

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VIZIO, INC.,
Petitioner,

v.

POLARIS POWERLED TECHNOLOGIES, LLC,
Patent Owner.

IPR2024-00073
Patent 7,843,148 B2

Record of Oral Hearing
Held: December 5, 2024

Before JOHN F. HORVATH, DANIEL J. GALLIGAN, and
KARA L. SZPONDOWSKI, *Administrative Patent Judges*.

IPR2024-00073
Patent 7,843,148 B2

APPEARANCES:

ON BEHALF OF THE PETITIONER:

SHEILA SWAROOP, ESQ.
Knobbe, Martens, Olson & Bear, LLP
2040 Main Street 14th Floor
Irvine, CA 92614
(949) 760-0404
2sns@knobbe.com

ON BEHALF OF THE PATENT OWNER:

DAVID ALBERTI, ESQ.
Kramer Alberti Lim & Tonkovich, LLP
950 Tower Lane
Suite 1725
Foster City, CA 94404
(650) 825-430 x104
dalberti@krameralberti.com

The above-entitled matter came on for hearing on Thursday,
December 5, 2024, commencing at 1:00 p.m., via video teleconference.

P R O C E E D I N G S

- - - - -

JUDGE HORVATH: This is Judge Horvath from the Patent Trial and Appeal Board. With me on the panel today are Judges Galligan and Szpondowski. We are here in the matter of Vizio, Incorporated versus Polaris PowerLED Technologies, LLC. Our case number is IPR2024-00073. If I could have counsel for Petitioner please make your appearance and let us know who is with you on the video call.

MS. SWAROOP: Yes, good afternoon Your Honors. This is Sheila Swaroop, Knobbe, Martens, Olson & Bear for Petitioner Vizio. And also attending with me here are my partners Marko Zoretic and Daniel Kiang. I believe also on the public line a representative from Vizio is attending as well.

JUDGE HORVATH: Thank you Ms. Swaroop. And if I could have counsel for Patent Owner make your appearance please and let us know who is with you.

MR. ALBERTI: David Alberti with Kramer Alberti. With me on the conference is Jason Fitzsimmons with Sterne Kessler.

JUDGE HORVATH: Thank you, Mr. Alberti. So we've -- well, maybe I should start out with some preliminaries. As you know this is a video call so if you could all mute your microphones when you're not speaking so that we don't have any crosstalk that would be helpful. Remember then of course when you are speaking to unmute yourself. I don't know if this is -- it is certainly my first time using Webex. I don't expect there's going to be any problems with dropping the connection, but in case we do, if -- you know we will obviously stop the clock and try and get

1 everybody reconnected. I believe you all have a dial in number so, worst
2 case scenario, we can do this via phone call if not video connection. Now
3 I'm not expecting any problems but just in case you all have that information
4 and that's how we will proceed. And of course, if there is an interruption,
5 we'll try and backtrack to where that interruption occurred so that we don't
6 interrupt anybody's argument or deprive them of their argument time.

7 The other preliminary is that as you're speaking -- we do have
8 copies of all the materials, your petition, all your briefing. We've got all the
9 exhibits. We also have the demonstratives that each of you have provided.
10 It will help us and make a clean transcript for the court reporter if, as you are
11 speaking, as you're going through your slides, if you could point out the
12 slide number, I'm on slide 5, what slide 5 shows is Figure 3 of the '148
13 patent, or so that there's a clean transcript and we can all agree on what it is
14 that we're looking at and what it is we're discussing at the time. Do you
15 have any questions about that?

16 MR. ALBERTI: No, Your Honor.

17 MS. SWAROOP: No, Your Honor, and we do have a second
18 screen here, it's labeled Knobbe Martens. I was planning to share with that
19 second screen, share the demonstratives and project them during the Webex
20 if that would be helpful for the panel.

21 JUDGE HORVATH: That's fine. It's your choice. Again, we do
22 have our own copies, but if you want to share your screen and show the
23 slides as you're discussing that, that's perfectly fine.

24 So, we have granted each side one hour to present their case, and
25 the Petitioner has the burden of proof, so they will go first and can reserve
26 part of their one hour of time for rebuttal argument, after which Patent

1 Owner will proceed with its case and can also reserve time for rebuttal. So,
2 let's start with Ms. Swaroop. How much time would you like to reserve for
3 rebuttal?

4 MS. SWAROOP: Yes, Your Honor, I'd like to reserve 20 minutes
5 for rebuttal.

6 JUDGE HORVATH: Okay, 20 minutes. And Mr. Alberti, for
7 rebuttal?

8 MR. ALBERTI: I would like to reserve 15 minutes for rebuttal.

9 JUDGE HORVATH: Fifteen minutes, okay. So I'm going to try
10 something new. I'm going to keep time on my phone here, and I'm just
11 going to show you what -- I hate interrupting you if you're in the middle of
12 argument, but you also need to know when you're going to run out of time.
13 So, I'm just going to set five seconds on it and let you hear the signal.

14 MS. SWAROOP: That's fine, Your Honor.

15 JUDGE HORVATH: Okay. So, what I'm going to do is I will set
16 a three-minute warning. You will hear that signal, and then after that signal,
17 know that your time is about to expire, and then I will set another 30-second
18 warning, and then when that 30-second buzzer goes off, you really have just
19 30 seconds to really wrap up what you're talking -- what you're discussing at
20 the moment. Is that understood?

21 MS. SWAROOP: Understood.

22 MR. ALBERTI: It is understood, Your Honor. I would just note I
23 was having a little bit of a difficult time hearing the signal --

24 JUDGE HORVATH: Okay.

25 MR. ALBERTI: -- so please feel free to remind me if I keep going
26 on past the signal.

1 JUDGE HORVATH: Sure. And I'll put it closer to the
2 microphone, so I had it in -- a little bit of away -- so I'll put it as close to the
3 microphone as possible. But I will also, if you don't mind my interrupting
4 you, I'm more than happy to. I hate interrupting trains of thought, you know,
5 to let you know that your time is about to expire, but I'm more than happy to
6 do that if that's your preference.

7 MS. SWAROOP: I didn't hear the signal either, so I'd be happy if
8 you would just interrupt and let us know.

9 JUDGE HORVATH: Okay. I'll do that. I'll give you a three-
10 minute warning, and then I'll give you a 30-second warning, and that will be
11 it. And I'll just shout it out, and you can keep talking, just to let you know
12 that your time is about to expire. All right. So, Ms. Swaroop, you had
13 requested 20 minutes for rebuttal, so that's 40 minutes. And with the three-
14 minute warning, that would be 37 minutes. And you may begin when you're
15 ready.

16 MS. SWAROOP: Okay, thank you. I think what we'll first do is
17 share our slides here and so if we could do that.

18 JUDGE HORVATH: And we can see them.

19 MS. SWAROOP: Great. Okay, then we'll go ahead and get
20 started. So, on behalf of Petitioner Vizio, I'd like to thank the panel for their
21 attention and time to this matter. As you know, we are here for our IPR
22 petition on the '148 patent. Just to briefly level set, this patent describes and
23 claims an LED driver for driving LEDs in parallel paths. And it describes
24 the use of a staggered PWM or pulse width modulation signal to control
25 current going through the LEDs. And the result is described by the patent is
26 that not all of the LEDs are energized at the same time. And as we

1 explained in our petition, this LED driver configuration was described in
2 several prior art references. The elements of an LED driver, a voltage
3 source, a PWM signal, current set circuits, as we demonstrated in our
4 petition, were all well-known and described in the prior art.

5 This patent has two Independent Claims, Claim 1 and Claim 14.
6 Claim 1 recites an LED driver with various elements. And then Claim 14
7 recites a method of driving the LEDs, again, using the elements described in
8 Claim 1. So, for purposes of our analysis, we've largely treated the Claim
9 14, the method claims, it's relatively the same analysis as we did for
10 Independent Claim 1, which recites the LED driver.

11 So, if we could go to our slide 2 here. So, in our petition, and we
12 have slide 2 projected now, we have four main grounds based on two
13 primary references. The first is the Thomas reference, and you see that here,
14 both anticipation and obviousness. And then we have two grounds, Ground
15 3 and 4, based on the Zane reference. And before I get into them, I just
16 wanted to set forth some issues that I believe are not in dispute, and I think
17 Patent Owner would agree with me here. First off, the parties have not
18 objected to each other's demonstratives, so there's no objections there. There
19 are no objections to exhibits other than the motion to strike the portions of
20 the sur-reply in the brief that's pending before the panel. There's no dispute
21 regarding the prior art status of these references. And so, we have, again,
22 the Thomas patent and the Zane publication as our primary references.
23 There is no dispute regarding the level of skill in the art. And finally, there's
24 no evidence from the Patent Owner here regarding any secondary
25 considerations of non-obviousness.

26 So if we go to our slide 3, we've set forth here the level of ordinary

1 skill in the art governing this petition. And so, we did propose a definition
2 in our petition, and it was largely adopted by the panel, just with the words
3 'at least' was removed from the definition and Patent Owner did not
4 challenge that. So, again, we believe we're in agreement with regard to the
5 level of ordinary skill here, which again is set forth in slide 3. And then, as I
6 mentioned, in slide 4, just very briefly, again, no secondary considerations of
7 non-obviousness that our expert was aware of or that was raised by Patent
8 Owner in this proceeding.

9 So, we'll go ahead and start with the Zane grounds. So, if we can
10 go to slide 5. So, we're starting the argument here with the Zane grounds,
11 even though those were Grounds 3 and 4 in our petition. And the reason that
12 we're doing that is because Patent Owner largely did not substantively rebut
13 our petition on the Zane grounds. The anticipation grounds, there was really
14 no challenge, and Patent Owner did raise one set of challenges to an
15 obviousness combination for Claims 5 and 16. But beyond that, there was
16 really no substantive challenges to Zane. So, we thought it would make
17 sense to start with that and run through those claims first.

18 If we go to slide 6, again, again, we just have here an overview of
19 the Zane publication, so that's Exhibit 1006. This is a paper with Dr. Doshi
20 and Dr. Zane as co-authors. And it discloses an LED driver circuit for
21 driving parallel LED strings using a digital phase-shifted pulse width
22 modulator.

23 And if we go to slide 7, what we have here is we've laid out what
24 our grounds are in the petition, based on the Zane reference. We have the
25 claims that are challenged based on that ground. And then we've identified
26 the arguments that Patent Owner has made in response to our petition. And

1 what you can see here is that there's a large overlap between the claims that
2 we have made an anticipation argument for and the claims that we've made
3 an obviousness argument for. And the only additional claims in the
4 obviousness grounds are Claims 5, 13, 15 and 16. And as I mentioned
5 earlier, Claims 5 and 16 are the ones where we've proposed a particular
6 modification, a relocation of the switch in the circuit of the Zane reference.
7 But with regard to Claims 13 and 15, there really has been no substantive
8 argument by Patent Owner challenging our obviousness grounds there.

9 And so, what I was planning to do was just really focus on the
10 areas of disagreement between the parties in connection with our grounds
11 based on Zane. So, again, for the anticipation ground, really there's one and
12 only one argument, which is that the opinions of our expert, Regan Zane,
13 should be discredited because he's a co-author of the reference in Grounds 3
14 and 4. And then, again, as I mentioned, the second argument with regard to
15 obviousness was a challenge to the proposed modification for Claims 5 and
16 16.

17 So, if we go to slide 8, I'd like to start with the first argument, and
18 again, the only argument challenging our anticipation grounds based on the
19 Zane reference. And that is that this panel should somehow discredit and
20 not consider the opinions of our expert because he's a co-author of this
21 reference. And first, I think this is actually a pretty unusual argument.
22 There's really no authority holding that an author of a prior art reference is
23 somehow unqualified to opine on that reference. And in our paper, as we
24 mentioned, the *Nvidia* case, which had similar circumstances, again, in that
25 case, the expert was a thesis advisor on a reference that he was offering
26 opinions on, and there was an attempt to criticize him for offering opinions

1 on that reference, and the Board rejected that argument and said the expert
2 was -- it was proper and appropriate for that expert to opine on the reference.
3 And we have a similar situation here.

4 And I think what's more important is Dr. Zane was very express
5 about what he was doing in connection with this reference. And we've set
6 that forth here in our slide 8, and it's paragraph 32 from his declaration,
7 which is Exhibit 1003 in this proceeding. And he made it very clear that he's
8 performing his analysis and expressing his opinions from the perspective of
9 a person of ordinary skill in the art at the relevant time. And so, again, he
10 wasn't applying any specialized knowledge or any unique knowledge he may
11 have based on the reference, he was putting himself in the shoes of a person
12 of ordinary skill, a person that --that level is not disputed -- and giving his
13 opinions. And in connection with the anticipation arguments, there was no
14 critique, nothing at all from Patent Owner suggesting that Dr. Zane
15 somehow went beyond the four corners of Zane in offering his anticipation
16 analysis. There was in fact no substantive arguments at all from their expert
17 about our anticipation grounds. So, this critique that he should somehow be
18 excluded from ever giving opinions on papers that he was involved with
19 again has no legal basis and has no support here in this record.

20 You will hear from Patent Owner and it was cited in their brief and
21 I believe it's on their slides, they cite a *Glaxo* case suggesting that expert
22 testimony can sometimes be discredited. That was a very different set of
23 facts. That was a case where an expert was designing experiments based on
24 a paper that he had authored. And so, there was a critique there that the
25 expert was using some specialized knowledge to design the experiments.
26 And again, that's not what we're doing here. That's not what Dr. Zane did.

1 He looked at the reference just like he looked at the Thomas reference, put
2 himself in the shoes of a person of ordinary skill, and provided opinions on
3 that basis.

4 Now, if we go to slide 9, there was also, again, a suggestion or
5 critique from Patent Owner that Dr. Zane is somehow biased because he
6 thinks that he invented the technology described in the claims of the patent
7 before the inventors of the '148 patent. And what we've set forth here is
8 some of the deposition testimony from Dr. Zane where he explained and
9 elaborated on his position. And so, again, when he was asked, he explained,
10 and we have the quote on the left here from his deposition. And we're on
11 slide 9, Exhibit 2004, page 59, lines 4 through 8, and he explained when
12 asked that, he said he believed that that was a mischaracterization. And in
13 the righthand side of our slide, we have pages -- page 60, line 21 through
14 page 61, line 11, where he explained, and we've highlighted that in the
15 bottom portion of the excerpt. He said, I can certainly confirm that there are
16 many aspects of components that are used in the article, the Zane article, and
17 that the Zane article itself even indicates were known in the field at the time
18 of that article. And so, what he was really saying is, you know, the
19 components, these LED drivers, a voltage source, staggered PWM signals,
20 yes, they're described in the Zane article. They're also described in articles,
21 even predating Zane, including the Thomas reference, which is, I think, from
22 the mid-'90s. And so, this idea that he's somehow biased or, you know, has
23 an axe to grind here because he happens to publish in the field, again, is
24 simply -- is not supported by the record. Any questions with regard to that
25 position or that argument from Patent Owner?

26 JUDGE HORVATH: No questions. We'll jump in when we do.

1 MS. SWAROOP: Okay, great. And then I wanted to just move
2 on. If we can go to slide 10, Patent Owner had also criticized the
3 obviousness arguments that we made for Claims 1 and 14 on grounds that
4 they were somehow deficient. And, you know, our position with regard to
5 the Zane grounds and to the Thomas grounds is that we believe that all of the
6 limitations of Independent Claim 1 and Independent Claim 14 are disclosed
7 and anticipated by Zane and disclosed and anticipated by Thomas. And so,
8 again, we cited the case law, which explains, well, if they're anticipated, then
9 they would meet the obviousness standard as well.

10 So, with that I'd like to go on to the actual, the only actual
11 substantive dispute on our Zane grounds, which is Claims 5 and 16 of the
12 '148 patent. And if we can go to slide 11, we have recited the claim
13 language of Claim 5 here. So, Claim 5 is a dependent claim, and it recites a
14 very specific location of the PWM brightness control transistor. And this
15 claim recites that that transistor is connected between an output of the
16 feedback circuit and a control terminal of the current control transistor.

17 And if we can go to slide 12, again, we have that same language
18 here, so that the limitation at issue here is, again, the location of the
19 transistor of the switch in the circuit. And we can see here, we have Figure
20 4 from the Zane reference on slide 12, and we've highlighted in yellow and
21 put it in, encircled with a red box, the transistor, the switch here in the Zane
22 circuit and you can see where it's located. So again, no dispute that the Zane
23 reference, in fact, includes this PWM brightness control transistor. The
24 dispute is really whether or not the proposed modification would have been
25 obvious.

26 And so, if we go to slide 13, here we've illustrated, again, we have

1 Figure 4 from Zane, from Exhibit 1006, that's been annotated to illustrate the
2 proposed modification. So, you can see here, again, highlighted yellow, we
3 have the switch there, and the proposed modification is simply to relocate
4 the switch so that it's between the output of the feedback circuit and the
5 current -- the control terminal, which is labeled Q. And so, our expert, Dr.
6 Zane, again, explained in his declaration that this, again, this is simply a
7 switch, it's an on-off switch and it can be placed in several locations in the
8 circuit without changing the overall operation of the circuit. And there's,
9 again, a finite number of ways in which this switch can be connected, and he
10 opined and explained that it would have been obvious to do this as a mere
11 design choice.

12 Now, if we go to slide 14, I want to go through some of the
13 critiques that Patent Owner has made to our proposed modification. And so,
14 one critique is that an allegation that we had -- our petition only explains that
15 this modification could be made, not that it would be done. And so, we've
16 explained again and shown in our petition where we did explain that the
17 modification would be done and it would have been obvious. And that's in
18 our petition at pages 78 to 79, and our expert declaration Exhibit 1003 at
19 paragraph 186. We also cited to the KSR decision in our brief, and in which
20 that decision explains that a person of ordinary skill, when there are a finite
21 number of solutions, a person of ordinary skill would have a good reason to
22 pursue known options. So again, this is simply moving a switch in a circuit,
23 which again our expert explained would be an obvious design choice.

24 Now, --

25 JUDGE HORVATH: Ms. Swaroop, if I could interrupt. This is
26 Judge Horvath. So, is your contention then that if it's a design choice issue

1 or if it's an obviousness -- obvious to try issue that you don't need a
2 particular reason to try a different location? That the fact is that there might
3 be multiple locations. And is that what your contention is? That you don't
4 need a specific reason? The reason is the fact that there are multiple
5 locations where you might put this switch?

6 MS. SWAROOP: Right. I mean, the reason is you're designing a
7 circuit and you need a switch in the circuit, right? And then as *KSR*
8 explains, when there's just a finite number of options that's well within the
9 technical grasp of a person of ordinary skill, that enough provides good
10 reason to try these known options. And that was in our reply brief, I believe
11 at page 9.

12 JUDGE HORVATH: Okay. Thank you.

13 MS. SWAROOP: Now, Patent Owner has criticized this and I
14 think in actually in a very, what we believe is a very conclusory fashion.
15 And I think there's only, I think it's one paragraph in the expert declaration,
16 paragraph 57, that has a number of sentences attempting to critique the
17 proposed modification. And so, what we've done here in the next set of
18 slides is really to go through and unpack each one of the reasons given in
19 that conclusory expert declaration from Patent Owner and explain why, you
20 know, these arguments are not supported by the record and by what a person
21 of ordinary skill would understand.

22 So, if we can go to slide 15. So, the first criticism is that -- an
23 argument that the proposed modification would somehow hamper the ability
24 of the circuit to maintain a precision voltage. And again, in his original
25 declaration, which specifically at paragraphs 184 and 185, Dr. Zane
26 explained that you would have the same function if he relocated the switch,

1 the same function. There would be, you know, Patent Owner's expert didn't
2 identify any actual difference that would be caused by the proposed
3 relocation. And again, Dr. Zane in his reply declaration, which is Exhibit
4 1031, explained in paragraph 32, that again, moving the switch from the
5 non-inverting input of the op amp to the output of the op amp would not
6 change the operation of the circuit.

7 If we go to slide 16, there was also a statement, again, in that same
8 paragraph 57 from Patent Owner's expert, a suggestion that the switch has
9 been designed in some way to apply a precision voltage to the positive
10 terminal of the op amp to achieve a precision current flow. And so, that
11 statement is kind of suggesting that the switch was designed to apply a
12 precision voltage. But if you look at the Zane diagram, which, again, we
13 have here on our slide 16, Figure 4, you can see that the precision voltage,
14 and it's labeled as V-prog, and we've called it out with a red arrow there on
15 the left. That's not being supplied by the switch. That's being supplied by a
16 different component here of the circuit. And you can see here that there is
17 the programmable voltage reference there on the left. And that same voltage
18 is being applied on the righthand side there, and you see the V-prog over RS.
19 And so, that's the whole point of this feedback circuit, is that this
20 programmable voltage reference is being applied here within the circuit, and
21 the switch is not the component that is doing that.

22 And if we can go to slide 17, another critique from Patent Owner's
23 expert is a suggestion that, well, in this proposed modification, a person of
24 ordinary skill would not know how to adjust the settings of the op amp to
25 achieve the correct voltage on the base of transistor Q. And again, our
26 expert responded to that. And not only in his declaration, but he was asked

1 about this at his deposition and explained that, again, the purpose of the op
2 amp, it's a feedback circuit to make sure that the precision voltage is being
3 applied. And so, this idea that a person of skill wouldn't understand how to
4 do that doesn't really make sense. I mean, that's the whole point of the op
5 amp circuit is to regulate the voltage and make sure that the correct current
6 is being applied.

7 And so, again, if we have our figure, I think it might be on the
8 previous slide, we can go back to slide 16. You can see when the switch is
9 closed here, then the programmable voltage would be applied to that R sub
10 A. And again, this idea that there would be a confusion about what voltage
11 would be applied and, you know, in the context of this op amp and this
12 feedback circuit -- which is exactly the '148 patent also has a feedback
13 circuit -- not really clear what confusion would be -- would arise here in that
14 context. And again, as we, as Dr. Zane mentioned, the properties of the
15 switch are really irrelevant to the current here. It's simply, it's an on-off
16 switch. And the properties, again, are set by the programmable voltage
17 reference with the feedback circuit, making sure that the voltage remains the
18 same.

19 And then the last point, which is on slide 18, there was a statement,
20 again, the same paragraph, 57, that, again, a statement by Patent Owner's
21 expert that if the switch was placed after the op amp, that a person of
22 ordinary skill would not know if the precision voltage would set the LED
23 current to the desired current because the properties of the switch are
24 unknown. And again, our expert explained that the current is independent of
25 any properties of the switch. The negative feedback circuit loop through the
26 op amp automatically adjusts the output to achieve the desired current. And

1 that is exactly what Dr. Zane explained in paragraph 35 of his reply
2 declaration, which is Exhibit 1031, that a person of ordinary skill would
3 understand that the point of using an op amp in a negative feedback loop is
4 to regulate the voltage across the resistor -- resistor RS, to be equal to the
5 programmable voltage reference, regardless of any non-idealities in the
6 circuit.

7 So, those are kind of each of the specific points that were raised by
8 Patent Owner and their expert in connection with our proposed modification.
9 And again, we think this is a pretty straightforward obviousness argument,
10 simply relocating a switch without any -- and that doesn't result in any
11 changes to the operation of the circuit.

12 If we go to slide 19, we'll just wrap up this section. So Claim 16,
13 again, as I mentioned, that's part of the method claim set, corresponds to the
14 same limitations as Claim 5, and so, our same arguments with regard to
15 Claim 16 would, it's the same as for Claim 5.

16 So, if there are no further questions on that, I just wanted to briefly
17 touch on the other claims in our Zane grounds. And if we can go to slide 21.
18 And so here, and I won't go through all these slides, we've given them to the
19 panel just so you can kind of see what the claim limitations are, and our
20 support, again, Patent Owner has not substantively rebutted, but we wanted
21 to lay out this framework for the Board to have as a reference. So, we've set
22 forth the claim limitation in blue here on the left, and then you can see here
23 we have Figure 3 from Exhibit 1006, the Zane reference on the right, and
24 pointing out where these limitations are disclosed. And on the bottom left,
25 we cited the support in our petition and from our expert, providing the
26 opinions with regard to that limitation. So, we've done that for the various

1 undisputed limitations and that covers slides 21 through 36. I'm happy to
2 address any of them if there's any questions from the Board. If not, I will
3 move on to the Thomas grounds. Okay.

4 JUDGE HORVATH: This is Judge Horvath, I don't believe there's
5 any questions, so feel free to move forward.

6 MS. SWAROOP: Okay. So, why don't we go ahead and jump to
7 slide 38. And slide 38 is where we start the Thomas grounds. And so, just
8 as a reminder, Thomas is an issued U.S. Patent. It's directed to a method for
9 pulse width modulation of LEDs with power demand load leveling, and then
10 issued in May of 1994. And so, what we have here is a number of figures
11 from Thomas. And so, Thomas is disclosing an LED driver with multiple
12 LEDs connected in parallel to a power supply and driven with multiple
13 staggered PWM signals. And what we have here, a number of diagrams.
14 So, we have Figure 1, which is what Thomas describes as a block diagram.
15 In the middle is a timing diagram showing the shift register elements and
16 how the delayed pulse signals work. And then the figure on the face of the
17 Thomas patent is Figure 2, which is described as a partial circuit diagram
18 from Thomas.

19 So, if we go on to slide 39. Slide 39, again, we've laid this out here
20 where we've summarized, again, what our grounds are based on Thomas.
21 So, there is a set of anticipation arguments and then a set of obviousness
22 arguments. And what we have on the righthand column to kind of focus the
23 argument is really what are the issues in dispute here between the parties.
24 And so, there are really four main disputes on the anticipation grounds that
25 I'll run through. One is Patent Owner disputes the current set circuit
26 limitation of Claims 1B and 14B. There's a dispute as to whether Thomas

1 discloses that a PWM signal is applied to the current set circuit. There's a
2 dispute over a dependent claim, the current regulator of Claim 3. And then
3 finally, the fourth is whether a clock is inherent in Thomas.

4 And then on the obvious grounds, I actually don't think that there is
5 a dispute here, but I'm sure Patent Owner will correct me if I'm wrong. But
6 again, we have the same argument about the obviousness challenge, which
7 again, our position is that Thomas discloses all of the elements of Claims 1
8 and 14.

9 And then there was an argument by Patent Owner challenging our
10 obviousness arguments for Claim 13, but I don't think that that's being
11 maintained because we did point out in our reply where we presented an
12 obviousness argument.

13 JUDGE HORVATH: This is Judge Horvath. I do have a question
14 for you. So, one of the Patent Owner's arguments about your obviousness
15 grounds, and this is true of also the Zane obviousness ground, was that when
16 you were talking about the independent claims, you didn't really give a
17 reason for why the claims were obvious, other than to say anticipation is the
18 epitome of obviousness. And so, they're obvious, apparently, because
19 they're anticipated. So, if we were to find that the claims weren't anticipated,
20 would that also mean the claims are not obvious?

21 MS. SWAROOP: Well, it does rest on the anticipation. I mean,
22 our position -- those limitations are disclosed and they are anticipated. So
23 yeah, they do follow one from the other. I think what we understood, and
24 again, Patent Owner may clarify, is they were suggesting that our other
25 claims are dependent claims with additional limitations, there was some flaw
26 in that analysis. But for those, we specifically explained if there's a

1 limitation that we thought was not there, why it would have been obvious to
2 modify Thomas or modify Zane to include that, so.

3 JUDGE HORVATH: Thank you and this is Judge Horvath, I'm
4 sorry.

5 MS. SWAROOP: Please go ahead.

6 JUDGE HORVATH: This is Judge Horvath again. So, that leads
7 to my next question. So, looking at, for example, Claim 6, I believe it's
8 Claim 6, which specifically identifies what components are part of the
9 current set circuit. If we were to find Claim 1 was not anticipated, and then
10 because it's not anticipated, it's not obvious, relying on your rationale that
11 obviousness is the is the -- anticipation is the epitome of obviousness, then
12 would we -- are we able to even address Claim 6? In other words, if the
13 independent, I believe that's Patent Owner's position, although they didn't
14 actually come out and say it, but I believe their position is if you don't find
15 Claim 1 obvious, then you don't even get to Claim 6 because if Claim 1 is
16 not obvious, then Claim 6 can't be obvious. And so, my question is, is that
17 right? Or can we address Claim 6 independently? And do you have any
18 case law that would support that position?

19 MS. SWAROOP: Well, I think Claim 6 in particular, it just
20 describes a configuration of the current set circuit, right? And we propose
21 a -- we explained why that modification would have been obvious. And I
22 don't think Patent Owner really rebutted that. So, I do think, I mean, I guess
23 it depends on what the basis for non-anticipation would be. I mean, we're
24 not aware of any, but I mean, I'm assuming it, for example, is the dispute
25 over the current set circuit, and we have laid out an argument for that for
26 Claim 6 and why that is -- would have been obvious. So, I do think the

1 Board could do that, could analyze that claim specifically.

2 JUDGE HORVATH: Okay, thank you.

3 MS. SWAROOP: Okay. So, if we go to the kind of disputed and
4 I'll just move to, I believe it's limitation 1.b, which is our slide 42 and that is
5 the current set circuit limitation. So, claim limitation 1.b discloses a
6 plurality of current set circuits. And just to kind of focus the dispute here, I
7 think there's an allegation by Patent Owner that our petition somehow
8 limited the identification of a current set circuit to a resistor in isolation.

9 And frankly, we just think that that's incorrect. And so our petition, again, at
10 pages 25 to 26, and also the Zane declaration at paragraphs 62 to 63, made it
11 very clear that we were referring to the resistors in series with the LEDs, and
12 that's recited again, page 25 of our petition, paragraphs 62 and 63 of the
13 Zane declaration.

14 And so again, you'll see in Patent Owner's slides references to, you
15 know, passive resistors, resistors in isolation. That's simply not the petition
16 that we set forth. It was the resistor in series with the LEDs defining a
17 current path. The resistor is certainly the element that is setting current, but
18 it is part of this overall current path. And then that is how we articulated in
19 our petition the resistor in this path.

20 If we go to our slide 43, there was some arguments again by Patent
21 Owner about, you know, what is a circuit? What, you know, giving various
22 definitions. And the point we were really trying to make in our reply with
23 these figures here is that the '148 patent describes Figure 6 as a current set
24 circuit. So regardless of, you know, how a current set circuit may be defined
25 or what words are being used, if Figure 6 is a current set circuit, which is
26 shown on the left, Thomas certainly has all of those elements of the current

1 set circuit as well. And that was our point in connection with the diagrams
2 here.

3 And if we go to our slide 1D, the second kind of disputed point
4 was whether or not the PWM signal is applied to the current set circuit. And
5 again, you're going to see a lot of arguments from Patent Owner about the
6 resistor, the resistor in isolation. Again, that was not our argument in our
7 petition. Our argument was that it was a resistor in series with the LEDs that
8 would be the current set circuit and the PWM signal is applied to that current
9 path. And then again that was in paragraph 63 of Dr. Zane's declaration, and
10 again the PWM signal is applied to that current path of the resistor in series
11 with the LEDs to set the duty cycle.

12 JUDGE SZPONDOWSKI: I have a question about that. This is
13 Judge Szpondowski. Because I'm looking at your petition on page 26 at the
14 bottom, the last sentence on that page and it says the resistor shown in
15 Thomas's Figure 1 and more specifically the individual resistors in each sub-
16 path in Figure 2 are each a current set circuit. So, that seems to indicate that
17 you're pointing at the -- to the resistors as the current set circuit for limitation
18 1.b.

19 MS. SWAROOP: And I'm sorry, I mean this is page 25. Yeah and
20 I think if you look at --

21 JUDGE SZPONDOWSKI: Yes.

22 MS. SWAROOP: Twenty-six, okay.

23 JUDGE SZPONDOWSKI: Yeah, but the last sentence on that
24 page.

25 MS. SWAROOP: Right. And I think that and it's again the
26 resistors shown in Thomas's Figure 1 and if you look at page 25 we explain

1 Thomas's Figure 1 shows a resistor in series with the LED group. So, you
2 know, we open that section by explaining it was -- Figure 1 is showing the
3 resistors in series with the LEDs and then we're explaining the resistor
4 shown in Thomas's Figure 1, we then kind of that's what we're referring to
5 there is the resistors in series with the LEDs. And if you read that in
6 connection with the Zane Declaration I think that that -- that makes that
7 clear.

8 The other thing I just wanted to go back to in terms of your
9 question Judge Horvath about claim, you know, if you decide Claim 1 is not
10 anticipated I think if Claim 1 is found to be, sorry, if Claim 6 is found to be
11 obvious then Claim 1 would also be obvious as well, right? So, hopefully
12 that clarifies that issue.

13 JUDGE HORVATH: Yeah, this is Judge Horvath. I mean, there's
14 a legal question, I think, that's buried in there. And it's one that I certainly
15 am curious about. And so, you know, I would say there's probably two
16 schools of thought. And one is if Claim 1 isn't found to be obvious, then any
17 of its dependent claims are not obvious. And I'm sure you can find lots of
18 case law that says that. The facts of those cases may be different than the
19 facts here. And then there's a second line of cases which says basically what
20 you say, if a dependent claim is found obvious, then the independent claim
21 has to be obvious as well. And that usually comes up in a line of cases that
22 have to do with either collateral estoppel or issue preclusion -- that you can't
23 come back later and assert an independent claim in a later case if in a
24 previous case the dependent claim was found obvious. And this is sort of a
25 unique situation that doesn't fall into either of those categories. So, I guess I
26 was interested in hearing your thoughts on whether we can actually look at

1 Claim 6 if we find that Claim 1 was not obvious. And what's the legal
2 justification for doing that?

3 MS. SWAROOP: Yeah. So, I mean, I think that you can, and
4 again, because it's a dependent claim that, again, if that claim was rendered
5 obvious, and it depends from Claim 1, then that claim would be obvious as
6 well, so.

7 I think I have five minutes left, so I do want to just make sure we
8 kind of get to the other disputes here in Thomas. So, again, if we go to our
9 slide 47, we have here again, you know, the cites in our petition where we
10 explain it was a resistor in series with the LED group as the current set
11 circuits. Again, the PWM signal is applied to this current path of the
12 resistors in series with the LEDs. The Board itself in the institution decision
13 recognized, and we have that in our second excerpt here, that the '148 patent
14 itself identifies a resistor in series with one or more LEDs in an LED string
15 as a current set circuit. And so, and again, the function of the resistors is to
16 set the current in the current path of Thomas.

17 JUDGE GALLIGAN: Counsel, this is Judge Galligan. I think
18 Patent Owner's argument is that the signal is applied to a preceding
19 component, so how would you respond to that? It's not applied directly to
20 what you identify as the current set circuit.

21 MS. SWAROOP: Sure. So I think, again, I think that that
22 argument by Patent Owner is premised on an assumption that we identified
23 the resistor as a current set circuit. And we identified the resistor in series
24 with the LEDs, and the PWM signal is applied to that same current path.
25 And Dr. Zane explained that, and again, in paragraph 63 of his declaration,
26 as well as --

1 JUDGE HORVATH: Three-minute warning.

2 MS. SWAROOP: -- in paragraphs 69 and 70 of his declaration,
3 explained that as well. And so, again, I think if you hear from Patent Owner,
4 the arguments are going to be, well, Petitioner was only pointing to resistors,
5 and that's simply not the case. We pointed to resistors in series with the
6 LEDs. We pointed to that current path, and we explained how the PWM
7 signal is applied to that current path, which includes the switch of Thomas.

8 JUDGE GALLIGAN: This is Judge Galligan. Okay. So, the
9 current path includes the switch, and therefore your contention is that the,
10 let's say, the LED in series with the resistor and the switch comprise the
11 current set circuit to which the signal is applied?

12 MS. SWAROOP: So, the signal is applied to, yes, the signal is
13 applied to that current path, yes. Yeah, and paragraph, so I'll direct --
14 paragraph 95 of the Zane declaration explains this. Paragraphs 69 and 70 as
15 well, and I think if you look at paragraph 69 in particular of Zane explains
16 how Thomas describes this.

17 And the Board's institution decision as well, if -- I just wanted to
18 flag that page 13 of the institution decision, explains Thomas as well as
19 showing each of Thomas's parallel LED paths, including a resistor coupling
20 the LEDs in the path to ground such that current flows from the power
21 supply for flows through the LEDs and resistor to ground. So, that's the
22 current path and the PWM signal is applied to that current path that is
23 described in Thomas.

24 And I think I may only have a minute left. And I think I just
25 wanted to point out on the clock claim, which is Claim 7, a lot of the
26 arguments we hear from Patent Owner really have nothing to do with

1 Thomas. There's a lot of theories about what else could be a shift register,
2 but the real issue is whether the shift register of Thomas, which is clearly
3 talking about synchronous shifting of the bits here in the shift register as
4 shown by the Figure 3 timing diagram, whether that includes a clock and
5 their expert doesn't really dispute that. Our expert has explained why a
6 clock would necessarily be present with the synchronous shifting of the bits
7 in Thomas.

8 So, I believe I'm at the end of my 40 minutes here. I'm happy to
9 answer any questions. If not, I can address any questions on rebuttal.

10 JUDGE HORVATH: Any questions? Okay. Well, thank you.

11 MS. SWAROOP: Thank you.

12 JUDGE HORVATH: So, let me just reset my clock, and Mr.
13 Alberti, you had requested 15 minutes rebuttal, so that will give you 45
14 minutes of argument time. I will set my clock for 42 minutes to give you a
15 three-minute warning, and you may begin, hold on, when you're ready.

16 MR. ALBERTI: Thank you, Your Honor. May it please the
17 Board, David Alberti, on behalf of Polaris Power LED. I'd like to start
18 with --

19 JUDGE HORVATH: Well, actually, let me interrupt you. Sorry.
20 If we could change the slides.

21 MS. SWAROOP: Oh, yes.

22 JUDGE HORVATH: You're presenting, Mr. Alberti, slides? Or if
23 you're not, we have the slides. We can follow you along. It's up to you.

24 MR. ALBERTI: I'm happy to allow you all to use your hard copy,
25 unless if you prefer I can go into presenter mode. But if you guys have hard
26 copies, we could do it that way.

1 JUDGE HORVATH: Okay. That's fine.

2 MR. ALBERTI: Okay. So, I'd like to start on Patent Owner's slide
3 2. Slide 2, we see includes all of the different grounds. I'd like to just start
4 at a high level. With respect to Thomas, it's really, and counsel admitted as
5 much, the majority of their grounds are really just an anticipation argument.
6 And to have anticipation with respect to circuit claims, as I would say, it's
7 particularly difficult because you need to show that you have the same
8 electrical components and they have to be connected in the same way. This
9 isn't a software patent where you're just talking about functionalities. You're
10 talking about circuits with components connected in certain ways, sending,
11 and receiving signals. And if you go through the Thomas grounds,
12 Petitioner just didn't do the homework on that. And because the anticipation
13 fails on Thomas, obviousness also fails. The *Magnum Oil* case is very clear
14 that conclusory statements about obviousness are insufficient as a matter of
15 law.

16 So, while it's true that if the Board were to find Thomas anticipated
17 the claims, that it could also say, well, they would be obvious too, but that's
18 not what we have here. We have fundamentally flawed anticipation analysis
19 and there was nothing really to do to fill that in. Instead, it was just a
20 conclusionary obviousness opinion. And I'd like to address Claim 6. And I
21 know there's a legal issue here, but I don't think the Board doesn't even need
22 to reach that legal argument because we in fact did rebut Claim 6 and said
23 it's flawed for the same reasons as Claim 1. And the opinion there with
24 respect to Claim 6 is again, it's just a conclusory opinion. It mentions Ohm's
25 law, and you could rearrange components. It doesn't really say why you
26 would do that. But more importantly, there's a limitation that's missing there

1 that's not shown. And that's the fact that the signal has to be applied to that
2 current set circuit. And it isn't, not by any definition that Petitioner has
3 presented in this proceeding.

4 Moving on at a high level with respect to the Zane references, first,
5 as both sides agree, the expert that's being used, Dr. Zane, is in fact the
6 author of that prior art. There's obvious bias issues here beyond just
7 hindsight, right, we have personal bias. He's invested in this technology. It
8 was attempted to be commercialized. It was funded via the university. And
9 now, years later, he's being paid to be an expert, to talk about something that
10 he thinks that he developed first. And again, there's problems here, but in
11 particular, I think the problems really show up in the most troublesome way
12 when he's asked to opine that Zane alone, with nothing else, with no other
13 corroboration, renders these other claims obvious. In particular, we
14 discussed, we discussed Claim 5, Claim 16, where all he presents is this
15 obvious to try type argument without addressing the real world
16 consequences of this rearrangement of components.

17 Apologies, there's an alert here in California. So, that everyone's
18 cell phone just went off. You know, so apologies.

19 JUDGE HORVATH: Do we need to break or is everything okay?

20 MR. ALBERTI: No, it's an Amber Alert. If there's a message
21 now, there's something like that. So, everyone's phone just went off on that.
22 We don't, nothing personal is --

23 JUDGE HORVATH: So, Mr. Alberti, let me ask you this, and it
24 relates to, this is Judge Horvath, one of the things you said about, you know,
25 the obviousness grounds, and I think he -- I heard you say that, you know,
26 because there's a problem with the anticipation grounds, the obvious grounds

1 are also bad because all the Petitioner really said was, you know, if the
2 claims are anticipated, they're also obvious. And I -- would you agree that if
3 the claims -- if we did find the claims anticipated, that then the obviousness
4 grounds would be good, even for the independent claims. Like if we found
5 Claim 1 under Zane, for example, anticipated by Zane, then it would also be
6 true that, as Petitioner contends, that Claim 1 is obviousness -- obvious over
7 Zane because you haven't presented any secondary considerations evidence
8 that would suggest that maybe it's not obvious. Would you agree with that?

9 MR. ALBERTI: Well, I would say this. I don't know that we
10 made an argument that says that you can't find the claims obvious if you
11 believe they're anticipated. We don't -- we think their obviousness
12 arguments should just fail based on the fact that they're completely
13 conclusory. However, if you -- I don't think we said that, okay, well, if you
14 find it anticipated, you can't find it obvious. I don't know that we made that
15 argument. Again, I don't think with respect to the Zane grounds and the
16 Zane claims that we are affirmatively contesting, that's again, that's not
17 really an issue. But I don't recall anywhere in the papers where we
18 vigorously argued that if the Board finds these anticipated, it can't also find
19 them obvious. I would just say that as a matter of principle, having such a
20 conclusory obviousness opinion to me, I find it hard to say that they met
21 their burden of proof just by putting in that kind of conclusory language.

22 JUDGE HORVATH: Okay. Thank you. And I have a follow-up
23 question or separate question really about your contention that we shouldn't
24 give any weight, I guess, to Mr. Zane's or Dr. Zane's testimony because of
25 his alleged bias. So, as I recall in your briefing, I think you said that without
26 his testimony, all there is is attorney argument. But wouldn't you agree that

1 there's still the circuit, there's still -- the Zane paper is itself evidence that we
2 could rely on, is it not?

3 MR. ALBERTI: With respect to issues of, say, anticipation, what
4 the circuit actually does, then of course you could rely on the paper and the
5 argument on the paper. The problem comes in is if the paper said what it
6 said and it met all the limitations of these claims, why would they need to
7 bring Dr. Zane in to interpret his paper, right? So, our problem really is
8 allowing Dr. Zane to provide uncorroborated testimony with respect to,
9 especially when it comes to these obvious to try type arguments where he's
10 not pointing to anything else and he's filling in the blanks to where his paper
11 failed to teach certain limitations. And that's the crux of our argument is that
12 you should -- the Board should require more from Dr. Zane than him just
13 speaking uncorroborated about things that maybe he could have done that he
14 chose not to do. And I'll note for the record, and I believe this is in the
15 record, that Dr. Zane filed for a patent on this very technology. And
16 obviously, he had every motivation in the world to disclose all the possible
17 embodiments he could in his patent application. And even there, he doesn't
18 disclose the specific circuits required, for example, by Claims 15 and -- 5
19 and 16.

20 And with that, I'd like to move on unless you have any other
21 questions about the high-level grounds here. Okay. So, I'm now on slide
22 number 3, and just for the record, it's important to consider both the Thomas
23 grounds and the Zane grounds here because there's not complete overlap.
24 And just for the Board's reference, Claims 4, 5, and 16 are not covered by
25 the Thomas grounds. It's only Petitioner's obviousness analysis under Zane
26 that challenges 5 and 16, which again are why these claims are particularly

1 important. And with respect to Claims 6 through 10 and 18 through 21,
2 those are not covered by the Zane grounds. And so, really the only relevant
3 challenge there is the Thomas anticipation challenge because that fails to
4 teach these fundamental limitations and those carry through all the other
5 claims.

6 So, starting just a brief overview of the '148 patent, I know it was
7 discussed a little bit, but there are a couple of things I would like to
8 specifically note here. And that's the purpose of this patent is you're creating
9 a new LED driver. And the idea of the LED driver, and I'm looking now at
10 slide 5 and which references the abstract of the patent, is to reduce these
11 effects of applying current through all the LEDs at the same time. As the
12 patent notes, this reduces ripple in the power supply, which has a lot of
13 effects that will not be good for something like an LED TV where you have
14 backlights that illuminate the TV. The patent also references reducing noise,
15 flickering, ripple compared to conventional LED drivers. For example, the
16 patent at column 2, lines 51 through 57, column 4, lines 9 through 12 all
17 focus on these issues that you're trying to overcome. And that's to have tight
18 control of your on-off of your LEDs and of the stress that's going on to your
19 power supply.

20 Slide 6 just is exemplary Claim 1. Just to go through this quickly,
21 again, we're talking about a specific circuit. The circuit has detailed
22 requirements. The way it's connected, you have a voltage source, a plurality
23 of current set circuits, a PWM brightness control signal generator. And the
24 last limitation, which is important to our arguments, in particular with
25 Thomas as we'll discuss, that each circuit is configured to draw peak current
26 through its associated one or more LEDs at a duty cycle corresponding to a

1 duty cycle of the PWM brightness signal applied to it. So, the PWM
2 brightness control signal has to be generated by the PWM brightness control
3 signal generator and applied to the current set circuit.

4 Moving now to slide 8. Again, a single passive resistor is not a
5 current set circuit. It sounds like Petitioner is kind of coming across to that.
6 Now, I don't think Petitioner is any longer trying to argue that a single
7 resistor could be a current set circuit. As we see in the limitation here, you
8 have a plurality of current set circuits, one current set circuit per parallel
9 path controlling a peak current through the one or more LEDs. So, the
10 circuit is actively doing something. It's controlling a peak current. A single
11 passive resistor is not a circuit and it doesn't actively control peak current.

12 And I just want to address this -- the latest argument that I'm
13 hearing today is that, well, the circuit is actually the resistor and the LEDs.
14 But the LEDs are a separate limitation in the claim. It's not part of the
15 circuit. The circuit is one thing and that's controlling current through
16 another thing, the LEDs. So, trying to now kludge these two things together
17 and say, well, the circuit is really a single resistor connected to the LEDs.
18 Well, the LEDs are a separate claim limitation. So, that doesn't work either.
19 And again, it was not what was argued in the petition.

20 Referring now to slide 9, they were very crystal clear in the
21 petition. As you could see, "the resistors shown in Thomas's Figure 1 are
22 each a current set circuit." That's the petition at 26. When asked at
23 deposition, Dr. Zane was also very clear. It is my opinion that those
24 resistors are current set circuits. Again, it was clear as day, the LEDs, now
25 that they're trying to add, are not part of the current set circuit. The resistors
26 are the only things that were identified, and the LEDs are a separate

1 limitation in the claim anyways. They can't be part of the circuit itself.

2 Moving now to slide 10, I won't spend too much time on this, but
3 both of the experts agree that a circuit is not a single component, it requires
4 two or more components connected together with electricity. Again, I don't
5 think this is controversial at all, so I'll move on.

6 JUDGE GALLIGAN: Counsel, this is Judge Galligan. I had a
7 question. So, your, I think it was the sur-reply. You have a let's see -- or
8 Patent Owner has a position about whether you have a resistor and whether
9 two resistors, so, you know, a resistor is 100 ohms, let's say, and said you
10 put 2 50-ohm resistors in series. Is that a circuit?

11 MR. ALBERTI: Oh, okay. So, yeah, I think I recall this argument
12 where Petitioner is saying, well this isn't -- this wouldn't really be fair
13 because you could connect just two resistors together and those in
14 combination would be a circuit, even though Thomas only discloses one.
15 Would it be a circuit, I guess, depends if it was connected such that current
16 could flow through the two, but I believe it's an irrelevant hypothetical since
17 it was not -- obviously not in the petition. And it was again we're talking
18 about anticipation here and Thomas doesn't teach that. Thomas teaches a
19 single resistor. And while in a certain hypothetical, I could envision two
20 resistors connected together with current flowing through them as being
21 considered or described as a circuit, I wouldn't necessarily dispute that, but
22 that's not what Thomas teaches.

23 JUDGE GALLIGAN: This is Judge Galligan. So, I wanted to get
24 to this idea of active control. My understanding of a resistor, given a
25 constant voltage, that it would, you know, the resistance would control the
26 current. So, what's this idea of active control that you're -- that Patent

1 Owner is making?

2 MR. ALBERTI: Well, you're controlling a peak current that flows
3 through the LEDs and the patent is pretty clear on how you do this. I mean,
4 the only two current set circuits that are disclosed are shown on our slide
5 number 11, if you take a look at that. And each of those includes a transistor
6 as well where you apply the PWM signal to that. That causes a transistor to
7 turn on and off at a very rapid rate which controls the flow of current
8 through those LEDs. You cannot apply a PWM signal to a simple resistor
9 that -- I don't even know what that would look like. But a resistor doesn't
10 accept a PWM signal. A PWM signal is driven into a transistor that causes a
11 transistor to activate and deactivate at a very rapid rate which controls the
12 amount of brightness that you get out of those LEDs. And it's not an
13 unknown phenomenon at the time of this patent that the way you control a
14 current flow through an LED is using a PWM signal that's fed into a
15 transistor. So, the notion that you could have a single resistor and somehow
16 control that with a PWM signal applied to it, it just doesn't make sense from
17 an electrical engineering standpoint.

18 JUDGE GALLIGAN: But that isn't really what -- this is Judge
19 Galligan. That isn't really what Thomas discloses now, is it? I mean, there
20 is a signal applied to components that precede the resistor, such as a
21 transistor.

22 MR. ALBERTI: Exactly, which is why our point is it can't be the
23 resistor because the resistor never has a PWM signal that's applied to it.
24 Ever.

25 JUDGE GALLIGAN: Okay, thank you.

26 MR. ALBERTI: Yep.

1 JUDGE HORVATH: And this is Judge Horvath. I just have a
2 different question. I think what one of Petitioner's contentions was that in
3 Patent Owner's response, that you've sort of opened the door by defining
4 what a circuit is and saying it has to be two or more components, that you've
5 now introduced, you know, opened the door for them to come back in the
6 reply and sort of identify more than just the resistor as the current set circuit.
7 And I just wanted to hear your response to that. How do you respond to
8 that?

9 MR. ALBERTI: Sure, no. Both sides agreed to use the plain
10 meaning of circuit. There was no construction, *Phillips*-type construction
11 here, anything like that. It's textbook electrical engineering, first class you
12 ever take. I can barely remember. It's been like 35 years now. But the first
13 thing you learn is a circuit includes multiple components that current runs
14 through. We weren't trying to introduce a construction here. We're just
15 applying the plain meaning as Petitioner claimed they were applying, but
16 certainly they weren't.

17 JUDGE GALLIGAN: This is Judge Galligan. It sounds like the
18 plain meaning is disputed, and your point about a circuit, I mean, if I put a
19 paperclip across two battery terminals, that's a short circuit, and that's one
20 component. Is there a dispute about the plain meaning that we have to
21 resolve for this case?

22 MR. ALBERTI: From what I'm hearing from Petitioner now, I
23 don't believe there's a dispute on the plain meaning. I think Petitioner is
24 more or less agreeing that you need multiple components now, and they're
25 falling back to some other attempt at defining a circuit. If -- should
26 Petitioner come up and argue that a single resistor is now a circuit, I'm

1 happy to address that in rebuttal, but that's not what I heard in Petitioner's
2 opening comments.

3 So, I'd like to move now to the second issue regarding the current
4 set circuit, and that's the issue that the claim requires, and I'm referring now
5 to our slide 12, a PWM brightness control signal that is applied to the circuit,
6 and a PWM signal is simply not applied to the resistor in Thomas. We can
7 see that if we look at slide 13, the resistor never receives that PWM signal.
8 The current would flow from the power supply through the LEDs to the
9 resistors to ground. That PWM signal never gets anywhere near those
10 resistors. So, this notion that the resistors have a PWM brightness control
11 signal applied to them, they do not.

12 Moving to slide 14, now I'd like to address, again, this new
13 argument that, quite frankly, the Board should reject this attempt to sort of
14 retroactively change the petition as it was filed. We cite the *FanDuel* case
15 and address that at POR at page 23, but now the Petitioner is trying to take a
16 second bite at the apple, and what the Petitioner does in referring to the reply
17 at 16, they draw -- they change their theory and draw this blue box to
18 include that transistor 33, which is the BJT.

19 But moving on to slide 15, we see, again, that the PWM signal
20 that's generated by the device that they identify as the PWM brightness
21 control signal generator never applies the signal that it generates to the
22 control transistors. Instead, those signals terminate at AND gates 32.
23 They're subsequently combined with other signals and the resulting signals
24 end up flowing to transistors 33. Again, we're talking about anticipation
25 arguments, and anticipation arguments in circuits require specificity. You
26 have to literally meet the language of the claim. And looking at the

1 proposed new circuit, even if the Board were to entertain that, the signals
2 that are generated never reach those control signals -- transistors 33.

3 So, as a result, the answer --

4 JUDGE HORVATH: This is Judge Horvath. I just want to make
5 sure I understand what you're saying. So, the signal, I mean, let's just focus
6 on the top LED string in that -- on page 15 of your slides. You know, there's
7 that AND circuit 32 or AND gate 32. And then there's a transistor 33 and it
8 looks like, AND gate 32 receives two signals, one comes from the system
9 bus, and let's call that an enable signal. And one comes from the pulse width
10 modulated signal generator. I think it's signal E that gets applied to that top
11 AND gate. So, is your position then that what gets applied to the AND gate
12 is the pulse width modulated signal E, but what comes out of the AND gate
13 is some signal E prime, which is different than signal E?

14 MR. ALBERTI: Correct, because it's being fed into AND gates
15 32. What's coming out of AND gates 32 is a logical combination of two
16 signals of a PWM signal E and whatever the system bus is outputting. And
17 again, the claim itself says the signal that's generated has to be applied to the
18 current set circuit. We're talking about a circuit claim in anticipation. That's
19 not what happens here. What happens is there's intermediate processing,
20 there's intermediate components that are combined with that signal to create
21 a logical combination that is output and subsequently fed into control
22 transistors 33.

23 JUDGE HORVATH: Yeah, I -- and this is Judge Horvath again. I
24 just want to -- so, I mean, if that enables it, well, I'm calling the enables it, if
25 the top signal into the AND gate was a one, right, then the output from the
26 AND gate is going to have at least the same functional form, would you

1 agree as the signal E? If E is high, the output of the AND gate will be high.
2 If E is low, the output of the AND gate will be low. Would you agree with
3 that?

4 MR. ALBERTI: If it were fixed as a single, say it was one the
5 entire time, would the output, would the waveform look similar? So, of
6 course there's going to be inherent impedance and all that kind of stuff. The
7 waveform would look similar. It would be a different signal, but the
8 waveform would look similar if the AND gate, if the one gate was set to a
9 one all the time, if that's --

10 JUDGE HORVATH: What I'm hearing you say is that even if that
11 top of AND gate was set to one, you know, perpetually, you still say there's
12 a distinction because what comes out of the AND gate is, even though it
13 might have the same functional form, it's a different signal than signal E. It's
14 a signal E prime. Is that fair?

15 MR. ALBERTI: Exactly. That's our position. Regardless of what
16 signal you put into there, the logical combination -- it will still be a logical
17 combination and henceforth a different signal.

18 JUDGE HORVATH: Okay. Thank you.

19 JUDGE GALLIGAN: This is Judge Galligan. I wanted to follow
20 up on some things. So, if -- it sounds like your position is that Petitioner
21 said there's a signal applied to a current set circuit. There's a PWM signal
22 applied to a current set circuit. That's fine, but that wasn't done here.

23 MR. ALBERTI: What we can say, maybe this is the best way to
24 say it, is regardless of whether there's some interpretation here that might
25 work, none of that was in the petition. And it's unfair and improper to allow
26 a continued revisiting of the theory that was in the petition, especially in the

1 context of an anticipation ground where it was very clearly set forth in that
2 petition. And even so, even given the latest iteration, which is shown on our
3 slide 14, it still doesn't meet the strict requirements of the claim, in particular
4 because we're talking about the anticipation of a specific circuit claim where
5 they can't show all the limitations are there.

6 JUDGE GALLIGAN: And I'm looking at your slide 13, and we
7 have this, the PWM signals, EFG and H, go to the switches and I believe
8 Petitioner in reply says something like, well, the signals are applied to the
9 current set circuits, the resistors via the switches, and there's no requirement
10 that there be a direct connection. So, how do you respond to that? Why
11 need the connection be direct to a current set circuit?

12 MR. ALBERTI: It does -- that's -- okay. Well, so first of all, it
13 never -- the diagram's a little bit misleading, but the way that this works is
14 the resistors take current that was received via the power supply that flows
15 through the LEDs. That goes straight to ground. There's never a PWM
16 signal that reaches that resistor. So, either the switch is on and the resistor
17 takes current and flows to ground, or it's off and it doesn't. The PWM signal
18 never, ever reaches the resistor.

19 JUDGE GALLIGAN: Okay. So, fair enough. This is Judge
20 Galligan. But that's, I think that's Petitioner's point -- that it enables the
21 current path. I mean, you know, we're talking about the LEDs going left -- I
22 mean, from right -- the power supply starts the power, goes through the LED
23 through the resistor and down. So, from that perspective, you know, if you
24 have a switch on and off, it's never going to hit a resistor per se, that signal.
25 It's going to enable the resistor, so why isn't Petitioner right that there's a
26 signal applied to a circuit that sets the current? Why isn't that contention

1 correct?

2 MR. ALBERTI: Because they identified the circuit as a resistor,
3 and you can't apply a PWM signal to a resistor. And that's, I mean, it's,
4 again, we can look at the '148 patent, which, where it's very clear what's
5 happening. You're applying a PWM signal to a transistor and not to a
6 resistor. The resistor can be part of the circuit, but it can't be the entire
7 circuit. And the petition was very specific, and Dr. Zane admitted in his
8 declaration that the circuit was the resistor. So, again, you know, they
9 should have to live by what's in their petition. Again, citing the *FanDuel*
10 case, trying to come up with a new theory now that even again, even that
11 new theory doesn't hold water for the reasons we explained. The PWM
12 signal never even makes it to the transistor that they allege is part of the
13 circuit now.

14 JUDGE GALLIGAN: What if the AND gate or the left -- let's just
15 say the switches are part of the circuit, then it makes it to the switch, right?
16 That's what enables the current path.

17 MR. ALBERTI: They haven't made that argument, Your Honor.

18 JUDGE GALLIGAN: Well, they argue --

19 MR. ALBERTI: They haven't even made that argument.

20 JUDGE GALLIGAN: Well, and I understand your point about the
21 identification in the first limitation. It's limitation labeled 1.b, I think, the
22 current set circuit. They say it's a resistor that limits the current. And I think
23 that's generally right. I mean, from an electrical engineering standpoint, you
24 pick the resistance you want and that limits the current given a constant
25 voltage. But then in pages 31 to 32 of the petition, they identify that there is
26 a signal that's applied to a path, you know, parallel path, and that enables

1 that parallel path. So, I'm getting -- I feel like I'm getting drawn into a box
2 drawing exercise here where, I mean, I'm looking at Thomas and it clearly
3 anticipated Claim 1 in my opinion. And we're talking about whether
4 Petitioner in one limitation narrowly identified a resistor. I don't, I mean, I
5 don't see any other way to say that everything's disclosed, at least limitation
6 1.b and 1.c -- 1.d, I mean, the ones we're talking about that those aren't
7 disclosed. So, that's why I'm -- I just -- we're just talking about how they
8 drew the boxes in one limitation.

9 MR. ALBERTI: No, it's the, again, it's the entire claim. They did
10 not, Petitioner has a year to, after the filing of a lawsuit to put together a
11 legitimate IPR petition. They chose anticipation here. They chose to have a
12 conclusory obviousness opinion here. So, they should have to live by their
13 petition. And I think the law is very clear on that. Giving them a do-over
14 and a second do-over and now a third do-over just is against -- it's not --
15 doesn't comport with the law, and they shouldn't be able to do that at this
16 stage. They're very clear on what their circuit was. The argument didn't
17 hold water. They've tried to amend it now once, and apparently through this
18 latest argument, again, where now they want to include the LEDs as part of
19 the circuit, which they're clearly not under the claim. Look, I mean, we have
20 procedures for a reason, and they are the ones that chose anticipation.
21 They're the ones that fouled up the read, and I just don't think it's appropriate
22 to give them this many do-overs or any do-overs at this point. They should
23 have to live by what's in their petition.

24 JUDGE GALLIGAN: Thank you, Counsel.

25 MR. ALBERTI: For the sake -- in the sake of time, because I
26 think we're running a little short on time here, I just want to say briefly with

1 respect to Claim 7, that is another anticipation ground. I'm referring now to
2 slide 19. And Claim 7 requires, again, two pieces of hardware that are
3 disclosed in Thomas. You need a shift register and a clock connected to the
4 shift register. That's not in Thomas. Dr. Zane's argument was that, well,
5 you know, it would have been inherent. We go in detail why that's not the
6 case. In particular, you can have asynchronous shift registers that are not
7 connected to a clock, dynamic shift registers. And even in reply, Petitioner
8 incorrectly alleged that dynamic shift registers utilize clocks signals but they
9 never identified a clock connected to the shift register.

10 And if I refer to slide 21 we'll see these are excerpts from Dr.
11 Zane's deposition, page 98, lines 6 through 20, page 16, lines 8 through 18,
12 and he's clear where he admits that you can either have you can either derive
13 the clock or have a dedicated clock. Well, if you're deriving the clock
14 because the clock's quote-unquote it's embedded in data, that doesn't satisfy
15 the specific requirements of Claim 7 which require two things, a shift
16 register and a piece of hardware called a clock that's connected to that. The
17 idea of having the concept of a clock in data, again, this is not obviousness
18 this is anticipation. They should be held to the strict standard of anticipation
19 and they didn't satisfy that here.

20 So with that, I would like to move to Claim 5 and 16 in the Zane
21 grounds. And these, we get into the obviousness to try, obvious to try,
22 opinions from Dr. Zane. Again, we're talking about claims that are very
23 specific. They recite very specific circuits with specific components
24 connected in a specific way.

25 Referring now to our slide 25, you'll see the Figure 4 of Zane and
26 where Zane introduces this concept of a SPDT analog switch. Just to rebut

1 what counsel for Petitioner said, this is not just any type of switch. It's a
2 specific type of switch known as a single-pull double-throw analog switch.
3 This isn't a simple transistor. This type of switch has inherent impedance
4 and switching noise. So, it's not like a simple transistor. And Zane himself
5 discusses the fact that this is going to have impedance, and there's going to
6 have to be workarounds if you alter the position of this switch. Mr. Credelle
7 explained why the switch is where it is and why moving it doesn't make
8 sense.

9 So, let's move to slide 26 so we can see this proposed change. And
10 the proposed change, you're taking this analog SPDT switch and you're
11 moving it from being positioned before the op amp to after the op amp
12 where it is in direct connection to the control terminal of the switching
13 transistor Q. And that's very important because that from an electrical
14 engineering circuit design standpoint makes no sense whatsoever. And I'll
15 explain why. Well, first, Mr. Credelle explained that you need very specific
16 current draw properties that are achieved by this circuit. And the way that
17 the circuit works is when you put a voltage at the base of transistor Q that
18 opens up, it allows current to flow in that path to ground through the LEDs.
19 And when a noisy high impedance analog switch is introduced into the
20 system, you'll see Dr. Zane was smart enough to put it before the op amp.
21 Why is that? Because the op amp here in the circuit isolates this switch, this
22 noisy high impedance switch, from the terminal of a drive transistor Q. So,
23 this means that any impedance switching noise is much less likely to
24 propagate down to that terminal.

25 Now, what happens if you move that and you put it after the op
26 amp? Then all of the impedance and switching noise that is going to occur

1 from switching that on and off, you're going to feel that at the base of that
2 transistor. What's that going to cause? It's going to cause it to interact
3 directly with the base of the transistor Q, which is going to potentially, it
4 will introduce noise, ripple, flickering into that current path. And I'd like to,
5 again, now let's go full circle, we'll come back to what was the purpose of
6 the '148 patent? Expressly teaches away from something like this. The
7 whole purpose was to reduce noise, to reduce ripple, to reduce flickering in
8 your LED paths. Positioning a high noise, high impedance switch at the
9 terminal of your switching transistor that's causing current to flow through
10 that LED does the very opposite of what the '148 patent is achieving.

11 So, this move makes no sense at all. And it's no surprise that Dr.
12 Zane, the author of the paper and the inventor of the patent that embodies
13 this, didn't ever disclose any embodiment or suggest that you could move
14 that switch anywhere else. In particular, where he's proposing to move it,
15 which is after this op amp that's isolating a control transistor from the noise
16 of that switch.

17 JUDGE GALLIGAN: This is Judge Galligan, I have a question on
18 that. Where in the evidence and Mr. -- and the Patent Owner's declarant's
19 testimony is all this evidence about impedance and noise and I don't know if
20 you said jitter. Where is that?

21 MR. ALBERTI: So, on -- hold on, we address this in our PO, I'm
22 sorry, our sur-reply we talk about this at pages 25 and 26 where we note Dr.
23 Zane's testimony that there's -- there's impedance involved. Of course, the
24 patent itself talks about why you do not want impedance or noise in the
25 system. And I think I cited the patent, but just for the record '148 patent,
26 column 2, lines 51 through 57. Column 4, lines 9 through 12, and in the

1 abstract all teaching away from something that would introduce ripple,
2 noise, flickering in your -- in your LED path of your driver. And quite
3 frankly doing this exact proposed move is going to cause that and
4 importantly there's no secondary corroborating evidence that Dr. Zane
5 provides, and this is again -- ties into the fact that Petitioner chose to use Dr.
6 Zane to talk about his own reference, and when talking about rearranging the
7 circuit he didn't provide any corroboration for that. It's just purely his
8 testimony. While Patent Owner's expert, who doesn't have the same similar
9 personal bias that would occur when you're talking about your own patent,
10 tells you why you wouldn't do that.

11 JUDGE GALLIGAN: This is Judge Galligan. So, --

12 JUDGE HORVATH: Three minute warning.

13 JUDGE GALLIGAN: Thanks. So, I was reading—I think
14 paragraphs 52 to 57 of Mr. Credelle's declaration provide his testimony
15 regarding why you wouldn't make this change. One thing that strikes me is
16 that he says we, you know, the analog SPDT switch characteristics are not
17 disclosed by Zane, and I think yeah it says the properties of the analog SPDT
18 switch are unknown. So, how do we then, with that testimony and evidence,
19 how are we to credit the argument that you wouldn't do this. There are all
20 these properties because their testimony is that they're unknown.

21 MR. ALBERTI: Well, Zane himself at page 53, lines 5 through 10
22 of his deposition transcript concedes that there's, you know, you have to deal
23 with impedance, right, and again, just as a matter of simple circuit design, it
24 doesn't take a whole lot of evidence to understand that you would not move
25 that switch there. And more importantly, it's not our burden to say why you
26 wouldn't move a switch to there. It's Petitioner's burden to say why you

1 would.

2 So the question, again, referring now to slide 28 of our
3 presentation, the case law here is very clear. The question is not whether
4 something could be done. The question is would you do it? And Dr. Zane
5 never addresses how you would solve the impedance problem by moving the
6 switch directly in front of your switching transistor. He just says you could.
7 And I find it obvious that's based on design choice is precluded where the
8 difference between the claim features and the prior art results in a functional
9 difference. That's the *Lumenis* case. Dr. Zane himself conceded that there's
10 a functional difference. He just said well, you know, maybe we could take
11 care of it some other way. But that's not, that's not an appropriate
12 obviousness analysis. That's Dr. Zane using hindsight bias and quite
13 possibly personal bias because he's invested in this reference.

14 And again, another reason why in Dr. Zane's testimony and I'll
15 refer to slide 30, he clearly says in his deposition page 62, lines 3 through
16 14, so was it your opinion that you and Dr. Doshi developed the technology
17 that's described in Claim 1 before the inventors of the '148 patent? "I
18 believe that's an appropriate characterization." So, he should, if he's opining
19 on something that he believes that he invented, he should have to provide
20 some level of corroboration and he simply doesn't do it. He says, okay,
21 yeah, this switch has impedance you can move it in front of this transistor
22 but maybe you could address it some other way. You can't address it some
23 other way. Well, why didn't he do that? Why didn't he put it in his patent
24 when he was listing all his embodiments? He simply didn't and he shouldn't
25 be able to -- or we shouldn't grant the Petitioner the license to simply say
26 well you can just move things around because it's possible without saying

1 why you actually would.

2 And with that --

3 JUDGE HORVATH: Mr. Alberti, your time has expired. Thank
4 you. I do have a question I would like you to address in your rebuttal. And
5 this is the question of, if we were to find for example an independent claim
6 was not obvious can we address a dependent claim separately, and if we
7 were to address the dependent claim and find the dependent claim was
8 obvious would that necessarily mean the independent claim was obvious?
9 And the question is, you know, what is the legal support one way or the
10 other? Can we reach -- can we look at the independent claim or the
11 dependent claim, a dependent claim, if we find an independent claim has not
12 been shown obvious? And then if we do look at the dependent claim, can
13 we then find that the independent claim must have been obvious as well?
14 You can address that in your rebuttal.

15 MR. ALBERTI: I will.

16 JUDGE HORVATH: Thank you. Okay, Ms. Swaroop, you had
17 requested a 20-minute rebuttal period. So, I will again give you a three-
18 minute warning. Let me reset my clock. So, that'll be 17 minutes. And you
19 may begin when you're ready.

20 MS. SWAROOP: Thank you, Your Honor. So, I just actually
21 wanted to respond to the question I think you posed to both Patent Owner's
22 counsel and myself about whether there was case law on this issue about if a
23 dependent claim is obvious would that render the independent claim
24 obvious. And I believe there is a PTAB decision on point. It's the *Eastman*
25 *Kodak v. CTP Innovations*, IPR2014- 00788. And there are two decisions,
26 Paper 39 at 12 and Paper 44. And in that decision, the Board did exactly

1 what Your Honor asked about, which was found a dependent claim obvious,
2 and then also found the independent claim obvious as well. And so, I
3 wanted to address that.

4 And for my rebuttal, I'll just walk through Patent Owner's slides
5 and just respond to some of the points that counsel made. So, if you look at
6 Patent Owner's, and I think if Your Honors have Patent Owner's slides, I
7 won't project them, I'll just kind of refer back to them. But if we go to the, I
8 believe it was slide 2 when Patent Owner's counsel was talking about the
9 overview of the grounds, and specifically talked about Claim 6, which I
10 think Your Honor asked me about as well. And suggested that our
11 obviousness analysis for Claim 6 was conclusory. And I would disagree
12 with that. It was far from conclusory. And again, our expert in Exhibit
13 1003, his opening declaration, paragraphs 112 to 116 provided very specific
14 reasons for the proposed modification, the advantages of moving the
15 resistor, and the benefits that would be achieved by that. And again, not
16 rebutted or responded to at all by Patent Owner. So, I wanted to draw the
17 Board's attention to that portion of our analysis for Claim 6.

18 The second thing that Patent Owner's counsel opened with -- with
19 regard to our expert is -- suggested that our expert's opinions, particularly on
20 the issue of obviousness and modification of the circuit in Exhibit 1006 was
21 somehow unsupported or uncorroborated, and to me, again, it's very unusual
22 to use the word uncorroborated in the context of an opinion regarding
23 obviousness. Corroboration comes up when you have a -- you're trying to
24 corroborate oral testimony of a prior invention. Those are the contexts for
25 corroboration. The idea that an expert, opining on what would have been
26 obvious to a person of ordinary skill in the art, that that somehow requires

1 corroboration. Again, there's no case law suggesting that. No case law
2 provided by the Patent Owner. No case law that I'm aware of.

3 And also, Patent Owner was simply incorrect on that point,
4 suggesting that Dr. Zane was just talking and had no support. His opening
5 declaration on this very issue of the modification actually cited to another
6 patent, cited to the Chang patent, which is Exhibit 1027. Again, and that one
7 actually shows the transistor between the output of the feedback circuit and
8 the current control transistor. So, this idea that this modification is
9 unsupported, no, I think he said, came from nowhere, no, you know, that's
10 just simply not true. And so again, it's paragraph 185 of the Zane
11 Declaration, which is Exhibit 1003. And the Chang reference is Exhibit
12 1027. And specifically, Dr. Zane gave Figure 1 of Chang as an example
13 there. So, I wanted to bring that to the Board's attention as well.

14 Also in criticizing our expert, he mentioned the Zane patent.
15 Again, there was no analysis of the Zane patent in this record. And so, any
16 argument or assertions about that really have no bearing on this proceeding.
17 The issue before the panel is whether the publication that Dr. Zane co-
18 authored with his graduate student, what that discloses. And again, no
19 allegation that Dr. Zane went beyond the four corners in doing his analysis
20 here.

21 So, the next point I wanted to cover was in Patent Owner's slide 9.
22 And this was the discussion again of the current set circuit and whether that
23 is disclosed in Thomas. And again, I think you saw from Patent Owner's
24 argument that it's premised on an assumption that the petition identified a
25 resistor and a resistor alone in isolation as a current set circuit. And that's
26 simply not what the petition set forth. And I think we pointed out again, the

1 petition at 25, and also our expert declaration, Exhibit 1003 at paragraphs 62
2 and 63. Patent Owner's slide 9 cropped a quote from our expert. It's the
3 fourth, a very last bullet point on slide 9, and the sentence or the crop was, it
4 is my opinion that those resistors are current set circuits, and cited one little
5 piece of Dr. Zane's deposition. But if you read the entirety of that
6 deposition, and actually literally the sentence right before that, he explains,
7 he's saying the resistor in series with the LEDs, and he gives a very -- an
8 explanation of what he was talking about with his opinion on current set
9 circuits. So, you know, simply cropping a quote from a deposition without
10 considering the full context, I don't think that -- that's really not accurately
11 portraying what we included in our petition, and what our expert opined on.

12 I think we also heard from Patent Owner that, you know, a current
13 set circuit, you know, is that we were somehow misconstruing the current set
14 circuit. But again, the '148 patent, and I think this is actually on Patent
15 Owner's slide 11, and in our slides as well, our slide 48 showed Figure 6.
16 Figure 6 is what the '148 patent describes as a current set circuit. And Patent
17 Owner only highlighted the bottom portion, but you can see the current set
18 circuit has LEDs. It has the PWM brightness control going to the transistor,
19 and it has a resistor. And our point simply is that, you know, there's
20 semantics over what's a current set circuit, how it's being defined.
21 Regardless of how it's being defined, it is in Thomas. And we show that.
22 We show that in our original petition. This is not a recharacterization or a
23 second bite at the apple. Our expert explained this in the original -- with the
24 original declaration accompanying the petition. Again, paragraphs 62, 63,
25 paragraphs 69 and 70 as well.

26 And the patent itself, if the panel would like to refer to that, the

1 '148 patent itself at columns 6, lines 7 through 11, describes the current set
2 circuit. And again, as we can see from Figure 6, the current set circuit is
3 shown in Figure 6, and it includes the LEDs, PWM brightness control being
4 applied to the transistor and the resistor there.

5 JUDGE GALLIGAN: Counsel, this is Judge Galligan. What
6 about Patent Owner's argument though that if you are limiting your current
7 set circuit to the resistors and the LED, that signal is not applied to that. It's
8 applied to maybe an AND gate that enables the path, but the current drain is
9 down through that then. So what's your response to that? How do you meet
10 the limitation 1.d?

11 MS. SWAROOP: Yeah, so as we explained, and I think Dr. Zane
12 paragraph 95 of his original declaration, Exhibit 1003, also explains how the
13 current, that the PWM signal is being applied to this current path that
14 includes the resistors in series with the LEDs. And let me just pull that up,
15 actually. Let's see if I have it here. So, he explains that Thomas discloses
16 transistors which are connected in series with the current set resistors. So,
17 that's the very first sentence of paragraph 95. And then on the next page, the
18 last sentence of that page explains that the transistors are connected to the
19 PWM brightness control generator via AND gates 32. So, explaining that
20 the transistors are connected through the AND gates, receiving the PWM
21 signal. And again, that is part of the same current path here, which I think is
22 how Your Honor also explained that in one of his questions.

23 JUDGE GALLIGAN: This is Judge Galligan. So, why not in
24 limitation 1.b just say that? This is saying you're pointing me to the
25 testimony about Claim 17.

26 MS. SWAROOP: Sure. And I think in our paragraphs, again, 62

1 and 63, we explain it was the resistor in series with the LEDs as shown in
2 Figure 1 of Thomas. So, you know, it was a resistor on the associated
3 components there. And again if we can turn to 63 of the --

4 JUDGE SZPONDOWSKI: Counsel, can I ask one more question
5 about that? Patent Owner, you know, pointed out that the LEDs are recited
6 separately in that limitation. So, there's a plurality of current set circuits, and
7 then later on, controlling a peak current through one or more LEDs. So,
8 what's your response to that? Because you keep pointing us to the resistors
9 in series with the LEDs.

10 MS. SWAROOP: Right. And so -- let's go to that. So, I think,
11 again, what we're pointing to is the resistors as part of this current path is
12 what we were trying to explain here. And again, in paragraph 63, Dr. Zane
13 explains that a person of ordinary skill would have understood that the
14 function of the resistors, highlighted green above, again, referring to Figures
15 1 and 2 of Thomas, is to set the current flowing through the LEDs to a peak
16 value when the transistor switch in their path is turned on. So, you know, is
17 explaining the resistors in this path and how that works in Thomas.

18 JUDGE SZPONDOWSKI: So, doesn't that indicate that you're
19 relying on the resistors to teach the current set circuit?

20 MS. SWAROOP: The resistor is in series with the LEDs. That's
21 right. And with regard to your question, Figure 6 is described as a current
22 set circuit, and Figure 6, you know, shows LEDs as well. So, the resistor is
23 the current limiting element of the current set circuit, but it's not a resistor in
24 isolation. It's a resistor as part of this current path.

25 JUDGE SZPONDOWSKI: Okay. Thank you.

26 MS. SWAROOP: Okay. So, we are on, I think, slide 13. Yeah.

1 So, again, there was, again, an allegation by Patent Owner that somehow we
2 didn't assert that the signal moves through the current path. And again, I
3 would just direct the panel to paragraphs 69 and 70 of Dr. Zane's
4 declaration, which is, again, Exhibit 1003 for that explanation.

5 And then if we go to slide, let's see, 15, there were some questions,
6 I think, by Judge Horvath to Patent Owner about the control signal and the
7 AND gate and the PWM signal and how that works. And we would agree
8 with Your Honor that it is, you know, the same signal. The figure that's
9 shown, the way it's drawn here on slide 15 of Patent Owner's response is
10 really showing it when the control signals are off. But as Your Honor
11 pointed out, when the control signals are on, then the PWM signal will be
12 delivered. And we show that in paragraph 95 of Dr. Zane's declaration,
13 again, and with the schematic and there's purple lines kind of showing that
14 path. Again, Exhibit 1003, paragraph 95.

15 JUDGE HORVATH: This is Judge Horvath. I just wanted to
16 clarify. So, my understanding of Patent Owner's contention is that what
17 comes out of the AND gate is not the same signal. It might have the same
18 characteristics in terms of when it's on when it's off. But it's not going to be
19 identically the same signal because the fact that it does get passed through
20 this AND gate, which has its own sets of transistors and whatnot, it's going
21 to necessarily affect the signal, so it's not the same signal. What's your
22 response to that?

23 MS. SWAROOP: Well, it's the -- I mean, it's the duty -- the way
24 the claim reads is it's a duty cycle corresponding. If it applies a duty cycle
25 corresponding to the PWM signal, if you read limitation 1.d. So, we would
26 say that limitation is met. And it is the signal in paragraph, I believe it's

1 paragraph 95 of the Zane declaration explains that the transistor is receiving
2 the signal from via the AND gates. So, there is the additional control signal.
3 Your Honor is right, the 1 or 0 there. And when the control signals hide and
4 the PWM signal then will be received by the AND gates. I'm sorry, received
5 by the transistor, 33.

6 JUDGE HORVATH: Okay. Thank you.

7 MS. SWAROOP: And then the last thing I wanted to touch on, I
8 think I just have a few minutes left here, was on the slide 25, which was the
9 proposed modification in Zane. We heard a lot of attorney argument there
10 that really wasn't in the record. I think I even heard a reference to teaching
11 away. Teaching away was never presented by Patent Owner. And there was
12 a lot of arguments about, you know, the voltage at the base of the control
13 terminal Q. And as I had explained in my opening presentation, you know,
14 the feedback circuit is controlling the voltage here. And so, the voltage at
15 the base Q, and I know our expert explained this too at his deposition. His
16 second deposition, Exhibit 2004, at lines 49, 6 through 18, that that's not
17 really the relevant voltage. The relevant voltage is what's being applied to
18 the resistor here at the righthand side of the diagram. And so, Dr. Zane
19 explained that and explained why the feedback circuit would regulate. And
20 again, explained that relocating the switch here would not affect the
21 properties of the circuit.

22 Counsel had suggested that our expert had explained that there was
23 some relatively high impedance and it cited to a portion of Dr. Zane's second
24 declaration, and that's Exhibit 2011. But when he was asked, and I would
25 encourage the Board to read pages 52 to 53 of the deposition, and he said
26 that the SPDT switch, as shown in the experimental section of the Zane

1 reference, is a skilled person to understand, has very little impact on the
2 operation of the circuit in terms of its impedance. So, this idea that, you
3 know, there's lots of impedance, that it's noisy, that is simply not what was
4 in the record. And so, that was, again, his second deposition, which was
5 Exhibit 2011. I think earlier I misspoke when I mentioned the deposition
6 where he discussed the op amp properties and why it was not impacted by
7 the switch, and that was actually his first deposition, which is Exhibit 2004,
8 page 49, lines 6 through 18.

9 And then I just wanted to briefly touch on the slide 28. Counsel
10 mentioned the *Lumenis* decision from the Board and suggested that if there's
11 a functional difference, then, you know, an obviousness based on design
12 choice is precluded. You know, we don't think there's any functional
13 difference here. And also, the *Lumenis* case was very different in terms of
14 its facts. There, there was an obviousness case being presented. This was an
15 institution decision. The Board denied institution there because they found
16 the expert opinion was very conclusory. And the proposed obviousness
17 modification there was actually to add to the circuit -- added, and I think it
18 was an additional capacitor. That's not what's happening here. This is
19 taking the existing circuit, simply relocating the switch, supported by well-
20 reasoned testimony from Dr. Zane, and actually an example from another
21 reference, from the Chang reference. So, we don't think that case is on point
22 and we don't think there's any functional difference from the modification.

23 JUDGE HORVATH: And you have three minutes.

24 MS. SWAROOP: Okay, thank you. And then the last slide I
25 wanted to touch on from Patent Owner was slide 30, again, criticizing Dr.
26 Zane because he testified that he talks about developing the technology. He

1 did that again at a university that he's no longer at. The patent that Patent
2 Owner's counsel has mentioned is not the reference at issue. There's been no
3 analysis of that patent, so any suggestion of bias from Dr. Zane based on that
4 patent really is not really supported in the record here. And again, no case
5 law suggesting that what he opined on here was in any way improper.

6 So, I think that is, just looking at my notes here to see if there's
7 anything else that I wanted to address. I also just wanted to briefly address,
8 again, the clock limitation. And again, I would encourage you to read the
9 Credelle declaration. That's Patent Owner's expert and his analysis of the
10 clock limitation. He never says that he disagrees with our expert that a clock
11 wouldn't be required by Thomas. And that is the relevant inquiry here. And
12 again, the shifting at predetermined intervals, which is clearly what is going
13 on in Figure 3 of Thomas, would need to be implemented through a clock.
14 And our expert provided testimony to that, to support that point.

15 JUDGE HORVATH: This is Judge Horvath. I do have a question.
16 I want to go back to Patent Owner's slide 28.

17 MS. SWAROOP: Slide 28, yes.

18 JUDGE HORVATH: This is the move of the switch to the other
19 side of this op amp. And I thought I heard you say that it wouldn't change
20 the voltage provided to the, I guess it's the non-inverting input of the op
21 amp. But I think Patent Owner's contention, as I understood it, was that
22 because of the impedance of this switch, that if you moved it to the output of
23 the op amp, it would cause variations or unwanted variations or ripple or
24 uncertainty into the voltage applied to the base of the transistor Q. So, did
25 your expert, Dr. Zane, address that issue?

26 MS. SWAROOP: He did, and that was the portion of his

1 deposition testimony, and let me just find that here. That was in his first
2 deposition. It was Exhibit 2004 at page 49, lines 6 through 18, and
3 explaining that relocating the switch there to the output of the op amp would
4 not impact the operation of the circuit. And again, the reason is because
5 there's this feedback circuit, and really the voltage that's important here is a
6 voltage that's being applied to the resistor, the RS there. And this feedback
7 circuit makes sure that that voltage remains the same here. And so, Patent
8 Owner was focusing on the base, the base at Q, but that's not really the
9 relevant voltage here. And so, the voltage to be concerned about is the V-
10 prog on the righthand side, and Dr. Zane explained that. And again, I may
11 have misspoke his first or second deposition. It should be the second
12 deposition, and so, I may have miscited. So let me make it clear, it would
13 have been Exhibit 2011 at page 49, lines 6 through 18.

14 JUDGE HORVATH: Okay, thank you. Your time has expired.

15 MS. SWAROOP: Thank you, Your Honors, and thank you for
16 your time in considering our petition.

17 JUDGE HORVATH: Okay. And Mr. Alberti, you had requested
18 15 minutes of rebuttal, so I will set the clock for 12 minutes, give you a
19 three-minute warning. And you may begin whenever you're ready.

20 MR. ALBERTI: Thank you, Your Honor. I would like to first
21 address some of the comments related to the limitation of the signal having
22 to be applied to the current set circuit. And for ease of reference, we can
23 look at our slide 6, which has Claim 1. I understood Petitioner to be arguing
24 now that, well, you don't really need to apply the signal to the circuit itself.
25 It's about the duty cycle. It's simply not the case. If we take a look at Claim
26 1, again, it recites a very specific circuit with things that are connected

1 together. There's a voltage source that's connected to LEDs in parallel paths.
2 There are a plurality of current set circuits, each per path, that control the
3 current to the LEDs. Then you have a PWM brightness control signal
4 generator connected to the plurality of current set circuits.

5 And then finally, each current set circuit being configured to draw
6 the peak current through its LEDs at a duty cycle corresponding to a duty
7 cycle of a brightness control signal applied to it. Very clearly it's requiring
8 the PWM brightness control signal that's generated by the PWM brightness
9 control signal generator to be applied to each current set circuit and that's
10 very obvious when you consider that the PWM brightness control signal
11 generator is connected to those circuits. So, it has to be connected and apply
12 the signal to it. And that simply is not done in the petition. And again, if
13 referring to slide 15 you could see that the signal that's generated doesn't
14 ever reach the control transistors and again the control transistors were never
15 part of the circuit in the petition. So, it's unfair and should not be entertained
16 at this late time.

17 What was the circuit is identified in slide 14. It was just the
18 resistor, just the green resistor. We show in detail why this new theory was
19 new. It was never in the petition. They're very clear, petition at 26, the
20 resistor shown in Figure 1 are each a current set circuit. Petitioner's counsel
21 also made reference to Figures 5 and 6, somehow suggesting that the LEDs
22 here are part of the circuit. Again, simply not the case. If you look at
23 Figures 5 and 6, the current set circuit is shown -- is either 62 or 70, and
24 there's an arrow directly showing the elements that are not the LEDs. The
25 LEDs instead are connected to that circuit. Again, as explained in the claim,
26 they're not part of the circuit. So, this new theory that the resistor plus the

1 LEDs is the current set circuit simply doesn't hold water based on the plain
2 language of the claim, the plain reading of the specification, including the
3 figures.

4 I want to touch briefly on, if we talk about the Chang reference that
5 was mentioned, I think it was counsel referenced Exhibit 1027. Chang is not
6 part of their obviousness -- of Zane's obviousness opinion. It's a single
7 reference obviousness opinion, again, with lots of problems, not excluding
8 the bias of Zane, hindsight bias. And if you actually look at Chang and how
9 it's referenced in the petition, it's simply referenced for the notion that, well,
10 you could rearrange transistors in some undisclosed way. Well, the fact that
11 you can rearrange transistors in a circuit begs the question.

12 The question is, would you arrange the circuit in Zane in the way
13 that's disclosed and required by the claims, Claim 5 and 16 of the '148
14 patent? And there's just no attempt to explain why you would do that. Even
15 referring to slide 14 that Petitioner addressed, if you look at what Zane says,
16 I mean, his quote is right here, plain as day. It says a POSITA would have
17 understood there are a finite number of ways in which the brightest control
18 transistor could be connected to the current sink, and it would have been
19 obvious to try any of those. He's not saying you would. He's not saying
20 why it would be obvious to put it in a specific way that's recited in the claim.
21 So, we're left to understand that the only reasons you would actually put it
22 that specific way is because of hindsight or potentially personal bias. But
23 certainly there's no disclosure as to why you would do that, which is what's
24 required in a obviousness analysis. That's simply and completely missing
25 from Dr. Zane's opinions and from the petition and the reply.

26 Finally, just addressing, if we take a look at this proposed move of

1 the switch again, and what counsel was focusing on is this notion of, well,
2 you'll still get the same voltage, which if we look at slide 27, you've got this
3 programmable voltage reference that will either pass through this analog
4 SPDT switch and go to the op amp, or if you just short that out, that voltage
5 will still go to the op amp. That doesn't address the issue that you're putting
6 a switch that is going to inherently have impedance and noise, the amount of
7 it Dr. Zane could dispute, but there will no doubt, and you could take note --
8 judicial notice of this. Of course, any analog switch is going to have
9 impedance and noise, there's nothing fancy about that. And if you put it
10 directly in front and connect it to the control terminal of transistor Q, which
11 is what you want to precisely control, that's going to cause noise. It's going
12 to cause ripple. It's going to cause the very things that the '148 patent was
13 designed to overcome.

14 So again, they provide no reason why you would do this other
15 than, well, you could put transistors in other places. Well, of course,
16 nobody's disputing that you can move components around in a circuit. The
17 point is, is there a reason why you would do this, especially in a case where
18 you're going to cause serious problems to the circuit and you're going to
19 cause the very same problems that the '148 patent was designed to
20 overcome.

21 Finally, on the issue of whether you can find dependent claims or
22 if you find dependent claims obvious, are you're required to find the
23 independent claim obvious. So, I don't think that we need to delve into that
24 to the extent that I could see a situation where if you're looking at different
25 references, then maybe -- or different combinations that maybe you could
26 reach different conclusions for an independent or a dependent claim. I think

1 that the bigger question is if you have a petition that fails to identify specific
2 elements that need to be in the claim and they're missing from the prior art
3 like they're missing from Thomas, like the fact that you don't have a
4 brightness control signal that's applied to a current set circuit, then all the
5 claims have to fail because that limitation isn't met.

6 And so, if we want to talk about Claim 6, we can talk about Claim
7 6, but in the context of the fact that they never proved that all of the elements
8 of Claim 1 are there. So, the attempt to redo Claim 6, even if we want to
9 grant them the ability to argue now that you have an additional component in
10 the current set circuit, that being the transistor, we showed that the specific
11 requirements of that claim, particularly the brightness, the PWM brightness
12 control signal has to be applied to that, it's not there either.

13 So, with that, unless Your Honors have any other questions, I can
14 submit my time.

15 JUDGE HORVATH: This is Judge Horvath. I do have two
16 questions for you. So, let's go to the first question. Actually, let's go back to
17 Claim 1. And I take it that your analysis of Claim 1 is that the -- when you
18 say the pulse width modulator generator is connected to the plurality of
19 current set circuits, you require that to be directly connected. Is that a fair
20 assessment?

21 MR. ALBERTI: Well, that limitation in and of itself, I don't know
22 that if we were just to look at connected, I'm not saying that you can't be
23 indirectly connected to satisfy that. What I'm saying is that if the PWM
24 brightness control signal generator is generating a signal that is then applied
25 to the circuit, that signal, you have to show that that signal is in fact applied
26 to the circuit, regardless if it's directly or indirectly connected. So --

1 JUDGE HORVATH: What I understood Petitioner to say is that
2 what the claim requires is that it is the current set circuits are at a duty --
3 receive a -- draw the peak current at a duty cycle corresponding to a duty
4 cycle of the PWM control signal. And so, I think my understanding of your
5 position is that you think that the current that comes out of these AND gates
6 is not the current of the generator E, it's a different signal E prime. But I
7 think you also agree that if I'm enabling that AND gate by putting one of the
8 inputs to one, that E prime will have the duty cycle of E, will it not?

9 MR. ALBERTI: Okay. So, let me back you up there because
10 counsel, when counsel read the claim, she left out the important part, which
11 is it's drawing current, quote, at a duty cycle substantially corresponding to a
12 duty cycle of a PWM brightness control signal applied to it. So, it has to
13 actually be applied to the circuit. The fact that it corresponds is irrelevant.
14 The signal that's generated by the PWM brightness control signal has to be
15 applied, not some other signal, the signal that's generated by the PWM
16 brightness control signal generator. That signal, by the plain language of the
17 claim, has to be applied to the current set circuit, not some substantial
18 corresponding signal, some E prime. It has to be the signal by the plain
19 language of the claim.

20 JUDGE HORVATH: Thank you. So, going back to now Claim 6,
21 let's assume for the sake of argument that we agree with you that they've
22 only identified in Claim 1 the resistor. And that was defective. That's a
23 defect in their obvious or anticipation analysis of Claim 1. By the way,
24 there's three minutes left. So, I'm going to try to get this question out, but I'll
25 give you time to answer. That that was the defect in Claim 1. The
26 interesting thing about Claim 6 is -- doesn't Claim 6 fix that defect? Because

1 Claim 6 specifically -- the defect with Claim 1, if we find it is defective, is
2 that they identified a resistor as the current set circuit, and perhaps we
3 disagree with that. But Claim 6 specifically requires the current set circuit to
4 be a resistor in series with a transistor. And they have certainly shown, I
5 mean, it was an obviousness argument, and the order is not the same. But in
6 Thomas, there is a transistor in series with a resistor. So, doesn't that fix the
7 -- whatever defect there may be in their analysis of Claim 1?

8 MR. ALBERTI: Again, they -- no, I would disagree because, first
9 of all, they rearranged the components in order to meet the claim. They
10 gave a conclusory reason why you would do that, citing Ohm's law. And
11 even under that configuration, they don't include -- the signal is not applied
12 to transistor 33. For the same reason we explained with Claim 1, even if you
13 were to rearrange these components somehow, you still have to deal with the
14 fact that the signal that is generated by the PWM brightness control signal
15 generator does not go -- it's not applied to either the resistor or the transistor
16 33. Instead, it's applied to an AND gate, it's logically combined with another
17 signal, and some resulting signal that is not the signal in the claim, is
18 generated and would be then sent to that circuit. But the signal in the claim,
19 which is the one that's generated by the PWM brightness control signal
20 generator, does not make it all the way to that. So, even under this broader,
21 even if you accept their conclusory Claim 6 analysis, they still do not
22 address and cannot address the fact that that signal is not applied to the
23 current set circuit.

24 JUDGE HORVATH: Okay, thank you. And then I just, going
25 back to, I just want to, I do want to get your opinion on this, or is that let's
26 say for sake of argument that we disagree with you and think that the signal

1 that is applied is the signal required by Claim 1 in Claim 6, and that Claim 6
2 fixes a defect that exists in Claim 1. The question then becomes, if we were
3 to agree with you that Claim 1 doesn't anticipate under the Thomas grounds,
4 and therefore it can't render obvious under their rationale for why it's
5 obvious, namely because it's anticipating. Then the issue is, if we make that
6 conclusion about Claim 1 not being obvious, but we feel that Claim 6 fixes
7 that error, can we even reach Claim 6 or not?

8 MR. ALBERTI: Well, again, I don't --

9 JUDGE HORVATH: Your time has expired, but I'll give you two
10 minutes to answer that.

11 MR. ALBERTI: So, are you saying that if you say Claim 6 is
12 obvious, can you find that they failed to meet their burden for Claim 1? I
13 would say yes because their petition completely fails to meet its burden for
14 Claim 1.

15 JUDGE HORVATH: Okay. And there's a second question which,
16 can we, if we find, if we agree with you that they didn't initially meet their
17 burden on the obviousness of Claim 1, can we nonetheless determine
18 whether or not they've met their burden with respect to Claim 6?

19 MR. ALBERTI: You know, sitting here, I can't think of a legal
20 reason why you wouldn't consider a separate ground as a separate ground.
21 But again, for the reasons we stated, we don't believe that, you know, that
22 ground makes it either and is nonetheless conclusory for the reasons we
23 stated. So, I can't, sitting here today, I can't give you a case that says you
24 cannot consider a separate ground as a separate ground. But I would stand
25 on our position that they haven't met the burden on that either.

26 JUDGE HORVATH: Okay, thank you. I think your time has

1 expired, so we appreciate the vigorous debate here, and your answering our
2 questions and your participation. Thank you. It's been very helpful to us
3 and instructive.

4 And we are adjourned. So, we will issue our decision in due
5 course.

6 MR. ALBERTI: Thank you, Your Honors. Appreciate it.

7 MS. SWAROOP: Thank you, Your Honors, and thank you on
8 behalf of the Petitioner Vizio.

9 COURT REPORTER: Okay. We're going off record and the time
10 is 3:13 p.m. Eastern Standard.

11 (Whereupon the above-entitled matter went off the record at 3:13
12 p.m.)

IPR2024-00073
Patent 7,843,148 B2

PETITIONER:

Sheila Swaroop
Marko Zoretic
Daniel Kiang
KNOBBE, MARTENS, OLSON & BEAR, LLP
2sns@knobbe.com
2mrz@knobbe.com
2dck@knobbe.com

PATENT OWNER:

David Alberti
Russell Tonkovich
KRAMER ALBERTI LIM & TONKOVICH LLP
dalberti@krameralberti.com
rtonkovich@feinday.com

Jason Fitzsimmons
Richard Bemben
Jennifer Chagnon
Michael Specht
STERNE, KESSLER, GOLDSTEIN & FOX PLLC
jfitsimmons-ptab@sternekessler.com
rbemben-ptab@sternekessler.com
jchagnon-ptab@sternekessler.com
mspecht-ptab@sternekessler.com