Yes. Good morning, Your Honors. I'd like to reserve 20 minutes, please.

JUDGE HUDALLA: Okay. You can begin whenever you're ready, sir.

MR. ANDROS: Thank you. So I do want to follow-up on the Board's questions about Dr. Foty's qualifications. The Board is correct that he does not qualify as a POSITA under Patent Owner's definition. The Board was correct to recall that this is what was found at the ITC, as we discussed in the related IPR in the '599 patent. The ALJ excluded Dr. Foty's testimony in the '593 and the '599 patents, due to his lack of qualifications under Kyocera. And so the Board is correct that under Kyocera, Dr. Foty does not qualify as an expert and we --

JUDGE MCMILLIN: Mr. Andros, this is --

MR. ANDROS: Yes.

JUDGE MCMILLIN: -- Judge McMillin.

MR. ANDROS: Yes, Your Honor.

JUDGE MCMILLIN: Did Patent Owner ask us to exclude Dr. Foty's testimony? It seems to me that Patent Owner only asked us to give it less weight.

MR. ANDROS: That is correct, Your Honor. We did not file a motion to exclude in this case, but we did explain in our response that Dr. Foty does not qualify under the proper definition and lacks qualifications to opine on matters requiring the perspective of a person of ordinary skill. That's in the response at page 7 and so we do believe that his testimony should be afforded little to no weight in this case.

JUDGE GIANNETTI: Well, this is Judge Giannetti. No weight would be tantamount to excluding it, wouldn't it?

MR. ANDROS: That may be the case, but certainly, we believe

that it should be entitled to no more than little weight.

JUDGE GIANNETTI: Okay. You know, just coming back to this issue, I don't want to dwell on it for too long because I think we've hashed it out pretty much. I'm just looking at these circuit diagrams. These look like something that an engineering student should be able to handle. Why do we have to add this specialized knowledge that you have added to the definition of the person of ordinary skill when it looks like we are looking at standard electronic components, such as transistors and capacitors?

MR. ANDROS: Yes, Your Honor. There are aspects of these circuits that are specific to displays and active matrix displays, and those includes, for instance --

JUDGE GIANNETTI: Well, I haven't seen any. I've looked at a lot of circuit diagrams and maybe you could point those out to me. I've just seen transistors turning on and off and timing diagrams, and that's standard electrical engineering.

MR. ANDROS: Certainly, but the timings -- the way that these circuits are configured to provide specific timings are particular to how the displays would be driven, and the purpose of a stage circuit and a scan driver is to provide the timings necessary to drive the display. And the '593 patent does have disclosures relating to providing pixels with transistors and so that is one example of an active matrix feature. And the way that those pixels are driven will dictate the timings of the display, how the display is refreshed, for example. And so getting those timings correct and getting those transistors to operate in a way to provide those timings is tied to that notion of an active matrix display.

MR. GIANNETTI: Well, we're now an hour into this argument or

almost an hour -- 45 minutes -- and I've heard precious discussion of the claims -- precious little discussion of the claims.

MR. ANDROS: Yes, Your Honor.

MR. GIANNETTI: Can you point me to something in the claims that would support your view that specialized knowledge of active displays is necessary for persons of ordinary skill?

MR. ANDROS: I think one example would be Claim 15, which has that -- it has the concept of a scan driver and the --

JUDGE GIANNETTI: Yes.

MR. ANDROS: -- stage circuits that make up the scan driver, and the stage circuits are connected to the scan lines, which go to the pixels and the display, and the scan driver provides scan signals to those scan lines.

JUDGE GIANNETTI: Well, is there something special about a scan signal, or is it just an electrical signal coming out of a collection of transistors?

MR. ANDROS: I think it's a signal coming out of a collection of transistors that has to be precisely timed. It should go out exactly when you want it and not when you don't, and that's what the scan driver does. It connects the stage circuits to scan lines that connect to the pixels and the display to drive the transistors in the pixels to operate in the intended way.

JUDGE GIANNETTI: So your position is that if you were to approach a PhD in electrical engineering with the description that you just gave me, that it would be beyond the level of skill if that person had not personally worked on this type of display?

MR. ANDROS: I don't know if a PhD -- I'm not sure that our standard or our level of ordinary skill would require specifically that, but

some experience with displays would be necessary to understand how to provide those timings to get the display to operate correctly.

JUDGE GIANNETTI: Okay. Well, I have your position. Thank you.

MR. ANDROS: So I will try to share my screen now. And Your Honors --

JUDGE HUDALLA: Mr. Andros, it's not necessary to share your screen. We can just simply follow along.

MR. ANDROS: Okay. If that is Your Honor's preference, I will stop sharing my screen. I'll start with Kimura and I'll go to Patent Owner's Slide 10 and discuss some of the problems in the petition's theory with Kimura. As we've heard, the Petitioner relies on Figure 27C and that's because Kimura doesn't discuss many of the claimed elements in its description of Figure 27C. There's really one paragraph in Kimura that describes Figure 27C, so the petition instead looks to the discussion of other circuits for a description of those elements.

Moving on to Slide 11. We've been discussing the petition relies on the timings and the Figure 21B timing chart, and we explained in our briefing how those timings can't apply to the Figure 27C circuit and we've heard Petitioner say that it's relying on only a portion of this chart now, but that theory also has some issues, which I will get into. But the first --

JUDGE HUDALLA: Mr. Andros?

MR. ANDROS: Yes.

JUDGE HUDALLA: We've heard Petitioner's Counsel talk pretty extensively about that there are certain hooks in Kimura that talk about building upon embodiments and I do see those in Kimura. Are you denying

that we should be looking at those and kind of following the line of Petitioner's argument that there actually is kind of a roll out of an additional transistor to this embodiment and another transistor here and, you know, there's these common teachings among all these embodiments?

MR. ANDROS: I would say that it's not -- it's certainly not as simple as Petitioner has suggested and I'd refer Your Honor to our Patent Owner's Slide Number 15. This reproduces the flowchart that I think is directed to Your Honor's question, which has a number of figures from Kimura and I think one thing to point out is this is not like a simple linear build here. There's multiple embodiments, there's nine different figures, there's multiple arrows going across certain levels and down through certain levels.

And one example of why I would disagree that this is simply a build from circuit to circuit is Figure 17A, which is one of the figures included in this flowchart. It's sort of to the top and right, and we were hearing a moment ago from Petitioner about Figure 17A and Dr. Foty acknowledged that with respect to Figure 17A, node 13 is used as an input signal, but then I believe Petitioner's Counsel said that that's different in the other circuits, in Kimura. So that's one example where you cannot just take the discussion of one of these circuits and map it full sail onto any of the other circuits in Kimura. There are differences between these circuits. And as we've explained in our briefing and as Dr. Wolfe has also explained, when you add additional circuit elements, that changes the operation of the circuit.

And going down to Figure 27C, we've got a number of different transistors all being pulled, and no discussion of how these circuits would

operate differently with respect to the individual circuits, let alone for these circuits in the flowchart where multiple different transistors have been added and the internal connections have changed. And at times, different input signals are required to drive these circuits with their different elements, and there's nothing in Kimura to tell you how those circuits would operate. That --

JUDGE HUDALLA: So for instance, on page 18 of the petition, there's a paragraph at the bottom there where Patent Owner has alleged that Petitioner is, you know, relying on Figure 18A, 19A, and 19B, and not Figure 27C for certain teachings, including one about the potential at node 13 becoming a high level. And so I guess we heard Petitioner's Counsel argue that despite the fact that these might come from other embodiments, they're still true and they're still citations to Kimura's reference that support them. Are you denying that these things are true or is it just, boy, this is really complicated and, you know, they haven't done a great job explaining it?

MR. ANDROS: I think that for these circuits, where a description is provided for what an individual transistor is doing with respect to that circuit, Kimura, for certain circuits at least, provide some of that discussion. But my point is that when you begin adding multiple transistors, you are fundamentally changing the resulting circuit and there's nothing in Kimura that tells you how those circuits that are pulling multiple transistors from other circuits would operate when all combined in the particular arrangement of Figure 27C.

JUDGE HUDALLA: Okay, I think I understand.

MR. ANDROS: And I would turn, perhaps, to Petitioner's Slide

16. I think one important aspect here is that Dr. Foty has noted that node voltages will differ as between how the --

UNIDENTIFIED MALE: Judge, (INDISCERNIBLE), I'm sorry to interrupt you. Judge McMillin, he's having a problem hearing, so he's going to call in.

JUDGE HUDALLA: Okay. We'll just go off the record for a moment then.

UNIDENTIFIED MALE: Thank you.

(Whereupon, the above-entitled matter went off the record at 11:35 a.m. and resumed at 11:48 a.m.)

JUDGE HUDALLA: We'll go back on the record then, please. We were having a presentation from Mr. Andros and Mr. Andros, you have just under 44 minutes remaining and you can continue.

MR. ANDROS: Thank you, Your Honor. So I'd like to take a look at Petitioner's Slide 16 and here, Dr. Foty has acknowledged that internal voltages in a circuit will differ depending on the different circuitries, the different embodiments, how the input signals are applied. And so when you start changing a circuit and adding additional circuit elements and connecting them in particular ways, that will change the voltages in the circuit.

And so if we look at Petitioner's Slide 14, where the analysis from Dr. Foty about the operation of the circuit is provided, one thing to note is that still pointing to Figure 21B and the entirety of Figure 21B for these periods A, C, and D that are highlighted here, and the only thing that's cited on this slide is several paragraphs from Dr. Foty's declaration, as well as the figures themselves from Kimura. There's nothing from Kimura's disclosures

explaining how the analysis of each of these periods is performed.

JUDGE GIANNETTI: Mr. Andros?

MR. ANDROS: Yes.

JUDGE GIANNETTI: Judge Giannetti. Listen, I'm having a problem with your argument here, and it ties into your description of the person of ordinary skill. You've asked for a fairly sophisticated person to be the person of ordinary skill. Someone with experience in this field and degrees in engineering, and now you're telling me that just because a couple of voltages are going to change, that this person is not going to connect these figures. How does that square? It doesn't seem to fit together. You know, KSR says that the person of ordinary skill in the art is not an automaton. Aren't you treating the person of ordinary skill in the art that's rather unskilled in your argument?

MR. ANDROS: Your Honor, I don't believe so. I'm not suggesting that so much as I am just pointing out that the voltages in these circuits will differ and Kimura does not tell you.

JUDGE GIANNETTI: Well, I don't think there's a dispute about that, but wouldn't a person of ordinary skill in the art looking at this array of circuits all in the same patent, wouldn't a person of ordinary skill in the art immediately see a connection here? I mean, I just have problems with squaring that argument with your argument on the person of ordinary skill for Dr. Foty.

MR. ANDROS: Yes, Your Honor. I think I understand. The point that I'm trying to develop here is that Kimura does not tell you how -- Kimura, at most, talks about an individual circuit that says you can add one transistor there, but when we get to Figure 27C, suddenly many circuits or

transistors from many circuits are being provided, in addition to the transistors in some of the preceding figures. And this -- the analysis that's provided here is purporting to show how all of these transistors will turn on or off, but whether or not a transistor will turn on or off is dependent on the gate source voltage of the transistor.

And the point that I was trying to make is Dr. Foty has acknowledged that the internal voltages will change when these additional circuit elements are added to the circuit, but that will also change the internal voltages that would determine whether or not these transistors would turn on or off, and that is the point that I was attempting to make.

JUDGE GIANNETTI: Is that really disputed, though, if you change the circuit, it's going to change the voltages? That doesn't seem to be to me --

MR. ANDROS: I don't know that it's disputed, but the point --

JUDGE GIANNETTI: I wouldn't hang my case on that argument, if I were you.

MR. ANDROS: I'm merely attempting to show that this analysis is not coming from Kimura. It's not coming from anything in Kimura's disclosures --

JUDGE GIANNETTI: Well, it's coming from the knowledge of a person of ordinary skill, this person who has been trained in this technology, as you've said, with experience in active displays. Wouldn't that person be able to see the connection here?

MR. ANDROS: I think that there are things missing that would inform a person of ordinary skill's ability to understand the circuit. If we look -- as another example --

JUDGE GIANNETTI: Yes, these are rather basic circuits. These are just -- this is like a sophomore – a senior engineering project. This is not a highly technical field, if you -- yes, the circuits are a little complicated, but engineers deal with circuits like this all the time.

MR. ANDROS: Yes, Your Honor. I think that it's the combination of circuit elements that I'm attempting to describe here and if we look at Slide 17, for example, here we have an annotated figure in the bottom middle of Figure 27C.

JUDGE GIANNETTI: Um-hum.

MR. ANDROS: And we see here that even for the Figure 21B timing that's been modified to the bottom right by Petitioner, there is no IN5, as we had touched on previously. That input signal is not shown in Figure 21B and when that transistor that's connected to the gate of N5 turns on, that's going to couple, for example, node 13 to signal line 115, and that's just an example of how these different circuit elements and the input signals provided to them are necessary to determine how the circuit will operate. And Kimura does not give any disclosure about how --

JUDGE GIANNETTI: So your contention is your person of ordinary skill in the art would not be able to understand the operation of 27C because it wasn't specifically spelled out in Kimura; is that your argument?

MR. ANDROS: I think the argument is a combination of many different elements that come into Figure 27C, and when you combine all of them and you're trying to drive these circuits to get the timings that are specific to the display, how these circuits are operating will depend on the input signals, the internal voltages --

JUDGE GIANNETTI: I don't think that's disputed. The question

is would a person of ordinary skill in the art understand this timing diagram and this diagram and, you know --

MR. ANDROS: Well, the timing diagram is missing --

JUDGE GIANNETTI: You see my point, right?

MR. ANDROS: Yes, Your Honor. I do, but the timing diagram is missing input signals. That was a point that I was pointing to a moment ago. This timing diagram does not have all of the input signals necessary to drive the circuit.

JUDGE GIANNETTI: Okay, all right. I have your argument then. Thank you.

JUDGE HUDALLA: Mr. Andros, it's Judge Hudalla. I just wanted to follow-up on -- you were on Petitioner's Slide 17. And I guess you were trying to say that Kimura doesn't say these, you know -- doesn't tell us what's going on in this 27C circuit and literally to the left of that circuit you just referenced, there's paragraph 286 of Kimura, which tells us that in period D, the potential node 13 will be lowered. That very teaching is cited word for word -- well, close to word for word on petition page 21. So even beyond what Judge Giannetti was talking about, don't we have expressed teachings from Kimura that tell us what's going on?

MR. ANDROS: We do for that piece of Figure 27C, certainly. Paragraph 286 does describe that in period D, the potential of node 13 can be lowered. We did note that that is inconsistent with the timings in Figure 21B, but this is all that Kimura says about Figure 27C with respect to how the circuit operates. It's in paragraph 286. So the slide is titled Kimura explains differences in operation, but we know that there are many additional elements that are added to Figure 27C and my point is that

nothing in Kimura describes how each of those would operate, so this definitely describes a difference in the operation of a circuit with respect to period D and lowering voltage of that particular node, but Kimura does not describe how the other differences in the circuit lead to -- or how the resulting circuit would operate.

JUDGE HUDALLA: Okay. I guess, you know, we have a lot of additional testimony in the reply brief and in the reply declaration from Dr. Foty trying to talk about this boot strapping operation that they're trying to combat that problem, and what results then is paragraph 286. Isn't that enough to tell a person of ordinary skill in the art what's going on here?

MR. ANDROS: I think it does with respect to -- the piece that is described here, it does tell you that you can lower the potential, but it does not describe how. This circuit has the -- we can turn to the Petitioner's flowchart. All of these additional circuit elements that are coming from these various figures combing into Figure 27C and that was the point I was attempting to make is that Kimura only discusses this one piece of what's different relative to the circuits. It does not provide any discussion of the rest. And the discussion about boot strapping, respectfully, I don't think was really mentioned much, if at all, in the petition, although it does have paragraph 286. That's about the limit of it.

JUDGE HUDALLA: Okay. I think I understand your position, but know that that's kind of the fulcrum point of this case right now is, did Petitioner tell us enough in the petition versus the fact that Kimura has some teachings that definitely support Petitioner's positions. Maybe they weren't explained very well or, you know, the background wasn't given to us, but they're in there.

MR. ANDROS: Yes, Your Honor. And I think that between the differences and the circuits -- and again, I'll just reference Figure 17A. To the extent the idea is that we can simply take a wholesale of the discussions of previous circuits in Petitioner's flowchart and just apply them in a different circuit, we know that from Dr. Foty's testimony with respect to Figure 17A, there are differences in how these circuits in the flowchart are operating.

Dr. Foty acknowledged that in Figure 17A, node 13 is an input signal to that circuit and that is different under Petitioner's theory for Figure 27C, and that hasn't -- that distinction has not been discussed or rectified in the petition, and it's an example of why you cannot just simply take the disclosures for each of these individual circuits and these individual transistors, get down to Figure 27C, and combine them all and say they'll all work the exact same way.

JUDGE HUDALLA: We understand your position. Thank you.

MR. ANDROS: So I'll turn to Patent Owner's Slide 21 here. This slide has to do with dependent Claims 6 and 20, which are directed to the first driver limitation. And there are a couple of issues here to note. So on the left of this slide, we have the identification of the outputting unit in the first driver for Claim 1 in the petition. And so at the top in red, the outputting unit is identified as having transistors 201, 202 and 203, and the first driver is shown in blue and includes transistor 204, 205, 206, and 207.

And then on the right, we have the identification for the dependent claims, which are 6 and 20, and here first, two additional transistors are added -- 208 and 209 -- and those are identified as the outputting unit and then the identification of the first driver has changed and it includes

transistor 201. And additionally for the identification for Claim 1, 211 is identified as the output terminal, but for Claim 6, 214 is identified as the output terminal. And there's really no discussion in the petition about why this shift in identification has been made and there's no mapping back to how the circuit that adds these additional transistors would operate for Claim 1.

And one example of that is transistor 201, which is identified as part of the outputting unit, and it's part of it for Claim 1 and it is identified as part of the first driver for Claim 6, and the petition never describes this change or explain why it's made. And it is not the case that this was described in the petition. Now, in the reply, there's a discussion about a dual role for transistor 201, but that's in the reply. That's not in the petition. The petition is clear.

I'm looking at page 30 of the petition that with respect to Claim 6, transistors 208 and 209 now form the device's outputting unit, and it later states that 201 has been added to the first driver. So there's no discussion of a dual role in the petition and no discussion of how those elements would be mapped back with the modified analysis to the independent claim.

And turning now to Patent Owner's Slide 22, a second issue with respect to these dependent claims has to do with the output terminal. So again, for the independent claim, 211 is identified as the output terminal, but for Claims 6 and 20, the output terminal is identified as element 214, but Kimura tells us that 214 does not provide an output. It instead provides an input to another stage in the scan driver, and so it's only the signal that goes out on 211 that goes to the display and that is the output of the stage circuit.

JUDGE HUDALLA: Mr. Andros?

MR. ANDROS: Yes.

JUDGE HUDALLA: One thing I'll note is that Patent Owner didn't say that there was any claim construction issue as to the term "outputting unit." I think that's something that Petitioner talked about in his presentation. Are you suggesting that an output to a subsequent stage is not an output?

MR. ANDROS: I think that in the context of this patent, the output of the scan driver stage circuit is the scan signal. I think that's clear. For example, on Petitioner's Slide 3 in describing the patent, the highlighted portion at the bottom, the scan driver includes stage circuits coupled to the scan lines. The stages supply the scan signals to the scan lines, coupled thereto to correspond to signal supply thereto. So I think that the output of a stage circuit is what goes out onto the scan line.

JUDGE HUDALLA: Okay. So I understand that could be a position, but if that were true, then why didn't you try to propound a claim construction of outputting unit that limited the outputting unit to that sort of signal?

MR. ANDROS: Well, I think it's clear from the context of the patent. I think it's used consistently with the plain meaning that the output of the circuit is what is output by the circuit. And in this case, this circuit outputs a scan signal.

JUDGE HUDALLA: Okay. Well, unfortunately, that seems like a claim construction issue to me.

MR. ANDROS: Another example I could raise is Claim 15 does specifically recite that the stage circuits are coupled to scan lines that are coupled to the pixels in the display. So at least in Claim 15, that is very

clear. So I'll turn now to Patent Owner's Slide 23. This slide relates to Claim 7 and 21. These claims require adding additional capacitors or having capacitors, I should say, in the outputting unit. And for Figure 27C of Kimura, there are no capacitors added, or there are no capacitors in the figure, so they need to be added.

And what the petition points to in support of its theories here are that Kimura says the capacitors can be added to other circuits of Kimura, but nothing suggests adding -- nothing in these paragraphs suggests adding capacitors to Figure 27C or provides a reason for doing so, and neither Figure 9C, nor Figure 30C are part of the flowchart that Petitioner contends builds towards Figure 27C. And Dr. Wolfe has offered an opinion.

There are detriments to providing capacitors that increase size of the circuit that may change how the circuit is timed and how it's driven, delays that may be incurred by adding capacitors, and the petition didn't substantively address these concerns. The petition does point to testimony from Dr. Foty about potential concerns with EMI or crosstalk, which may cause changes on the voltage of the nodes. But these concerns are speculative and nothing in Kimura's disclosure suggests that its circuits would be particularly susceptible to these issues.

And while in the DI, the Board didn't address the Kimura grounds for these claims, it did note that for the separate ground based on Tobita, the Petitioner was relying on hypothetical concerns. They're very similar concerns to those that are raised by Dr. Foty with respect to Kimura. And as Dr. Wolfe explains, again, these speculative concerns would not have motivated one of skill in the art to add two additional capacitors to Figure 27C. So unless Your Honors have any questions with that, I'll move to

Patent Owner's Slide 27, which is directed to Claims 8 and 22.

These claims require a particular arrangement of transistors in the second driver, as well as a second power supply. These elements are not found in Figure 27C, so the petition seeks to modify Figure 27C to add these elements. And the petition's analysis of these claims, in particular, is remarkably sparse. The theory requires significant modifications to the circuit, but unlike for some of the other claims, there's no attempt to show a modified figure that would show how these modifications would be implemented. The entire discussion is quite short.

The analysis is about a page and a half, and nothing addresses, as Dr. Wolfe has described and has been described in our briefing, among other significant changes, what the second power supply would be, what voltage it would provide, what voltage first power supply would provide when modifying the circuit to provide two power supplies. No discussion of how the connections would be made to the circuit elements that the power supplies are connected to or any timings that would be necessary to drive the circuit with the two power supplies. These things are just not addressed in the petition.

And on Patent Owner's Slide 29, we see there's no rationale for making these modifications. Dr. Foty says that Kimura says that they could be made with respect to other circuits in Kimura, but that's not a rationale or a motivation to make these significant changes to Figure 27C, as Dr. Wolfe explains more fully. So I think we can rest on our briefing for the Shin grounds, unless Your Honors have any questions with respect to those grounds for me.

JUDGE HUDALLA: No, I don't.

MR. ANDROS: Okay then. I will turn then to Patent Owner's Slide 41 and address the Tobita grounds, which are Grounds 4 and 5. So Tobita alone, which is Ground 4, is only asserted for a subset of the challenge claims -- those are Claims 1 and 2, and 15 through 18. The petition also includes Ground 5, which combines Tobita with Jeong and that challenges Claims 7 and 21, but there's no Tobita ground that challenges Claims 3 through 6 or 8, 14, 19 through 20, or 22. Those claims are only challenged by other grounds. Not based on Tobita.

And I'll start now with the next slide -- Patent Owner's Slide 42 -- but before I dig into the details there, I'd just like to start with a brief overview to orient the discussion because I think the arguments on Tobita have been, at times, a bit complicated. Most of the parties' (INDISCERNIBLE) speeds have centered on the first driver limitation of the independent claims, and that again, requires that the first driver controls the voltage of the second node in accordance with the first, second, and third -- signals of the first, second, and third input terminals.

And the petition had a fairly direct theory as to how this limitation was met by Tobita, and that theory involved a particular set of transistors controlling the voltage of the second node by putting a low voltage on it. In the preliminary response, Patent Owner argued that that set of transistors actually controls a different node, and this is where the notion of indirect control was raised. But the Board found in the DI that that theory of indirect control was sufficient for institution, and after the DI, as the record developed, including through testimony from Dr. Foty and Dr. Wolfe, Patent Owner identified a different -- or another problem in the response with the petition's theory.

And that problem centers on whether the identified first driver controls the second node based on the signal of the third input terminal at all. And I believe the record shows that Petitioner recognized this flaw in the petition's theory because in reply, the Petitioner presents a new argument that a different set of transistors, it said puts a high voltage on the second node. And we've heard, I think, a little bit more about that today and I think there seem to be some additional problems with that theory, as well. So I'll dig into each of these now in more detail, but I just wanted to kind of give that overview first.

So on Slide 42, this was the petition's theory that transistors Q18 through Q21 control the voltage to a second node by bringing it to a low level. And on the next slide, the Board found in the DI that that theory was sufficient, that the theory of transistors Q19 through Q21 indirectly controlling the voltage of node N1 opening Q18 to provide at a low voltage or bring it to a low level was sufficient.

But turning to Slide 44 now. In the response, Patent Owner raised a different problem with this theory and that relates to the signal of the third input terminal. So here on Slide 44, we have on the left, Figure 20 of Tobita, which is the figure that's relied upon on the right. It's the timing diagram from Tobita, Figure 9, that corresponds to this figure, and the first, second, and third input terminals are annotated here by Patent Owner in gray, red, and purple, respectively.

The issue here is that the petition's theory was that Q19 through Q21 operate to turn Q18 on to provide a low -- or to bring the node N1 to a low level. So as we see here, when the signal of the third input terminal turns on Q21, that, in fact, turns off Q18, which has no impact on the voltage

of the second node. And in fact, on Slide 45 --

JUDGE HUDALLA: Counsel?

MR. ANDROS: Yes.

JUDGE HUDALLA: Sorry to interrupt. That point that you're making, I didn't read the petition as saying it was reliant on Q18 being on. Where are you finding that?

MR. ANDROS: Well, I would say it's -- they control the voltage by bringing it to a low level and what the third input terminal does is it's connected to the gate of transistor Q21 and so what that signal does when it turns Q21 is it turns off Q18. And when that happens, no low level can be provided, so that's inconsistent with the petition's theory.

JUDGE HUDALLA: Well, I guess --

MR. ANDROS: Did that address Your Honor's question?

JUDGE HUDALLA: Well, my confusion here is that that CK1 signal is going to be on or off and as a result, that's going to turn on Q18 on or off, right?

MR. ANDROS: Yes.

JUDGE HUDALLA: Okay. As a result of it -- CK1 changing its, you know -- being a one or a zero or whatever it is, and as a result of Q18 opening or closing, doesn't that change the voltage of the second node in some circumstances? Maybe not all of the circumstances, but some.

MR. ANDROS: Certainly for Q19 and Q20, that may be the case, but for Q21, when it's turned on, that will only ever turn off Q18. And that will only ever prevent or disconnect VSS from node N1, but if we look at Slide 45, Dr. Foty has acknowledged that that will have no impact -- no effect upon the voltage of N1. So the operation --

JUDGE HUDALLA: Well, the --

MR. ANDROS: The third input -- yes, Your Honor?

JUDGE HUDALLA: I was just going to say, I mean, aren't there circumstances where the case -- where VSS moves through that Q18 transistor? Isn't that having a control impact on the second node? I guess that's my concern is that in some instances, that's true.

MR. ANDROS: In some instances, that may be true, but the distinction that I'm attempting to point Your Honor to hear is that the claim requires control of the second node based on the signals of the first, second, and third input terminals. And here, CK1 or CLK is identified in the petition as the signal of the third input terminal and it will not be the case that the operation of CK1 will turn on Q18 to provide VSS to node N1.

So that may be the case that Q18 will be turned on and provide VSS or couple VSS to N1 in some circumstances, but not through the operation of CK1. So at least for the third input terminal, our position is that that does not affect control based on the signal of that third input terminal specifically.

JUDGE HUDALLA: I guess this is where my confusion lies, is why do we have to have a high signal or a high-level signal coming into CK1 for there to be control in this? I mean, why can't the low level signal, the zero, for instance -- the fact that that's going into CK1, why isn't that causing the same sort of control?

MR. ANDROS: Well, because when that happens, there's no provision of signal that goes up through Q18 to node N1. So it's when -- it may be the other transistors, and by others, I mean Q19 and Q20, that may provide a signal based on either the signals of the first or second input

terminals. Those may be operated to control Q18 to turn it on, but not CK1. Not the signal of the third input terminal.

JUDGE HUDALLA: Well, I think Petitioner's case is that, you know, all those transistors in concert are controlling things based on ones or zeros, or high levels, low levels, going into these three input terminals. That's why I'm having some confusion as to why that matters. You're saying okay, Q18 turns off in one instance. Right? I get it, but also, the signals combined in another instance can turn Q18 on and that actually controls that voltage node. So I'm not seeing the concern or the problem here.

MR. ANDROS: So I think the concern is again, that if control is occurring through the situation that Your Honor described, it's not happening based on the signal of the third input terminal, and the claim does require that the control is performed in accordance with each of the three recited signals. And I might point out --

JUDGE HUDALLA: Can I push back on that, Counsel? I mean, the fact that the CK1 is getting a zero instead of a one, why is the zero the lack of a signal? I mean, zero is part of a signal, right? I don't understand why that's an issue.

MR. ANDROS: When that is a zero, then Q21 is not providing a signal, so through -- which is the transistor that CK1 is connected to. So when it's a zero, that transistor is off and no signal is being provided to Q18. So in that scenario, it may be that Q19 and Q20 are on and providing a signal that goes to the gate of Q18 that may then turn Q18 on to provide a signal up through Q18 to the node, but that would not be based on what CK1's signal is at that time. It would be based on the signals of either IN or CK2 that are coupled to the gates of Q19 and Q20.

JUDGE HUDALLA: Well, sure. I mean, you have to have the certain -- you have to have all three working in concert in a certain way to get the Q18 transistor to turn on and off. Isn't that Petitioner's position here?

MR. ANDROS: Well, if I could point Your Honor to Patent Owner's Slide 46, what the Petitioner said in reply may be instructive because what it says there is that when transistor Q18 is off, no low level VSS signal is supplied to node N1 and this allows the other transistors of the first driver, Q3, Q4, and Q5 to provide a high-level signal. So the theory in reply is that when Q18 goes off, then subsequently, something else affects control of the node and --

JUDGE HUDALLA: I did look at this issue. I read your brief and I went back to the petition, and there's two sentences that I highlighted in the petition that said, you know, beyond the bringing to a low-level thing that we started this whole discussion with, there's a sentence that says, transistors Q4 and Q5 likewise provide output to and operate to control the potential of node N1. And then there's another sentence that says, regardless, Tobita's first driver does directly provide input/output to and controls node N1 via transistors Q3 to Q5 and Q18. That's on petition, page 85. So I think you characterize that as a new argument, but certainly, these are hooks in the petition that support the argument, aren't they?

MR. ANDROS: Well, at a minimum, I don't think there's any discussion in the petition about providing a high-level signal or that that occurs when Q18 is off and then subsequently, the other transistors of the first driver provide that high-level signal. It does say that they operate to control, but there's no further explanation provided. So I would say that at least in that respect, the discussion about providing a high-level signal is

new and specifying this sequence, if you will, that Q18 turns off and other transistors then provide a high-level signal -- that, I don't believe, is reflected in the petition's arguments.

JUDGE HUDALLA: Okay. I understand your position.

MR. ANDROS: And one thing that I would like to note with respect to this theory that a high-level signal is provided is that it says -- the theory here is that Q3, Q4, and Q5 can provide a high-level signal, but if we look at Figure 20, I think we can quickly eliminate Q4 and Q5. Those have electrodes connected to a ground or VSS, so those transistors are not going to provide a high-level signal to the node. We can see that Q3 does have an electrode connected to VDD, so that transistor could provide a high-level signal.

But if we turn to Petitioner's Slide 34, I can attempt to illustrate this point. For this theory to work that Q18 turns off by the operation of Q21 and the high signal from clock one or CLK, and then a high-level signal to be provided by Q3, there would have to be a point in time where it -- the signal IN or N is high to turn on Q3 and provide VDD to node N1, and CLK would also have to be high to turn on Q21 and turn off Q18. And there's no such operational state, if you look at the Figure 9 on the right of the slide, there's no state when IN and clock are high at the same time. So the theory that Q18 is turned off and then a high-level signal is provided to node N1 is -- doesn't occur in this timing diagram. And this --

JUDGE HUDALLA: Yeah, it seems --

MR. ANDROS: -- maybe is an example of -- excuse me, Your Honor. Yes?

JUDGE HUDALLA: I was just going to say, obviously you

don't -- this was made in reply, so we don't have any -- a response from your expert on how that would work, I guess, but it will --

MR. ANDROS: That is true, Your Honor. Yes, this may be an example of the complexity of the circuits and how the timings are necessary to understand how the signals would flow through these circuits. They are fairly complex.

JUDGE HUDALLA: Okay. Did you make that point that you just made about Petitioner's Slide 34 in your surreply, by chance?

MR. ANDROS: Your Honor, we did point out that the theory wasn't elaborated on, as we looked at Petitioner's slides and heard their theory of collective control. That's what caused me to look at this and describe that. So our surreply points out that we believe that the high-level signal theory is new. We don't believe that it's explained beyond two sentences in the reply and that it doesn't explain how that theory would track to each of the recited input signals controlling the node, but that is what our surreply says with respect to that theory.

JUDGE HUDALLA: Okay.

MR. ANDROS: So I have a few minutes left. I'd like to quickly turn to objective indicia and I'd point Your Honors to our Slide 57. We believe that we've provided evidence of objective indicia that is largely unrebutted and Slide 57 is focused on copying in particular. So Dr. Wolfe has shown that the representative display that he analyzed from Mengtor practices the claims in the same manner as the SBC product that he analyzed does, and that has not been rebutted. And also, Dr. Wolfe has looked at the circuits and analyzed them and --

JUDGE GIANNETTI: Counsel, Judge Giannetti. When you say

he's analyzed them, has he done the same kind of analysis for these other circuits that he did for Mengtor?

MR. ANDROS: So in the -- he has analyzed the circuits. The products that are charted are for Mengtor and for the SBC.

JUDGE GIANNETTI: So when you say he's analyzed it, what has he done? Just looked at them and said they look similar?

MR. ANDROS: He's looked at the products. He's analyzed the connections between the circuits, and then used the Mengtor product as representative of the analysis of the other products.

JUDGE GIANNETTI: Well, how much can you tell from just looking at these circuits without actually --

MR. ANDROS: Well, he --

JUDGE GIANNETTI: -- getting into reverse engineering? I guess I would put it that way.

MR. ANDROS: Yes, Your Honor. Well, these diagrams -- or rather, these images, are from teardowns of the products --

JUDGE GIANNETTI: Um-hum.

MR. ANDROS: -- brought down to the level that these features can be seen. And so you can see certain features, including transistors and capacitors, and the connections between them at the level of these torn down images. And then for the Mengtor product, Dr. Wolfe provided a representative claim chart that then maps each of those elements to the claims.

JUDGE GIANNETTI: But how does he know that there was copying, though? I mean, there might be similarity simply because that's the way you put these circuits together. There's only --

MR. ANDROS: Sure, but --

JUDGE GIANNETTI: -- a couple ways to put them together. It doesn't indicate that there's copying, does it?

MR. ANDROS: Yeah, yeah. And pardon me for interrupting you, Your Honor.

JUDGE GIANNETTI: Yes.

MR. ANDROS: I think that Dr. Wolfe's analysis, he looked at and analyzed the products and determined that there were similarities that were so significant that they could only be explained by deliberant copying, and these are fairly complex layouts of these circuits and there are striking similarities --

JUDGE GIANNETTI: Well, that's quite a step, though, isn't it? To say, well, the products are similar, so it must be copying.

MR. ANDROS: I would say that it's not merely that the products are similar. It's that these are fairly complex layouts and there are striking similarities. Not just some similarity, but striking similarities that Dr. Wolfe, having analyzed them, determined could only be explained by deliberate copying, and that is an approach as the Institute Pasteur case that we cited in our briefing reflects. The Federal Circuit has said that that is or that can be evidence of copying, that that approach is acceptable to show copying, and it also does stand unrebutted. There hasn't been any suggestion that copying -- that this does not reflect copying.

JUDGE GIANNETTI: Well, it's still your burden of proof, copying, isn't it?

MR. ANDROS: But I think we believe that with Dr. Wolfe's analysis of this and --

JUDGE GIANNETTI: Yes.

MR. ANDROS: -- showing similarities, that we have met that burden.

JUDGE GIANNETTI: All right. Thank you.

MR. ANDROS: Your Honor, unless you have any questions for me at this time, I'll reserve my last two minutes.

JUDGE HUDALLA: Well, actually, I will ask you one question in your last two minutes here. We spoke with your colleague, Mr. Weidenfeller, in the last hearing -- set of hearings that we had about describing multiple different patents' worth of inventions, and the secondary considerations for them to a single product in this case would be the Galaxy S4 smartphone.

And so here we come again and we have yet another patent -- last time it was pixel technology, this time it's stage circuit technology, where we're, again, going back to the S4 Galaxy product and trying to tie secondary considerations to it. Could you address how that would -- we can do that in some kind of a consistent way when these -- there has to be a point when another invention can't be tied back to the S4.

MR. ANDROS: Yes, Your Honor. I think I understand the question. I believe that those other patents had to do with the pixel layout rather than the circuitry. So I think that's one important distinction. These are directed to different aspects of the displays and I think we've cited case law, including, I think, the Ecolochem case that says that the success of a patented product can be based on multiple factors -- one that might be covered by the claims and the other that may not, and I think this would be one of those instances where this is directed to a different aspect of the

display, but was still important in the success.

JUDGE HUDALLA: Okay, thank you. So I have you at 20 minutes left here, Mr. Andros, and we'll turn back to Mr. Herman. And Mr. Herman, you have 15 minutes, and you may begin when you're ready.

MR. HERMAN: Thank you, Your Honor. I'll begin by briefly revisiting the person having ordinary skill in the art issue. As Your Honors noted, while Patent Owner includes its own definition in its briefing, it asked for no relief. It does note that Dr. Foty purportedly doesn't meet Patent Owner's definition, but it did not move to exclude his testimony. It also never even says that Dr. Foty's purported lack of qualifications should have some impact on his credibility. In fact, you won't even find the word "credibility" in Patent Owner's response. Now, in answering to --

JUDGE HUDALLA: They do have arguments that pages 15 to 16 of the surreply are directed to this specific thing, and as Judge Giannetti mentioned earlier, you know, we may have our hands tied. This is case law we're talking about. This isn't just something that's teed up in a motion.

MR. HERMAN: So yes, Your Honor, the level of ordinary skill in the art is reflected in the briefing, but I think the key point here is that accepting Patent Owner's level of ordinary skill in the art, there's nothing in the record that supports that particular definition and accepting it would be error and I'll say why. The Patent Owner's sole support for that definition is the testimony of its own expert and you can see that on page 5 of its response. That's the only thing it cites, but Patent Owner's expert admitted in his deposition in this proceeding that the '593 patent says nothing about active matrix displays. You can see that testimony in Exhibit 1026 on page 9, starting at line 16 and proceeding on through page 12 at line 25, which is

cited on page 27 of Petitioner's reply.

So there, Patent Owner's expert unambiguously admitted that there is no mention of active matrix displays in the specification of the '593 patent and that in his view, "plain meaning construction" of the '593 patent's claims do not require active matrix displays. So Petitioner, once again, submits that only its definition of a person having ordinary skill of the art is the appropriate one here.

There is no reason to impose any sort of requirement of years of active matrix display design experience when the patent at issue does not claim that, the patent at issue does not mention that in its specification, and Patent Owner's own expert, which is the only authority that it relies on for its definition admitted during deposition that the patent neither discloses active matrix displays and a plain meaning construction of its claims doesn't require that. So perhaps --

JUDGE HUDALLA: Mr. Herman, don't you rely solely on testimony of your expert for your definition, too? Aren't you in the same boat?

MR. HERMAN: So Your Honor, I believe Petitioner's definition of ordinary skill in the art is consistent, not only with our expert's testimony, but also with the patent itself. So what experts say in these proceedings is not the sole thing that drives the analysis. And respectfully, this is a legal issue.

This is not an issue that experts should be addressing, but yes, our expert declaration includes a definition of the level of ordinary skill in the art because it's important to articulate the perspective that the expert was providing. But the fundamental support for Petitioner's definition of the

level of ordinary skill in the art is the patent itself -- what the patent discloses in its specification and what the patent requires in its claims. And support for that particular definition is also evolved out of this proceeding as moved along, and one of the ways it's evolved is that Patent Owner's own expert has admitted that Petitioner is right regarding what the specification says, what the specification does not disclose, and what the claims here require and what they do not require.

And what the claims here do not require is an active matrix display. There's no limitation in any claim that requires that. There's no mention of active matrix displays in the specification. So essentially, we're talking about grafting onto requirements that has nothing whatsoever to do with a particular patent at issue. So perhaps --

JUDGE HUDALLA: Doesn't Claim 15 --

MR. HERMAN: Yes?

JUDGE HUDALLA: Doesn't Claim 15 with its recitations of organic light emitting display, data driver, scan driver, doesn't that -- isn't that an active matrix display?

MR. HERMAN: So, no, Your Honor. So, scan drivers are part of all displays. They're not just -- that is not a component that is unique to active matrix displays.

JUDGE HUDALLA: Okay, well --

MR. HERMAN: And there's no testimony noted --

JUDGE HUDALLA: Yeah, I --

MR. HERMAN: -- that says that that is a unique component of an active matrix display. In fact, Dr. Foty testified at deposition that scan drivers have been around since the 1930s, long before either passive or

active matrix displays are available. And you can see that at Exhibit 2061 on page 26, line 1 through 15. So scan drivers and scan circuits have been around since the 1930s.

The circuitry to drive those circuits have been around for decades, so the fact that that appears in Claim 15 does not limit the claim to active matrix displays. We're talking about old technology that is generically applicable to a wide range of different displays, and this argument that there's anything about this patent that even remotely relates to active matrix displays is entirely manufactured and not supported by the record.

So moving on to Kimura. Patent Owner spent much of its time today arguing that Petitioner's arguments are somehow inconsistent or not adequately explained, and that's simply not the case. The parties have taken two distinctly different approaches to the prior art. Petitioner and its expert, Dr. Foty, have assessed the prior art in its totality. Dr. Foty provided an extensive technical discussion of how transistors work and respond to applied signals. You then leverage that along with the teachings in the prior art as a whole to explain how Kimura's stage circuit works, how Tobita's stage circuit works, and how the stage circuits of Shin and Sasaki work.

In doing so, we presented annotated versions of those circuits, along with paragraphs of explanation showing exactly how the circuit's transistors cooperate to produce the types of outputs respectfully taught in the prior art references at issue here. That was all found in the declaration accompanying the petition, and the petition not only cited that testimony, but it paraphrased it when discussing the relevant claim limitations. It explained why a person having ordinary skill in the art, when properly defined, would've considered the identified transistors to affect control of the

required nodes.

This is not the type of analysis that Patent Owner performed, did not review or assess the totality of the prior art's teachings. Instead, again and again, it fixates on single passages and isolation and out of context, and it was the petition that properly considered the totality of Kimura's teachings. Kimura says that its figures build on each other. Kimura says that it reuses the same elements to perform the same functions of later circuits. Kimura explains what input signals IN1, IN2, IN4 and IN5 are, and all that was cited in the petition.

The petition on page 15 cited Kimura's explanation regarding the interrelation of its figures. The petition discussed the passages of Kimura explaining what input signals IN2 and IN1 are. Those are the clock signals on page 17 and Kimura's discussion of start pulse IN4 is mentioned on that same page. The petition also specifically discussed how transistor 204 in Figure 27C operates to lower the potential of node 13, and you can see that on pages 19 through 20 of the petition. So that's all part of the petition, it's all part of Kimura, and it cannot be ignored, and it's only Petitioner that has performed that analysis.

So moving on to the Tobita reference. Respectfully, there was no new argument made here. Petitioner has consistently pointed to all of transistors Q3 through Q5 and Q18 through Q21 as making up the first driver. This is not a new argument. Q3 through Q5 were identified in the petition as part of the first driver because they allow signals, like VDD, which is high, to get to node 1. Q18 through Q21 are part of the first driver because they allow VSS, which is low, to get to node 1. This is the argument Petitioner has always been making.

In addition to the petition's passages that Your Honor noted during Patent Owner's presentation, which discuss the role these particular transistors play, you can see that in the planning diagrams on Petitioner's Slide 34, which shows how all the transistors -- and that's Q3 through Q5 and Q18 through Q21 operate in concert to turn node N1's potential either high or low during different periods of operation. That slide includes timing diagrams from Dr. Foty's opening declaration. It is this collective operation that's important and all the transistors identified are part of the first driver because they play a role in that collective operation. If any of those transistors were removed, Tobita would not operate as intended and that's what makes all of Q3 through Q5 and Q18 through Q21 part of the first driver.

I'll also note that the argument Patent Owner made here today that there's some sort of issue with Tobita's claiming that prevents it from operating the way Dr. Foty says it does in his opening declaration, is found nowhere in any of its briefs. It's not in its response, it's not in its expert declaration, and it's not in its surreply. All that that is, is attorney argument that was made for the first time here today. So not only is that an entirely improper and untimely new argument, what Patent Owner is effectively telling Your Honors is that an attorney could just look at the circuits and understand how they operate. So this simply cannot be squared with its overly elevated definition of the level of ordinary skill of the art, let alone anything that says about obviousness.

So turning back to Kimura and the dependent claims, Patent Owner's dependent claim arguments are simply more of the same. Rather than considering all that Kimura discloses, they focus on single passages and

isolation and tried to cabin Kimura to just those passages. It also deprives a POSITA of any ability to collectively consider Kimura's teachings. So according to Patent Owner, because there are no capacitors in Figure 27C, a POSITA would never use capacitors in that circuit, but that ignores that Kimura not only teaches that capacitors can be present, but also explains both, how they are to be incorporated and the benefit they provide when so incorporated.

If that were not enough, Petitioner and Dr. Foty have pointed to other prior art confirming that it was known to use capacitors for the very same purpose taught in Kimura. This includes the Jeong reference that's discussed on page 34 of the petition and it's this collective teaching, including Kimura's own instruction and a POSITA's background knowledge that renders the claims obvious. Only Petitioner and its expert have taken this into account. Patent Owner does little beyond to properly assume that Kimura limits its capacitors to just the figures in which they're shown.

Its other dependent claim arguments are no better. Kimura unambiguously presents circuits with multiple outputs, transistors arranged in different ways, and multiple power supplies as viable design options. And not only does it present those as options, but it explains how they improve or beneficially change its circuit operation. That's what renders --

JUDGE HUDALLA: Mr. Herman?

MR. HERMAN: Yes.

JUDGE HUDALLA: On that point for Claim 8, I think Patent Owner's argument is that basically, you didn't explain even how those extra elements might be worked into the circuit. Could you respond to that?

MR. HERMAN: So Your Honor, I believe Kimura has a figure

that specifically shows how, for instance, the different power supply voltages can be supplied to its circuit. So instead of just having one shared VSS input signal, it can have four, five, six different VSS supplied input signals, depending upon the needs of the transistors in its circuit. So how that's --

JUDGE HUDALLA: I don't doubt --

MR. HERMAN: Yes?

JUDGE HUDALLA: Yeah, I don't doubt that those things are taught. It's just that you didn't necessarily show up how you incorporate them into that -- in the circuit in your particular -- that you're citing.

MR. HERMAN: So they'd be incorporated in the same way they're shown in the predicate figure, which I believe is Figure 15 of Kimura, which already shows an example of how different power supply voltages are incorporated into the circuit that Kimura is building from its beginning, up until the eventual Figure 27C.

JUDGE HUDALLA: Which figure was that you just referenced?

MR. HERMAN: It's in the 15s. I'd have to look. I don't remember what the number is specifically, Your Honor.

JUDGE HUDALLA: Okay.

MR. HERMAN: I'll conclude by very briefly addressing secondary considerations. So here, I'll just note two things. First, Patent Owner argues that its patent meant a long felt need for smaller stage circuits, but there was no such need. How do we know that? Because the art teaches smaller stage circuits than the '593 patent. So the '593 patent circuit is much bigger than that of the prior art. And Patent Owner itself continued filing patents with upwards of 20 transistors in a stage circuit years after the '593

patent was filed.

Second, Patent Owner argues that there was copying, but the purportedly copied circuit is not what's in the '593 patent. It's a different circuit and Petitioners explained why that's the case in its reply briefing. And all that Patent Owner has done here is shown that there's similarity between circuits. It hasn't shown that there's any access, which is part of its burden of production. And I believe, Your Honors, that I've reached the end of my 15 minutes, but I'd be happy to answer any questions that Your Honors may have.

JUDGE GIANNETTI: This is Judge Giannetti. Nothing further from me.

JUDGE HUDALLA: Okay. I don't think Judge McMillin has anything for us. So we'll go ahead and turn back to, I guess, Mr. Andros. Mr. Andros, you have 20 minutes remaining and you can begin when you're ready.

MR. ANDROS: Thank you, Your Honor. I'd like to start briefly with Dr. Wolfe's testimony that was referenced by Petitioner's Counsel. What Dr. Wolfe said when asked, Claim 1 does not mention an active matrix OLED display, correct? His response was, not in so many words, it does not. That's Exhibit 1026 at Page 10, line 24 through page 11, line 1. That does not suggest that he's contradicting the opinions in his declaration describing how some of the same elements that I have mentioned indicate an active matrix display.

Then moving on to Kimura and the dependent claims, I'd like to talk briefly about Claims 6 and 20 first. The issue here is that the same elements are identified for one claim element for the independent claim, and

then shifted to an entirely different claimed element in the dependent claim, but there's no explanation for why that would happen. And it seems clear that this is simply to arrive at the limitations of Claims 6 and 20, which claim serial transistors and there are not serial transistors in the identification of the first driver in the analysis of the independent claim. So to meet this limitation, the analysis has to shift, but there's no other reason provided as to why that change is made.

For Claim 7 and 21, with the addition of the capacitors, again, saying that Kimura says the capacitors can be added is not a rationale for making this modification and we pointed to detriments in adding capacitors to circuits that would incline a POSITA to not make those modifications absent some basis to do so, and Kimura doesn't provide that. And we actually illustrated in our briefing that what Petitioner points to for one of the capacitors is adding a capacitor -- and it says that -- this is not with respect to Figure 27, but with respect to a different figure -- that that capacitor will raise the voltage on node 13.

And then in Figure 27, as we previously discussed, Kimura says that that circuit is designed to lower the voltage on node 13. And then Petitioner suggests that nevertheless, you would add this capacitor from a different figure that's never described as added to Figure 27C and added, when Kimura teaches you to what that capacitor will do is raise the voltage on node 13. So this is just an example of pulling various elements from different figures in Kimura with no basis in Kimura to make the modifications, and argue that simply because Kimura says that other circuits in Kimura can have these elements that you would not only make the modification, but there's a reason to make the modification. We don't

believe that such reasons exist here.

With respect to Claims 8 and 22, again, all the petition points to is that Kimura says these modifications can be made. There's no explanation of why, particularly with respect to the addition of an entirely different power supply. There's no explanation in Kimura for why this modification would be made and there's no explanation in the petition for why you would do this, and then how you would do it, how you would put the voltages on those two separate power supplies and how you drive the circuit. It's not there. There's no discussion of it and that is another example where it's just pulling other disclosures in Kimura about other circuits and saying, because they're described here, you can and would make these modifications in Figure 27C.

And then with respect to Tobita, it is correct that the petition identified transistors Q3 and 4 as part of the first driver, but I would respectfully, again, say that this theory that those transistors provide a high level to the node is not the theory that was presented in the petition. The theory in the petition was that other set of transistors, Q18 to Q21, providing a low signal.

That was what the Board credited in the DI when finding the Tobita argument sufficient to institute, and Petitioner's Counsel has said that the discussion earlier about whether or not it's technically correct that transistors Q3, Q4, and Q5 could provide a high signal to the node, after Q21 turns off -- or when Q18 turns off, Petitioner's Counsel didn't dispute the accuracy of that argument. Simply said that it was new argument, but this was raised for the first time when our expert didn't have the opportunity to analyze this and provide a discussion, and it was really only today when this

theory was elaborated on and we could go back to it and point out issues with that theory.

JUDGE HUDALLA: Well, Mr. Andros, I mean, I think his point was you didn't address in the surreply in the same way that you spoke about it today. I think that was the issue.

MR. ANDROS: That is true, but it was only after we could understand a little more. The theory in the reply was, I think, two sentences. It was only really in reviewing the slides that we kind of pieced together that piece of it.

JUDGE HUDALLA: Understood.

MR. ANDROS: And I think with that, unless Your Honors have any other questions for me, I'm done.

JUDGE GIANNETTI: I don't have any.

JUDGE HUDALLA: Okay. I don't think we have any further questions, so we thank you both for your presentations today. This case is now submitted and we will issue a decision in due course. So we're about to go off the record, but please stay on the line so that the Court Reporter may ask for any clarifications or spellings after we're done. So with that, we are adjourned. Thank you.

(Whereupon, the above-entitled matter went off the record at 12:54 p.m.)

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