

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG DISPLAY CO., LTD., SAMSUNG ELECTRONICS
CO., LTD., and SAMSUNG ELECTRONICS AMERICA, INC.,
Petitioner,

v.

POLARIS POWERLED TECHNOLOGIES, LLC,
Patent Owner.

IPR2023-00771
Patent 7,259,521 B1

Record of Oral Hearing
Held: July 17, 2024

Before TERRENCE W. MCMILLIN, JON M. JURGOVAN, and
KARA L. SZPONDOWSKI, *Administrative Patent Judges*.

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The above-entitled matter came on for hearing on July 17, 2024,
commencing at 1:00 p.m., via video teleconference.

P R O C E E D I N G S

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JUDGE SZPONDOWSKI: Okay. Good afternoon, everyone. We have our final hearing in IPR2023-00771. Let me introduce the panel. I'm Judge Szpondowski and joining me are Judge Jurgovan and Judge McMillin. Let's get started with the parties' appearances first. Who do we have here for Petitioner?

MR. WILLIAMS: Good afternoon, Your Honor. This is Eliot Williams of Baker Botts for the Petitioner.

JUDGE SZPONDOWSKI: Okay, thank you. And who do we have for the Patent Owner?

MR. HAMILL: Good afternoon, Your Honor. Andrew Hamill with Kramer, Alberti, Lim & Tonkovich for the Patent Owner, Polaris Power LED Technologies, LLC. With me today are Sal Lim, who is lead counsel, and Rob Kramer, also with Kramer, Alberti, Lim & Tonkovich, and Jason Fitzsimmons with Sterne, Kessler, Goldstein & Fox.

JUDGE SZPONDOWSKI: Thank you. Well, welcome, everyone. Obviously, our hearing today is by video. Given that, I just want to start off by clarifying a few things. First, if you encounter any technical difficulties that you feel fundamentally affect your ability to represent your client, please let us know immediately. Second, when not speaking, please mute yourself. Third, please identify yourself each time you speak in order to help the court reporter prepare an accurate transcript. Fourth, we have the entire record, including all the demonstratives. Please refer to the

1 demonstratives, papers, or exhibits clearly and explicitly by slide or page
2 number. This will also help to prepare an accurate transcript of the hearing.
3 Finally, there is a public line, so please be aware that members of the public
4 may be listening as well.

5 We set forth the procedure for today's hearing in our June 10, 2024
6 Order. Just as a reminder, each party will have a total of 60 minutes to
7 present arguments. Petitioner has the burden of proof, so will go first.
8 Patent Owner will then present opposition arguments, and then to the extent
9 that Petitioner has reserved time, Petitioner will present rebuttal, and then to
10 the extent that Patent Owner has reserved time, Patent Owner will present
11 sur-rebuttal.

12 We remind the parties that they are not to interrupt the other party
13 while the other party is presenting its arguments and demonstratives. If a
14 party believes that a demonstrative or argument presented is objectionable
15 for any reason, you should raise that objection or any arguments relating to
16 that objection during your own time. I would also just add that we do have a
17 lot to cover today. There are multiple grounds, and we'd like to hear from
18 you on all of the grounds, so please keep that in mind when you're managing
19 your time. Does counsel have any questions before we begin?

20 MR. HAMILL: No, Your Honor.

21 MR. WILLIAMS: No, Your Honor.

22 JUDGE SZPONDOWSKI: Okay, great. All right. Would
23 Petitioner like to reserve time for rebuttal?

24 MR. WILLIAMS: Yes, Your Honor. I'll reserve 15 minutes,
25 please.

1 JUDGE SZPONDOWSKI: Okay. You can proceed whenever
2 you're ready.

3 MR. WILLIAMS: All right. Thanks, Your Honor. I'm going to
4 begin, I guess, just by digging into the -- the ground, given Your Honor's
5 comments. So, let's start with the Kim Grounds, which are 1 and 2. And if
6 you have our demonstratives, we can just start with slide 16, Petitioner's
7 slide 16. There, you'll see the sort of visual correspondence between the
8 embodiment, well any embodiments of the '521 Patent and Kim's Figure 10.
9 The short version of our argument today is that if these claims cover any of
10 the embodiments of the '521 Patent, then they must cover Kim. Kim
11 describes essentially the same technique as is disclosed in the '521 Patent
12 and Kim specifically teaches that that technique will have the effect of
13 making sure that the current signal going to the pixel will not be -- is
14 substantially not influenced in the language of Kim by the positive power
15 supply voltage. So, the problem underlying the purported invention of the
16 '521 has to do with the positive power supply variations creating undesirable
17 artifacts in the image the viewer sees, and Kim solves the problem in
18 precisely the same way.

19 So, probably makes sense just to begin with the actual arguments
20 Patent Owner is making with regard to the Kim grounds and I can address
21 each of those in in turn and that will lead us presumably into any discussions
22 the Board wants to have about the meaning of the claims or any other
23 questions. So, just beginning with I guess the argument that Patent Owner
24 makes shown on slide 26 of the Petitioner's slides. Thank you. This
25 argument essentially has to do with whether the box that the Petitioner has

1 drawn and Kim for the video driver could correspond to the claimed video
2 driver. And Patent Owner's argument appears to be that there must be some
3 sort of isolation between the driver and the pixel circuit, and because Kim
4 doesn't have that it doesn't map to the claims. I'm paraphrasing the
5 argument, but that nutshell seems to be the gist, as you'll see from slide 26.

6 There are several problems with Patent Owner's argument here,
7 some of which the Board has already sort of commented on in the institution
8 decision. So, I don't really intend to redo all of that analysis, but I do want
9 to maybe point to a few of the more salient responses that we have.

10 So, if you turn to slide 28, you'll note here that, you know, the first
11 problem with Patent Owner's argument is that the claims actually don't have
12 any of this recitation of the requirement that there be a separate or
13 distinctness between these components, nor does it describe that they have to
14 be isolated in any way. That's just not an element of the claims. Moreover,
15 the specification actually teaches the opposite of that. So, the specification
16 that you'll see here on slide 28 at column 7 around line 52, has a discussion
17 of different ways the '521 Patent can be implemented, and it's clear that that
18 can include the situation where the driver circuit is integrated with the
19 display panel, and including, by the way, the current driver. So, the current
20 driver that's driving the pickles can be integrated with the video driver, and
21 that's exactly what happens in Kim, so there's no reason to believe that
22 there's anything in the claims, or the specification that would take Kim
23 outside the claims.

24 Again, the Board --

25 JUDGE SZPONDOWSKI: Counsel, is it your position that there's

1 a video driver integrated into the pixel circuit in Kim that's shown in Figure
2 10 of Kim?

3 MR. WILLIAMS: The language, Kim, I think it's fair to say that
4 Kim uses the language pixel circuit, too. So, if we look at probably our slide
5 12. Let me get there. Hang on one second. Claim 12 shows Figures 3 and
6 10 of Kim, and those circles in Kim as I recall, are described as pixel
7 circuits. And it's true that that appears to be what then is shown in Figure 10
8 of Kim. The, I mean, obviously you see the data line DM coming down
9 Figure 10 on the left side of that page, and that connects up to the data driver
10 at the top of Kim. So, I think Kim does describe that as a pixel circuit.
11 Now, it's not clear if Kim does use the word pixel circuit is the same as the
12 '521 use of the term pixel circuit. And, you know, another way to think
13 about the pixel circuit might be that current driver and the OLED, which is
14 the blue and purple boxes of Kim. But I think it's fair to say that Kim uses
15 the term pixel circuit to describe what's shown there in Figure 10, which I
16 think, I think that was your question, Your Honor. Was there some other
17 issue you were trying to get out there?

18 JUDGE SZPONDOWSKI: Well, I understand Patent Owner's
19 argument that what you've identified here in Figure 10 in the green box isn't
20 a video driver. It's a pixel circuit. So, I guess I'm just trying to understand
21 it, because, according to Patent Owner, or at least part of their argument, is
22 that it doesn't have the structure necessary to be a video driver, such as, for
23 example, it doesn't have an amplifier. So, how do you respond to that?

24 MR. WILLIAMS: Yeah, that's -- I'm getting to those arguments,
25 which I think they're incorrect. We have several responses to them, but I

1 think the first thing I would just start with is, you know, there's nothing in
2 the claims that corresponds to this argument Patent Owner is making.
3 There's no notion of distinctness. And, in fact, if you look at Claim 1, which
4 I'm sure I have a slide for. I have a slide 3. You know, one thing you might
5 notice about that claim is the term video signal, which appears in the
6 preamble, is received by the display panel, and it's also received by the video
7 driver. So, you know, that's the antecedent for the video driver receiving the
8 video signal. I mean, that obviously implies that the video driver is part of
9 the display panel, which is exactly what's going on in Kim. So, I think the
10 claim language itself just very clearly maps directly onto what Kim's doing,
11 whether you call this thing a pixel circuit or something else. It's got the
12 claimed video driver that is receiving a video signal exactly in the way that
13 the claim works.

14 So, what I was intending to make -- the point I'm intending to
15 make with this argument is just that the notion of these things having to be
16 separate and distinct is wrong. But now let me turn to what I think your
17 question was getting at, Your Honor, which has to do with some of these
18 sort of purported properties of a video driver and whether what Kim is doing
19 satisfies those. So, let me first turn to well slide 30, I think, summarizes
20 Patent Owner's arguments here on this point. So, here we have kind of what
21 we characterize as being the second mapping argument that Patent Owner
22 seems to be making, that there are these requirements of a video driver that
23 are somehow in this claim even though they're not explicit, and that Kim
24 doesn't satisfy them. We'll have several responses. As to the amplifier
25 piece, the requirement of an amplifier, Claim 1 does not recite an amplifier

1 for sure. There are various claims that do, 3, 4, 6, and 8, for example. And
2 that language would seem to be rendered superfluous if Patent Owner were
3 correct that all of the claim video drivers require amplification. The other
4 two arguments that Patent Owner makes are based on this extrinsic
5 evidence, Den Boer, as well as the specification. And so, let me address
6 both of those things.

7 Slide 32 begins to address the Den Boer reference. So, the first
8 problem, I think, for Patent Owner is that they rely heavily on Den Boer to
9 help inform what a POSITA would have thought the video driver was. The
10 problem is Den Boer never uses the word video driver. And in fact, the term
11 video driver seems to be one that's used almost solely in this Patent. So, it's
12 not going to help us to read what Den Boer talks about to understand what a
13 video driver is. All of the things that Patent Owner points to have nothing to
14 do with video driver in Den Boer. They have to do with other things. They
15 have to do with data drivers or column drivers when they're called various
16 other things in Den Boer. But Patent Owner seems to be making the leap
17 that when Den Boer talks about column or data drivers that that is the
18 claimed video driver, which of course it couldn't be because the claimed
19 video driver is supposedly the inventive thing going on here. But also,
20 there's no reason to think that that's what Den Boer is talking about. So, you
21 know, that's just kind of the main reputation of this whole Den Boer
22 argument is it just sort of fails at the language level, just talking about
23 something totally different. The other problem is that these requirements
24 that Patent Owner appears to find in Den Boer are not consistent with how
25 the Patent talks about the invention itself. So, the specifications you'll see

1 on slide 33 makes clear that these requirements are not satisfied by Patent
2 Owner's embodiments.

3 So, for instance, the idea that you have to do a digital analog
4 conversion after you do level shifting is inconsistent with how the '521
5 Patent works, which seems to go in the opposite direction. The other thing
6 is that this '521 Patent section doesn't talk about an op-amp, which Patent
7 Owner seems to think is required by this claim. And then, of course, you
8 know, the portion of the spec the Patent Owner is pointing to does seem to
9 be talking about the prior art and not the claimed video driver. So, we don't
10 think any of these arguments really have a strong basis and there's no reason
11 to insert all of these requirements into the claim.

12 If you turn, again, this is confirmed, and turn to slide 35. As we
13 pointed here, none of the embodiments actually satisfy the three-step
14 framework that Patent Owner would propose. The video drivers shown in
15 the Patent don't perform the shifting. They don't perform the digital analog
16 conversion, and they don't amplify the signal. It's clear that the
17 specification, although it talks about amplification, it says unity gain is
18 sufficient, so, there's no reason that you have to actually change the gain of
19 these signals in the video driver. At one point, I think Patent Owner pointed
20 to the fact that VDD shows up in Figure 4. You'll see there on the right, but
21 that VDD is really, you know, just simply powering it up on op amp. It's not
22 an input into this op amp. We don't think that these arguments really work,
23 but, you know, even if the Board were to construe the claim in the narrow
24 way that Patent Owner wants, the remedy for us would just be to remap
25 Kim, so you'll see on slide 36. You know, we could just draw that video

1 driver box around the data driver, which appears, you know, it's the column
2 driver in the top of column three, the one that's actually sending that signal
3 DM into the driver circuit. We draw that green box to cover video data
4 driver in Kim, it would satisfy Patent Owner's new construction that they
5 want to propose that we point out. And we asked Dr. Credelle about this
6 during his deposition. We addressed that in the reply brief. It was Exhibit
7 1016. The question I asked him was, okay, do you dispute that there is a
8 video drive signal in Kim? And his answer was, what I say in Kim is that
9 the video drive signal is what's shown in the data line coming into the circuit
10 10. So, he seems to agree that it does have a video drive signal. It's just that
11 it comes from a different place. So, you know, that's fine. If they wanted to
12 narrow the claim that way, then we could just redraw the box.

13 Those are the arguments I have on that, and I think our response to
14 Patent Owner's arguments on this point, Your Honor. Just have one other
15 point on Kim, really, which has to do with the reference to part of the claim.
16 So, I'm not sure if Patent Owner is continuing to make this argument. I
17 didn't really see it in their sur-reply, but it is in their Patent Owner response.
18 So, I do just want to address it. As you recall, the claims here require that
19 the video drive signal be referenced to a positive power supply. And Patent
20 Owner's argument that Kim doesn't do this because essentially Kim has a
21 storage capacitor, and therefore there's a temporal difference between the
22 power supply voltage that appears during the programming phase and what
23 happens when the circuit is actually emitting. And we have many responses
24 to that that we lay out in the reply. But, you know, the first and most
25 obvious one is that whatever this temporal difference is that the Patent

1 Owner wants to say must exist in Kim can subsumes it when it says that the
2 OLED current is substantially not influenced by power supply variation. So,
3 whatever that difference is, even if it was there, which of course Kim doesn't
4 discuss it being there, even if it was there, Kim expressly teaches you that
5 it's taken care of, right? The variations are substantially removed. And that
6 we think is sufficient for the claim, but the second point to make is that this
7 argument that Patent Owner makes really renders its Patent problematic
8 because it would be a defect in all of the embodiments of the '521 Patent as
9 well. So, you know, both experts admit that to have an active matrix
10 display, you're going to have to have a storage capacitor, and that is
11 necessarily going to create this potential for a time difference between the
12 voltage at the time of programming and the voltage at the time of emission.
13 And so, you know, because of that, if these Patents cover anything that's in
14 the specification, then Kim has to teach the claims as well. So, in other
15 words, there's just no way that reference to could possibly mean what Patent
16 Owner seems to be suggesting here because it would eliminate all of the
17 embodiments from the scope of the claims. And it would also create a
18 logical inconsistency because the claims require that this be an active matrix
19 display panel and every active matrix display panel would have this exact
20 same issue.

21 So, in our view, Kim is a very strong ground. We think it
22 anticipates and renders obvious the challenged claims that are laid out in
23 Ground 1 and 2. And I was going to move on to Hayafuji, which, sorry,
24 that's Claims 1, 2, and 7, just to be clear. And I was going to move on to
25 Hayafuji unless the Board had further questions about Kim.

1 Okay, hearing nothing I'll move on to that. Okay. So, just
2 beginning I guess with the main points of Hayafuji. The first, I guess the
3 first thing to say is, you know, Patent Owner has this argument that there's
4 this main component, which they call the main component of the power
5 supply, that I guess, well, would exist, and therefore would prevent Hayafuji
6 from satisfying either the reference to or independent of. So, this is at slide
7 39, it's probably easiest just to go there and we can look at Patent Owner's
8 arguments. Okay. So, Patent Owner seems to say that their claim requires
9 that the power supply voltage main component, VDC, be used as a baseline
10 for generating the video drive signal. We don't think this argument makes
11 sense for a few reasons. So, we address those on slide 40. First of all, that
12 idea doesn't seem to be present in the actual claims. It doesn't make a
13 distinction between the various parts of the power supply voltage. They
14 don't limit themselves to being referenced to a particular part of the power
15 supply voltage, and they don't say what part of the power supply voltage, the
16 output current needs to be independent of. So, you know, again, these
17 arguments that Patent Owner is making seem to be not commensurate with
18 what the actual claim language is. The other thing to note about this, it kind
19 of implies -- I mean, I think Patent Owner's argument here is that
20 independent of means that if there's any effect in the output current from the
21 power supply that the claim is not satisfied. And the problem is that can't be
22 right. You see on slide 40 there that middle box from Credelle's deposition.
23 This is Patent Owner's expert. Both experts say this, by the way. Everyone
24 agrees that there's always going to be an effect of the power supply because
25 if the power supply, for instance, drops below the threshold voltage of these

1 transistors, the whole circuit is going to fail. You're not going to get any
2 output at all. So, you can't eliminate all dependency on the power supply
3 voltage. There has to be some dependency on the power supply voltage.
4 That's how the circuit works. The laws of physics would break down if
5 somehow the thing could be powered with no voltage. So, it just can't be
6 right what Patent Owner is arguing here that any dependency, including
7 dependency on the steady state DC voltage is somehow sufficient to take a
8 device outside the scope of the claims.

9 So, because of that, what we say is Hayafuji's dependency on the
10 steady state voltage still satisfies the claims, you know, if -- if anything
11 Hayafuji is exactly the kind of thing that the Patent seems to be talking about
12 because what it's eliminating is the stuff other than the DC sort of the ideal
13 version of this power supply voltage it's eliminating the, what they call the
14 ripple, which the experts talk about is corresponding to, you know, noise,
15 they use those terms. Not quite interchangeably, but it's clearly there's an
16 overlap between drift, and, sorry, between ripple and noise, and we can look
17 at those examples in the record in a minute. But the larger point here is, if
18 anything, Hayafuji is doing exactly what the Patent talks about as being the
19 key of the invention which is eliminating the effects of the voltage variations
20 from the output. And if you don't want to eliminate effects of the DC
21 component of the voltage because, I mean, that seems to be not possible
22 because there's always going to be a DC voltage effect if the DC voltage
23 again drops below. You know, easy way to think about it if it goes to zero,
24 if you take the battery out or disconnect it with power, that thing is not going
25 to work. And that obviously can't be what the claims are talking about.

1 Okay, let's see here. Yeah, we looked at slide 40. Yeah, if you
2 look at slide 42, you'll see the, you know, the analysis that our analysis of
3 Patent Owner's arguments here, which sort of essentially I think summarizes
4 what I was just saying. Their argument seems to be that to practice this
5 claim, the only thing that you have to -- what you absolutely have to
6 eliminate is drift and everything else is optional. And this is just not
7 consistent with anything in the specification, including the various
8 embodiments that we've seen in the '521 Patent. This is an excerpt from
9 Figure 4, and from column 7 of the Patent, and as you'll see here, you know,
10 this is an example embodiment where noise is still present. So, we know
11 that not all effects, not everything from the -- not all variations in power
12 supply have to be eliminated to be within the scope of the claims, which is
13 consistent with what we're saying in Hayafuji that, yeah, although it's true
14 that Hayafuji would still have a DC component in the output, that's the one
15 thing that you would want to keep in the output. What you want to eliminate
16 is the noise and ripple, and that's what we do.

17 I think that is it. I was going to move on to the other Hayafuji
18 ground, the obviousness ground. Okay. All right. So, here we can look at --
19 so, slide 46 shows the modified version of the circuit we're proposing in the
20 obviousness ground which, you know, the video driver here has been
21 slightly modified from the original disclosure in Hayafuji, and we have
22 various reasons why that combination would have been made, which I'm
23 going to turn to in a few minutes. Before I do that, though, I just want to
24 jump down to Claim 5 for a moment. So, we address Claim 5 within this
25 obviousness ground, so if you turn to slide 50. So, we mapped Claim 5 onto

1 both the modified and the original Hayafuji, and you'll see that from our
2 petition, page 77 where we say, as such, a POSA would have recognized that
3 Hayafuji circuit three, including transistor Q3, is a current mode isolator
4 circuit. Again, Claim 5 depends, just to be clear, to make sure everyone's
5 following along, Claim 5 depends from Claim 2, and Claim 5 requires that
6 the video driver comprise a current mode isolator circuit. So, our contention
7 in the petition was that both the modified and the original version that meet
8 this claim. And Patent Owner doesn't really have a response to that other
9 than, I think, arguing that that's a new argument, but as I just indicated, you
10 know, it's to us, it was clear in the petition that both were being mapped, and
11 we said explicitly the thing I just read on 77 about Q3, which is Figure 10 of
12 Hayafuji satisfies this current mode isolator circuit. So, the point of that
13 transgression is just to point out, if the Board were to disagree with us about
14 the motivation to combine, sorry, the motivation to modify Hayafuji, it
15 would not really affect the analysis of Claim 5, because Claim 5 would be
16 satisfied by Hayafuji as is.

17 So, with that, let me now move back to the modification and just
18 sort of address what I think is the main argument here. So, Patent Owner's
19 argument seems to be that, and we have some of it on slide 47, that the
20 problem is, and, you know, I did see some language that seemed consistent
21 with the Patent Owner's view of this in the institution decision that what
22 we're doing is removing a key feature of Hayafuji, which is its ripple
23 extraction circuit. And, you know, the main response that I have to that is
24 that although it's true we're modifying Hayafuji and the filter that he used to
25 do the filter extraction -- to do the ripple extraction would be removed from

1 circuit. The functionality is not being removed if, in fact, it's an
2 improvement to the functionality Hayafuji. So, the whole point that our
3 expert explains in his declaration, that's Exhibit 1015, Dr. Kattamis says,
4 you know, these modifications would add to that functionality, that it would
5 improve the performance of Hayafuji and would have better accomplished
6 the thing that it's trying to accomplish. So, you know, we don't think we're
7 destroying the principle of operation or removing functionality. It actually is
8 just the opposite. We're just reconnecting the circuit that he already has to
9 better improve it. And when you do that, you can eliminate that filter at the
10 beginning. And, you know, the revised circuit is the one that's shown on 46.

11 It's, you know, again, largely find -- you know, you can walk
12 through the expert declaration to see how he gets there, but, you know, it is
13 not a major redesign. It's quite simply taking the circuitry that already
14 exists and recognizing that it could be improved to better reject any
15 variations in the positive power supply voltage. So, I think -- I don't think I
16 had any other points to make on Hayafuji unless the Board had questions
17 about it. If not, I'll move on to Steer. Okay.

18 So, there's sort of two arguments that Patent Owner makes about
19 Steer. One was shown on slide 55. Is that, sorry, there we go, getting there
20 on my computer. So, this -- Patent Owner makes note of the fact that Steer
21 talks about amplified output, and based on that, it assumes that the circuit
22 extra requires that the gain be changed, which would have an effect on, you
23 know, the ultimate equations that when you do the circuit analysis, at the end
24 of the day, may then affect whether or not, you know, the voltage. Whether
25 the voltage actually is referenced in the power supply voltage. In our view,

1 amplification is not required by Steer, and although he talks about that, it's
2 clear that the gain could be a unity gain. So, those opposed amplification
3 may just be buffering, which would then, you know, satisfy the claim
4 elements. So, you know, at the very least, unity gain would be an obvious
5 way to implement what Steer teaches because he just shows those resistors
6 without telling you what the values are and uses the same values, the same
7 sort of identifier for all of them, implying that they could very well be the
8 same. So, in our view there's no reason to think you have to make a change
9 and gain, and at the very least, it would be obvious not to, and would get you
10 to the claim language.

11 The only other argument Patent Owner seems to have is shown
12 here on slide 60. This has to do with Steer. So, the way Steer is
13 implemented is through some current feedback system, which gives you an
14 additional term in the equations, but in our view that, you know, we have to
15 respond of that. First of all, that current can be zero, as our expert explains,
16 but even if it's non-zero, it wouldn't take the Steer -- there's no reason to
17 think that takes Steer outside the scope of the claims. All the claims require
18 is the voltage drive signal be referenced to the power supply voltage, and
19 Steer definitely does that. If there's a non-zero current, then there's another
20 term present for sure, but that doesn't take it out of the scope of the claims
21 because it is -- because the power supply voltage is still present in that
22 equation. So, it's still -- in this case, Steer calls the power supply voltage V
23 supply, and as we explained in the petition and the reply, you know, the
24 relevant voltages are still, you know, V supply still appears in the equations
25 for those relevant voltages. So, it's still the case that you're referenced to the

1 power supply voltage, even if other terms are present. So, that's really it. I
2 did want to just comment or point out to the Board in case you didn't notice.
3 There was a District Court claim construction order entered in the parallel
4 litigation. We have entered into the record as an exhibit with an updated
5 mandatory notice. But, you know, in our view, the District Court claim
6 construction is fairly straightforward and consistent with the positions we've
7 taken in the petition, so we didn't seek any further briefing on it. The Board
8 looks at that and would like further briefing, we're happy to provide it, or I
9 can answer any questions you might have now, but I just did want to flag
10 that.

11 JUDGE SZPONDOWSKI: So, you don't think that the claim
12 construction order affects anything in your petition?

13 MR. WILLIAMS: I mean, I think it supports our petition. For
14 instance, the Board -- the District Court's construction of reference to is
15 essentially connected to and, you know, all of our grounds have that in one
16 way or another, the video driver is connected to the positive powers play
17 voltage. That's true in Kim, Hayafuji and Steer. The construction of
18 independent of sort of was really resolving an indefiniteness issue. So, it's
19 probably not directly applicable to issues before the Board, but certainly the
20 District Court's reasoning there implies that independent of means
21 independent of some part of the power supply voltage and doesn't mean all
22 of it. And I think that's consistent with the arguments we've made in the
23 petition as I've just gone through. For instance, you know, Hayafuji, one is
24 the most obvious example where, you know, the presence of an ideal DC
25 source in the output current could still be within the scope of the claims

1 because that current, the drive current is independent of variations in the
2 power supply caused by ripple. And I think those are the only constructions
3 that are relevant to this -- or potentially relevant to this proceeding, Your
4 Honor.

5 JUDGE SZPONDOWSKI: Okay. Yeah, it didn't seem like there
6 was much dispute over what the claim terms meant.

7 MR. WILLIAMS: Yeah, you mean in this proceeding?

8 JUDGE SZPONDOWSKI: In this proceeding, yes.

9 MR. WILLIAMS: Yeah, I mean, I don't disagree with you. Some
10 of Patent Owner's arguments do seem to be based on the narrow
11 interpretation of the claims which we don't think is well supported. And so,
12 to that extent, I just want to flag that, you know, we do disagree that any of
13 these Patent Owner's arguments have a basis in the claim language. But,
14 yeah, no one has proposed really clearly conflicting instructions, you know.

15 So, with that, I think I can reserve the balance of my time unless
16 the Board had additional questions.

17 JUDGE SZPONDOWSKI: I think we can turn to Patent Owner.
18 So, you will have, it looks like 23 minutes rebuttal. And would Patent
19 Owner like to reserve time for sur-rebuttal?

20 MR. HAMILL: I'd like to reserve 15 minutes as well, please.

21 JUDGE SZPONDOWSKI: Okay, great. You can start whenever
22 you're ready.

23 MR. HAMILL: Okay. Thank you, Your Honors. And to get
24 started, I'll please turn to slide 2 of the Patent Owner's demonstratives. And
25 Petitioner already provided an overview here. But what was missing from

1 Petitioner's presentation is an overarching theme that applies to each of
2 Petitioner's references. And that's that these references are all attempting to
3 solve different problems than the problem the '521 Patent addresses. Kim
4 and Steer, for example, attempt to solve the problem of non-uniformities
5 between pixels in the AMOLED display. One of those problems is IR drop,
6 which is a difference in voltage in different parts of the display panel.
7 Another problem is differences in drive transistor characteristics in different
8 pixels, meaning that the threshold voltage of the drive transistor will be
9 different, which is due to manufacturing defects. And then with respect to
10 Hayafuji, Hayafuji attempts to solve the problem of predictable voltage
11 ripple, resulting from the operation of a DC to DC converter in the power
12 supply. And so, because these references address different problems, it's not
13 surprising that they don't disclose the intentions of the '521 Patent.

14 And so, with that I'll -- let's turn briefly to slide 5. And I'll provide
15 a little overview of the '521 Patent. And in contrast to the prior art
16 references that the Petitioner relies on, the '521 Patent addresses positive
17 power supply voltage variations that affect the AMOLED display panel as a
18 whole. And so, the first excerpt in the upper left, we see here the Patent
19 states that the invention relates to a video driver for AMOLED displays that
20 it's capable of isolating the pixel circuit from power supply voltage
21 variations. And then there are some examples provided. So, for example,
22 skipping to the excerpt in the middle of the right-hand column, the
23 specification explains that when the AMOLED display is incorporated in a
24 battery powered application, the power supply voltage will inevitably
25 fluctuate whenever circuitry in the application device is powered up from

1 being in standby mode. And then turning to the last excerpt and other
2 examples provided, the power supply voltage will fluctuate when the
3 transmitter or receiver circuit is powered up. Furthermore, battery voltage
4 tends to drift over time.

5 So, with that background, turn to slide 7 and address Kim first.
6 And so, there are two main arguments that apply to Kim, but they're --
7 because they're related I'm going to address them together today. The short
8 version is Kim's pixel circuit does not generate a video drive signal. It
9 doesn't drive a column of pixels. And so, it's not a video driver. Now,
10 Kim's, the Kim reference does disclose a video driver, something you could
11 call a video driver, which is data driver 300, but it doesn't reference anything
12 to the positive power supply voltage. And that's why Petitioner had to
13 incorrectly point to the pixel circuit in its analysis.

14 And so, if we turn to slide 8, we have the claim language. And so
15 just to emphasize the claim requires a video driver receiving a video signal
16 and generating a video drive signal indicative of the video signal and
17 reference to a positive power supply voltage of the AMOLED display panel.
18 So, you have the video driver and the video driver must generate a video
19 drive signal. And turning to slide 9, and this was, Your Honor explored this
20 during Petitioner's presentation. There's no dispute that in what Petitioner
21 relies on as disclosing the claimed video driver is in fact a pixel circuit. And
22 Kim describes it as a pixel circuit and really any -- that would be consistent
23 usage of the term pixel circuit with all the other references as well.

24 Turning to slide 10, we have what the Petitioner asserts is the
25 video drive signal, which is the voltage at a certain portion within the pixel

1 circuit at node A4. And if we skip ahead to slide 12, we have Mr. Credelle
2 providing some background on generating a video drive signal. Mr.
3 Credelle explains that generating a video drive signal requires taking a
4 usually digital video signal and shifting, converting the analog, amplifying
5 so that it can properly drive the transistors in the display panel's pixel
6 circuits. And Mr. Credelle here relies on a figure from the Petitioner's Den
7 Boer reference. And --

8 JUDGE SZPONDOWSKI: So, is it your position that, you know,
9 every time a video drive signal is generated, these three steps have to be
10 performed?

11 MR. HAMILL: Your Honor, really, this is a background
12 discussion of generating a video drive signal. And so, as, I mean, as Mr.
13 Credelle states here, he says the video signal would usually be digital, but it
14 can be analog, depending on the system. And so, really, the idea here is to
15 show that generating a video drive signal in the literature, and based on a
16 POSITA's understanding, it maps to the functionality that's done by the
17 video driver in the '521 Patent.

18 JUDGE SZPONDOWSKI: So, is this an inherency argument?

19 MR. HAMILL: It's not an inherency argument. It's really the
20 claims relate to an AMOLED display, and in an AMOLED display, you
21 have certain components. You have drivers that drive either columns or
22 rows of pixels. You have the, for example, in Den Boer and in Kim, they
23 call these a data driver that drives the actual video data voltage to a column
24 of pixel circuits. You also have scan drivers, which drive rows of pixels to
25 switch those on so that they can receive the data voltage and be

1 programmed. So, those are the basic elements of an AMOLED display. So,
2 you have drivers and you have pixel circuits. You have OLED display
3 elements. So, this is just background on what an AMOLED display panel is.
4 So, it's not an inherency argument, Your Honor.

5 JUDGE SZPONDOWSKI: Okay. Thank you.

6 JUDGE MCMILLIN: This is Judge McMillin. Is it a claim
7 construction argument? Are you giving a special meaning to video driver as
8 used in the claims?

9 MR. HAMILL: Your Honor, no, I don't think this is a special
10 meaning at all. And I think we'll get into some additional materials that
11 show that this is a plain meaning and how a person of skill would understand
12 an AMOLED display to operate.

13 JUDGE MCMILLIN: Thank you.

14 MR. HAMILL: And so, if we turn to slide 13, Mr. Credelle
15 explains that the '521 Patent's teachings are consistent with a POSITA's
16 understanding of generating a video drive signal. Mr. Credelle explains that
17 the '521 Patent describes generating a video drive signal as, among other
18 things, receiving a video signal from a video source, such as an image
19 processor, and shifting it to bring the DC range of the analog video signal to
20 within the range of the AMOLED display panel. And this, well here is from
21 the '521 Patent's prior art discussion, but in every embodiment this is also
22 done, but it's done by the video driver referencing that video signal to the
23 positive power supply voltage. And then we see here in this exemplary
24 Figure 2, once that referencing is done, then the video driver sends the video
25 drive signal to the display panel, specifically to the pixel circuits. And that's

1 what's shown here, and a person of skill would understand that there are a
2 number of pixel circuits that would receive that video drive signal in an
3 AMOLED display.

4 And so, then if we jump ahead to slide 20, Mr. Credelle explains
5 that in an AMOLED display first you have what is, in the Tsujimura
6 background reference, data drivers that supply these analog video signals to
7 columns of pixels in the display, and you have scan drivers shown on the left
8 of that figure that turn on the switching transistors one row at a time. And
9 so, if we turn to slide 21.

10 JUDGE SZPONDOWSKI: So, if this -- is the data driver and the
11 scan driver are those video drivers?

12 MR. HAMILL: Well, in the context of the '521 Patent, it's clear
13 the video driver is sending the signal, the video drive signal, that have the
14 video information, and so that would map to the data driver in an AMOLED
15 display. The scan driver is really just sending a high or low signal to turn on
16 or off the switching transistor across the row of pixels so that -- determine
17 whether they will actually receive that as an input and store it in the
18 capacitor. But there's no question that it's the data driver that drives columns
19 of pixels with the actual video data information.

20 And so, if we turn to slide 21, we see that Kim's disclosure is very
21 similar to that figure from Tsujimura, and it's -- and that's because this is a
22 conventional AMOLED display system. There's really no dispute that this is
23 how AMOLEDs work. You have the data driver driving these data lines,
24 which are connected to columns of pixel circuits. You have the scan driver
25 applying the high or low to determine which row of pixels will be

1 programmed, and that happens sequentially in an AMOLED display one row
2 at a time and then starting all over again.

3 And so, turning to slide 22, here we have Mr. Credelle at
4 paragraph 92 explaining that what Kim discloses is consistent with a
5 POSITA's understanding of an AMOLED display. So, Mr. Credelle's
6 explanation, it's consistent with the literature, it's consistent with Kim, he's
7 not making this up. And Dr. Kattamis at paragraphs 67, 68 of his
8 declaration agrees that this is how AMOLED displays work.

9 So, turning to slide 23, Mr. Credelle at paragraph 92 explains that a
10 POSITA would understand that the video driver of the '521 Patent is the
11 same or maps to the functionality of the data driver in Kim's Figure 3 or the
12 data driver in Tsujimura.

13 JUDGE SZPONDOWSKI: So, is your argument then that
14 Petitioner just mapped the video driver to the wrong thing in Kim?

15 MR. HAMILL: So, the bottom line is that the Petitioner couldn't
16 find anything in Kim's video driver that was referenced to the positive power
17 supply voltage. And so, they relied on the pixel circuit, but they missed that
18 a video driver has to drive multiple pixel circuits. They missed this because
19 the actual video driver doesn't do what they want it to. And so, it's
20 undisputed in AMOLEDs, the video driver drives columns of pixel circuits.
21 They've shoehorned the pixel circuit into the video driver in an AMOLED
22 display that does not work. So, the Petitioner is just wrong about this point.
23 So, that's really the bottom line on Kim.

24 JUDGE MCMILLIN: What claim language are you addressing?
25 I'm sorry, this is Judge McMillin. What claim language are you addressing?

1 MR. HAMILL: Yes, Your Honor --

2 JUDGE MCMILLIN: Excuse me, Mr. Hamill.

3 MR. HAMILL: And so, if we can turn back to slide 8. And so, the
4 claims are -- here we have Claim 1 in slide 8. The claim is unquestionably
5 related to an AMOLED display panel and you have a video driver that
6 generates the video drive signal, which is indicative of the video signal. So,
7 this is the video data in an AMOLED display. This is the signal that's
8 coming from the driver, it's the video drive signal indicative of the video
9 signal in reference to the positive power supply voltage. Other parts of the
10 claim get into the current driver. And so, in the context of an AMOLED
11 display the video driver has to be the driver that drives the columns of pixel
12 circuit.

13 JUDGE MCMILLIN: But in each of the -- sorry, this is Judge
14 McMillin again. In each of the embodiments displayed and shown in the
15 figures of the Patent. The circuit, for example, Figure 2, only seems to be
16 driving one pixel, 32. Not columns. And that seems to be true of all the
17 embodiments.

18 MR. HAMILL: Yes, Your Honor. The Figure 2, and we can see
19 that in slide 13, if you want to take a look at it, the -- it's a simplified
20 drawing. The, in an AMOLED display, there's no question that the circuitry
21 there, in the video driver of Figure 2 would be outside the pixel circuit,
22 sending the video drive signal to the pixel circuits, and in an AMOLED
23 display those pixel circuits are arranged in columns. And so, this simply
24 shows one exemplary one, but a POSITA would understand that you have a
25 column with pixel circuits there, not just one.

1 JUDGE MCMILLIN: Okay. Thank you.

2 JUDGE JURGOVAN: This is Judge Jurgovan. So, in this -- are
3 you saying that basically there's one amplifier in the video driver that drives
4 the entire column of AMOLEDs, as opposed to what the prior art is showing
5 that each pixel circuit has its own driver? Is that the difference that you're
6 pointing to?

7 MR. HAMILL: Well, not exactly, Your Honor. The real
8 distinction over the prior art that we have with the '521 Patent is that that
9 video drive signal is referenced to the positive power supply voltage. And
10 so, it's not using some different voltage source in order to generate that
11 signal and bring it to the proper voltage level for driving the transistors in
12 the AMOLED display in those pixel circuits, actually using the positive
13 power supply voltage from the AMOLED display and using that to generate
14 that video drive signal. And so, that's the distinction over the prior art.

15 JUDGE JURGOVAN: So, you think that this circuit is
16 substantially different? I'm talking Figure 2 of the Patent as compared to
17 having a pixel circuit that has -- is also, you know, has a driver that's also
18 referenced to the positive voltage?

19 MR. HAMILL: That would not be an AMOLED display if you
20 had a driver going to every pixel. That would be a different type of display
21 technology. In an AMOLED display, you have that concept of sending the
22 video drive signal to columns of pixel circuits. And the specification of the
23 '521 Patent, admittedly, there's not a large discussion of the concept of
24 columns, but it is mentioned in column 1 of the '521 Patent that you have -- I
25 believe the language is that you have column decoders and switches. And

1 so, that is referring to this active matrix concept where you have the scan
2 driver activating switches and the column is being supplied with the video
3 drive signal. And depending on which switches are activated, the video
4 drive signal will program the appropriate pixel circuits.

5 JUDGE JURGOVAN: Thank you, I think I understand your
6 argument.

7 JUDGE MCMILLIN: This is Judge McMillin again, Mr. Hamill.
8 And again, this art argument hinges on the words video driver in Claim 1?

9 MR. HAMILL: Well, the word video driver is certainly part of it,
10 but also the nature of the video drive signal that it generates, which is
11 indicative of the video signal in reference to the positive power supply
12 voltage. Also, that the video driver is claimed distinctively from the current
13 driver, which receives the video drive signal. And so, in the context of an
14 AMOLED display, for all these reasons, a POSITA would understand that
15 the video driver wouldn't need to drive a column of pixel circuits.

16 JUDGE MCMILLIN: Rather than one pixel?

17 MR. HAMILL: That's correct. In an AMOLED display, you
18 wouldn't drive one pixel at a time like that.

19 JUDGE MCMILLIN: Thank you.

20 MR. HAMILL: Okay. And so, if there are no further questions
21 about that argument, I'll turn to slide 30, which addresses the passage of the
22 '521 Patent specification that describes various ways the video driver can be
23 integrated with the display panel. And I know Petitioner touched on this as
24 well. Here we see on this slide, highlighted a couple of the examples of how
25 this integration can be done. The first one is the video driver circuit of the

1 present invention can be implemented as an integrated circuit to be
2 incorporated in the AMOLED display system. The other one, the next
3 highlighted passage, reads the video driver of the present invention can be
4 integrated on the same integrated circuit with the current driver and the
5 OLED pixel elements of the AMOLED display panel. And the point here is,
6 as we'll see, for example, turning to slide 31, these embodiments do not
7 eliminate the requirement the claimed video driver drive on the pixel
8 circuits. As Mr. Credelle states in paragraph 100, even if the video driver
9 and display panels are integrated, a POSITA would understand that the
10 display would still comprise distinct pixel circuits and video drivers. And
11 here we have a figure from the Petitioner's Den Boer reference, which shows
12 on a single surface you have the data driver, you have a select driver, which
13 is the same as the scan driver, and then the viewing area, which is where all
14 the pixels are. And they're all on the same panel. And Den Boer calls it a
15 system on a panel. So, despite the fact that they've been integrated onto the
16 same substrate here, you still have distinct data drivers and scan drivers and
17 pixel circuits.

18 Turning to slide 32, we have another example. Here we have a
19 system where the drivers and pixel circuits are on the actual same
20 semiconductor substrate as in a single integrated circuit. And Mr. Credelle
21 explains that the video driver, in this case that's the H scan driver, and the
22 vertical scan driver, which is the drives of select signals, that they're all still
23 distinct. They have their distinct roles, but they're on the same piece of
24 silicon. And you can see here on the lower right, you have distinct pixel
25 circuits still. And so, despite the integration of these components onto a

1 single, integrated circuit, you still have distinct drivers and pixel circuits.

2 And then turning to slide 33, even Kim, at paragraph 48, discusses
3 that there can be various integrations and despite those integrations, Kim
4 still teaches that you have data driver and that you have pixel circuits. And
5 so, for example, the scan driver 200 and/or the data driver 300 may be
6 coupled to the display panel 100 or may be installed in a chip format
7 coupled to the display panel. The last sentence highlighted reads, in other
8 embodiments, the scan driver 200 and/or the data driver 300 may be
9 installed on a glass substrate of the display panel. So, these are similar
10 integrations contemplated by the '521 Patent, but also in Kim, you have
11 these distinct components. So, happy to address any questions, otherwise,
12 I'll move it into type three.

13 JUDGE JURGOVAN: I have a question, and that is, is the
14 preamble limiting here in Claim 1?

15 MR. HAMILL: Your Honor, I believe the preamble, the
16 discussion came up that the video signal is the AMOLED display panel
17 receives a video signal here. We don't believe that is limiting, but even if so,
18 this is hardly -- it's not -- for example, this could tie to an embodiment where
19 things are integrated. We don't think this is limiting, but the video signal
20 being received by this system doesn't override that you have a video driver,
21 you have a current driver. It's an AMOLED display panel. I really don't
22 think it's relevant to the analysis here.

23 JUDGE JURGOVAN: But it sounds like you're reading a lot into
24 what an AMOLED is in your analysis of the claim.

25 MR. HAMILL: Well, Your Honor, I -- the claim is clearly

1 directed to an AMOLED display system, and so --

2 JUDGE JURGOVAN: But why does an AMOLED display system
3 have to be integrated -- or constructed or integrated, as you say? In other
4 words, I don't think you're pointing to any standard that requires that an
5 AMOLED be constructed, as you're saying, it must, to have a video driver
6 driving all of the pixels in the column, for example.

7 MR. HAMILL: Well, Your Honor, there's no dispute about this.
8 The -- Dr. Kattamis described an AMOLED display the same way in
9 paragraphs 67 and 68. And so the -- I think, as Mr. Credelle explains, a
10 POSITA would understand that this is how an AMOLED works with drivers
11 driving columns and rows of pixel circuits.

12 JUDGE JURGOVAN: Thank you.

13 MR. HAMILL: Petitioner's own references, Kim, for example,
14 describes this exact same architecture. So, for those reasons, Kim does not
15 either disclose or render obvious the '521 Patent claims.

16 And I'll turn next to Hayafuji, which also does not disclose or
17 render obvious the claims. And so, turning to slide 36, there are two main
18 arguments I'd like to cover and they're related. Hayafuji does not disclose
19 either the reference to or independent of limitations. And the issue with
20 Hayafuji is that he uses only the ripple to generate the video drive signal,
21 does not use the positive power supply voltage. And using only the ripple
22 component is insufficient for two reasons. First of all, the claim requires the
23 video drive signal to be referenced to the positive power supply voltage. By
24 using only the ripple voltage, this does not meet the plain language of the
25 claim, which imposes a narrower scope than what Hayafuji discloses. And

1 then the other reason is that the outcome of referencing the video drive
2 signal to the positive power supply voltage is different than referencing it to
3 just the ripple component.

4 And so, if we turn to slide 38, we see Petitioner asserts that V_{gate}
5 from the Hayafuji schematic or circuit is the video drive signal, and this is
6 the sum of the video signal and the ripple voltage.

7 Turning to slide 39, here we see Hayafuji's Figure 6 and V_a in
8 Hayafuji is the positive power supply voltage. And that figure, it goes out to
9 the left and the ripple extraction circuit blocks everything except the ripple
10 voltage from passing, only the ripple, not V_a is combined with the video
11 signal. And I'll quickly address one of the points Petitioner raised right now,
12 which is that in the claim construction in the District Court, reference two
13 was actually not construed as simply receiving the positive power supply
14 voltage as an input, but rather also the video drive signal has to be based on
15 the positive power supply voltage. And so, I think that the Patent Owner's
16 arguments apply with or without that construction. But I wanted to clarify
17 the record that the District Court's construction requires more than what
18 Petitioner stated. In this case, only the ripple is combined with the video
19 signal at the block labeled voltage addition circuit. And the output V_{gate} ,
20 the alleged video drive signal, is not based in any way on V_a . And now, in
21 Hayafuji's own words, we see below the figure here on this slide, paragraph
22 49, Hayafuji explains that in the voltage addition circuit 15, treating the data
23 voltage V_{data} as a base, the ripple component, V_{RI} extracted by the ripple
24 component extraction circuit 14 is added to the base. And so here in
25 Hayafuji, it does not describe V_{gate} as being based on or an offset from V_a .

1 It's using the data as the base and adding only the ripple.

2 JUDGE SZPONDOWSKI: So, it's your position that it would
3 need to be the entirety of V_a ?

4 MR. HAMILL: Correct. The claim requires the positive power
5 supply voltage. For referencing here, that's V_a . And V_a is not combined
6 with the video signal at all.

7 JUDGE SZPONDOWSKI: But V_{ri} is, which is extracted from
8 V_a ?

9 MR. HAMILL: Yes. And so, and I'll address the differences in
10 outcomes that result from using only V_{ri} as opposed to V_a , but there's no
11 question here that V_a is not supplied to that voltage addition circuit or
12 combined with the video signal.

13 And so, turning to slide 40, here we have the Petitioner's
14 discussion, which they provided, you know, they broke down V_a into V_{dc} ,
15 which is sort of your ideal voltage plus the ripple. And I think we -- the
16 Board understands now only the ripple, not V_{dc} or any other component of
17 V_a other than V ripple is used to generate the video drive signal. So, if we
18 turn to slide 42, here Mr. Credelle explains that referencing the video drive
19 signal to the ripple voltage instead of V_a leads to different results. Mr.
20 Credelle explains here in paragraph 131, ripple is consistently introduced by
21 the normal operation of the DC-DC converter in the power supply system.
22 If the power supply voltage experiences fluctuations other than ripple, the
23 solution of Hayafuji will not work. And Dr. Kattamis agrees with this. He
24 states, since ripple originates from a deterministic switching behavior, ripple
25 components of power supplies are themselves deterministic and tend to

1 exhibit periodic behavior at the same frequency as the oscillating signal
2 controller in the DC to DC converter, noise on the other hand is a random
3 phenomenon and can originate from many different sources. And so, this
4 gets to the different outcomes because Hayafuji is addressing a
5 predetermined known disturbance in the power supply voltage. It is not
6 designed to account for any kinds of random noise or drift as contemplated
7 by the '521 Patent.

8 JUDGE JURGOVAN: Counsel, can I ask a question here? And
9 that is positive power supply voltage. Is that just the ideal voltage? Or is it
10 the ideal voltage plus the ripple in your view?

11 MR. HAMILL: Well, in the context of the '521 Patent, it's the
12 actual voltage that's used in driving the display. And so, that would include
13 any undesirable fluctuations that take it -- that make it different than what
14 the ideal positive power supply voltage would be.

15 JUDGE JURGOVAN: Okay. So, in order to be referenced to
16 positive power supply voltage, it must be referenced to both the DC power
17 supply level and the time varying components of it, in your view?

18 MR. HAMILL: That's correct, Your Honor.

19 JUDGE JURGOVAN: Thank you.

20 MR. HAMILL: Okay. Turning to slide 43, then the other hand of
21 -- the other side of the same argument is that Hayafuji does not disclose the
22 current drive voltage being independent of the positive power supply
23 voltage. And turning to slide 44, we have the claim language. And so, now
24 we're at the current driver. Previously, we were discussing the video drive
25 signal generated by the video driver. Now we're at the current driver. And

1 the claim recites the drive current being proportional to a current drive
2 voltage being indicative of the video signaling independent of the positive
3 power supply voltage. And so, if we turn to slide 45, the Petitioner presents
4 an equation for the current drive voltage, which is denoted V_{gs} , or the gate
5 source voltage, of the drive transistor. And Petitioner explains that, again,
6 V_a is made up of V_{dc} and V_{ri} . And the Petitioner's formula is that the V_{gs}
7 is V_{dc} minus the data. And so, again, the Petitioner admits that V_{dc} , which
8 is part of V_a , is part of the equation for the current drive voltage. And now,
9 the Petitioner made the point that, well, you have to have V_{dc} , otherwise the
10 display won't work. And I think this is really a conflating of what it means
11 to say gate source voltage, which is what they're pointing to as the current
12 drive voltage. And the gate source voltage is the difference between the
13 voltage at the gate and at the source of that drive transistor. And so, while
14 there is a minimum voltage that has to be applied to any given terminal of
15 the transistor, there is no minimum difference in voltage. And so, what the
16 '521 Patent is talking about when it describes the current drive voltage being
17 independent of the positive power supply voltage, it means that that's, when
18 you're calculating that difference, which determines how much current
19 flows, the positive power supply voltage is not a factor. And so, the
20 argument that it won't work if you don't have the positive power supply
21 voltage, that doesn't apply to what the claim is talking about here, that
22 current drive voltage that gate source voltage, it's a voltage difference. And
23 so, there's no need to have the positive power supply voltage or the V_{dc}
24 component of it as part of that difference. And then --

25 JUDGE SZPONDOWSKI: I've got about five minutes left in your

1 time.

2 MR. HAMILL: Okay. Thank you, Your Honor. I'll hurry along
3 here then. I'll just quickly -- let's turn to slide 48. And here, Mr. Credelle,
4 at paragraph 140, explains that in the current drive voltage, drift, and noise,
5 as discussed in the '521 Patent, would not drop out of that. And so, here
6 again, you have different results flowing from the different approach that
7 Hayafuji takes.

8 And so, I'll point to Steer, and turn to slide 54. I want to -- I'll
9 address one argument with respect to Steer. The alleged video drive signal
10 is not referenced to the positive power supply voltage. And that's because
11 the feedback current is inserted into the feedback circuit. We turn to slide
12 56, and actually to move things along, why don't we jump to slide 57. Here
13 we have Steer's Figure 4. This is the feedback circuit. I don't think there's
14 any dispute that there is a -- this is a feedback circuit. In this figure, it's the
15 op amp circuit 50 that Petitioner claims or argues is the video driver and the
16 output at node six is the alleged video drive signal. And what you have here
17 is the video signal is one of the inputs into the op amp of circuit 50. But the
18 other input is the output of this previous op amp circuit, which takes the
19 positive power supply voltage and also the feedback current. And what
20 comes out of there is not the positive power supply voltage, but rather the
21 positive power supply voltage modified by the value of the feedback current.
22 And then also, and that would be multiplied by the values of the resistor 46.
23 And so, what you have is that input, a second input to the video driver, is not
24 the positive power supply voltage. The positive power supply voltage has
25 undergone one or more operations now and then been changed. You have a

1 different voltage. It's based on the current as well as the positive power
2 supply voltage. And so, you're not using positive power supply voltage as
3 an offset in that case, or as a basis for determining the current video drive
4 signal. It's entirely new voltage. And so, that video drive signal is not
5 referenced to the positive power supply voltage.

6 JUDGE SZPONDOWSKI: But the claim doesn't preclude it from
7 being referenced to something else, does it?

8 MR. HAMILL: It doesn't preclude that, but in this instance, what's
9 happened is because the positive power supply voltage has undergone this
10 combination, it's no longer referencing that video drive signal to the positive
11 power supply voltage. So, it's a new voltage now that's being inserted into
12 that video driver, not the positive power supply voltage.

13 JUDGE SZPONDOWSKI: All right. Thank you.

14 MR. HAMILL: And if there are no further questions, I'll reserve
15 the rest of my time.

16 JUDGE SZPONDOWSKI: Okay. We will go back to Petitioner.
17 And you have 23 minutes. And you can start whenever you're ready.

18 MR. WILLIAMS: Okay. Can you hear me, Your Honor?

19 JUDGE SZPONDOWSKI: Yes.

20 MR. WILLIAMS: Great. All right. So, we'll just go back to Kim
21 then. Let me sort of -- actually, I'm going to just share it. I'm going to try to
22 share my slides. Let's see if this works. This is always a fun roulette. Okay.
23 Can you see those now, Your Honor?

24 JUDGE SZPONDOWSKI: Yes.

25 MR. WILLIAMS: Okay, great. So, this is slide 16, just for the

1 record. I mean, I think the main point from Kim is that it appears that most
2 of Patent Owner's arguments have to do with some silent claim construction
3 that they're proposing but don't want to be bound by. And as we pointed out
4 earlier, there's really nothing in the claims that requires the video driver have
5 all these particular restrictions that Patent Owner would like to put onto
6 them. And then as we'll get to, even if somehow those were restrictions in
7 the claims, Kim would still satisfy that even narrow claim construction for
8 the same reason that the '521 Patent does. And as is the point I was going to
9 raise here is, you know, comparing on slide 16, comparing what they
10 actually show in the '521 Patent to Kim, it is indistinguishable. I mean, this
11 notion that there needs to be a separate video driver that's doing something
12 more here is just not ever explained in the '521 Patent. And really what
13 they're trying to do is penalize Kim for teaching a system that actually works
14 with an active matrix display. So, you know, as Kim explains it here, you
15 know, the video signal coming in from the column driver comes along this
16 line DM, and then, you know, the video driver kicks in and does its
17 additional work in order to get that video signal in a state so that you won't --
18 you can remove the power, the variations caused by, or you can say the
19 undesirable power supply variations from the current that's going into the
20 pixel. So, Kim and the '521 Patent are teaching identical things. I mean,
21 and it's just really inappropriate, I think, for the Patent Owner to try to
22 penalize Kim because it's teaching the system as it would actually work.

23 But so, again, the main point, though, I think, is that, you know, all
24 of the arguments the Patent Owner is making about what is required by the
25 claimed video driver just appear nowhere in the claims. And, frankly, the

1 specification doesn't help it either, which is why Patent Owner largely
2 resorts to making this argument based on an extrinsic reference that doesn't
3 show at all how, you know, you would do the supposedly inventive video
4 driver technique.

5 And then the other thing I was going to just mention, because I
6 think this is clear from my presentation, but Patent Owner's counsel, the way
7 he described it, I think, is based on sort of an incorrect assumption. So, the
8 point we were making on slide 36 is that, you know, if this construction that
9 Patent Owner is pushing for, although, again, sort of *sub silentio*, they're not
10 saying this is their construction, but based on the arguments it seems like
11 they're having -- they're making a claim construction argument if they were
12 right about what a video driver had to be, then we would just draw this green
13 box here larger to include the video driver -- sorry, the data driver that is in
14 Kim's Figure 3, the thing that's actually feeding the signal into what we call,
15 what we currently call the video driver, right? So, that box would just get
16 bigger. We're not moving the box somewhere else. We're just drawing the
17 bigger box to encompass the thing that everyone agrees is in the prior art
18 that does the thing supposedly is necessary for the claimed video driver. So,
19 you know, Kim would still map to the claims. It would still have the data
20 driver performing the functions that Patent Owner now says are required,
21 plus the ones that Kim teaches about removing the effects of the undesirable
22 power supply variation. And there's no reason they have to be all in the
23 same place, as we've pointed out in our argument and as the Patent itself
24 makes clear, you know, these are components could be in different places,
25 one closer to the pixel and one farther away from the pixel and there's

1 nothing in the claims that seems different to prohibit that.

2 JUDGE SZPONDOWSKI: Well, would it redrawing the box
3 affect the mapping of some of the other claim elements, like, for example,
4 the video signal? The video signal needs to be received by the video driver.

5 MR. WILLIAMS: Yeah, well, the video driver. So, in our current
6 mapping, the video signal is coming in through the DM line. And it's
7 coming into the DM line because it's coming into the data driver. Now,
8 that's obviously not shown here, but it would be present in Kim. I mean,
9 that's how Kim works, right? You get a video signal and you distribute it to
10 all of the columns of the pixels, and then you scan across all of the rows of
11 the pixels. So, yeah, the video signal would be coming in to the video driver
12 still. I mean, it would move -- yeah, you're right, though. We would move
13 the box from the DM line to the input to the data driver. That's where the
14 video signal would have to come in. But for sure, it comes in there. No one
15 disagrees. Again, as we talked about before, even Patent Owner's expert
16 admits that there's a video driver and it's this data driver in Kim, and that's
17 the thing that's going to get the video signal and distribute it appropriately to
18 the pixels.

19 Okay. I don't really have much more to say on the integration
20 point. I think I'll just stand by what I said at the outset, which is neither the
21 claims nor the specification describe anything that would preclude the video
22 driver and Kim from satisfying the claims.

23 I heard a discussion, I think Judge Jurgovan, you asked the
24 question about whether the preamble is limiting. I don't know. We didn't
25 take a position on that, but we pointed out that assuming it is limiting, Kim

1 teaches it, which I think is right. Now, it is a long preamble. It does seem to
2 provide antecedent to several of the elements of the claims we spoke about
3 during the first part of my presentation. So, I think there are certainly parts
4 of that preamble that almost certainly are limiting. But unless we had any
5 other questions about that, I was going to move on to Hayafuji.

6 Okay. All right. I'm just going to go to my slide 13. So, just to be
7 clear, I'm going to show you this, it's not annotated in this drawing, but when
8 we annotated this in our petition, the yellow box is the claim video driver.
9 And, you know, you'll notice that video driver is certainly reference to Va,
10 Va is input into what's going on in Hayafuji. Hayafuji, the yellow box, the
11 video driver operates on Va and it gets combined with the video signal
12 coming in to produce this Vgate or video drive signal. So, now, in our view,
13 that satisfies every construction of reference to, it is connected to that power
14 supply voltage, what comes out of it is based on the power supply voltage.
15 And it's not clear to me why Patent Owner disagrees with that, it is operated
16 on. So now, if the argument is that somehow what Hayafuji is doing can't be
17 within the scope of claims because there is a part of the Va, some, when you
18 break VA up into the frequency domain, there'll be a part of it now that
19 perhaps gets excluded in this box. There's no reason to think that goes
20 outside the scope of the claims, which is shown by slide 42, where we have
21 the Patent Figure 4 embodiment. And as described in that, in the Patent and
22 as shown here in equation nine on slide 42, what ultimately comes out of the
23 video driver is essentially largely indistinguishable from what Hayafuji is
24 doing because there is a frequency domain portion of the VDD, the video,
25 the positive, sorry, the positive power supply voltage in this '521

1 embodiment that if Patent Owner's argument is right, is not referenced,
2 sorry, the video drive signal is not referenced to because you notice the $V(t)$
3 signal here in this equation nine doesn't include the noise, which they admit
4 is a portion of VDD and it's not showing up here. So, it's not referenced to.
5 And as a result, the noise appears in the output. But again, this is an
6 embodiment of the Patent itself and Hayafuji therefore would also be within
7 the scope of the claims for doing essentially the same thing. Now, it's
8 admittedly Hayafuji is eliminating a different part of the frequency domain
9 of the time -- of the VDD signal than this embodiment, but it's still
10 essentially doing the same thing. There's at least a part that is arguably
11 excluded and therefore does appear excluded from the video drive signal and
12 therefore does appear in the pixel output. But the Patent makes clear that's
13 not outside the scope of the claims, and it gives you a specific example of
14 that happening here. And again, if anything, Hayafuji, you know, better
15 serves the goal than the '521 Patent set out to achieve because it's excluding
16 noise as opposed to this, which is specifically allowing noise into this output
17 signal.

18 Okay. The only other -- I don't think I had any other point on --
19 there was a -- we addressed it in the brief, so I'll just mention it clearly. I
20 don't have a slide for it. I'm trying to find where I had it. Sorry. Oh, yeah,
21 it was Mr. Credelle's deposition. So, in his deposition, which is a good, I
22 may have talked about this earlier. I can't remember, but that's Exhibit 1016,
23 around page 160, line 22, and again, we cite this in the reply, he sort of, it
24 was clear that he's talking about ripple as a type of noise, and in fact, when
25 he describes Hayafuji, he says they are clearly focused on ripple noise

1 caused by the power supply. So, it's certainly a very similar type of thing
2 that is going on in Hayafuji, and it's correcting for that by limiting ripple
3 noise from the output, which again, I think is a better version of what is
4 actually an embodiment of the Patent itself.

5 Okay. Unless there's any questions about that, I'll just lastly
6 address here, and yes, this is our slide 61 that talks about Steer. Again, the
7 argument Patent Owner focused on here is this, you know, this term R46
8 times I, that's being present in the video drive signal. So, as we point out, as
9 Dr. Kattamis explains here in the portion of his declaration shown on slide
10 61, there's no reason to think that reference to means that you exclusively
11 reference to the positive power supply voltage. You know, you do use it as a
12 basis, for sure. And that's what Steer does. I mean, it has additional terms,
13 but there's no reason to think that's outside the scope of the claims.

14 So, really, I think those are the only main points I had. Did the
15 Board have any further questions for me?

16 Okay, then I'll begin, I'll end where I begin, which is to say that,
17 you know, as we pointed out, it appears to us that, you know, if any of the
18 embodiments of the '521 Patent are actually covered by these claims, then,
19 you know, they're unpatentable over all of these references, which I think all
20 teach a very similar idea of excluding power supply variation from the
21 output of the OLED current in very similar ways.

22 And so, with that, I will give back the balance of my time.

23 JUDGE SZPONDOWSKI: Okay. Thank you. And we will turn
24 back to Patent Owner, and you have 15 minutes.

25 MR. HAMILL: Thank you, Your Honors. So, I'd like to start by

1 revisiting one of the issues we discussed with respect to Kim. And if we can
2 turn to slide 8 of the Patent Owner's demonstratives, we have Claim 1, and
3 here we see AMOLED display is in the body of the claim. And that refers
4 to, in that highlighted portion, you have the AMOLED display panel. And
5 so, that refers to the AMOLED display panel introduced in the preamble.
6 So, in the preamble and in the body of the claim, there's no question that
7 Claim 1 relates to an AMOLED display panel, not any other kind of display.

8 Next, I'd like to address Petitioner's, slide 12. Turning to that, we
9 have Kim's Figures 3 and the annotated Figure 10. And one of the things
10 that Petitioner has argued in its reply in here today is that you could just
11 draw a bigger box. This would be a new argument that was not presented in
12 the petition. It would require, as the panel observed, redrawing, not just the
13 video driver box, but then redrawing the video signal. And that would be
14 very different because, as we see here, in Figure 3, that pixel circuit in
15 Figure 10 is in each of those circles. So, every single pixel circuit, that
16 would -- is what figure 10 has in Kim's fourth embodiment. And so, having
17 the claimed video driver be all over the display is a very different theory
18 than the one the Petitioner has presented in the petition. And so, it would
19 not be obvious to make those modifications, and that's not a theory that has
20 been presented or should be considered by the panel. And so, what we have
21 here in this -- on this slide is Figure 10, the pixel circuit, Petitioner argues
22 that that's a video driver. But as we can see here in Figure 3D, that data
23 driver 300, that is what drives the columns of pixel circuits, and Mr.
24 Credelle explained in paragraphs 92 and 93 that a driver has to drive
25 multiple pixel circuits in an AMOLED display. That's what you see here in

1 Figure 3D. The data driver drives columns of pixel circuits, the scan driver
2 drives rows of pixel circuits. That's not done by the pixel circuit in Figure
3 10. And again, stepping back, the reason that we're looking at that pixel
4 circuit is because in Kim's disclosure, the actual driver doesn't reference
5 anything to the positive power supply voltage. That signal that drives the
6 column of pixel circuits is not referenced to the positive power supply
7 voltage. That's why Petitioner is incorrectly pointing to that pixel circuit of
8 Figure 10.

9 Another point I'd like to address is in the Petitioner's slide 42. The
10 Petitioner is arguing that the Figure 4 embodiment of the '521 doesn't use the
11 positive power supply voltage. That's not correct. Here you can see that
12 VDD, the positive power supply voltage, is used to generate the video drive
13 signal. What the '521 Patent explains is that any noise that is introduced
14 after that capacitor is charged would not be reflected. But when that
15 capacitor is charged and that value is stored, which is used to generate the
16 video drive signal, that is the actual VDD, the positive power supply voltage.
17 So, nothing has been carved off. The point of the discussion in the Patent is
18 that that can vary until the next time it's charged during the next blanking
19 interval to use the terminology of the '521 Patent. And so, that is a
20 distinction between Hayafuji and even the Figure 4 embodiment of the '521.
21 Hayafuji does not combine V_a with the video signal. Here, VDD is
22 combined with the video signal.

23 I'm happy to address any questions from the Board on those points.
24 If there are no questions at this time, I'll wrap up for now at this point.

25 JUDGE SZPONDOWSKI: Okay. Well, thank you very much.

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1 This concludes our hearing in IPR2023-00771. If the parties could stay on
2 the line just in case the court reporter has any questions or needs any
3 spellings, we'd appreciate it.

4 (Whereupon the above-entitled matter went off the record at 2:42
5 p.m.)

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