

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HESAI TECHNOLOGY Co., LTD.,
Petitioner,
v.

OUSTER, INC.,
Patent Owner.

IPR2023-01421
Patent 11,175,405 B2

Record of Oral Hearing
Held: December 17, 2024

Before MEREDITH C. PETRAVICK, KEVIN W. CHERRY, and
JON M. JURGOVAN, *Administrative Patent Judges*.

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The above-entitled matter came on for hearing on Tuesday, December 17, 2024, commencing at 10:00 a.m., at the U.S. Patent and Trademark Office, 600 Dulany Street, Alexandria, Virginia.

P R O C E E D I N G S

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JUDGE CHERRY: Good morning, everyone. This is Judge Cherry. With me are Judges Petravick and Jurgovan. So we're getting a bit of an echo. This is *Hesai Technology Limited v. Ouster Inc.*, if that's the correct pronunciation. Please correct me if I'm wrong. IPR -- this is IPR2023-1421 involving U.S. Patent Number 11,175,405.

Will the parties please make their appearances?

MR. NEWTON: Good morning. For Petitioner, this is Jared Newton from Quinn Emanuel Urquhart & Sullivan, and I'm joined by my colleague today, Ron Hagiz, who is going to be handling the argument.

JUDGE CHERRY: Welcome, Mr. Newton and Mr. Hagiz. Patent Owner?

MR. LAUPPE: Good morning, Your Honors. My name is Patrick Lauppe, and I'm with Cooley. I represent Patent Owner Ouster, Incorporated, and I'm joined by my colleague, Phillip Morton, and I'm also joined by two representatives from Ouster, so Megan Chung and James Isbester.

JUDGE CHERRY: Okay, Mr. Lauppe. I think, Patent, that you're also a LEAP practitioner. Is that correct?

MR. LAUPPE: Yes, Your Honor. Yes.

JUDGE CHERRY: All right. So we -- so Petitioner, we've scheduled it originally for one hour a side, but because you're a LEAP practitioner, you'll get an extra 15 minutes, so Petitioner gets one hour of argument time. Patent Owner gets an hour and 15 minutes. We will begin with Petitioner because they have the burden of proof. Then we will proceed to the Patent

1 Owner's response. Then the Petitioner gets a rebuttal time, and then we
2 conclude with the Patent Owner gets a surrebuttal time.

3 Mr. Newton, how much time do you want to reserve for rebuttal?

4 MR. NEWTON: I'm going to defer that to my colleague, Mr. Hagiz.

5 JUDGE CHERRY: Oh, Mr. Hagiz. Mr. Hagiz, how much time you
6 want to reserve?

7 MR. HAGIZ: Thank you, Your Honor. I'll reserve 20 minutes.

8 JUDGE CHERRY: Great. Mr. Lauppe, how much time do you want
9 to reserve for rebuttal?

10 MR. LAUPPE: Twenty minutes as well, Your Honor.

11 JUDGE CHERRY: Great. Great. And with that, I think we're ready
12 to begin. Mr. Hagiz, whenever you're ready.

13 MR. HAGIZ: Sure, Your Honor. Let me just share the demonstrative
14 that I'll be using today. One moment. All right, I'm ready.

15 So, Your Honors, I know that you're familiar with patents and the
16 prior arts. I'd like to dive right into the issues and disputes. And I'll start
17 with slide 3 of Petitioner's demonstratives.

18 Now, the disputes across all the grounds really focus on two
19 elements here in the independent claims of the challenge, independent
20 claims 21 and 26. And those are specifically the aperture layer limitation
21 and the single photon avalanche diodes, or SPAD, limitation. On grounds 1
22 to 2, which are based on the *Pacala* and *Droz* combination, primarily the
23 only disputed limitation is the term "stop region," which is part of the
24 aperture layer in the claims. Patent Owner's argument is primarily based on
25 a construction of stop region the Patent Owner advanced for the first time in

1 his Patent Owner response. Patent Owner's only other argument on grounds
2 1 and 2 specifically is a lack of motivation to combine.

3 JUDGE CHERRY: Mr. Hagiz, one second. There's like a gray
4 square on your -- it kind of looks like it's kind of blocking part of your
5 presentation. I just wanted to make sure you're aware of that.

6 MR. HAGIZ: I was not. Let me see. I think it is the video window.
7 Let me see if I can move that or collapse that. Is that any better?

8 JUDGE CHERRY: Yes. Thank you. Oh, there, you got it.

9 MR. HAGIZ: I guess as long as I don't look at the video, then it won't
10 block it. So we'll do that for now. Actually, let me just try to make it a little
11 smaller so I can still see Your Honors while I'm looking at my own slides.
12 All right. I think that should block less of it, so that should hopefully work.

13 So returning to grounds 1 and 2, the only other argument other than
14 the stop region limitation is motivation to combine, which is also directed to
15 *Droz'* disclosure of an aperture layer that's relied on as part of the
16 combination.

17 For grounds 3 to 4, there's no dispute that every limitation in all the
18 challenged claims is disclosed between *Hall*, *Spector*, and *Borowski*. The
19 only arguments that Patent Owner advances on this set of grounds is three
20 separate motivation to combine arguments. So Patent Owner argues there's
21 no motivation to add an aperture rate of *Hall* based on *Spector's* teachings.
22 Patent Owner argues there's no motivation to add SPADs to *Hall* based on
23 *Borowski's* teachings. And then Patent Owner separately argued that there
24 wouldn't be a motivation to use both the aperture rates from *Spector* and the
25 SPADs from *Borowski* and the same combination.

1 Then there are two other secondary considerations of non-
2 obviousness arguments raised by Patent Owner. Both of those also focus
3 specifically on the use of SPADs in LiDAR devices and that aspect of the
4 combination.

5 So I'm going to start with grounds 3 to 4, since there's no dispute that
6 every limitation is in the prior art and motivation to combine is the only
7 question. We think Patent Owner's arguments here are both contrary to law
8 and contrary to the evidence the Patent Owner relies on. So we think this is
9 really the easiest path for the Board to find all the challenged claims
10 unpatentable without really wading into the more potentially trickier issue of
11 claim construction on grounds 1 to 2. After that I'll come back to grounds 1
12 and 2, address the claim construction issue and motivation to combine issue,
13 and then finish up with secondary considerations.

14 Briefly, just turning to the claim language, this is slide 6 of
15 Petitioner's demonstratives. The limitations that are really at issue in these
16 disputes are highlighted here. So using claim 21 as a representative of the
17 same limitations appear in claim 26, there's an aperture layer comprising a
18 plurality of apertures separated by a stop region and each photosensor in the
19 plurality of photosensors comprises a plurality of single photon avalanche
20 diodes or SPADs.

21 So turning to the first argument on grounds 3 to 4, the combination of
22 *Hall* and *Spector*. The reasons provided in the petition for combining -- for
23 including an aperture area caused by *Spector* and *Hall* systems, those
24 reasons, particularly reducing noise and crosstalk, those aren't really dispute.
25 Instead, Patent Owner raises the argument that *Spector*'s aperture array is too

1 low resolution to work in *Hall's* LiDAR system. But that is an improper
2 bodily incorporation argument and is legally incorrect.

3 So turning to slide 18, I know Your Honors are familiar with the law,
4 but because it's essential to the dispute, I'll highlight it again. *Allied*
5 *Erecting & Dismantling Co. v. Genesis Attachments*, 825 F.3d 1373, 1381,
6 2016 Federal Circuit case is very clear on this issue. "The test for
7 obviousness is not whether the features of a secondary reference may be
8 bodily incorporated into the structure of the primary reference, but rather
9 whether a skilled artisan would have been motivated to combine the
10 teachings of the prior art references to achieve the claimed invention." And
11 what this tells us is that the question of obviousness is not about whether we
12 can take the specific aperture array that *Spector* discloses in its embodiments
13 and insert that into *Hall's* systems. Really the question is whether the
14 teachings of *Spector* would motivate a person of ordinary skill at the art to
15 arrive at the claimed invention. In other words, would it motivate a POSITA
16 to add an aperture array to *Hall's* system, not necessarily the specific
17 aperture array that is in *Spector's* system?

18 Now slide 19, this is from the petition on pages 57 to 58 and also
19 references Dr. Shanley, Petitioner's expert's declaration, Exhibit 1003,
20 paragraph 191. The petition describes specific motivation and reason to add
21 an aperture array to *Hall's* system. Specifically that *Hall* acknowledges
22 there's a need to avoid crosstalk in LiDAR systems. And *Spector*
23 specifically teaches that an aperture range establishes individual optical
24 detection sites which produce crosstalk. And so there's a motivation
25 specifically based on these two teachings to add an aperture array to *Hall's*
26 system.

1 Patent Owner's argument is very much taking the specific aperture
2 array in *Spector* and inserting it into *Hall*. And Patent Owner argues
3 because *Spector*'s aperture array is in a scanning LiDAR system, where the
4 actual LiDAR system itself moves horizontally, kind of in a zigzag pattern to
5 scan the field of view, well, if you put that in *Hall*'s system, which is a
6 rotating LiDAR, not a scanning LiDAR, then you're not going to get a
7 sufficiently fine resolution of the object in the field of view. But that's
8 precisely the type of bodily incorporation argument that's been rejected by
9 the Federal Circuit, right? The argument that if you take the specific
10 aperture array in *Spector* and put it into *Hall*, the system becomes
11 inoperable.

12 And slide 21, Federal Circuit addressed exactly this type of argument
13 in *Elbrus v. Samsung*, 738 Fed. Appendix 694 at 698. They said
14 specifically, it's not necessary that the two prior art references be physically
15 combinable to render a claim obvious. And so the argument that combining
16 the references leads to something unworkable is "basically irrelevant." And
17 that's exactly the scenario we have here.

18 Now, we can see exactly what the issue is. Neither *Spector* nor the
19 petition require a particular spacing between the apertures and the aperture
20 array. So Patent Owner focuses on the example on the right. And they say,
21 look, the apertures are spaced so far apart that when you combine them, you
22 can't actually detect objects. But *Spector* doesn't require the aperture array
23 to be this way. The petition doesn't require it to be this way. And the law of
24 obviousness makes clear that that is not what the combination is limited to.
25 So this is really challenging a specific combination, a specific
26 implementation that the petition never advanced in the first instance.

1 There's absolutely no reason why in the proposed combination you
2 can't -- a person of ordinary skill in the art cannot just make the aperture
3 space more closely. I think that is common sense. When you know at that
4 point that you're not going to be scanning the system along the pattern, then
5 you know that in order to get the full scene, you need to have more
6 apertures. And Patent Owner doesn't provide any reason why that wouldn't
7 be something that could be accomplished by a person of ordinary skill in the
8 art. And that in itself is sufficient to resolve the issue. But we don't even
9 have to get here because the argument in the first instance is just contrary to
10 law.

11 I'll move on next, unless there are questions on that issue to the
12 *Borowski* and *Spector* argument also on grounds 3 to 4.

13 Now the argument here is that specifically you wouldn't use the
14 aperture array from *Spector* with SPADs from *Borowski*. And Patent
15 Owner's argument is that *Spector*'s aperture array is designed for systems
16 and for photosensors with a higher fill factor, meaning there is essentially
17 more photo detectors per region of area. And they say *Borowski*'s SPADs --
18 or rather they say a person of ordinary skill in the art would understand that
19 SPADs have a low fill factor. And the problem is that's just not actually
20 supported by the weight of the evidence.

21 So turning to slide 26. Turning to slide 26 -- I'm sorry, 26. This
22 shows the relevant disclosure from *Spector*. This is on Exhibit 1005,
23 *Spector*, column 3, lines 49 to 54. And Patent Owner points to this
24 language. It says for an optical sensor array where the detectors are much
25 smaller than the spacing, and *Spector* focuses on fill factors less than 10
26 percent, then the optical detection sites are defined by the array of

1 photosensors and you don't need an aperture array. And so then Patent
2 Owner argues, well, SPADs would have a fill factor of less than 10 percent.
3 But evidence doesn't show that, especially in 2017, the earliest priority data
4 of the '405 patent.

5 So one example that Petitioner raised in response to this in the reply is
6 Exhibit 1032, the Takai paper. Takai is a paper from Toyota Research
7 published in 2016, so roughly a year before the earliest date of the '405
8 patent. And Takai specifically finds -- describes a LiDAR system where
9 SPADs were incorporated. And in the particular SPAD used in that example
10 the fill factor achieved with 33.1 percent. So that's more than three times the
11 10 percent minimum that *Spector* indicates you would want to -- or it would
12 be beneficial to use an aperture array for.

13 And Takai also on slide 29, Takai Exhibit 1032 on page 2, also
14 describes some other researchers in the field that achieved similar fill
15 factors. So they refer to improvement in another device where the
16 researchers were able to achieve a fill factor of 21.6 percent. That's more
17 than two times that the minimum fill factor that *Spector* focuses on. Both of
18 these show that it is clearly not necessarily the case that SPADs have a fill
19 factor of less than 10 percent. And so you can't go from that to the
20 conclusion that there's no motivation to combine because there are at least
21 some SPADs that could be used that would have a higher fill factor and thus
22 there would be a motivation in those instances to apply to combine *Spector's*
23 aperture array in order to get the benefits that are undisputed for that
24 scenario.

25 Even the evidence that Patent Owner relies on, which is a single paper
26 from a lone researcher named Vinogradov, even the Vinogradov paper

1 doesn't reach the conclusion that SPADs always have a low fill factor. He
2 provides one example of a fill factor of 3 percent and then acknowledges
3 that the same research resulted later in a fill factor of 20 percent for the same
4 team. Discussing some other research with fill factors at 50 percent, 78
5 percent, and all of these papers that Vinogradov is citing are in the 2010 to
6 2015 timeframe. So we're still good two years before the '405 patent. And
7 we have SPADs that Vinogradov acknowledges are known in the art that are
8 able to achieve a fill factor that would make -- that would motivate a
9 POSITA to use *Spector's* aperture array to get improved performance.

10 The PO's response to this is really that there are disadvantages with
11 these particular SPAD systems, but just the fact that there may be some
12 vague unspecified disadvantages. And here one of the disadvantages noted
13 is they're expensive for price. The fact that there's a disadvantage isn't a
14 reason by itself not to combine the references when there are also clear
15 undisputed benefits and advantages.

16 Unless there are any more questions on this one, I will move to the
17 next argument on the *Hall* and *Borowski* combination.

18 So turning to slide 32 on the *Hall-Borowski* combination, the
19 argument there is one about noise. So the petition provides several reasons
20 why a person of ordinary skill would combine *Hall* and *Borowski*. Patent
21 Owner -- well, Patent Owner raises two arguments. Initially, in his Patent
22 Owner response they argue that because *Hall* discloses a different type of
23 photo detector called the avalanche photodiodes, APDs, there's no
24 motivation to use SPADs. I don't know if they're still pursuing that
25 argument. I didn't see it in the surreply or in their demonstrative, but I will
26 briefly address that. And then they also argue that because *Hall's* system is

1 noisy and SPADs are more sensitive to noise, that would discourage the
2 combination of the two references. And both of those arguments are legally
3 incorrect.

4 So touching briefly on the first argument -- actually, before I touch on
5 the first argument, let's just look at what we said in the petition. Slide 33,
6 this is the petition on page 57. We noted that *Hall* specifically
7 acknowledges that in existing LiDAR systems there are significant sources
8 of measurement noise. And *Hall* explains in conventional systems, in order
9 to allow for larger range or for longer range, they would increase the laser
10 pulse intensity, so you have a stronger light source, the light that's reflected
11 back, you get more light reflected back. And so the photo detector is more
12 capable of detecting longer range signals. But the problem with that,
13 according to *Hall*, is you're increasing power consumption because you have
14 a stronger laser. And so *Hall's* goal is to have power management, so lower
15 power consumption, but still maintain sufficiently high resolution and range.

16 And *Borowski* specifically teaches SPADs can help with this
17 problem because SPADs provides significant carrier amplification. And
18 what that means is SPADs are more sensitive to the light that's coming back.
19 And so even without increasing the illumination Or the strength of the laser,
20 the Photo detector will be able to detect longer range signals that are more
21 attenuated when they come back to the receiver. And so the petition
22 explains that is a motivation to combine because you get the benefits of that
23 in *Hall's* system and it's solving a specific problem that *Hall* acknowledges.

24 So touching on Patent Owner's first argument and Patent Owner
25 response, it's just legally incorrect that because *Hall* discloses one type of
26 photo detector that would teach away or preclude a motivation to use a

1 different type of photo detector. This is *In re Mouttet*, 686 F.3d 1322. The
2 Federal Circuit made clear that the disclosure of alternative designs does not
3 teach away. So *Hall's* disclosure of APDs does not teach away from using
4 SPADs. That's particularly true when *Borowski* identifies specific benefits
5 of using SPADs that would solve a problem that *Hall* acknowledges.

6 Now I'll move on to, I think, the main argument. You know, in its
7 Patent Owner response, Patent Owner originally identified a number of
8 different potential sources of noise that could exist in *Hall's* system. And in
9 our replies, Petitioner identified, I'm pointed specifically to the declaration
10 of its expert, Dr. Shanley, identified a number of different ways that a person
11 of ordinary skill in the art would know how to mitigate different sources of
12 noise. Now, those appear to be largely undisputed in the surreply. And the
13 surreply appeal really focuses on this specific disclosure from *Hall* that we
14 looked at earlier that describes significant sources of measurement in a way
15 that are exacerbated as measurement ranges are accepted. And PO argues,
16 well, Petitioner has not shown how to overcome that noise and so SPADs
17 would be inoperable in the combined system.

18 Now, the problem is that the vague allusions to noise in *Hall* doesn't
19 show by itself that the references are incompatible. So *Hall* and its
20 discussion of noise is talking about LiDAR systems in general. There's no
21 evidence that *Hall's* system is particularly noisy such that SPADs would be
22 inoperable. There's no evidence that the amount of noise in *Hall's* systems
23 render SPADs inoperable as opposed to just perhaps reducing performance,
24 which by itself could not necessarily be enough to preclude a combination.
25 And there's no evidence that a person of ordinary skill wouldn't be able to

1 accommodate or to deal with the noise in *Hall's* system using the known
2 noise mitigation techniques.

3 So, for example, in his opening declaration, Exhibit 1003, Dr. Shanley
4 explains and describes a number of known techniques for mitigating noise in
5 optical systems. This is paragraph 53 and 56 of his declaration. He
6 describes a number of different techniques for reducing the impact of stray
7 light, which is one type of noise. He describes a number of known
8 techniques for minimizing crosstalk, which is another type of noise. And
9 even setting aside Dr. Shanley's declaration, the references and the
10 combination itself is on slide 39. They all disclose techniques for reducing
11 related to photosensor and all of these are specifically part of the proposed
12 combination.

13 So *Hall* Exhibit 1008, 713 to 27, describes using filters, optical filters
14 that will essentially limit the spectra that enter the photo detector so that you
15 can eliminate stray light and undesired sources of light. *Borowski* Exhibit
16 1009 in paragraph 53 talks about combining multiple individual SPAD
17 detectors into this macrocell that essentially functions as a single pixel and a
18 perfect SPAD. So even if there is noise on some of the individual receivers,
19 when you wire them all together and treat them as a single cell, for example,
20 by averaging the results, then you get a perfect detector that is able to
21 overcome the sensitivity to noise. *Spector* Exhibit 1005, 611 to 20, talks
22 about the use of the aperture array to reduce crosstalk and multipath signals.
23 In Exhibit 1025, *Borowski* 838, which is a reference that Dr. Shanley
24 describes -- discusses rather in his declaration, also describes some
25 techniques that can be used to mitigate noise. And importantly, all of these
26 are techniques that the '405 patent itself acknowledges may be used to

1 overcome challenges with SPADs. That's '405 patent at 2812 to 27
2 discusses these exact same techniques of using filters and aperture arrays
3 and these plurality of SPADs fired as a single cell to overcome these noises.

4 And so it's clear that these solutions in the prior art of record for a
5 person of ordinary skill in the use -- a person of ordinary skill in the art
6 could use to deal with and accommodate any noise in *Hall's* system,
7 certainly enough to render the system operable such that there would be a
8 motivation to combine. And separate from that, other contemporaneous
9 references make clear that the use of SPADs in LiDAR systems is not
10 foreclosed by the existence of noise.

11 So going back to the Takai reference discussed earlier, Exhibit 1032,
12 they not only use SPADs in LiDAR systems, they find that doing that
13 achieves higher performance, longer range, higher precision and higher
14 measurement rates. And this is, again, 2016, so roughly a year before the
15 date of -- the earliest date of the '405 patent. Clear that a person of ordinary
16 skill would not look at *Hall* and *Borowski* and conclude that they are
17 inoperable or uncombinable because of noise.

18 Now, before I move on to grounds 1 and 2, let me just pause in case
19 there's any questions so far. All right. So I will move on to grounds 1 and 2.

20 And so grounds 1 and 2, the *Pacala* and *Droz* combination, I'll start
21 with the actual limitation in dispute, which is the term "stop region." And
22 specifically Patent Owner relies on a claim construction of stop region
23 advancing Patent Owner response that we believe imports a limitation from
24 an embodiment improperly and is not a correct claim construction. There's
25 no dispute, there's no argument from Patent Owner that if this construction is

1 not adopted that *Droz* does not disclose a stop region. So really the
2 argument rises and falls with Patent Owner's claim construction.

3 But we also have Petitioner's also advanced a separate argument that
4 *Droz* discloses stop region even under Patent Owner's construction. So let
5 me start with the claim construction argument first.

6 Patent Owner's proposed construction, this is on slide 44, is that the
7 stop region should be construed as "an optically non-transparent region that
8 defines a field of view for a photosensor." And that specific language that
9 defines a field of view for a photosensor, that is drawn almost verbatim from
10 a particular embodiment described in the '405 patent. This is Exhibit 1001 at
11 column 37, lines 17 to 23, describes an aperture layer "including an optically
12 transparent aperture, an optically non-transparent stop region configured to
13 define a narrow field of view," and it continues, "when placed at the focal
14 point of an imaging optic." And so that language configured to define -- that
15 defines a field of view, this specific disclosure is really the only place that
16 that additional limitation or that additional language appears with respect to
17 the term "aperture layer."

18 And we know from prevailing Federal Circuit law the fact that there
19 is a certain limitation or a certain description in an embodiment, that's not
20 enough to support a narrow construction of the claim. This is slide 45
21 referring to *Thorner v. Sony* at 669 F.3d 1362. And that's exactly what we're
22 looking at here in Patent Owner's construction.

23 JUDGE CHERRY: I guess my question is what then does the
24 petitioner recommend we should construe the term to mean?

25 MR. HAGIZ: I think the only thing that's really required, I think --
26 well, I think it helps -- let me turn to slide 8 because I think it -- sorry, let me

1 turn to the claim language rather on slide 6 because I think it's helpful to
2 look at the term in the context of the limitation. I think our view is that in
3 the context of the claims, the stop region is really a non-transparent -- sorry,
4 is the -- I would say it's just that first part of Patent Owner's construction. So
5 an optically non-transparent region. And I know they provide some
6 arguments as to why they think that's not the case, but the issue is that this is
7 in the context of the aperture layer. And so the aperture layer here is
8 composed of a plurality of apertures separated by a stop region. And so in
9 this instance the stop region is referring to the optically non-transparent
10 region in the aperture layer, which is what separates the plurality of
11 apertures. And I think that's really all that's required and that's consistent
12 with the examples and the specification. I think if there's an affirmative
13 construction necessary, I think we would say it is just that initial portion of
14 Patent Owner's construction, an optically non-transparent region. And the
15 remainder of Patent Owner's argument, which I'll address in a minute, are
16 essentially all resolved by virtue of the fact that in the context of the claim,
17 the stop region is part of the aperture layer.

18 So I think -- sorry, was there more, Your Honor?

19 JUDGE CHERRY: No, thank you. That's helpful.

20 MR. HAGIZ: I think if we look at the specifics, the disclosure and the
21 specification the Patent Owner relies on, it helps to provide a little bit of
22 context. And this is on slide 8. So I think in the first instance we have to
23 look at the full sentence that Patent Owner is relying on. And I think there is
24 potentially a grammatical issue in their construction.

25 Patent Owner says that -- the highlighted sentence, the sentence at the
26 beginning of column 37, line 14, about defining the field of view, Patent

1 Owner says that that is defining the term "stop region." But really the
2 description of defining a field of view is referring to the aperture layer. And
3 we can see that here when we read the full sentence, "An input aperture
4 layer that includes -- including an optically transparent aperture and
5 optically non-transparent stop region." Now, the following clause
6 "configured to" is plainly describing the aperture layer as a whole and not
7 the stop region. And we know that because it doesn't just say that it's
8 defining a narrow field of view. It also continues, "when placed at the focal
9 point of an imaging optic." And the thing that is placed at the focal point of
10 the imaging optic is the aperture layer as a whole, not the stop region.

11 Now, in the context of the claims, what the aperture layer looks like in
12 one example is what's shown in figure 17. So the aperture layer is the item
13 labeled 1740. And in reality there would be more photosensors, so you
14 would have a plurality of these regions that have a stop region and then an
15 aperture. And I think the arrows here are, unfortunately, backwards. So the
16 part labeled stop region is actually -- that should be the aperture. The part in
17 the transparent part of the center is the aperture, the surrounding opaque or
18 non-transparent region 1746 is the stop region. And so what you have in the
19 aperture layer and all that the claims require is this layer that has apertures
20 that allow the light to pass through and a stop region that separates those
21 apertures.

22 JUDGE CHERRY: So the way you're reading that sentence is: an
23 aperture layer, comma, including an optically transparent aperture 1744 and
24 optically non-transparent stop region 1746, comma, configured to define a
25 narrow field of view when placed at the focal plane of an imaging optic,

1 such as the bulk receiving optic 202 or 1008. Is that the way you're reading
2 it?

3 MR. HAGIZ: That's right, Your Honor, exactly. And I think that's
4 also consistent if we look at slide 7, which has figure 2 from the patent, we
5 see the screen, so there's no blockage. We see that that's consistent with
6 what the system looks like. So the aperture layer is what is -- the aperture
7 layer 211 is what's placed in kind of in the field of the optics 202. It is not
8 the stop regions. So that configurative sentence we believe plainly is
9 describing the aperture layer as a whole.

10 And this is significant because, number one, it means that there's no
11 basis to define the term "stop region" specifically to be required to configure
12 a field of view. And I think more importantly, when we understand that it's
13 the aperture layer that is potentially defining a field of view, there's no
14 argument presented by Patent Owner. Number one, this is a required
15 limitation of the term "aperture layer," but, number two, that *Droz*, which is
16 relied on in grounds 1 and 2 for the aperture layer, that *Droz's* aperture layer
17 does not define a field of view for the photosensors.

18 Now, a few other items of support. Number one, on slide 46 there's a
19 number of other places where the '405 patent refers to stop regions. In no
20 other embodiment or example is the stop region described as configuring a
21 field of view. Some examples we've shown from column 38, lines 44 to 47,
22 38:66 to 39:2, and 40:56 to 63. All of those describe stop regions that are
23 optically non-transparent that may absorb or reflect incident stray light, a
24 number of other functions, but only in that one embodiment that Patent
25 Owner is trying to import into the plain language is there a description of the
26 aperture -- or rather the stop region as defining the field of view.

1 Getting to slide 48, Patent Owner's main argument, or at least the key
2 argument Patent Owner is relying on, is that there are other optically non-
3 transparent regions in the embodiment of the '405 patent, and those are not
4 described as stop regions. And Patent Owner points to examples figure 19A
5 and figure 19B and I reproduced one of their annotated images from Patent
6 Owner's response on 28 to 29. And they say, well, look, the stop region is
7 this portion in red, and the portions in blue are also optically non-
8 transparent, but they are not described as stop regions, they are described as
9 spacer structures. And the simple answer and the simple explanation for that
10 is that we know from the claim language that the stop region is part of the
11 aperture layer and the spacer structures in these examples are not part of the
12 aperture layer. So their optically non-transparent material would not be a
13 stop region as that term is used in the claims. It would be something else.
14 But that doesn't mean that the stop region or that the optically non-
15 transparent material in the aperture layer is in itself not a stop region or that
16 it needs to do something more in order to qualify its stop region.

17 Patent Owner also cites some extrinsic definitions. I think I'd begin
18 by saying that just as a matter of law, extrinsic evidence is not going to
19 defeat the clear import of the claims. But I'd say also these particular
20 definitions, number one, do not define the term "stop region." They define
21 the term "aperture stop," which is an element in a camera or a camera lens or
22 a telescope, depending on the particular example Patent Owner relies on.
23 We're looking at the term "stop region" in the context of a photosensor in a
24 LiDAR device. And so it's not clear if these definitions are even applicable
25 to this context that we're looking at. And in any event, they would not

1 overcome the clear significance or the clear disclosure and intrinsic evidence
2 of the '405 patent itself.

3 Now, if Patent Owner's construction is adopted, and again we don't
4 think there's any supportive basis to do that, we would argue that *Droz* still
5 discloses a stop region, specifically a stop region that configures or defines a
6 field of view. And it helps to look at a couple of embodiments in *Droz*.

7 So in one of the original embodiments in *Droz*, which not the
8 specific one relied on in the combination, but it is helpful to establish some
9 context, looking at figure 3D, there are a series of waveguides: 364, 374,
10 384. And there is a larger aperture that encompasses multiple waveguides,
11 which is I believe 322 in figure 3B. And it's surrounded by opaque material
12 320. And in this instance *Droz* shows that there is a field of view that's
13 defined by that larger macro aperture 320 and 322. Now, in the particular
14 embodiment that we rely on for the combination, this is on slide 53, we
15 remove that opaque material 322 and *Droz* specifically teaches that you can
16 do that. And when that happens, each respective input end of the
17 waveguides corresponds to an aperture of the system.

18 Now, Patent Owner argues, well, in that instance -- sorry, in this
19 example, Petitioner and petition rely on this optically non-transparent or
20 opaque material 368 as comprising the stop region. The Patent Owner's
21 main argument is, well, that material 368 is not used to define a field of
22 view. It is used to prevent light from leaking between the waveguides. So it
23 prevents light from 364 from traveling into waveguide 374 or from 374 from
24 traveling to 384. And that may be true in the center portions of the
25 waveguide, but at some point before we get there, light has to enter the
26 waveguide from one of the ends. And so in this particular example, light

1 would enter the waveguide from the right end, the front of the waveguide of
2 364, 374, and 384.

3 And so at a minimum, that front end of the opaque material or the
4 non-transparent material 368 and 378, they will limit the light that can enter
5 each of these waveguides because light coming from certain directions, from
6 certain angles will be stopped, will hit the stop region and will not proceed
7 into that waveguide. And each of those stop regions defines the particular
8 aperture which, again, will limit the sources of light that will end up in that
9 particular waveguide.

10 Now, I think Patent Owner's -- essentially Patent Owner's response to
11 it, as I understand it, is not that there is no field of view at all that is defined
12 by these apertures and stock regions, but more that they define the field of
13 view in a different way from how the '405 patent's embodiments define the
14 field of view. And I think the best way to illustrate this point is actually with
15 Patent Owner's own demonstrative. And so I will briefly want to briefly just
16 look at Patent Owner's slide 39. And let me just pull that up.

17 And so --

18 JUDGE CHERRY: I just wanted to remind you, you have about five
19 minutes left in your main time.

20 MR. HAGIZ: Sure. Thank you, Your Honor.

21 So Patent Owner's slide 69 suggests that the soft regions in *Droz* do
22 not define a field of view because light from other angles can still enter the
23 waveguide because it's reflected within the waveguide. And I think at most
24 that shows that *Droz'* waveguides may define a different field of view from
25 the '405 patent stock region. But it's still clear that not all light from all
26 directions is going to enter each waveguide. Right? There's going to be

1 some limitations from light coming from further outside of the indicated
2 blue lines that will strike the stop region or that will enter other waveguides.
3 And so there is still a limitation on the field of view, a limitation on the
4 portion of the outside world from which light can arrive at each waveguide.
5 And that is defined, at least in part, by the stop regions illustrated in red.

6 So based on that, I think we would say that the stop region still
7 defines field of view even under Patent Owner's construction.

8 You switch back to my slides and briefly cover the last few points on
9 the motivation to combine *Pacala* and *Droz*. The argument here is, again, a
10 bodily incorporation argument. Essentially, the argument is that *Droz'*
11 waveguides would be too large and too heavy to incorporate into *Pacala's*
12 system. And I think we can see very clearly in Patent Owner's response that
13 this is a bodily incorporation argument. The TOR itself at 38 says that the
14 argument is that there is a challenge in attempting to incorporate the
15 waveguides of *Droz* into *Pacala's* system and that's simply not required
16 under obviousness. I know I talked through some of the law on this earlier,
17 so I won't belabor the point.

18 But again, the question for obvious is simply not whether you can face
19 *Droz'* waveguide into *Pacala's* system. It's whether *Droz'* teachings would
20 motivate a person of ordinary skill in the art to add an aperture layer into
21 *Pacala's* system in order to arrive at the claims. And that is really not
22 disputed in any of the arguments or evidence provided by Patent Owner.

23 It's really separate from the argument that essentially there's no
24 evidence to support the notion, even under the flawed argument, that *Droz'*
25 waveguides somehow cannot be placed into *Pacala's* system. The claims
26 don't require particular size or weight. Neither *Droz* nor *Pacala* require

1 specific sizes or weights. No evidence that *Pacala* must be small or that
2 *Droz* must be large or heavy. And I'd say even Patent Owner's expert
3 doesn't go as far to say that it's not possible to make them work. Patent
4 Owner's expert at Exhibit 2010, specifically paragraph 111, 119, and 129,
5 primarily relies on the fact that Dr. Shanley did not explain exactly how you
6 would size and fit and implement the combined system with respect to
7 weights and forces. But that's not required for obviousness. And there's no
8 affirmative opinion that for some reason the combination is not possible or
9 that would not be able to build such a system.

10 And Dr. Shanley was very clear you could design such a system.
11 Patent Owner repeatedly tried to suggest that he said you would need a team
12 to do it. Dr. Shanley said that you need a team to build an actual physical
13 system, which is not the inquiry for obviousness. The inquiry is can you
14 combine the references? Would you be motivated, sorry, to combine the
15 references, not could you actually combine the references into a system?

16 And he made clear -- sorry, this is from Exhibit 2011, 57:6 to 58:5.
17 But Dr. Shanley then made clear, on slide 61, that solving those problems of
18 system design is something that an engineer out of school could do with
19 CAD software. So that's less experience than you would need for a person
20 of ordinary skill in the art. So these are not problems that a person of
21 ordinary skill cannot overcome.

22 And finally, just touching briefly on secondary considerations
23 arguments, Patent Owner's industry skepticism argument relied entirely on a
24 design choice that Dr. Shanley made in 2008. He was asked about a LiDAR
25 system he designed in 2008. He said he didn't consider using SPADs for
26 that one because of the specific requirements of that system. That is far

1 from establishing that there is industry skepticism about using SPADs and
2 LiDAR devices almost 10 years later in 2017. And even if we set aside --
3 even if we consider Dr. Shanley's specific design choice as suggestive of
4 anything, on slide 64, Petitioner presents extensive evidence that others in
5 the field were actively pursuing projects and LiDAR systems using SPADs,
6 which very clearly undermines any suggestion of industry skepticism.

7 Finally, at the failure of others, Petitioner relies -- or Patent Owner
8 relies exclusively on the Vinogradov paper that we discussed before, lacking
9 awareness of SPAD-based LiDAR receivers. And it is a single quote,
10 Exhibit 2014 at 4, where Vinogradov says, "To the best of the author's
11 knowledge, there are no attempts to implement batteries or dSiPMs as a
12 single photon number resolving LiDAR receiver."

13 Now, it's not actually clear if he's even saying that there's no attempt
14 to implement SPAD in LiDARs at all or just in a particular type of LiDAR
15 receiver. But in any event, the fact that he is not -- that author was not aware
16 of attempts really does not establish failure of others when Petitioner's
17 identified a number of other examples in the field that show success in using
18 SPADs and LiDAR devices, which include the Takai reference 1032,
19 Exhibit 1032, as well as Marino and Matsubara, Exhibit 1028 and 1029, and
20 several others cited in Petitioner's reply.

21 So unless there are any other questions, I will reserve the rest of my
22 time.

23 JUDGE CHERRY: I don't have any questions. Thank you very
24 much. It looks like you have about 19 minutes remaining.

25 Okay. Mr. Lauppe?

26 MR. LAUPPE: Good morning, Your Honor.

1 JUDGE CHERRY: Good morning.

2 MR. LAUPPE: I'll go ahead and share my demonstrative slides.

3 JUDGE CHERRY: That's great. You'll have 55 minutes for your
4 opening and then you reserved 20 minutes for your rebuttal.

5 MR. LAUPPE: Thank you, Your Honor.

6 Can Your Honor see these slides okay? Is there a box issue like with
7 certain (inaudible) slides or --

8 JUDGE CHERRY: It's okay.

9 MR. LAUPPE: All right. Okay. So, thank you, Your Honor.

10 Petitioner has failed to show that any claims of the '405 patent are
11 unpatentable over the prior art. There are deficiencies with all of the
12 combinations that Petitioner has identified. And furthermore, for grounds 1
13 and 2, Petitioner has simply failed to account for an element as properly
14 construed, the stop region elements.

15 Faced with these deficiencies in the grounds laid out in its petition,
16 Petitioner has sought on reply to introduce a panoply of new arguments and
17 evidence, including a brand new 20-page reply declaration of its expert Dr.
18 Shanley, and these new arguments pervade all four of Petitioner's grounds.
19 This is -- we have pointed out where in our view this is improper. These are
20 improper reply arguments. But furthermore, across all four grounds these
21 new rationales, interpretations of the prior art undermine the strength of
22 Petitioner's grounds as presented in the initial petition.

23 And as, for example, the *Yita v. MacNeil* case, 69 F.4 1356, says the
24 initial petition must identify with particularity the grounds for the challenge
25 to each claim. And Petitioner's approach here retreating on reply and new

1 interpretations, new evidence, new arguments shows that it simply didn't do
2 so in its petition.

3 Furthermore, even if Petitioner's new -- improper new arguments,
4 evidence, interpretations, rationales are considered, they don't move the
5 needle here because Petitioner has still failed to show that it's met its burden
6 as to any of its obviousness combinations. And furthermore, for that stop
7 region issue, it still has failed to show -- point to a properly construed stop
8 region in the prior art.

9 So here's a brief overview of what I will be covering today. So
10 similar to Petitioner, I'll be starting out with grounds 3 and 4 and walking
11 through the various deficiencies Patent Owner has identified for the *Hall-*
12 *Borowski-Spector* combination. Then I'll be turning to grounds 1 and 2, both
13 based on at least the *Pacala-Droz* combination. There I'll be walking
14 through the stop region claim construction issue and why, in Patent Owner's
15 view, the Petitioner has failed to point to a stop region as properly construed.
16 And furthermore, I'll be covering the fact that Petitioner has failed to show a
17 reasonable expectation of success as to the *Pacala-Droz* combination. And
18 then finally, I'll have some remarks on secondary considerations of non-
19 obviousness.

20 So, again, to start out I'll be talking about the *Hall-Borowski-Spector*
21 combinations on which both grounds 3 and 4 rely. So a POSITA would not
22 have been motivated to combine *Hall* and *Spector*. *Hall* discloses a 360-
23 degree rotating LiDAR system. This is significantly different from the
24 *Spector* system which discloses a stationary system that views a single scene
25 from a single angle.

1 Now, Petitioner proposes a combination that would use a rotating
2 system as taught by *Hall* along with micro optics and apertures as taught by
3 *Spector*. But a person of ordinary skill would not have considered to use
4 apertures based on *Spector*'s teaching in a rotating system like *Hall*. A
5 person of ordinary skill would simply not have considered using, for
6 example, apertures in a rotating system like *Hall*. And the reason is *Spector*
7 discloses apertures and micro optics. But as a result, what *Spector* discloses
8 is that its system can only see these discrete light detection points that you
9 can see in figure 9 on the right side of slide 5. So those discrete detection
10 points are a consequence of *Spector*'s micro objects and apertures.

11 And what *Spector* teaches is that these discrete light detection points
12 leave a ton of the scene undetected, and that's demonstrated through the
13 following, I think, pretty stark demonstrative. So here we can see the
14 *Spector* system where you have these detection light points and you have
15 what *Spector* discloses of a scanning system where you have these discrete
16 light points, but since you haven't really gotten much of the scene due to
17 these discrete light points, basically you jitter them around, you color in the
18 scene, you fill in the gaps between the detection points caused by the micro
19 optics and the apertures. But a person of ordinary skill would also
20 understand that if the micro optics and apertures from *Spector* were used in a
21 system without this jitter, without the scanning system, what you'd be left
22 with is something like this shown in slide 7 of Patent Owner's
23 demonstratives.

24 Here potentially you see a box. But one thing that is completely
25 missed here is there's a person standing between some of these discrete light
26 detection points here. But *Spector*'s system doesn't even know that. And a

1 person of ordinary skill would understand this based on *Spector's*
2 disclosures. And as a result, a person of ordinary skill would not have an à
3 la carte view of the apertures and micro optics *Spector* discloses. A person
4 of ordinary skill would not understand you could simply strip these out of
5 *Spector's* system and put them in a system that doesn't have some type of
6 scanning jitter system like *Spector* does. That would be completely outside
7 the purview of what a POSITA would consider combining with *Spector's*
8 apertures and micro optics.

9 And here in figure 1, we pointed to a scanning system that *Spector*
10 discloses. So faced with this --

11 JUDGE CHERRY: I guess, I mean, the one thing that troubles me
12 about your argument is that, I mean, you seem to be kind of very fixated on
13 the grid that is disclosed in that figure in *Spector*. Why can't we make, you
14 know, as Dr. Shanley said, why can't we make the grid finer to address this
15 problem? If the problem is this grid is too coarse, why don't we just have a
16 finer grid?

17 MR. LAUPPE: Your Honor, if I may make one quick correction. Dr.
18 Shanley never opines that the apertures in this grid could be brought closer
19 together. That's only attorney arguments raised by Petitioner on reply.
20 There's nowhere in either of Dr. Shanley's expert declarations here where he
21 testified that a person of ordinary skill would know to bring the apertures
22 closer together. He never discusses the notion of aperture spacing or
23 proximity. So that's just one thing I briefly note.

24 But furthermore, -- but I think that also sort of answers your question
25 because Petitioner's raised this idea on reply that in the Petitioner's view, the
26 apertures -- it was common sense for the apertures to be brought closer

1 together. But that is supported by none -- by no expert's evidence. The only
2 thing that Petitioner seeks to point to is what you see in yellow highlighting
3 at the bottom of slide 12. So they point to this discussion in Dr. Shanley's
4 deposition where he discusses the use of CAD programs. But what
5 Petitioner leaves out is that Dr. Shanley was discussing the *Pacala-Droz*
6 system. He was not discussing the *Hall-Spector* system.

7 And furthermore, there is no mention in any of this yellow
8 highlighted discussion in Dr. Shanley's deposition testimony, there's no
9 discussion here of aperture spacing. And in fact, when Dr. Shanley was
10 explicitly asked in this same deposition, how in your opinion would an
11 aperture array be incorporated into the *Hall* system shown in figure 5, Dr.
12 Shanley made no mention of aperture spacing. And just to point you to that,
13 that's Exhibit 2011, page 62, line 4, to page 67, line 2.

14 So they new that it would have been common sense to a person of
15 ordinary skill in the art to bring the apertures closer together, but that's not
16 any of the experts' view in this case. There's no evidence. For example, if
17 we look back to where Petitioner discloses this argument in his reply, there's
18 no citation here. This is strictly attorney argument raised for the first time
19 on reply.

20 And so in that sense, in our view, this is sort of doubly deficient as
21 an argument similar to the facts of the *Henny Penny* case quoted on slide 13,
22 where not only did Petitioner raise a new obviousness theory on reply, but
23 that new obviousness theory was unsupported by any expert testimony. And
24 the Board disregarded that new theory and the Federal Circuit found that the
25 Board did not abuse its discretion in doing so because, again, this is simply a

1 new attorney argument raised on reply for the first time without expert
2 support.

3 Does that answer your question, Your Honor?

4 JUDGE CHERRY: That's helpful. I mean, I guess I'm still a little
5 worried about the -- I mean, we're, you know, told by the Federal Circuit,
6 you know, we don't do bodily incorporation. I guess I just -- why is this --
7 you know, what is your response to that? Why is this not bodily
8 incorporation?

9 MR. LAUPPE: Great question, Your Honor. So this is -- we are not
10 saying here that a person of ordinary skill would not be able to put any
11 apertures from *Spector* into *Hall*. Rather, what we're saying is that based on
12 *Spector*'s teachings, a person of ordinary skill would not have even thought
13 to put *Spector*'s apertures in, for example, *Hall*'s rotating system. And that's
14 because *Hall*'s rotating system cannot accommodate a scanning system like
15 *Spector* discloses. And that scanning system a person of ordinary skill
16 would understand is crucial, is critical when using micro optics and
17 apertures, as *Spector* teaches.

18 But Petitioner itself has conceded that it does not propose including
19 *Spector*'s scanning system at all. From our view, that ends the inquiry right
20 there. Because a person of ordinary skill would not have even thought,
21 based on *Spector*'s teachings, to strip apertures out of *Spector* and put it in a
22 system that did not use scanning, which Petitioner itself concedes the *Hall*-
23 *Spector* combination does not.

24 So just to reiterate, as opposed to bodily incorporation, that's not
25 what we're focused on. We're focused on what would a person of ordinary
26 skill have been motivated to do based on the teachings of the art. And in our

1 view, that's not a bodily incorporation argument. That's related to
2 motivation to combine.

3 JUDGE CHERRY: Thank you.

4 MR. LAUPPE: So unless you have any further questions, Your
5 Honor, I'm going to move on to another deficiency with the *Hall-Borowski-*
6 *Spector* combination. And this relates to the combination of the *Borowski*
7 and *Spector* references.

8 So Petitioner cites to -- relies on *Borowski* for its teachings related to
9 SPAD arrays, the idea you would use SPAD arrays based on *Borowski's*
10 teachings in the combined system. Furthermore, Petitioner relies on *Spector*,
11 as we were just discussing, for, for example, its aperture array. Now, the
12 issue with this combination is that *Spector* again focused on *Spector's*
13 teachings, *Spector* discloses that only a certain subset of detectors would
14 benefit from its aperture array. And it puts this in terms of this concept that
15 Mr. Hagiz discussed, which is fill factor.

16 We provided a demonstration slide here on what fill factor means or
17 would have meant to a person of ordinary skill in the art. On the left we see
18 a detector array with a smaller fill factor. So you have in red the sensors and
19 basically the sensitive parts of the sensors in red, this is slide 17. And then
20 in blue you have the supporting circuitry for those sensors. And so fill factor
21 relates to spatial efficiency of a photo detector. If you have a small fill
22 factor, you have a small ratio of sensitive area to supporting circuitry. Your
23 SPADs take up -- or your detectors take up a lot of room because of
24 supporting circuitry, but only have a little bit of sensitive area. On the right
25 we see a larger fill factor where you have the same sensitive area but for a
26 much smaller area for the supporting circuitry.

1 So moving then back to a disclosure in *Spector*, *Spector* discloses
2 essentially a conditional. Use an aperture array. Potentially, an aperture
3 array may be beneficial when you have detectors with a large fill factor, so
4 something like you see at the right of slide 17. However, if you have a
5 smaller fill factor for your detectors, for example less than 10 percent,
6 *Spector* discloses that the light spots are defined by the array itself. In other
7 words, an aperture is simply not necessary. What *Spector* basically says is if
8 fill factor less than 10 percent, an aperture is not beneficial. If your fill
9 factor is larger, an aperture array may be beneficial.

10 But the key here is Petitioner is using *Spector* for its teachings
11 related to aperture array and it's combining them with a type of detector,
12 SPAD arrays. But the Petitioner has simply failed to show that this key
13 conditional taught by *Spector* would have been met in this combination. So
14 essentially there is no discussion, there is no evidence provided in the
15 petition that the SPADs disclosed by *Borowski* would have had a field factor
16 larger than 10 percent and, therefore, in the range that would have made an
17 aperture array potentially beneficial. And this is a key question because if
18 *Spector* is teaching that an aperture is only beneficial for a large fill factor,
19 then that's a key part of the motivation to combine. A person of ordinary
20 skill would not have been motivated to combine *Spector's* apertures with a
21 device with detectors that had a smaller fill factor.

22 And the evidence shows here -- so first point, just to reiterate, is that
23 Petitioner has simply failed to meet its burden as to this issue. There is no
24 evidence that it presented in its petition regarding fill factor of SPADs. But
25 furthermore, through factual developments, there is evidence on the record
26 that SPADs did come with very particular circuit requirements. So, for

1 example, in Dr. Shanley's deposition, she discussed that if you don't have a -
2 - what's called a quenching circuit in SPADs, a type of supporting circuitry
3 for SPADs, you may burn your diode out, you may just destroy it. Dr.
4 Shanley has seen things where SPADs actually go into thermal runaway and
5 all you have is a heated mess of semiconductor there.

6 So moving back to this picture, Dr. Shanley is presenting evidence
7 that there is some very essential supporting circuitry for SPADs. And then
8 furthermore, turning to this Vinogradov article, Exhibit 2014, there's
9 evidence from this Vinogradov article that fill factor was a significant issue
10 with SPADs, that SPADs -- it discusses SPADs that had a fill factor of less
11 than 10 percent. So, again, this raises skepticism and at the very least shows
12 that Petitioner has not met its burden as to this key teaching related to fill
13 factor of *Spector*.

14 And Your Honor, unless you have any questions, I'm going to move
15 on to another aspect of this combination.

16 JUDGE CHERRY: No. I do think you're kind of overstating what
17 *Spector* says there. I don't think they say it may work alone, it may be
18 beneficial. It does seem like you -- they are making some connection there,
19 but I do think you're kind of overstating a little bit. And also I'm not sure
20 that that's evident from Dr. Shanley. I guess I'm having trouble seeing, you
21 know, okay, it needs a quenching circuit. Where does he say -- where do
22 you have evidence kind of tying that to fill factor?

23 MR. LAUPPE: Understood, Your Honor. I mean, I was just tying it
24 back to the fact that there is evidence --

25 JUDGE CHERRY: Yeah, right.

26 MR. LAUPPE: Sorry, go ahead, Your Honor.

1 JUDGE CHERRY: The quenching circuit is tied to fill factor?

2 MR. LAUPPE: Well, in that is part of the supporting circuitry for
3 SPADs. And furthermore, I would just point back to the Vinogradov article,
4 which discusses that SPADs came with certain fill factor issues.

5 JUDGE CHERRY: Okay. What about the evidence? I saw that they
6 put in some evidence that there was -- there were higher fill factor SPADs at
7 the time of the invention.

8 MR. LAUPPE: Right. So on reply, Petitioner introduced, I think it
9 was the Takai article that in its view shows that higher fill factor would have
10 been available for SPAD designs in the relevant period. Again, I mean, this
11 evidence came on reply.

12 JUDGE CHERRY: Well, you raised the argument that fill factor --
13 I'm having trouble seeing why that's not a proper reply argument. You
14 raised this kind of teaching away argument. Is that a fair characterization?

15 MR. LAUPPE: Understood, Your Honor. I mean, what we did was
16 we pointed to an explicit disclosure in *Spector* that the Petitioner failed to
17 account for in the petition. I don't know if that necessarily gave them the
18 opportunity to sort of fill in this gap. I mean, this was a disclosure in
19 *Spector* at the time of the petition.

20 But I think you've accurately encapsulated our argument that a
21 profession of ordinary skill would understand that *Spector* teaches away
22 from using an aperture or detectors with a certain fill factor. And that
23 Petitioner has simply failed to provide any evidence, particularly at least in
24 the petition, that fill factor, that SPADs in the *Hall-Borowski-Spector*
25 combination would have met this fill factor requirement.

26 JUDGE CHERRY: Okay, thank you.

1 MR. LAUPPE: So, turning next to the *Hall-Borowski* combination.
2 So *Hall*, the *Hall-Borowski* combination involves, as we were discussing,
3 using *Hall*'s rotating LiDAR system design and using SPADs based on the
4 teachings of *Borowski*. What we pointed out is that *Hall* discusses that the
5 detection of return signals in its system includes significant sources of
6 measurement noise that are exacerbated as measurement ranges are
7 extended. And for a person of ordinary skill, these issues would have -- a
8 person of ordinary skill would have understood these issues to be
9 particularly acute for SPADs. And that's including based on Petitioner and
10 its expert's own analysis here.

11 Petitioner and its experts argue that one of the motivations to
12 combine SPADs into the *Hall* system is to extend measurement range. But
13 that's precisely what *Hall* calls out as something that exacerbates significant
14 sources of measurement noise. And furthermore, based on Dr. Shanley, the
15 Petitioner's expert's own testimony and opinions, noise and interference are
16 particularly problematic in systems that employ SPADs.

17 So, you know, based on this particular combination of this teaching
18 in *Hall*, that says -- that flags significant sources of measurement noise
19 which are exacerbated as measurement ranges are extended, we think this
20 drastically undermines the validity of the *Hall-Borowski* combination as
21 presented by Petitioner. Because Petitioner is basically saying within this
22 context of a system with significant sources of measurement noise, a person
23 of ordinary skill would incorporate detectors with a longer measurement
24 range, thereby, basically -- I mean, that interfaces directly with what *Hall*
25 warns against. So in that respect, we think this disclosure in *Hall* directly
26 undermines one of the motivations to combine that Petitioner has presented

1 and also brings into doubt whether a person of ordinary skill would have
2 been motivated to use SPADs, which Petitioner itself and its experts admit
3 are particularly sensitive to noise and interference.

4 And, you know, on reply, Petitioner points to generalized discussions
5 in, for example, the declaration of Dr. Shanley about various types of noise
6 attenuating techniques that would have allegedly been in the prior art. But,
7 you know, sort of generally gesturing at various techniques or pointing to
8 possibilities in the -- disclosed in prior art references, for example, those
9 don't meet the Federal Circuit's requirement that a person of ordinary skill --
10 or a Petitioner must show how a combination would have been
11 implemented. Is Petitioner arguing suddenly that all of these various noise
12 interference attenuating techniques would have been incorporated in the
13 combination? Is it suddenly bringing in all of these additional references,
14 like Takai and these others, that discuss simulation?

15 JUDGE CHERRY: I guess my first question is, *Hall* is discussing
16 that in the background of the invention as existing systems. So how does
17 *Hall* address the noise problem?

18 MR. LAUPPE: Well, Your Honor, that's a good question. We don't
19 think that Petitioner has adequately pointed to disclosures that, for example,
20 within a *Hall* that discuss the techniques that would be used in a
21 combination to attenuate to it to address this noise issue. But, you know,
22 *Hall* is also describing sort of a general principle here that measurement
23 noise is exacerbated as measurement ranges are extended. So, again, this
24 comes back to, in our view, a person of ordinary skill would not have looked
25 to SPADs, which themselves both exacerbate sensitivity of noise and also
26 exacerbate this measurement range issue.

1 Your Honor, unless you have any questions, I'm going to move on to
2 the grounds 1 and 2 unless you have anything further.

3 JUDGE CHERRY: And I guess my question on that is we do have
4 *Borowski* that is using SPADs, right, in a LiDAR application. So, it was
5 known. Doesn't that seem to indicate that it was known at the time to use
6 SPADs?

7 MR. LAUPPE: Well, not -- *Borowski* is not necessarily disclosing
8 SPADs, so, for example, a rotating LiDAR design like *Hall* requires and
9 which the combination involves. So, again, we just come back to this issue
10 of this is using SPADs in an environment where, based on *Hall's* teachings,
11 a POSITA would recognize it had significant sources of measurement noise.
12 And in our view, Petitioner has not shown how that combination would
13 essentially -- would work based on -- and rather that a POSITA would avoid
14 and use, for example, some other type of detector, like *Hall*, for example,
15 discloses the use of APDs.

16 JUDGE CHERRY: Thank you.

17 MR. LAUPPE: So, Your Honor, moving on to grounds 1 and 2. A
18 common element to these two combinations for grounds 1 and 2 is the
19 combination of *Pacala* and *Droz* -- or I guess maybe it's pronounced *Droz*.
20 Petitioner has failed to point to a properly construed stop region, which is
21 required by all of the challenge claims in this proceeding. And so first I'm
22 going to cover the claim construction issue of the proper construction of stop
23 region and then I'll move on to applying that to Petitioner's read for what
24 constitutes the stop region in the *Pacala-Droz* combination in its view.

25 So a person of ordinary skill in the art would have understood the
26 term "stop region" to have a very particular plain and ordinary meaning.

1 And that is an optically non-transparent region that defines a field of view or
2 a photosensor. And we can start by simply looking at the claims. Stop
3 region appears in both claims 21 and 26 in the context of a light sensing
4 module and within that light sensing module you have an aperture layer
5 comprising a plurality of apertures separated by a stop region. This
6 limitation is the same in claims 21 and 26.

7 Now, a person of ordinary skill in reading this claim language where
8 you have a stop region inside of an aperture layer separating apertures, a
9 person of ordinary skill would have associated that with a well-known
10 optical concept, that of the aperture stop. And here we provided two
11 examples of textbook evidence demonstrating what would have been in the
12 understanding of a person of ordinary skill in the art when viewing this
13 claim language. And the textbook evidence shows that an aperture stop
14 would have had a very particular role in the view of a person of ordinary
15 skill. And that role is to define the field of view for an optical system, to
16 limit the size or diameter of the beam of rays which can cast (inaudible), to
17 limit the size of the maximum cone of rays. And the (inaudible) example
18 that both of these textbooks use is that of the camera iris, which, you know,
19 you iris in, iris out, and that determines what cone of rays can enter into the
20 system. So it defines the field of view for that system.

21 So based on this background, a person of ordinary skill reading the
22 requirements of a stop region in an aperture layer, separating apertures,
23 would have had a very particular view of the plain and ordinary meaning of
24 that stop region of what that stop region is doing in the system.

25 And so furthermore, we have testimony from Patent Owner's expert,
26 Dr. Janet, who says that the use of the term "stop region" in the '405 patent is

1 consistent with how persons of ordinary skill in the art understood the term.
2 So contrary to Petitioner's contention that Patent Owner is seeking to import
3 limitations from a specific embodiment, rather, it is Patent Owner's view and
4 the view of Patent Owner's expert that the '405 patent uses the term "stop
5 region" in a manner consistent with the plain and ordinary meaning to a
6 person of ordinary skill, which is demonstrated, for example, by the
7 textbook evidence that we've just been looking at.

8 So next I'd like to march through some of the intrinsic evidence,
9 which, again, this is evidence that in Dr. Shanley's view and -- sorry, in Dr.
10 Janet's view and Patent Owner's view shows it's consistent with a person of
11 ordinary skill's understanding of the plain ordinary meaning of this "stop
12 region" term. So on the right we have figure 17. This is slide 18. And you
13 see at the top of figure 17, aperture layer 1740 and that, you know, we were
14 just discussing aperture layer in the context of the claims. We see an
15 aperture layer. You have stop region 1746 and you have aperture 1744.
16 And one key element of figure 17 is that you can see the field of view
17 defined by the stop region. You have these lines coming in to the aperture
18 layer and they exactly match up with the edges of stop region 1746. If we
19 zoom in a bit, you can see that a little bit better.

20 So turning now to flag 30, this is simply a zoomed in excerpt from
21 that figure 17 demonstrative. Well, figure 17 with some highlighting added.
22 So as you can see, there is this light cone disclosed by figure 17 with
23 maximum light ray angles shown in 1733 in this figure. That light cone is
24 defined by stop region. You see the lines of that light cone exactly match up
25 with the edges of the stop region. And so the stop region in intrinsic
26 evidence of the '405 patent has a direct role in defining that field of view, in

1 defining the angles of light that can make it into the system versus the angles
2 that can't.

3 And so if we look at slide 31, here is one angle of light that couldn't
4 make it into the system. It's coming at too wide of an angle and as a result it
5 is blocked by the stop region 1746. It doesn't fit into the set of angles into
6 the light cone that stop region 1746 allows in the system.

7 Now, Petitioner focuses on the fact that in its view, it's the aperture
8 layer, not the stop region that defines the field of view in, for example,
9 figure 17. But look at figure 17. There are only two things in the aperture
10 layer in figure 17. All you have is aperture 1744 and stop region 1746. And
11 you can see how the structure, the very shape of stop region 1746 is defining
12 the field of view for the system. It's not simply sitting there having a passive
13 role. It is directly involved in defining that light cone. And you can see that
14 by how those light rays, those angles match up with the edges of stop region
15 1746.

16 Now, the '405 patent defines a stop region against other non-
17 transparent structures with different rules, with rules other than defining the
18 field of view for the system. So for example, in figures 19A and 19B, the
19 stop regions are shown in red on this demonstrative on slide 32, whereas
20 other structures referred to as spacer structures are shown in blue here. And
21 the '405 patent is clear that these spacer structures have a different role in
22 defining the field of view for the system. Instead, they prevent any light
23 from traveling outside the receiver channel. So these have a different role
24 and in the '405 patent they have a different name. And there are other
25 structures in other embodiments. For example, there's something called a

1 tube structure in another embodiment with a similar role to what you see for
2 spacer structures here.

3 So Petitioner argues that, well, spacer structures here aren't stop
4 regions because they fall outside the aperture layer. But that doesn't change
5 the fact that the '405 patent could have referred to these as further stop
6 regions. It just so happens these might be stop regions outside the aperture
7 layer. But the '405 patent did not chose to use a different name for these
8 structures. And that suggests that the '405 patent has a very particular view
9 of what these "stop regions" are doing in the system. They are part of the
10 aperture layer. And in being part of the aperture layer, they define the field
11 of view for a photosensor.

12 JUDGE CHERRY: I guess, looking at figure 19B, so I understand the
13 red portions are what the patent identifies as the stop region in that structure?

14 MR. LAUPPE: That's correct, Your Honor. So elements 1946.

15 JUDGE CHERRY: Okay. And so, I mean, I see how your argument
16 works for the bottom part of -- the bottom 1946 in figure 19B. But what
17 about that -- those smaller blocks on top? Do they meet your definition of
18 stop region?

19 MR. LAUPPE: Yes, Your Honor, because both of these stop regions
20 shown in figure 19B, those are both involved in narrowing that field of view.
21 So you could potentially draw light cones for both of these apertures, for
22 both of these sets of stop regions.

23 JUDGE CHERRY: So, but they only do that together, so you'd have
24 to take them cumulatively?

25 MR. LAUPPE: Right. So, I mean, figure 19B is potentially a slightly
26 different embodiment, but it's still -- I mean, because you sort of have these

1 different layers of stop regions surrounding I think that's a lens shown in
2 1945. But in any case, you still -- these stop regions, whether taken together
3 or individually, these are each directly involved in defining the field of view
4 for this optical system.

5 JUDGE CHERRY: But isn't that what the cladding -- if we're going
6 to stretch it out to include anything that kind of contributes to the field of
7 view like you're doing, to kind of account for that block on top in figure
8 19B, doesn't that include the cladding that they've identified as the stop
9 region in *Droz*?

10 MR. LAUPPE: So you are focused -- I don't -- I think they've only
11 identified the absorbing layer.

12 JUDGE CHERRY: Absorbing layer, I'm sorry.

13 MR. LAUPPE: Oh, yeah, no problem. But so the absorbing layer --
14 and actually, let me -- well, okay, the absorbing layer in *Droz* is basically
15 insulated by these, what you were just describing as the cladding layers,
16 these reflective layers that guide light through the waveguide from the right
17 end to the left end. The apertures -- the stop regions in figure 19B, those
18 don't -- for example, there's no reflective area to the apertures in figure 19B.
19 But rather, these stop regions, by their very shape, by their very structure,
20 they define, they narrow the angles of light that can enter the system. And
21 that's the case for either of the 1946 elements that you see in figure 19B. I
22 don't think that that's similar to the cladding layers in -- sorry, the absorbing
23 layers in *Droz*. And in fact, the most analogous structure to the absorbing
24 layers in *Droz* are the spacer structures that you see in blue in this image
25 because they prevent, as the '405 patent discussed, they prevent light from
26 traveling outside the receiver channel.

1 JUDGE CHERRY: Okay. I'm struggling if we're going to say that, it
2 helps define the -- a stop region helps define the -- because clearly, like the
3 ones in 1946 on top, that doesn't define the field of view. It helps define it.
4 Right? So if we're helping define the field of view, I'm having trouble
5 seeing why the absorbing layers in *Droz* don't help define the field of view
6 in that system.

7 MR. LAUPPE: Because I think the key term there is "define." The
8 absorbing layers in *Droz* don't define a field of view. They might prevent
9 leakage between channels, but there's no -- they're not involved in
10 determining what rays of light, what angles of light can enter the system
11 versus what angles of light cannot enter the system. Whereas either of the
12 structures 1946 you can see in figure 19B, either of those are involved, you
13 can draw a light cone for either of those stop regions.

14 JUDGE CHERRY: Okay, thanks.

15 MR. LAUPPE: And so just to reiterate the point I was just discussing,
16 Petitioner initially proposed that absorbing layers 368 and 378 in *Droz* are
17 the stop regions. And specifically the argument is that since these absorbing
18 layers absorb leakage from one waveguide to an adjacent waveguide, that's
19 why they serve, in Petitioner's view, as stop regions.

20 However, properly construing this term "stop region" as an optically
21 non-transparent region that defines a field of view for a photosensor, there is
22 no evidence that these absorbing layers serve to define the field of view for
23 one of these waveguides. Petitioner has pointed to the fact that they prevent
24 leakage between one waveguide to an adjacent waveguide, but that is not
25 determining what cone of light, what set of angles of light can enter into the
26 system. And therefore, these absorbing layers do not have a role similar to

1 the stop regions disclosed by the '405 patent and what a person of ordinary
2 skill would understand based on the plain and ordinary meaning of that term.

3 And yeah, like I was just saying, instead of being similar to any of
4 the stop regions disclosed by the '405 patent, the absorbing layers in *Droz*
5 are much more analogous to these non-stop region elements. So for
6 example, the spacer structures or the tube structures disclosed by the '405
7 patent. And again, you know, the role for these elements that's disclosed in
8 *Droz* is preventing leakage. There's no discussion that these absorbing
9 layers prevent certain angles of light from entering the system.

10 Now, on reply, Petitioner has moved to a different interpretation of
11 *Droz*. Instead of focusing on preventing light from moving between
12 waveguides, it's pointed to the very rightmost ends of these absorbing layers.
13 And in attempting to show that the rightmost ends of these absorbing layers,
14 as a rule, you know, analogous to what, for example, Patent Owner has
15 shown, the '405 patent indicates that stop regions are involved with,
16 Petitioner's drawn these green lines on the figure of 3B embodiments. But
17 there are various issues with this understanding of *Droz* and how it works.

18 So one issue is *Droz* has these cladding layers, so light more -- can
19 come in at more extreme angles than what Petitioner has drawn as the green
20 lines here and still get guided along to the photosensor 316. So these green
21 lines, it's unclear what these represent.

22 Furthermore, these green lines are drawn as to the cladding layers
23 372 and 376, which, as we were just discussing, Your Honor, is not pointing
24 to the cladding layers as the stop regions in *Droz*. And so as a result, if you
25 removed these red regions that Petitioner's pointed to, the rightmost regions
26 of absorbing layers 368 and 378, it's unclear that anything would happen to

1 the green lines because they're defined, they're drawn against the cladding
2 layers 372 and 376.

3 Additionally -- and Petitioner discussed a bit in its presentation today
4 its structure 320, which draws discloses in figure 3B. This element 320 is
5 opaque. And figure 3B, the discussion in *Droz* actually discusses 322 within
6 figure 3B as an aperture. And you can see these diagonal lines coming into
7 the system, similar to the field of view, the light cone that we've been
8 discussing, for example, in the '405 patent. But what's key to understand
9 here is that in Petitioner's demonstrative diagram with the green lines,
10 structure 320 has been removed entirely. So Petitioner has taken away the
11 one area where there is discussion in *Droz* of sort of a light cone and instead
12 stripped that structure away and pointed to something entirely different,
13 these absorbing layers 368 and 378.

14 And then finally, Your Honor, one point we make in the papers is
15 that if these absorbing layers truly had some role -- played some role in
16 defining the field of view for the waveguides for the photosensors in figure
17 3B of *Droz*, then it is unclear why there are no absorbing layers shown on
18 the outside of -- on the outside edges, the top and bottom of figure 3B. If
19 these layers truly had played some role in defining the field of view, it seems
20 like that would be the most important place for putting an absorbing layer
21 because that's sort of the outside of the system as it's drawn in figure 3B.

22 So I'm going to pause there. Your Honor, do you have any questions
23 related to the stop region issue and *Droz*?

24 JUDGE JURGOVAN: One question, Counsel. Are you arguing that
25 there is not an aperture layer disclosed in *Droz*, a layer, emphasis on the
26 word "layer"?

1 MR. LAUPPE: Well, Your Honor, not an aperture layer as claimed
2 by the '405 patent, by claims 21 and 26, because the aperture layer in the
3 '405 patent includes stop regions which -- or at least a stop region which
4 Petitioner's failed to point to in *Droz*.

5 JUDGE JURGOVAN: Thank you.

6 MR. LAUPPE: So I'll turn now to issues with the *Pacala-Droz*
7 combination. The issue with this combination is *Pacala* discusses a
8 spinning system, *Droz* discusses a stationary system. And so a person of
9 ordinary skill in the art doing the teachings of these systems as prior art
10 would have understood that a key question in determining whether these
11 systems could be combined is related to these very differently structured
12 systems. However, the issue is that Dr. Shanley, Petitioner's expert, in
13 discussing the *Pacala-Droz* combination, testified that you would have to
14 have a team to put all these pieces together in this combined system.
15 However, neither Dr. Shanley nor Patent Owner's expert proposes a team
16 POSITA. The POSITA definition proposed by either party relates to one
17 person with a certain level of experience.

18 And furthermore, this is consistent with the fact that Dr. Shanley
19 himself, despite these incompatibilities regarding, you know, a rotating
20 system on one side, a stationary system on the other, had not even begun to
21 do any of the kinds of analysis that a person of ordinary skill in the art would
22 have considered necessary to understand whether these systems were
23 combinable in the first place. He couldn't answer questions as to size, as to
24 weight, as to mass distribution, or, for example, you know, how much labor
25 effort would be required in combining these systems.

1 So, viewed in total, this undermines the fact that there was any
2 reasonable expectation of success in this combination because Dr. Shanley
3 simply hasn't begun to do the analysis necessary for that inquiry.

4 And then finally, Your Honor, I know I'm running short on time, I've
5 just got a couple brief remarks about the secondary considerations of non-
6 obviousness.

7 Petitioner focuses here -- so first I'm going to speak to industry
8 skepticism on slide 51. Petitioner focuses here on the fact that, allegedly,
9 Dr. Shanley, when he discussed the fact that he knew about SPADs as of the
10 early 1990s, but then never used SPADs in any system, any LiDAR system
11 that he worked on up until the priority date of the '405 patent, Petitioner says
12 that, oh, this only relates to something that he did in 2008. Looking at the
13 record here of Dr. Shanley's testimony, that is certainly not clear. Dr.
14 Shanley spoke to having worked on multiple LiDAR systems and he
15 indicated that he never used SPADs in any of these LiDAR systems despite
16 having learned about them in the early 1990s. And in fact, he could not -- he
17 was unaware of any commercial or noncommercial LiDAR systems that
18 used SPADs prior to the '405 patent. So we think this is still strong evidence
19 that there was industry skepticism. There's about a 30-year span on the
20 record during which Dr. Shanley himself, Petitioner's expert, knew about
21 SPADs, but declined to use them in any of the LiDAR systems that he
22 worked on.

23 And then finally, for failure of others -- failure by others, we're
24 pointing to the Vinogradov article, which marches through a variety of
25 different attempts to use SPAD arrays and LiDAR systems that speaks to
26 various issues that came up, you know, in these research prototype systems.

1 And as a result, Vinogradov discusses that there have been no attempts
2 either to implement data rays in 3D imaging LiDARs.

3 So that concludes my opening presentation, Your Honor. So I'll
4 reserve the rest of my time for rebuttal.

5 JUDGE CHERRY: Great. It looks like you just went over by like 3
6 minutes, so you still have 17 minutes.

7 MR. LAUPPE: Thank you, Your Honor.

8 JUDGE CHERRY: Great. All right. Mr. Hagiz, do you want to do
9 your rebuttal?

10 MR. HAGIZ: You mentioned that I have, I think, 19 minutes left,
11 Your Honor?

12 JUDGE CHERRY: Yes.

13 MR. HAGIZ: Okay, great. So let me start -- I just want to make a
14 brief note on the last point that Mr. Lauppe touched on in secondary
15 considerations. I just want to note Dr. Shanley's 30-year span, bear in mind
16 that he testified at his deposition that the last time he actually designed a
17 LiDAR system was in 2008. That's Exhibit 2011, at 23:16 to 17. So not
18 particularly surprising that he hasn't used that between 2008 and 2017. The
19 suggestion that that that means that in 2017 there was industry skepticism is
20 a little far-fetched given the wealth of other evidence.

21 Now, I want to focus on stop region. I think there were a number of
22 questions there that Your Honors asked and I think a number of points that
23 would be helpful to clarify. The first point, I just want to be clear, and I
24 know you saw this, but the claim language itself doesn't say anything about a
25 field of view. Right? So Patent Owner's construction is based really on the
26 specific language and it's listed almost word for word out of the language in

1 the specification. And this is particularly notable because there are other
2 dependent claims that have additional limitations relating to the field of view
3 of the system. That's not in dispute. Right? We're looking at a limitation in
4 claims 21 and 26 that says nothing about field of view. And that's what the
5 proposed construction is adding in.

6 Now, one question, one point Judge Cherry had asked about, I think
7 one of the examples that Patent Owner -- that Mr. Lauppe showed that had
8 two stop regions layered together. And I think it's helpful, I passed over this
9 slide earlier, but I think it's helpful to look at one similar example that I will
10 pull up right now.

11 So on slide 47 of Petitioner's demonstratives we included, and this
12 was discussed in our reply on page 4, we included this example through
13 figure 20D. And in figure 20D we have a large number of stop regions. So
14 the specification 41:7 to 29 on Exhibit 1001, the '405 patent, it describes a
15 stop region 2063. And so essentially in figure 20D, we're looking at
16 essentially this series or layers of apertures and stop regions. And 2063,
17 which is at the top or at least at one end of this aperture layer, is described as
18 a stop region. Specifically, it says, "Aperture 2049 can define the maximal
19 cylinder of light desired to be passed into optical filter layer 2060 by optical
20 filter 2061, and stop region 2063 absorbs or reflects any incident stray light
21 outside the diameter of the aperture."

22 And then if we keep going, there's also a reference to -- sorry, there's
23 a reference to "an additional aperture 2054 and corresponding optically non-
24 transparent stop region 2055." And that stop region 2055 is on the opposite
25 end of this aperture layer. And in this particular example, if the stop region
26 is what's defining field of view, this angular or conic field of view that Mr.

1 Lauppe kept referencing, then we can see how 2063, that might limit the
2 angles that come in. Assuming 2049 and 2063 are at the front end of this
3 aperture layer, we can see how that might limit some of the angles that come
4 in in the front. But at that point, it's not clear how 2055 and 2054, which are
5 much further down, are -- have any additional impact on the cone or the field
6 of view that is coming into this aperture. So I think that by itself undermines
7 the notion that the stop region is necessarily the thing that is defining the
8 field of view as that's used in the specification.

9 Now, the other important point here, Mr. Lauppe's examples were
10 focused on this notion of angles or cones. But the field of view does not
11 have to be limited to angular cones. So in the example here, it refers to
12 aperture 2049 as defining a maximal cylinder of light that passes into the
13 optical filter layer. And if we look at the extrinsic evidence that Patent
14 Owner relied on, too -- and let me just pull up their slides so that we have it
15 in front of us. I think a few of Patent Owner's slides on this topic are helpful
16 to illustrate the point. One moment.

17 There we go. If we look at Patent Owner slide 26, you see the
18 definition in Exhibit 2013 refers to the aperture stop as limiting "the size or
19 diameter of the beam of rays which can pass through the system." And so
20 there's a problem with the focus on these cones or these angles as the
21 exclusive source of what the field of view is.

22 So we can see that that's the focus, right? On Patent Owner's slide
23 29, Patent Owner's focus really is on this notion of limiting a cone that goes
24 into -- that essentially reaches the photo detector. But the definitions and the
25 specification, they clear -- the term "field of view" is broader than that.
26 Right? And --

1 JUDGE CHERRY: Mr. Hagiz, is it fair to say that the stop region
2 defines the aperture?

3 MR. HAGIZ: Sorry, what was that question, Your Honor?

4 JUDGE CHERRY: That the stop region defines the aperture.

5 MR. HAGIZ: Well, so the stop region -- given that the aperture is
6 essentially transparent, right, and the stop region is a non-transparent region,
7 then the apertures that are amidst or among the stop region, the size and the
8 dimensions of the aperture, will be defined by the surrounding stop region
9 essentially. Right? Because the stop region defines the boundaries of where
10 the aperture is.

11 JUDGE CHERRY: I guess under that understanding, how does *Droz*
12 meet that? Because it seems that the apertures are defined by the cladding
13 and the -- because not all of the -- I'm concerned because it doesn't seem that
14 all of the -- what we've identified, what you identified as the apertures in
15 *Droz*, or "Drews" or however you say it, are defined by these absorbing
16 layers if that's true.

17 MR. HAGIZ: Sure, absolutely, Your Honor. I think there's two
18 arguments on that point. Number one, Dr. Shanley testified that the total
19 aperture is the cladding layer plus that interior part of the waveguide. And
20 so I think there's evidence in the record and argument in the record that the
21 aperture is the part between the non-transparent region. And he explained
22 towards the latter portion of his reply deposition, Exhibit 2017, he explained
23 that the reflectivity of the cladding layer also depends on -- essentially you
24 have to configure it for certain angles. So some light will be reflected, some
25 light will still potentially pass through depending on the angle that it comes
26 in. And *Droz* recognizes also in the specification that there is light that can

1 enter the cladding layer and then that gets absorbed by the light absorbing
2 layer. So the aperture I would argue includes the cladding layer.

3 I think the other answer to that question is that, again, we're in a
4 comprising claim. So I think so long as, even under PO's construction, so
5 long as the stop region is at least in part defining the field of view, which it
6 definitely is here, there is clearly a narrowing or a limitation on the cylinder
7 of light or the size of the beam of light that can enter waveguide 374 by
8 virtue of the surrounding opaque or non-transparent absorbing material at
9 the input end of the waveguide. I think at a minimum that at least in part
10 defines the field of view. The fact that there may be other elements that also
11 in part define the field of view doesn't mean that the construction or that the
12 limitation is not met.

13 Does that answer your question, Your Honor?

14 JUDGE CHERRY: Yes.

15 MR. HAGIZ: Sorry, I can't -- I don't think I can hear you.

16 JUDGE CHERRY: I guess how do you respond to this? Not all of
17 the waveguides have light absorbing layer. It means it's shown as between
18 that center one and the ones on either side.

19 MR. HAGIZ: A few responses to that. Number one, Dr. Shanley
20 explained and I think it's clear from the other figures as well, figure 3B is
21 showing one part of the system that is a microcosm of the larger system. Dr.
22 Shanley explained it would be clear to a POSITA, especially when you put it
23 in the context of figure 3A that shows that this entire waveguide structure is
24 inside this larger enclosure, that there will be other layers outside of what is
25 shown. So a POSITA would understand that you're going to have additional
26 opaque material on the exterior of this entire assembly.

1 Even if that's not the case, which I know Patent Owner disputes that
2 that is necessarily the case, but *Droz* also teaches that you can have any
3 number of waveguides in series there. So figure 3B shows three, but you
4 could have four or five or six, in which case you would have at least a layer
5 of non-transparent material between each set of adjacent waveguides. And
6 so that means at least some subset of the system. Right? Maybe not the
7 entire waveguide assembly, but there is at least some portion of the
8 waveguide that includes an aperture layer with stop regions which define a
9 field of view. And that's enough to meet the claims.

10 It's not necessarily required that every single waveguide within *Droz*'
11 system would satisfy the claim language as long as some part of it would.
12 That clearly would be the case when you have more than three waveguides.

13 Unless there are other questions on stop region, I do -- I want to touch
14 briefly on some of the other points that were raised just with my remaining
15 time.

16 You know, Mr. Lauppe began his presentation commenting on new
17 arguments and evidence in the reply. And Judge Cherry, you alluded to this,
18 but our positions haven't changed. The only thing that has been added is
19 additional evidence and a reply declaration responding to new arguments in
20 Patent Owner's response. We cited in our reply to *Axonics v. Medtronic*, 75
21 F.4 1374, which made clear that when a new construction is raised for the
22 first time in Patent Owner response that a Petitioner is allowed to raise new
23 arguments in response, but is not allowed to raise new prior art. We didn't
24 raise new prior art and we're actually relying on the same elements in the
25 same references in the same combination in response to the new arguments

1 raised in Patent Owner's response. So there's really no reason to discount
2 any of those arguments.

3 On the *Hall-Spector* combination, it seems like the Patent Owner is
4 shifting to an analogous art argument. I heard this both there and on the
5 *Pacala-Droz* combination that because one is rote feeding and one is
6 stationary, a POSITA would not consider combining the references. And
7 that really goes -- whether a POSITA would consider combining the
8 references really goes to whether they're analogous are not an argument that
9 I saw raised in any of Patent Owner's papers. But in any event, it's clear that
10 they are, as explained in the petition itself. Specifically, both *Hall-Spector*
11 and *Pacala-Droz* are both directed to LiDAR systems and so they're directed
12 to the same technology and are analogous. And in any event, they
13 specifically relate to similar problems in the field. In particular, *Hall* talks
14 about crosstalk and that type of noise being a problem in LiDAR sensors.
15 *Spector* specifically teaches that its aperture layer reduces crosstalk. That in
16 itself makes them analogous and would provide a reason for a POSITA to
17 consider them for the combination.

18 JUDGE CHERRY: I am concerned with what evidence we have that
19 we can use this technique from a scanning system in a rotating system. I am
20 concerned that we have a lot of discussion or some discussion in the reply,
21 but there doesn't seem to be a lot of evidence to support that discussion.

22 MR. HAGIZ: So I would say there's really -- I think Dr. Shanley
23 essentially testified and -- or explained in his original declaration that there's
24 no -- essentially there's no real reason why a person of ordinary skill
25 wouldn't be able to apply the teachings. I think this is similar to an argument
26 that was raised in the pre-Institution response and that the Board addressed

1 in its Institution Decision where originally Patent Owner was saying that you
2 couldn't combine the references because *Spector* uses kind of a single light
3 source and that's somehow different than the multiple light sources. And in
4 the Institution Decision the Board explained, well, that doesn't mean that
5 you can't take this one element from *Spector*, which is the aperture array,
6 and be motivated to use that.

7 So the fact that one is stationary and one is rotating, at the end of the
8 day they have the same underlying sets of elements. You have light emitters
9 that send light out, light comes back and has to be received at a set of
10 detectors, and you need to make sure that the detectors are receiving the
11 light that correspond to it. So it's not clear from Patent Owner's response or
12 any evidence that Patent Owner has put in what the actual meaningful
13 difference would be between the systems that would create a barrier to
14 combining the two. I think Dr. Shanley explained that it would be within the
15 ordinary skill of a person of ordinary skill in the art to make the combination
16 of cells. And there's clear evidence of record on the motivation to include
17 the aperture layer because it's (inaudible) problem. But, again --

18 JUDGE PETRAVICK: Counsel?

19 JUDGE CHERRY: Go ahead, Judge Petravick. I'm sorry.

20 JUDGE PETRAVICK: I've heard you now characterize this issue as
21 bodily incorporation and sort of analogous art. But really -- the issue is
22 whether these differences in these LiDAR systems would weigh into the
23 obviousness and the reasonable expectation of success of the combination?
24 And based on what you're telling me is, I guess, the question is sort of is
25 your expert's testimony the only evidence you have of a reasonable
26 expectation of success of combining these things?

1 MR. HAGIZ: Yes, Your Honor. I mean, I think our expert's
2 testimony based on the capabilities of a person of ordinary skill in the art are
3 more than sufficient to meet the threshold, the threshold inquiry. I think the
4 other response would be that there's really no evidence put forth by Patent
5 Owner to contradict that. Right? So Patent Owner just says, well --

6 JUDGE PETRAVICK: But here's my question. This is an IPR. It's
7 your burden, it's Petitioner's burden to make the case by, you know, the
8 evidence standard. It's your burden, it's not Petitioner's burden to come back
9 and say, no, you can't do that. You're the Petitioner and it's your expert --
10 your burden to show the expert's testimony shows expectation of success.
11 They pointed out a few differences in the LiDAR systems, you know, seem
12 to have differences and changing one part for another part seems to
13 implicate whether you have to change other parts and so on But it's your
14 burden. So where do you prove that there's a reasonable expectation of
15 success of making this proposed combination? The only evidence is your
16 expert's testimony?

17 MR. HAGIZ: Yes, Your Honor. Our expert addresses it and I think
18 frequently the expert's testimony as to what would be within the capabilities
19 of a person of ordinary skill in the art and addressing the fact. And I think
20 beyond our expert's testimony, we also point to the fact that we're relying on
21 known techniques being used in predictable ways. A lot of the other
22 standards the KSR said it's sufficient to show (inaudible).

23 JUDGE CHERRY: Well, I guess what Judge Petravick I think is
24 trying to get at, I don't want to speak for her, but what's troubling me is that
25 it's kind of, yes, you came up with -- your expert kind of said that, -- again,
26 sufficient to establish a reasonable likelihood of prevailing standard for

1 Institution. But now they've come back and said, look, you know, this is a
2 scanning system and this is how this array would work with a scanning
3 system and these are the drawbacks and that's why, you do scanning with
4 this to kind of overcome this drawback. And you haven't really come back
5 with any evidence that says, no, that's not a drawback. You just kind of say,
6 well, yeah, you could do this. And so that's why we're having some trouble
7 here. Right? It's not even that it's analogous art, but they're just saying that
8 there's -- it could be analogous art, but then, you know, a POSITA would
9 say, oh, I wouldn't use that array because it won't work with a scanning or
10 with a -- sorry, whatever, whatever that system *Hall* is spinning.

11 And so, that's kind of I think where we're at in the, , if we're going to
12 go look at this framework. They don't have to -- I think you're kind of
13 imposing too high a burden and, they don't have to prove it would never
14 work. But they've kind of said that there's these problems and then you
15 haven't come back with any evidence that I've seen that says, no, this can't --
16 that doesn't make any difference. And so now we're kind of left with their
17 experts saying that this is a big problem and your experts are saying, oh, you
18 could combine it, you know, KSR. But now we've got this specific problem
19 that they've pointed to and you haven't really come back with any evidence.
20 So that's why -- that's what Judge Petravick -- well, as I understood what you
21 were saying. I'm sorry again, I'm not trying to speak for you, Judge
22 Petravick, but I'll let you say that. But that's what's troubling me.

23 MR. HAGIZ: Understood. So I think I can address that question. So
24 I think the issue -- and that's really where our bodily incorporation argument
25 comes in because the difficulty this Patent Owner is pointing to is not in
26 kind of the concept or the idea of adding an aperture layer to *Hall's* system

1 of record. Patent Owner never comes out and says you cannot put an
2 aperture layer full stop in *Hall's* system. Patent Owner's argument is the
3 specific implementation of an aperture layer in *Hall* where the apertures are
4 spaced widely apart because *Hall* is in *Spector's* scanning system. Well, that
5 won't work in *Hall's* system. But that's just not relevant for the obviousness
6 inquiry. It doesn't matter if we can take the specific embodiment of an
7 aperture layer in *Spector* and make that work in *Hall*.

8 The relevant inquiry is can we take an aperture layer, any aperture
9 layer, and add that into *Hall*? And there's no -- and Dr. Shanley says, yes,
10 we can and that is within the skills of a POSITA and it would just be
11 standard engineering experience. Patent Owner doesn't address that specific
12 point nor does Patent Owner's expert. Patent Owner's analysis is limited to
13 the particular aperture array in *Spector* where the apertures are spaced the
14 specific distance apart to accommodate scanning. And that's not the right
15 inquiry on obviousness. We're not looking at that specific one. The
16 question is, is an aperture layer itself problematic or not combinable? And I
17 don't think -- I didn't see an argument on that level coming from Patent
18 Owner. It's always limited to the specific aperture in *Spector*, which is
19 exactly what the bodily incorporation law from the Federal Circuit said you
20 can't do.

21 JUDGE CHERRY: I think we've run out of time. Does anyone have
22 any more questions? But I think you're a little past your time and I'm -- we'll
23 make up for that, Mr. Lauppe in just one second. Anybody else have any
24 other questions?

25 Okay. Thank you very much, Mr. Hagiz. Mr. Lauppe, we'll turn it
26 over to you.

1 MR. LAUPPE: Thank you, Your Honor. So to start out, I would like
2 to turn back to the stop region issue. I think Petitioner's approach in the
3 remarks that Mr. Hagiz just made is part and parcel of what we've seen
4 throughout this proceeding, which is when challenged, they move to a new
5 theory, and we think that's improper, particularly at this stage.

6 So, you know, for example, just to turn back to a couple that Mr.
7 Hagiz made, I'd like to turn to, sorry, slide 53 of Petitioner's demonstratives.
8 So again, this comes back to whether this demonstrative that Petitioner put
9 together by showing these green lines in figure 3D, you know, whether that
10 really reflects anything in the reality of the system or how a POSITA would
11 understand how the system functions. And in fact, as we've shown, given
12 the cladding layers, there's no evidence that any particular angles of light
13 here would be blocked, would be kept from entering into the system and
14 reaching the photosensor.

15 Now, Petitioner has raised this new theory. You can see down in the
16 left hand corner of slide 53, which we're not entirely sure how to parse this
17 theory, but this appears to be absolutely outside of anything Petitioner's
18 proposed at any stage in this case, where suddenly the cladding layers 372
19 and 376 are somehow involved with -- are part of the stop region here. And
20 that furthermore, the cladding layers, along with the absorbing layers, have
21 some kind of filtering function that Dr. Shanley appears to be discussing
22 through. Again, this is an entirely new theory presented not even on reply,
23 but on sort of sur-surreply that Dr. Shanley brought out during his deposition
24 testimony. I mean, this does not appear to actually be Petitioner's theory.
25 This has never been really a part of what they're pointing to in terms of stop
26 regions here. And in fact, it's not entirely clear how this works because you

1 have the stop regions, but you also have a part now that's partially reflective
2 or that's partially transparent. So it's unclear how this fits anywhere into
3 either Petitioner's theory or how this shows anything meeting the claim
4 language here, particularly if properly (inaudible) proper limitation.

5 Petitioner also raised an argument regarding kind of columns of light
6 as opposed to sort of cones of light. So there's an argument there that
7 apparently since, for example, the aperture might vary in width and let in
8 more lights from different kind of -- from a different column, as a result, the
9 aperture in figure 3D, somehow the stop regions might be involved in sort of
10 that widening or narrowing. But again, there's no indication there of how
11 these stop regions, alleged stop regions, in *Droz*' absorbing layers, how these
12 have a direct role in defining that field of view.

13 Again, going back to the '405 patent, we saw how the very structure,
14 the edges, the shape of the stop regions there define the field of view. All
15 that Petitioner appears to be able to focus on is that the width of the aperture
16 might vary. And you know, we -- the Patent Owner in, for example, the
17 Patent Owner response, we acknowledge that. We acknowledge the fact that
18 in *Droz*, *Droz* goes basically a different direction. Rather than using stop
19 regions to define a field of view, *Droz*, which is the idea of expanding or
20 contracting the aperture and so, you know, letting in more light that can then
21 reflect along and just guide it to the photosensor. But there is no account
22 there for where there is a stop region as properly construed according to the
23 plain and ordinary meaning of a person of ordinary skill in the art, which is
24 that it would define the field of view, that the stop region itself is directly
25 involved with defining, with determining what light enters into the system
26 and what light cannot.

1 And because of the various idiosyncrasies to the *Droz* system here,
2 the cladding layers, the reflective nature, the fact that the absorbing layers
3 are between cladding layers, the fact that there's no absorbing layers on the
4 outer edges of the system, these all speak to the fact that these absorbing
5 layers are not like the stop regions as properly construed for by the patent.
6 The absorbing layers have a different role entirely. They're simply there to
7 prevent light from leaking between different waveguides. And that is not a
8 stop region that's properly construed according to the plain and ordinary
9 meaning of a person of ordinary skill.

10 Furthermore -- sorry, I'll pause there because I'm next going to turn
11 to the *Hall-Spector*. Are there any further questions on the stop region issue
12 or on the *Pacala-Droz* combination?

13 JUDGE CHERRY: Not from me.

14 MR. LAUPPE: Okay. Thank you, Your Honor. So, turning now to
15 the discussion regarding the *Hall-Spector* combination, Petitioner gestured --
16 Mr. Hagiz gestured at the fact that Dr. Shanley opines somewhere in his
17 declaration that -- as to the exact, you know, deficiencies that Patent Owner
18 has identified in the *Hall-Spector* combination here. But the question in my
19 mind is where? Because if you look at, for example, Petitioner's reply, they
20 are not able to point to a single place where Dr. Shanley spoke to this
21 aperture spacing issue.

22 And in fact, again, just pointing back to that excerpt from Dr.
23 Shanley's deposition, I mean, you can't get more direct than the question that
24 Patent Owner asked him, which is how, in your opinion, would an aperture
25 array be incorporated into the *Hall* system shown in figure 5? This is
26 Exhibit 2011, 624 to 672. Dr. Shanley spoke at length in answer to this

1 question and failed to once mention the fact that in his view apparently, from
2 now Petitioner appears to be asserting, that there's this aperture spacing issue
3 that would have been allegedly common sense to a person of ordinary skill.
4 That just simply doesn't occur to Dr. Shanley when he's directly asked this
5 question. And I think you'll be hard-pressed, Your Honors, with finding
6 anywhere in Dr. Shanley's testimony, in his opinions, anywhere expressed in
7 this case on the record where he discusses the fact of this aperture spacing
8 issue. So, ultimately, all we have to go off is Petitioner itself saying this
9 would have been common sense to a POSITA. And that's nothing but fair
10 attorney argument and not entitled.

11 JUDGE CHERRY: You're not contending that aperture arrays can't
12 be used with scanning systems?

13 MR. LAUPPE: Your Honor, we're simply focused on the specifics of
14 the teaching. So that we're not -- we're saying that a POSITA, when viewing
15 the teachings of *Spector*, would not have understood that the apertures could
16 be taken out of *Spector* and put into a system that could not accommodate a
17 scanning system. So the fact of the rotation here is almost secondary in the
18 sense that the rotation means that you can't include a scanning system. But
19 ultimately, that's neither here nor there because Petitioner itself admits that
20 the scanning system would not be incorporated.

21 JUDGE CHERRY: But is your argument that it's the specific array of
22 *Spector* that can name arrays or just arrays generally as disclosed in *Spector*?

23 MR. LAUPPE: It's not related to the specific array disclosed in
24 *Spector*. It's the fact that *Spector* discloses an array and a person of ordinary
25 skill viewing the teachings of *Spector* would understand, oh, when using an
26 aperture array and micro objects like *Spector* teaches, you also need a

1 scanning system because you have gaps between these discrete detection
2 points.

3 JUDGE CHERRY: Does this spinning system in the challenged
4 patent, does it use an array like *Spector* uses?

5 MR. LAUPPE: You're referring to -- I mean we can look to --

6 JUDGE CHERRY: Challenged patent. What is the challenged
7 patent? Is aperture layer -- is it -- how is it different than what's used in
8 *Spector*?

9 MR. LAUPPE: So, Your Honor, just real quick I'd like to -- and we
10 can pull up a figure. Actually this appears in Petitioner's demonstratives. I
11 mean, here's one place where we can just view kind of from a thousand-foot
12 level where you see apertures in the '405 patent. So an aperture layer, It
13 teaches what's highlighted in sort of brighter yellow here. There's an
14 aperture layer and then that contains apertures and also some stop regions.

15 I don't think our particular dispute is as to the aperture itself, the
16 aperture disclosed by *Spector* not meeting, for example, the requirements of
17 the aperture layer in the '405 patent. Rather are disputed with the
18 combination and the motivation to combine and the fact that a person of
19 ordinary skill based on the teachings of *Spector* would not have looked to a
20 system that could not accommodate a scanning system. And Petitioner itself
21 now is saying, yes, we're not using the scanning system. So there's -- to us
22 that ends the inquiry. A POSITA would not have view this as an aperture
23 array based on *Spector* as something that could simply be stripped out of a
24 scanning system and put into one that doesn't have a scanning system.

25 JUDGE CHERRY: But, was there anything unpredictable about
26 using -- the one thing that's concerning me is that if your system is kind of

1 indistinguishable, where is the disclosure about how this was done and how
2 it was difficult to do at the time of the invention?

3 MR. LAUPPE: Well, so I would just point back again to the specific
4 teachings in *Spector*. And again I'm pulling up slide 6 where a person of
5 ordinary skill would understand. So turning to slide 5, that in figure 9, if
6 you don't have a scanning system, all you have is these discrete light points
7 that are missing huge swaths of the scene. And a person of ordinary skill
8 would not have understood that you could simply pull these apertures out
9 without also accommodating this limitation with these apertures, which
10 results in, for example, this teaching where, you know, if you remove the
11 scanning, you're actually missing a huge part of the scene which is a person
12 standing there. So that's what I would discuss point to in terms of just based
13 on the teachings of *Spector* alone, a person of ordinary skill would
14 understand this to be an issue, a concern with using an aperture layer.

15 JUDGE CHERRY: Other than array that I'm concerned about is that,
16 we're warned not to take patent drawings too literally. So, yeah, in that
17 figure it's showing the dots being spaced that far apart. But what evidence
18 do we have that that is how the system would -- is that there would be these
19 substantial -- you know, what evidence other than just the way it looks in
20 this drawing and it looks far apart, what other evidence do we have that there
21 is like a substantial amount that would be missed in the system?

22 MR. LAUPPE: Well, Your Honor, one thing I would point you to is
23 the fact that Petitioner, in order to rely on *Droz* as a piece of prior art, the
24 '405 patent, it actually has to tie its disclosures back to a very limited set of
25 disclosures in a provisional application. So Petitioner's hands are very much
26 tied here in terms of like any other elaboration or anything that can be

1 pointed to within *Droz*. So -- and if you look back at that provisional
2 application, it's extremely limited. It's essentially a PowerPoint, mostly just
3 drawings like these, for example, something similar to what you see in
4 figure 3B -- or figure 9. So that's just the first point that I would make there.

5 JUDGE CHERRY: You mean *Spector*? Just for the record, don't you
6 mean *Spector*? You said *Droz*.

7 MR. LAUPPE: I'm sorry, yes, *Spector*. Thank you, Your Honor. I
8 appreciate it.

9 But so, furthermore, I mean, there's not really that much that a
10 person of ordinary skill would have to work with here in terms of
11 disclosures. Really, ultimately, I mean, a large part of that provisional
12 application is discussing this issue of, you know, scanning between the
13 different detection points. So you know, I don't think this is necessarily
14 conferring sort of undue weight to this particular figure. There's really not
15 that much more that a person of ordinary skill within its record would have
16 really had to rely on.

17 So -- and furthermore, you know, I'd just like to speak to the point of
18 that analogous art that Petitioner raised. Again, our issue here is not related
19 to whether this art is analogous. We're specifically directing our objection
20 here to the fact that a person of ordinary skill would not have understood
21 you could simply take the apertures from *Spector* and put them into a system
22 without some kind of scanning system like *Spector* discloses.

23 I'm sorry, real quick, I'd like to just turn back to one point that
24 Petitioner made on the stop region issue. I'm just looking back in my notes.
25 So Petitioner raised this figure. This comes up in his papers as well. Yeah,
26 this is figure 20D. Just one thing I note here is that this is not an aperture

1 layer. What you see here is rather a filter layer. So it seems like Petitioner
2 is sort of putting undue weight on any significance to this figure because,
3 again, we're just talking about sort of an entirely different structure, entirely
4 different embodiments than what the stop region language in the claims
5 relates to.

6 And sorry, I'm sorry to jump around, Your Honor, but finally on
7 your -- on Judge Cherry's question about, you know, issues related to, you
8 know, difficulty regarding, you know, kind of the issues related to *Hall* and
9 *Spector* and using apertures and the like, I would just point you to the '405
10 patent. There's discussion of issues regarding narrow band imagers. This is
11 at lines like 2:8 to 2:12 or so, so this discusses the fact that, you know, with -
12 - fewer wide field of view sensors are required to do the same job as many
13 narrow field of view sensors, thereby decreasing the system cost. So this
14 relates back to this issue of kind of like, you know, creating a very, you
15 know, tiny field of view for -- related to *Spector* with these apertures and
16 things. So that's just one place that I would point you to.

17 So I think I have come to the end of my time. Are there any further
18 questions that I can address?

19 JUDGE CHERRY: No, I don't have any other questions. Do any of
20 the other Judges have any questions?

21 Great. Well, thank you very much to both of you. But let's wait one
22 moment. They've asked that we stay on the line after we adjourn so that the
23 court reporter can get any spellings. But with that, the case is submitted and
24 we'll adjourn. Now we'll go off the record and adjourn and reconvene at
25 1:00 for the next one. What time was it? One o'clock for the next one, I
26 guess?

1 Court Reporter, do you have anything that you wanted to ask about?

2 REPORTER: Yes, if I could. I just want to go over a couple things
3 with counsel, but usually we just wait for the Judges to leave. Just give me a
4 minute, Counsel, after they go.

5 JUDGE CHERRY: Okay. Well, the Judges, if you don't need
6 anything for us, we'll go and then you can continue your discussion with the
7 counsel.

8 REPORTER: Thank you, Your Honor.

9 JUDGE CHERRY: Thank you.

10 REPORTER: Thank you very much. Thank you.

11 MR. LAUPPE: Thank you, Your Honors.

12 MR. HAGIZ: Thank you.

13 (Whereupon, the proceedings at 12:27 p.m. were concluded.)

IPR2023-01421
Patent 11,175,405 B2

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