UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
AND GLOBALFOUNDRIES U.S. INC.,
PETITIONER,

v.

GODO KAISHA IP BRIDGE 1,
PATENT OWNER.

Case IPR2016-01376, Case IPR2016-01377,
Case IPR2016-01378, Case IPR2016-01379[1]
U.S. Patent No. 6,197,696 B1

Record of Oral Hearing
Held: September 12, 2017

Before JUSTIN T. ARBES, MICHAEL J. FITZPATRICK, and JENNIFER MEYER CHAGNON, *Administrative Patent Judges.*

[1] GlobalFoundries U.S. Inc.'s motions for joinder in Cases IPR2017-00921, IPR2017-00922, IPR2017-00923, and IPR2017-00924 were granted.

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The above-entitled matter came on for hearing on Tuesday, September 12, 2017, commencing at 2:00 p.m. at the U.S. Patent and Trademark Office, 600 Dulany Street, Alexandria, Virginia in Courtroom A.

P R O C E E D I N G S

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JUDGE CHAGNON: Good afternoon, everyone. This is the final hearing for four IPR proceedings today; IPR2016-01376, -01377, -01378, and -01379, all involving U.S. Patent 6,197,696.

Counsel, could you please go ahead and introduce yourselves and let us know who will be presenting today.

Start with Petitioner.

MR. YOCHES: Yes, Robert Yoches from Finnegan for Petitioner.

JUDGE CHAGNON: And for Patent Owner?

MR. BAUGHMAN: Your Honor, Steve Baughman and Jim Davis for Patent Owner. And with us we have representatives from IP Bridge Han Xu and Mr. Ikegami.

JUDGE CHAGNON: Thank you.

Per the trial hearing order, each party has 60 minutes of time total today to present arguments. Petitioner will present first followed by Patent Owner. And Petitioner may reserve time to rebut any issues raised during Patent Owner's presentation today.

Please also note during your presentations Judge Fitzpatrick is unable to see the screen in the room so please make sure to identify the demonstrative exhibit by slide number that you're referring to, so he's able to follow along

more clearly. And also please remember to speak into the microphone at the podium so that he can hear you.

As we're doing the presentations today, if either party believes that the other party is presenting improper arguments, I would ask that you please just raise that issue during your own presentation and not interrupt the other side during their presentation.

And, finally, we received the parties' objections to the demonstratives and we've noted those. We will overrule the objections. The parties can present their presentations today using the demonstratives as filed. And we just want to remind everybody that they're just visual aids to assist the presentation and they're not briefs or evidence. So we will be able to take that into account in rendering our final decision.

Are there any questions before we begin today?

MR. BAUGHMAN: Your Honor, if I may, I don't expect it will come up, but if there's an objection in the last portion of the presentations, should we save those to raise after the Petitioner's concluded or --

JUDGE CHAGNON: If it happens to come up, please just let us know. We can address that at that time.

MR. BAUGHMAN: Thank you, Your Honor.

JUDGE CHAGNON: All right. If there's no further questions, Petitioner, you can go ahead whenever you're ready.

Would you like to reserve any time today for rebuttal?

MR. YOCHES: Yes, I would like to reserve 30 minutes.

JUDGE CHAGNON: Okay. Whenever you're ready, you can begin.

MR. YOCHES: The technology that we're going to talk about -- if you can turn to Slide 3 to begin with -- has two components. One, is the wiring levels, the wiring patterns or trenches, and the other are the via layers, they go between the levels, contact holes.

And if you turn to Slide 4, what the patent and the prior art is about is forming the vias and the trenches at the same time, that's why it's Dual Damascene. So that's -- unless there's some additional questions, that's about the extent of the background I was going to go into from the technology standpoint.

The issues in all four IPRs are essentially the same. If we go to Slide 9, it summarizes -- there's two, one is an issue of priority and the other is the issue of motivation to combine.

The question of the priority, the question is whether the principal reference, Grill, is prior art which devolves into two questions; is the '696 patent -- can it antedate Grill because Grill has an earlier filing date. And if so, is Grill entitled to the benefit of its filing date

of its provisional application. And then there are some issues with regard to motivation to combine that are raised as well.

The question of -- the first question, which is whether or not the '696 patent is entitled to an earlier filing date, the '696 patent is claiming priority to the '371 Japanese patent. If you turn to Slide 28. And what this issue centers on is the claim construction from the Board in the decision to institute in which they construed the term using different layers as a mask to mean using those layers to define areas for etching.

And just to make sure things are clear, that is the Board's only construction. That is a construction that the Petitioner has applied. We've applied no other construction. There was then an application of that, in other words, a factual finding that was made by the Board in a decision of whether or not under that construction, a specific type of structure was covered.

If we go to the Slide 29. And the Board found that when you have a situation where you have essentially a buried layer, one that is not the top layer, and it has only a flush outside edge that's common with the overlying layer, in that case, that buried layer is not acting as a mask. So that was not a claim construction issue, but an issue of applying the claim construction to a specific factual situation.

So the question -- go to Slide 30 -- for the

Japanese '371 application is whether or not it teaches two elements. And the elements that are being discussed are whether or not steps 10(i) and 13(h), for example, are disclosed in the Japanese application. And in those steps, the question is, does -- in a specific case, does layer 358 act as a mask? Because according to the claim reading that the Patent Owner has relied on to claim priority, 358 has to be a mask.

And in their drawings -- and these are their drawings below here -- they talk about this situation in which there's a misalignment, specifically the misalignment is of the layer 359, the mask for that. And in that situation, you have a portion of layer 358 that kind of pokes out.

And what the patent teaches -- and there's no question about this because the Patent Owner relies upon this and so does the Petitioner. What the patent teaches is when you have that situation, you specifically etch away 358 so that it doesn't act as a mask. You specifically etch away 358 so that it does not interfere with the mask, which is 359. And the reason --

JUDGE CHAGNON: Counsel, is there express language in the Japanese application that says you're etching it so that it does not act as a mask or is that a paraphrase from you?

MR. YOCHES: Well, if you look at the slide, it's a

paraphrase in terms of those exact words aren't there; but if you look at the paragraph 0096, which is reproduced on this slide, the very last sentence, it talks about really what happens by dry-etching when there's a misalignment and you're dry-etching the openings of the mask, you're expanding them so that they are -- they include the opening from the 359 layer.

JUDGE CHAGNON: Thank you.

MR. YOCHES: And the patent explains that the reason you want to do that is because this is a self-aligned mask and you're trying to make sure that your contact hole is not reduced in size because of the misalignment. So in this particular case, the '371 is making sure that 358 is not acting as a mask to cause the contact hole to be smaller.

So if you would apply the definition, the construction, and ask whether 358 is defining the area to be etched, the answer is no. It teaches it's not. And if you look at step 10(j) and 13(i), step 10(j) and 13(i), again, use the resist pattern 359 as a mask.

And when you read the '371, it only refers to 359 as being a mask both for etching in this case the 354 -- I'm sorry, we're on slide 34, excuse me.

JUDGE FITZPATRICK: Mr. Yoches, do you have those claims in a slide when you say 10(j) and 13(i)?

MR. YOCHES: Let me pull those up here. Give us a second here.

JUDGE FITZPATRICK: You know, I have them now. I have them now independently.

MR. YOCHES: This is 107, I'm sorry.

JUDGE FITZPATRICK: Thank you.

MR. YOCHES: And, again, the patent -- the '371 Japanese teaches that only 359 is used as a mask. If you look at Slide 35, it explains what's happening here. 359 is used as a mask and then some of it remains after the etching and it's over etched to remove the rest of the resist pattern there.

So '371, the Japanese patent, does not support Claims 10 or 13 which are the only claims for which the Patent Owner is asserting an earlier filing date. And this makes sense. This is what you would expect. If you look at Slide 37, the Claims 10 and 13 were part of the claims that were added when the '696 patent was filed. They were not -- they were not in the Japanese patent application.

And the embodiments that they cover, the 5th and 6th embodiments and the modified 5th and 6th embodiments were added at the same time. So one might expect then that the Claims 10 and 13 cover the 5th and 6th embodiments, but they don't cover the 3rd embodiment or the modified 3rd embodiment which is what the Patent Owner is alleging.

Now, what Patent Owner is essentially doing, if we turn to Slide 39, is arguing that really the Board has not conducted the proper construction because they have not

followed the broadest reasonable interpretation of the contested term. And, specifically, they say they haven't because there are three examples in which a buried layer with a flush edge is called a mask. And those are the top three examples as they're shown on 39.

But if you take that in context, there are seven times in which you have the buried layer with the flush edge and the buried layer is not called a mask. So there's no consistency there. And on top of that, you have one example, and if you turn to Slide 40, and talking about Figures 22(b) and 22(c), in which the patent calls a layer 509 a mask and both experts agreed that 509 is not a mask in Figures 22(b) and 22(c).

So you have a situation here where the patent is inconsistent with regard to what's a mask and what's not a mask. It's erroneous sometimes. And, indeed, the Patent Owner's made much of the statement by Dr. Smith that something that's not called a mask could be a mask as well too, but that just reflects the fact that what a mask is or is not is in a sense kind of unrelated to what the patent says a mask is or is not.

If you go back to the plain and ordinary meaning that the Board applied to using something as a mask, the way one should do claim interpretation is you should look to the specification and see it has a specification clearly and unambiguously redefine that and it hasn't. There are three

instances where it's gone one way, seven instances another way, another instance in which it's completely erroneous. So the Board's construction as well as its application is correct. There's nothing in the patent that should change that.

And what the law is -- if you turn to Slide 45, these are just some of the cases that were cited. When you have a situation where there are inconsistencies or errors in the specification, those errors and that inconsistency cannot be used to broaden the claims.

The Patent Owner offers another argument. If you turn to Slide 47, on the left-hand side, they suggest, well, in this particular situation, shown on the left, perhaps Layer 2 is acting as a mask because perhaps it is blocking some ions from hitting the substrate.

A couple of things to keep in mind about this drawing. One is it's completely made up. There is no citation to any document that has this picture in it. There's no indication that this represents an actual drawing or diagram. And, in fact, it's inconsistent with the record. If we turn to Slide 48, there's an explanation of that.

Dr. Smith explained that in the etching that we're talking about, which is not only anisotropic meaning in one direction, but anisotropic for Dual Damascene. It is very, very directional. In fact, Dr. Smith explained it is about as vertical -- if you turn to Slide 49 -- it's about as

vertical as it can be. So it doesn't look like that figure at all, at least the etching we're talking about.

And there are patents here that were cited in our papers to the right, the Huang patent and the Yu patent, which make that same point that you have the etching -- the anisotropic etching coming straight down.

If you turn to Slide 50, in his deposition, Dr. Smith was asked, well, how vertical is it? And he testified and, again, nothing to rebut that, it is as vertical as you can get and measure it. So it's pretty vertical. So in this Dual Damascene context with the anisotropic etching, you're not getting the action of -- a flush sidewall has no effect whatsoever.

There was another argument that was raised too, which if we can turn to Slide 52, I will explain. It has to do with a tri-layer resist process. And it's a little bit confusing, but let me see what I can do to address it.

There was an allegation made that tri-layer resist shows that many layers are -- especially the sidewalls are acting as mask and that is, in fact, not the point at all. What happens in a tri-layer resist is, first of all, you got the top layer and you develop that, it's a photoresist layer, and you develop that. And you use that layer then to etch the middle layer. And then you remove the photoresist layer and then you use the middle layer to etch the bottom layer.

So you have three layers, two etching processes.

You never have a situation in which the two layers are acting together to etch any particular layer. So there's nothing magic about the tri-layer resist, it's just a way of using three layers sequentially to perform a patterning.

If you turn to Slide 53, this is from Dr. Smith's book and it is alleged that this is showing that the sidewalls of layers are being used as mask, but there's nothing in his book and there's nothing in this particular excerpt that shows that -- which supports that. In fact, what Dr. Smith explained and he explained -- if you look at the excerpts on Slide 54, for example, and then 55, is the figure that was being looked at is not an actual structure, it's just being used to explain tri-level etching.

And that the actual book explains tri-level etching exactly as I explained it. And all throughout his book, if you look at, for example, Slide 56, he is citing to references. Here's one of the references which shows that you've got the different layers being used sequentially. Nothing in there suggests that the sidewalls of a buried layer has any affect on masking.

And one of the key textbooks, if you look at Slide 60, is the Chang and Sze textbook, which in the highlighted portions explains exactly what happens. It says you use a conventional resist to pattern an intermediate layer, such as silicon dioxide or nitride, that then acts as a mask during the subsequent planarization of the organic

layer by oxygen RIE.

One other issue I want to address on this point is there's a reference that suggested that maybe some of the intermediate layers did have an effect. And if you turn to Slide 62, this is the reference that's being referred to. And the highlighted portion is what's being cited. It's talking about multilayer processing and layers of radiation sensitive, non-photosensitive organic materials are sandwiched together to become the total patterning layer.

And the conclusion that was drawn from this is, well, doesn't this show somehow multiple layers are being used in the patterning. And the answer is no because on the part that's not highlighted, what it is essentially saying is in the photolithography of the top layer, you have to make sure that the bottom layers don't reflect any light that goes through and somehow affect the patterning of the top layer.

So that's all that's being said there. Again, it has nothing to do with etching. Nothing in this reference has anything to support the argument that a flush sidewall has any affect on masking or etching.

Now, if there are no questions here, I'll go to the next issue which is a priority of Grill.

So Slide 64, please. So Grill teaches -- well, so you're looking at Claim 28 from Grill. The question is, does that have support in the provisional application to which Grill claims priority. And, again, the answer is yes because

the claim terms, if you want to look at it, is in Slide 66. And the question is, is there support for the term "transferring . . . while concurrently removing" or transferring the via pattern in the patterned first hard mask layer into the second dielectric layer while concurrently removing a via-patterned second layer of resist.

So the second layer of resist is 62 in Figure 5E. And the second dielectric layer is layer 12. And what Grill teaches -- in fact, if you look at -- now go back to Slide 64. Because when you go from -- in the process from Figure 5E to Figure 5F, you're doing two things; you are patterning layer 12 and you're removing layer 62. The patent explains that they're essentially the same type of material and so they react to the etchant the same way.

And they are then being -- the removal of the layer 62 is occurring at the same time concurrently with the patterning of layer 12. That's taught in the -- in the application that Grill is claiming priority to.

There is an argument that was raised by the papers which said that concurrently means the two processes have to end at exactly the same time. And there's no support for that. There's no support anywhere for the -- either the word "concurrently" or the word -- or the specification that requires the two processes, the transferring process and the removal process, to stop at the same time.

Indeed, the very words of this claim, which says

concurrently removing the pattern, the via-patterned second layer of resist, tells you that it's an ongoing process. It's "removing." It's not the complete removal of. The word "complete" isn't anywhere in this claim. And that's really the only issue that was raised with regard to the Grill claim for priority.

But you don't have to reach that issue if you find that the '696 patent is not entitled to its priority. You only have to look at Grill if you find that the '696 patent is entitled to an earlier date.

Now, in the time remaining, let me just address the issues of motivation to combine. And let's start with Slide 70.

So in the petition -- in the decision, excuse me, the Board found that there was sufficient motivation to combine two references that essentially were addressing the same problem, which is misalignment, lithographic misalignment, and avoiding the need to rework.

One of the arguments that was raised was that if you did this combination, the upper mask, which is a silicon dioxide, would be etched away faster than the lower level, which is silicon nitrite. And it turns out that was a complete error in the expert's analysis -- of Patent Owner's expert's analysis because he got the issue of selectivity upside down. Selectivity is shown in Slide 72, it's explained there.

What that simply looks at is, for a particular etchant, you're taking a look at how fast it's going to be etched away. And it turns out, as you might expect, silicon nitrite is etched much faster than silicon dioxide if you're using an etchant that's designed to etch silicon nitride. So, in fact, you can etch the silicon nitride with barely affecting the silicon dioxide layer. That was just a clear error, a factual error.

The second issue that was raised, if you turn to Slide 76, is whether or not the combination of Grill and Aoyama would defeat the purpose of Grill and, in particular, the purpose of having a dual relief cavity. So what's a dual relief cavity?

Well, Slide 77 explains that. And in the highlighted portion at the bottom here, it explains that in the dual relief pattern, all features of the smaller area substantially overlap with the features of the larger area, the wiring pattern in this particular case. So the combination would -- that's being proposed would have the smaller area, which is shown here on -- the picture above is the small white rectangle that eventually becomes a small red rectangle. And that substantially overlaps and all features of it overlaps the features of the wiring pattern, which is the green.

So you still have the dual relief cavity, nothing's been -- I'm sorry, dual, excuse me. So you still have the

dual relief cavity -- I'm sorry, you still have the dual relief cavity, but look what the patent explains, that what was shown and what the Patent Owner relies upon, is just a special case of the general category. So there's nothing in this combination which is contrary to the desire to have a dual relief cavity.

Two other issues, one is there is an argument that -- if you turn to Slide 79 -- that bad things would happen if we don't take over the carbon-etched layer 45 from Aoyama or if you did take it over, bad things would happen. And Patent Owner spends a great deal of time on that, but we're not suggesting that the carbon-etched layer from Aoyama be added to the Grill structure.

There is already something in Grill, if you turn to, Slide 80, which is Slide 58, which performs the function of that carbon stop layer so there's absolutely no reason to do that. So the argument that there would be problems if it was taken over are irrelevant because we're not suggesting that that element be transported.

And then their last argument is that there would be an unfortunate thickening of the resist. Take a look at Slide 81. If the combination occurred, two things to say about that. One is -- if you turn to Slide 82, you'll see that the additional thickness that would be added because of layer 58, is 20 to 50 nanometers and that's being added to something that's about a thousand nanometers to 2,000

nanometers thick. So it's a very small effect, very small problem that would exist at all.

But more to the point, the '696 patent has the exact same problem. So if it's a problem for the combination that we proposed, it's going to be a problem with the '696 patent. And that's Slide 83, excuse me.

And if there are no questions, I will end the first portion of this.

JUDGE CHAGNON: Thank you.

JUDGE FITZPATRICK: Mr. Yoches, early in the presentation, you said something, I think, to the effect of this is the Board's construction and you relied on it. Is there any other construction that you presented to us for our consideration?

MR. YOCHES: No, no, we did not present a construction and we did not contest the Board's construction.

JUDGE FITZPATRICK: Okay. Thank you.

JUDGE CHAGNON: Whenever you're ready. Take the time you need.

MR. BAUGHMAN: Thanks, Your Honor.

Good afternoon, Your Honors, may it please the Board. We obviously have a lot of material to address here so we'll do what we can in our allotted time.

But the Patent Owner also relies on the arguments and evidence we presented in our papers and we stand by the objections made in Papers 36 and 43 understanding the Board

has taken a view on use of demonstratives for this hearing. It's our understanding, although we'll try to address some of those issues that, as Your Honor stated earlier, these slides are not evidence. So to the extent we can't address something we say is improper in the slides, we understand that the Board wouldn't be relying on new arguments or evidence in reaching its final written decision.

On that subject, I do want to make --

JUDGE FITZPATRICK: Let me just clarify on that.

MR. BAUGHMAN: Yes, Your Honor.

JUDGE FITZPATRICK: Any demonstrative that's not used is completely like nonexistent in my mind. Okay.

MR. BAUGHMAN: Thanks, Judge Fitzpatrick. Understood.

I do want to call out one issue. Turning to Patent Owner's Slide 9, please, our Slide 9. I heard Judge Fitzpatrick's question and Petitioner's response about claim construction. I do want to note that we had an objection about calling, what's on the left side of our slide there, Petitioner's claim construction. I heard just now that they're adopting the Board's claim construction. Until now, we've been told they had no position on claim construction and that we were improperly calling what they had a claim construction.

I do think it's important to note that we obviously have a claim construction dispute here. The issue is a

negative limitation that was introduced in the Board's institution decision before the Board had the benefit of first argument from Petitioner about what the claim construction was.

And, in addition, evidence from the record, including evidence showing the specification, consistently uses the term using as a mask and that includes using multiple intermediate layers with flush sidewalls as a mask.

JUDGE ARBES: Counsel, can I ask a question?

MR. BAUGHMAN: Yes, Your Honor.

JUDGE ARBES: Is this really a claim interpretation issue? Petitioner has characterized it as a factual dispute about what meets the interpretation that both parties seem to agree to. Is this really a claim interpretation issue?

MR. BAUGHMAN: Your Honor, I think it is a claim construction issue because essentially we are arguing about whether the claims exclude the use of sidewalls as a mask, whether that is or is not within the scope of using the designated layers as a mask.

And like the Omega case that we cited on page 15 of our Patent Owner response indicates that kind of removal from claim scope is a matter of claim construction.

And what I think Your Honor will see is that as we look through the evidence here, starting on our Slide 10, we have consistent examples through the spec, and we'll talk about the exceptions that Petitioner argues, that show --

JUDGE ARBES: Before you get into the examples --

MR. BAUGHMAN: Yes, Your Honor.

JUDGE ARBES: -- I mean, are you advocating that we modify the base interpretation "using the designated layers to define areas for etching"? It seems like both parties say they agree with that, but there's something more. Do we need -- in our interpretation in the final written decision, are you advocating that we add or subtract something more to that?

MR. BAUGHMAN: Your Honor, I do think that because the Board in its institution decision stated that the claim excluded this negative limitation, that we need in the final written decision a clarification that that's not the case for the reasons that we'll present and we've presented in our papers.

JUDGE ARBES: Okay.

MR. BAUGHMAN: And, respectfully, I think it's an issue of claim construction because unlike what we just heard from Petitioner, who said that you think about the plain and ordinary meaning of a term and then see if the specification changes that, the Symantec case that Petitioners cited actually completely rejects that approach, it's entirely wrong, and that the key to claim construction is and always remains the specification. You begin with that.

And you can see whether a plain and ordinary meaning is the right application in the specification, but it explicitly criticizes the approach that respectfully

Dr. Smith took and that Petitioner takes in saying what's the meaning and if the spec says something different, it's wrong.

And what we've got here, starting on Slide 10, are three examples from the preferred embodiment descriptions. And what Petitioner suggests is that you simply ignore this language in understanding what the claims mean.

JUDGE ARBES: Well, but there are -- Petitioner made the point there are seven examples that are different; right? How are we to deal with the situation where three examples use it one way and seven examples use it another way?

MR. BAUGHMAN: Judge Arbes, that's a great question and I think what we see here is a quest to find some unifying principle to narrow what it means to use something as a mask. Respectfully, we don't see this sort of seven versus three divide. And we can talk about that.

But what I just want to call out before we get there is on Slides 10, 11, and 12, we have three examples here from the specification where two flush layers are described explicitly as being used as a mask. It is the claim language. We have two layers that are flush doing it. And what -- as we say on Slide 13, what Petitioner is arguing is you should consider all three of those to be errors.

They are three preferred embodiments. By the way, one of them is from the modified 5th embodiment. So the mapping we saw from Petitioner on Slide 37 of Petitioner's

demonstratives, call that up briefly, the suggestion that somehow the new material maps to the new claims so it doesn't apply. They're rejecting the modified 5th embodiment, which they call part of the new material mapping in these claims.

But going back to our Slide 13, what they're telling Your Honors to do is to disregard these statements in the specification. And, respectfully, what they're to say is, well, when we say using as a mask, it's different in different claim terms. Why is that so? There's no indication and there's no concept of claim construction that says, well, using as a mask means something here and something else somewhere else with no explanation.

As to the other examples, I will come to those, Your Honor, but before we move off this slide, the case law here is quite clear. The Apple/Immersion case makes quite evident that BRI must take into account all of what's in the specification. Microsoft reversed the claim construction for failing to adhere to the specification.

And in On-Line Techs, the same situation was presented. You have a claim construction excluding the language of a preferred embodiment.

JUDGE ARBES: Counsel, how do you respond to the case law cited by Petitioner in their Slide 45, in particular, the Columbia case? The patentee cannot rely on its own use of inconsistent and confusing language in the specification to support a broad claim construction which is

otherwise foreclosed. Why does that not apply here?

MR. BAUGHMAN: Two things, Your Honor. First, respectfully, it's not inconsistent or confusing. And we'll talk about the substance of what's actually happening in terms of masking here and the discussion about the drawing that the Petitioner went through.

I think if you actually look at the Columbia/Symantec case, again, at 1362, it says, it is the single best guide to meaning that's the specification. And the variation here, the Federal Circuit was talking about a single sentence that they couldn't reconcile with what they called overwhelming evidence in the remainder of the spec.

And if we turn to our Slide 14, we see, again, the incorrect approach, Slide 14, where the Petitioner's reply talks about 354A being a mask. When the Patent Owner's expert is first confronted with this at deposition, his first reaction is, well, the spec says that, but it's wrong. And, again, that is the completely wrong approach to take under the Symantec case that Petitioners have cited here, Your Honor.

If we turn to their Slide 39, the seven examples --

JUDGE ARBES: Counsel, one question first. Assume for the moment that we find there is inconsistency between the three and the seven, why does that principle from these cases not apply then?

MR. BAUGHMAN: Because in each of these cases,

there's a very small isolated example. They say, well, that -- we don't understand from that. And what we -- if we turn to their Slide 39, Petitioner's Slide 39, we've got three preferred embodiments here.

JUDGE FITZPATRICK: I'm sorry to interrupt, Mr. Baughman. I'm hung up on Slide 14.

MR. BAUGHMAN: Yes, sir.

JUDGE FITZPATRICK: Is there a typo? I assume there's got to be a typo in the red. It says "Cross-examination of Patent Owner's expert." That's Petitioner's expert; correct?

MR. BAUGHMAN: Yes, Your Honor. I'm sorry, that is a typo. Thank you for catching it. I apologize.

JUDGE FITZPATRICK: Okay. Thank you.

MR. BAUGHMAN: And I'm sure there are others that we have missed as well, but I apologize in advance for those.

On Petitioner's Slide 39, Judge Arbes, back to your question, so we've got three examples where they agree it's expressly in the specification that you've got two layers acting as a mask. One of them is added with the material that wasn't in the priority document, the other two were not. They had no explanation except to say that they're all wrong, all three.

What I think is interesting is that the seven examples they say are consistent and against us, actually include examples that are the same as the ones we've cited.

If you actually look at what they're pointing to, so we map to the 3rd embodiment, the 3rd modified embodiment, and the 5th modified embodiment for our three examples.

Let's take a look at their 5th example here on this list, Slide 156 of Petitioner's deck. This is Petitioner's Example 5. And they say, well, look, we've got the claim as a specification calling it here that one layer is being used as a mask so it's improper to say that two are. And it's quoting the specification from 20 to 29 in Column 17.

What they don't tell, Your Honor, is that if you take a look at their Slide 150, our Example 2 picks up right there, it's the same example in the specification. And it talks about layers 308 and 305 being used together as a mask. It's not inconsistent. It's not a typo. It's not three typos. It's not typos throughout the specification. It is how the specification uses the term using as a mask. And there's a physical reason that those intermediate layers are masking.

JUDGE CHAGNON: Counsel, can I interrupt you here on this point?

So is there a distinction then, for example, on your Slide 10, just for something to point out in the figures --

MR. BAUGHMAN: Yes, Your Honor.

JUDGE CHAGNON: -- under your application of the construction of using something as a mask, would this layer

355A, would you say it's always used as a mask or just that it can be used as a mask?

MR. BAUGHMAN: Your Honor, when it is appearing in the way it is here and if there's an etch, as in this figure of the layer below 355A, what is 354, yes, it is being used as a mask every time.

JUDGE CHAGNON: Every time.

MR. BAUGHMAN: And one of the things that I think is interesting is that as I think was conceded earlier, the specification doesn't always exhaustively call out everything that is acting as a mask in a particular step. So it's requiring certain things, but it's not saying, well, this is acting as a mask and that is and that is and that is.

If we turn to our Slide 15, we have two examples where the Patent Owner's -- excuse me, the Petitioner's expert said that something was acting as a mask, in 15, it's 505A, where the specification calls out two other layers that are masking. On 16, we have the specification calling out two additional layers as well and the expert calls out 505A. So we definitely have examples where not everything that is being used as a mask is being recited expressly.

Turning back to Judge Arbes' question, because we're going to go through four of their seven examples, we've gone through one. If we go to their Example 6 on Petitioner's Slide 157, this is the 3rd modified embodiment. They talk about one layer being used as a mask excluding the

idea that two layers could be used.

And then they go to the next step. So this is 16(a) to (b). If we look at their Slide 36, it goes from 16(b) to 16(c). And the explanation they give at the top is that layers 354A and 355B are both identified as masks because 355A is completely removed before 353's patterned so 354A is a mask. That's the reason.

Well, if we keep going from (b) to (c) now (c) to (d) our slide -- I'm sorry, Slide 149 of Petitioner's deck. This is our first example where we have 358 and 355A being recited as being used as a mask together. And 358 doesn't disappear, it doesn't get etched away as in the explanation on Petitioner's Slide 36.

So the idea that somehow their examples are being supported in little bits as long as you squint and close your eyes and don't look at the rest of the example is simply unsustainable.

JUDGE ARBES: Does that apply to all seven?

MR. BAUGHMAN: It applies to four of the seven, Your Honor. I can get --

JUDGE ARBES: What about the other three?

MR. BAUGHMAN: It goes back to the point I made on Slide 15, which is that the specification doesn't need to call out everything that's being used as a mask every time it's being used. It's not an exhaustive list of everything that can possibly be masking in a particular situation.

JUDGE ARBES: Isn't that an inconsistency, though? It's an inconsistency in how it describes it, at least.

MR. BAUGHMAN: Your Honor, I don't think it's inconsistent to say it's raining here and it's raining there without saying it's raining over there. It could still be raining over there. It isn't an exhaustive list of all the things that are masking. It never purports to be.

And a person of ordinary skill reading this wouldn't rip up the specification, throw out three of the embodiments, three of the six, by the way -- excuse me, three of the six, plus modifications, and then say, well, you know what, I'm going to just ignore those when I try to read the specification.

The function here is masking. What is stopping something from reaching the etched surface. And we'll talk about the criticism of that in a moment.

JUDGE ARBES: One more question.

What about the example that Petitioner pointed to that both parties seem to agree is not a mask, but the specification calls it a mask?

MR. BAUGHMAN: That's Petitioner's imagination, Your Honor, we don't agree it's not a mask.

If we take a look at Slide 17, the '696 specification expressly says 509 is a mask. It doesn't depict how 509 is a mask, but we know from all kinds of other evidence in the record, including Petitioner's own reading of

Grill, that there are three-dimensional aspects of some of these objects that do create that flush surface that contacts the etchant.

We know from the Board's institution decision that Your Honors looked on Pages 7, 8 of Paper 11 at a three-dimensional figure describing, I think, it's the 5th modified embodiment in trying to understand one of the 6th embodiments because it didn't illustrate how it was masking. But Your Honors understood that when it says it's masking, there's a reason, there's a way that can happen.

If we look at --

JUDGE CHAGNON: So how did that argument that you just made not -- wouldn't that also apply, for example, where the specification expressly states that -- if I'm looking -- I just have Petitioner's Slide 149 in front of me. If I'm looking at this disclosure that says 358 and 355A are both used as a mask, couldn't that be indicating that someplace else in a different cross section it's not only flush, but it shields some other area of the lower layer?

MR. BAUGHMAN: Your Honor, I don't think Petitioners ever argued that or that there's any evidence to suggest that here. We have the flush sidewalls in this situation. And I can actually show Your Honor some of the three-dimensional examples that would negate that.

If Your Honor will give me a moment, I'll pull a piece of paper together.

JUDGE CHAGNON: Okay.

MR. BAUGHMAN: So if we look at, let's see, Slide 151, this is Petitioner's Slide 151. It's talking about a 3rd example from Patent Owner, this is the modified 5th embodiment. And we see here that layers 559 and 556B are being recited as acting together as a mask and they're completely flush all around. There's no other dimension in which they're not masking. So it's expressly recited.

And, by the way, in case there's some suggestion, well, that's another typo, there are three different ways that masks are described, three different things that are pointed out about where masking is happening in the series of steps that involve the 5th modified embodiment.

So a person of ordinary skill would understand that what's at issue here is masking, what's blocking etchant, not whether it's a top surface or not. And we can come to that, but I'm concerned about losing some of the other threads about the intrinsic record here before we do that.

But if you take a look at Figures 25(b) to 25(c), so going backwards from Slide 151 in the specification, this is the Sheet 25 of patent. So Figures 25(c) from 25(b). You have two layers there that are acting together as a mask, 560 and 559, that are recited as both acting as a mask and are not flush.

From 25(c) to 26(a), you have two layers that both have a masking function, only the lower one is being called

out as the mask. And then you have 26(a) to 26(b) which is also being illustrated, I think, in the 28(b) to 28(c) example, the 3-D version. And that's where we have both are flush all around and being recited as acting as a mask. Now, maybe it's worth jumping for a moment to why that is so.

If we can talk about, let's see, how a person of skill would understand this. Turning to our Slide 19. Here Petitioner is complaining about this drawing. What the testimony from Dr. Glew is, is that etchant doesn't flow perfectly vertically and we know that and we can talk about the examples that Dr. Smith says are super anisotropic, but even there he concedes that they're not actually perfectly vertical. And that some amount of etchant flows in a horizontal direction against the sidewalls. So blocking that horizontal flow does change the shape of the etch at the bottom of the channel.

You can think of it like having a newspaper in a rainstorm. You can hold that above your head and basically their argument reduces to the idea that only the upper, uppermost surface of anything is ever masking. The infinitely thin layer at the top of something, that's the mask and nothing underneath it. So there's a reason we don't see masks in semiconductors that are simply a newspaper being held above your head in the rain. It's a lot different than being in a phone booth which has walls down the side.

Even if the rain is falling straight down, you're

going to get raindrops that are splashing and wetting your feet when you're holding the newspaper above your head. If there's the slightest variation from vertical, your feet are going to get wet if you don't stand inside a phone booth. And so those sidewalls clearly play a function, Dr. Glew testified about it expressly. Pointed out that the bottom of Layer 1 and the top of Layer 2 is indistinguishable the effect they're having on the etch on each other. It's just how you're naming those layers. So they're certainly acting together as a mask.

And in paragraph 67, as we talk about that distinction, paragraph 64 talks about why it's important, how for the high contrast ratio that we're talking about here, slight variations matter. On our Slide 20, this is consistent with the dictionary definitions that we've cited. With the dictionary definition Your Honors cited at institution. We have something here that is acting to shield selected areas of a surface from etchant.

And on Slide 21 of our demonstratives, we have Petitioner arguing that the etch is highly directional and that there's only a little bit of lateral deviation. But we have Dr. Smith also conceding that reactive ion etching does actually yield lateral flow and removal.

If we turn to our Slide 22, he talks about that coming from the chemical aspect of the RIE process. And he says they work together and that's what's causing this.

Turning to Petitioner's Slide 48, we have the suggestion here in the middle of Petitioner's Slide 48, that Dr. Smith says, undercutting just doesn't occur so Dr. Glew is wrong. If you actually look at Dr. Smith's Deposition Exhibit 2040, page 30, lines 11 to 13, he concedes, well -- here's the question, "Is it your testimony there's no undercutting in reactive ion etching?" "No, I've never said that." And then he goes and talks about how there are variations in RIE, it depends on what you're doing.

If you take a look at Petitioner's Slide 47, this is an old figure, but a new argument. Originally, this figure on the right was being used by Dr. Smith to argue there's no undercutting at all. The Petitioners re-purposed this to argue instead that if there's undercutting, it's not being prevented by the sidewalls. And we know that it doesn't need to be fully prevented in order to reduce it. And that's an effect of etching. It's an effect of keeping etchant from reaching the target surface.

Turning to Petitioner's Slide 49, we have testimony from Dr. Smith on the left about verticalness being a desired attribute of Dual Damascene processes, but he says it can be less than 90 degrees and then still you need to go and look at how good your results are if they're still in spec.

If you actually look at the petition itself on page 3, I think it is, there's an image of a Dual Damascene process provided by Petitioner, the sidewalls there are not

vertical. And the two citations here on the right I will just note were not part of the original argument on this point.

Finally, taking a look at page 4 of the reply, Paper 26, you'll see just a huge range of fudge words showing that even Petitioner has to concede that there is imperfectness in the vertical flow of etchants. They talk about "little undercutting." It's "assumed" that things are perpendicular. All this goes to say that, as Dr. Glew testified, there are good reasons that you don't see mask processes without a sidewall and that the sidewalls do matter, they influence how big the etch is at the bottom. And in paragraph 64, it's particularly important in terms of getting high aspect ratio patterning.

JUDGE ARBES: Counsel, is it your position that these flush sidewalls always act as a mask? Let's say there are ten layers instead of two, is every single layer acting as a mask now?

MR. BAUGHMAN: Your Honor, every layer that's coming into contact with the etchant is influencing it, yes. Although we don't have that situation here, we have two. So it's certainly clear. You know, maybe someone can make a physics argument that Petitioner has not made that something super high up in that chain isn't, I don't think that's necessarily correct.

But certainly the layer that's underlying, which in

our situation is typically the one right up against the etchant, that's certainly acting as a mask. And I think there's no principled way of saying that as a category, which I think is what the Board's institution decision said, that intermediate layers aren't acting as a mask.

JUDGE ARBES: Okay. So if it comes in contact with the etchant, however minute, it is acting as a mask?

MR. BAUGHMAN: If it's coming into contact with the etchant on the way -- from the etchant -- on the etchant's way to the etching surface, yes, Your Honor.

If we take a look, Your Honor, at Petitioner's Slide 31, this is the example that was talked about earlier that we rely on, the priority to the '371 document. It sounds like it's agreed that we end up with the structure in the middle there. And really the question is about whether those two layers together are acting as a mask for the etching of layer 355.

Turning to Petitioner's Slide 32, they're arguing it isn't -- they flipped the drawing around here, but the middle row, excuse me, is showing that bit of 358 clipped off. And, by the way, masks are constantly being etched and re-etched and relayered.

The notion that it's being etched ceases to allow it to be a mask is just not -- it's not consistent with anything we see in the record here. And the blue layer 358 is certainly acting as a mask that helps shape that contact

hole for the very reasons I've talked about.

Turning to 171, Petitioner's 171, they make the same argument at the bottom about this not being -- contributing to the contact hole, it certainly is.

Turning to the Petitioner's reply brief, page 12. As part of this argument, they're basically saying that there's not a buried layer acting as a mask that contains a different layer than the top pattern. Well, we know that's not true from their own Example 2.

If we turn to Slide 153, this is another one of those seven examples, Judge Arbes. This is Petitioner's Slide 170 -- I'm sorry, 153. What Petitioner has highlighted here is the mask and what the specification mentions is the mask is layer 104A. We can see that layer 104A is indeed flush with the sidewall on the right.

Now, it is certainly influencing the etch of the via hole 110 on the left there below the exposed area 111, but what's happening on the right, it is an intermediate layer. Their highlighting is the mask, the specification calls it the mask, it's part of the mask.

But I think even Dr. Smith would agree that layer 108 on the right, which, by the way, is a wiring pattern not a via pattern, is contributing at least to the masking of the etch on the right of that via hole. Now, paragraph 12 of Dr. Smith's reply declaration, 1049, says so. He says he looked down. So even he would agree that it's a part of the

mask. It's another example where it's true that 104 is acting as a mask, but it's not the only thing. And I think everybody would agree with that.

Turning to Slide 154 --

JUDGE ARBES: Stay on Slide 153 for a moment.

MR. BAUGHMAN: Yes, Your Honor.

JUDGE ARBES: What are the exact components that are acting as a mask there, all of them?

MR. BAUGHMAN: Your Honor, 108, 105, 104, 103. I'm not qualified to say what's happening on the left, but certainly on the right, those are all, I think, a mask.

JUDGE ARBES: All four. Okay.

And what was Petitioner's contention again, which one --

MR. BAUGHMAN: Petitioner said this is an example that excludes calling 103 a mask and, therefore, it supports them. What they fail to note is that 104 is in the middle as well on the right. And 108 in their -- in one of their arguments, if you were to frame it their way, they would say 108 was the mask. I don't see that in the spec. If Your Honor does, he can point it out.

JUDGE ARBES: The specification never says that 108 is a mask?

MR. BAUGHMAN: Not for this etch.

JUDGE ARBES: Okay.

MR. BAUGHMAN: And, Your Honor, the same is true of

their Example 3 on Slide 154, same situation, 104A is called out as the mask. So the idea that they can mix and match within the embodiments they're referring to and say, well, we get to seven, you only get to three, so let's disregard everything that is in the three pile is simply not how any claim construction happens.

We've explained why it makes sense for the intermediate layers to be referred to as masks because they're performing a masking function. As we note in our papers, adding this negative limitation brings the claim construction to a tighter narrower place than the Phillips construction that applies in District Court.

I'll note briefly about Dr. Smith's textbook. They have 21 slides on this, we have one. Clearly they care a lot about it. The one thing I'll say is on our Slide 23, Patent Owner's Slide 23, Dr. Smith is asked this question about his own textbook: What are these three layers, the imaging layer, the intermediate etch-stop layer, and the planarizing layer, what do they etch? And what does he say, he says, this is a multiple layer resist and they're etching the surface that's highlighted in yellow on the right.

And we have the other textbook talking about things becoming the patterning layer. The new argument we heard today, I never heard it before, about reflectivity on Slide 62, it doesn't change what the document says. This is Petitioner's 62. And if you actually look at that whole

series of slides from 55 to 62 in Petitioner's deck, you see that what we're arguing about is whether you end up with three layers or two.

So the textbook shows three layers after the etch process to create the structure is done. If you look at 56 -- excuse me, 57, you see on the lower right there are two layers remaining, still multilayer. 58, you'll see two layers remaining on the right. 59, two layers remaining on the right. 60, two layers remaining on the right. Same for 61 and 62.

And I think it's telling to look at Slide 54 of Petitioner's. It talks about what Dr. Smith intended to show and what he meant to depict. And you'll note that he tries to denigrate this document as very crude in his deposition, 2010 at 63, 5 to 7. What he meant to convey is not what a person of skill would understand. What a person of skill would understand is what it shows. And Dr. Smith himself testified that that three-layer structure is used to etch the yellow layer underneath.

One last thing I'll mention, Your Honors, because we're running out of time. There's a motion to exclude here, they're very upset about having a later version of Dr. Smith's textbook before Your Honors. But nine years later, this crude diagram that he says doesn't really well depict what's happening, it's still in there.

I'll note that if you take a look at their

Slide 175, Petitioners make a big deal about how we responded to their arguments and they tell Your Honors that they move to exclude these documents all for the same reason, cumulativeness under Rule 403. You'll see that in the middle of the page there.

They must have been reading a different motion to exclude than I did because the first page of their motion says, TSMC moves to exclude these exhibits as, quote, irrelevant and nonprobative under Rules 401 and 402 and 403. We were certainly entitled to respond in terms of relevance, which we did. We also addressed cumulativeness, which -- and 403 before the Board, which is not really an issue. The motion to exclude, the unauthorized motion to strike should be denied. The priority arguments rise or fall for the same claim construction reasons we've talked about.

Unless there are further questions, I'll pass the podium to my colleague, Mr. Davis.

JUDGE CHAGNON: Counsel, I just want to confirm with you, you did not file any motions -- so you're passing it off? I thought you were finishing. I'm sorry, I was just thinking you have a lot of time left.

MR. BAUGHMAN: I'm sorry for speaking fast. We were pressed for time.

JUDGE CHAGNON: Go ahead. I misheard you.

MR. DAVIS: Good afternoon, Your Honors. While the '696 patent is entitled to its earlier priority date, the

Grill reference is simply not. Now, Petitioner's arguments on this point really came in for the first time on reply. And we're left with kind of a procedural quandary here because if these arguments are coming in for the first time on reply, Patent Owner doesn't have a chance for another paper to come in, it doesn't have a chance to submit another declaration addressing their expert's testimony on this topic.

We identified these things that are beyond the scope of proper reply in a paper submitted to the Board. And Petitioner has taken the position that not only should they -- those not be struck and they should be considered, but they're also arguing and asserting that even our observations and all of Dr. Smith's inconsistent testimony on cross-examination also was improper.

If Petitioner has its way, Petitioner's position is effectively they're allowed to put in their whole position on this on reply for the first time and Patent Owner's not allowed a chance to respond to that. That's just procedurally improper.

But even Petitioner's attempt to show that Grill is entitled to its earlier priority date, as a threshold issue just falls flat on its face. If you look at the Dynamic Drinkware case, which Petitioner repeatedly cites, the plain language there says that a referenced patent is only entitled -- this is on Slide 40. A referenced patent is only

entitled to claim the benefit of the filing date of its provisional application if the disclosure of the provisional application provides support for the claims, not a claim, but the claims in the referenced patent.

Petitioner has only tried to address Claim 28 ignoring the remainder of the claims in the Grill reference. And even their attempt to show that Claim 28 was supported, it also fails. This is on Slide 41. Particularly the limitation at the top there where Claim 28 recites "transferring said via pattern in said patterned first hard mask layer into said dielectric layer, while concurrently removing said via patterned second layer of resist."

Now, what Petitioner is arguing is that "concurrently removing" or even just the word "removing" in general, doesn't actually mean removing. It means at least partially removing or some variation of that. And if you look at the Grill reference, all different variations of the word "removing," if it's removed, removes, removing, it's always referring to removing the entirety of what's ever being discussed even if it's talking about only a portion of something, it's saying remove the entirety of that portion. And that's consistent throughout the Grill reference.

We also asked Petitioner's expert about this, in particular, this language of concurrently removing. And what he said here, and it's quoted at the bottom of Slide 41, "Concurrently," well, that "wouldn't cover the situation where

one layer is removed before another layer is completely removed." Again, confirming that removing simply means removing. We have to get rid of the whole thing.

Now, turning to TSMC, Slide 64. You saw this during their opening argument. They refer to Figures 5E and 5F. And this is where the issue is. You see on the left side there, Figure 5E, layer 62 is still there, layer 12 hasn't been etched. And on the right side, layer 62 has been removed and layer 12 has been etched. And the issue is did those things happen concurrently.

There is no support in Grill whatsoever about the order of which -- of which those two things took place. And in fact, Petitioner makes a new argument on this slide in the bullet here arguing that Patent Owner doesn't dispute that the provisional application teaches etching or transferring the via pattern into layer 12 while etching or removing photoresist layer 62. Not only is that new, but it's just completely false. Patent Owner directly disputes that and has done so not only with its argument, but also with the evidence here.

If we turn back to Slide 42 of Patent Owner's slides, you see testimony from Dr. Glew, Patent Owner's expert, explaining that the Grill provisional application fails to provide any disclosure of the timing. It could happen before, it could happen afterwards, it could happen at the same time, there's simply just no disclosure whatsoever

about it.

Now, what's interesting is also it's not only what's not in the provisional, but what was added to the nonprovisional. If you see the bottom of Slide 42, that bolded sentence, that sentence is completely new in the nonprovisional application. And what it says is that "layer 62 is absent from Figure 5F because it is typically removed by the etching process used in pattern dielectric 12."

That means a couple things that are very important. One, the sentence was added because there wasn't any disclosure as to timing in the provisional application. And, two, the sentence tells us that this only typically happens, meaning there are other possibilities, meaning it cannot have been inherently disclosed in the provisional application.

Now, TSMC's Slide 68, attempts to introduce a new argument and a new interpretation of this -- of what typically means here by arguing that there are -- that's actually referring not to the timing of the removal, but instead to the makeup of those particular layers. Again, there's simply no support for that brand-new argument that they're trying to insert belatedly and, quite frankly, in the demonstratives for the first time in violation of this Board's trial hearing order in the St. Jude case cited therein.

JUDGE ARBES: Counsel, why do you believe it typically does relate to timing in the context that is used in the

cited portion there?

MR. BAUGHMAN: Your Honor, just because -- if we can turn back to Slide 42, Patent Owner Slide 42, it's saying the layer 62 is absent because it's typically removed by the etching process used to create dielectric 12, meaning they're happening at the same time, it's removed during that process. Just the plain language of the sentence.

Turning to slide 43. We asked Petitioner's expert when he thought the removal of layer 62 was actually taking place. And in response, as you can see here, he says, "it's after the second dielectric layer is removed in that via pattern." So he doesn't even think they're taking place concurrently. He thinks that the removal of 62 is taking place afterwards, again, demonstrating that Claim 28 is simply not supported by the provisional application.

Moving onto Slide 44. There's two different limitations here at play in Claim 28 that actually have a very similar language. We have "transferring while concurrently" and we also have "transferring at least partially concurrently." Now, Petitioner would have you believe that those references to "concurrently" mean the same thing. And that at least partially concurrent -- the word "concurrently" means actually partially concurrently. As a claim construction, that's just simply flawed.

But in addition to that, Petitioner's attempt to explain why it believes that's the case and really this is

Petitioner's expert here testifying. He thinks the reason that language can mean the same thing is because the number of etches happening in each of those two limitations at play in Claim 28.

And the first limitation is the limitation on the top. Their expert has testified, well, that refers to a transfer or an etch and a removal. And in the second limitation, he's testifying, well, that actually refers to two etches. The problem with this -- even if this explanation made sense in the first place and it doesn't, the problem is his math is also wrong. A removal is an etch, it involves etching. So there's two etches, both in the first limitation and the second limitation, his attempt to explain otherwise is simply flawed.

But if we move to Slide 45, yet another reason why Claim 28 isn't supported is that the removal of layer 62 could have happened beforehand. Petitioner and its expert argue, well, it couldn't have happened beforehand because if it had happened beforehand, this issue of undercutting would have arisen. Well, our expert, Dr. Glew, took a look at that and testified about it and, frankly, his testimony went unrebutted.

As Dr. Glew explained, the issue of undercutting, which is depicted here in Figures 2B and 2C of Grill occurs when that red layer on top is being removed, the sidewalls in Figure 2B are exposed. And when you remove the resist layer

on top, you begin to etch in this undercut layer 12. And that creates a problem that Grill identified.

Now, that's not the situation in the embodiment of Grill that Petitioner is actually relying on, which is shown there in Figure 5E. When the red layer there, layer 62, is removed, there aren't any sidewalls that are exposed necessarily. They're not depicted that way. So there wouldn't be any undercutting.

And if even if there were any undercutting, those portions of layer 12 are ultimately removed, again, demonstrating that the provisional application fails to disclose any timeliness as to whether or not layer 62 is removed before, after, or during the etching of layer 12.

It's for at least these reasons that Grill is not entitled to his provisional date and, frankly, Grill is not prior art to Claims 10 and 13 of the '696 patent.

Moving onto the next issue, this is on Slide 46 --

JUDGE FITZPATRICK: Mr. Davis, let me ask you a question about -- this is one of your first slides that you brought up, it was about Dynamic Drinkware using the language, quote, the claims, unquote. Is there a binding case that squarely addresses this? Obviously the Federal Circuit used that language, but I don't know if the focus of it was on one claim versus the claims?

MR. DAVIS: Your Honor, I think that passage -- and thank you for your question. That passage actually is

discussing a couple of different things. There's not only the issue of whether or not the prior art was entitled to its priority date, but also whether or not a particular claim in the patent at issue was entitled to its priority date. So the Federal Circuit there was addressing the situation of one claim for the patent at issue and all claims for, which it repeatedly states, for the prior art reference.

So I would say it was before the Federal Circuit there and that is the Federal Circuit's language. And I believe it's binding.

JUDGE FITZPATRICK: It's certainly binding and I understand your position. Is there another case that kind of takes this on, that expressly contemplates is the standard one claim, any claim or all claims and then resolves it?

MR. DAVIS: Your Honor, not that I'm aware of. I think, though, this case does address that and does take that on. So beyond this case, I'm not aware of another case right off the top of my head.

JUDGE FITZPATRICK: Okay. Thank you.

MR. DAVIS: And I guess just to put a finer point on that, Petitioner does cite some cases in response that address the issue of priority for a patent claim at issue which is done, we agree, on a claim-by-claim basis, but that is not the same situation as whether or not a prior art reference is entitled to get the benefit of its priority date or its earlier date should apply.

JUDGE FITZPATRICK: Understood. Thank you.

MR. DAVIS: Slide 46. So not only is Grill not prior art to Claims 10 and 13 of the '696 patent, but a person of skill in the art also would not have been motivated to combine Grill and Aoyama in the manner proposed by Petitioner and this is for at least three reasons.

First, Grill is directed to -- its intended purpose, frankly, is this idea of creating a dual relief cavity. And Petitioner's proposed combination completely eliminates that dual relief cavity. It eliminates Grill's intended purpose.

Second, Grill warns against the idea -- or warns against using carbon-based etch stops or photoresists and that's precisely the type of material that Aoyama uses to -- in the teaching that Petitioner proposes borrowing from Aoyama.

And, third, Grill teaches away from and warns against overly thick resist layers on top of a via relative to the thickness of the resist elsewhere. And, again, Aoyama has that very same problem. And we'll step through each of those.

On Slide 47, that first quote at the top of Slide 47, that's from the abstract of Grill. The second quote, that's from the summary of invention of Grill. The third quote, from the field of invention of Grill. And the fourth quote, from the description of the preferred

embodiments of Grill.

Each and every one of those quotations is directed at this idea of forming a dual relief pattern. And a dual relief pattern that they're discussing there and particularly in the bottom quote there that Petitioner's counsel referenced during their opening arguments, that's expressly talking about the example there in Figure 5H.

And what that figure depicts is that a cross section of a wiring groove, that wiring groove is shown going into the page in the box in yellow, beneath that is a via shown in blue. And what that is attempting to connect is connecting the wiring groove to the via all the way down to a metallic pad that's inside of layer 6, it's in that hatched cross section there, in some figures that's labeled as Element 4.

And the reason why -- there's a couple of reasons why the dual relief pattern goes in this direction, it's very specific to the cross section of the wiring group because that's -- as Dr. Glew describes, that's the critical dimension here.

You're concerned about that -- designers of these wafers are concerned about how close they can put each of these wires, not how long the wire can be. It's not something along the wiring groove, it's how wide the wiring grooves are such that you can then put a via underneath there that is smaller to then connect to a smaller landing pad

shown there in layer 6.

Now, Petitioner's proposed combination -- this is on the Slide 48 -- completely eliminates that. If you see on the left-hand side there, you have Grill depicting its dual relief cavity, Petitioner's proposed combination completely eliminates it.

And as the Federal Circuit has repeatedly held and as this Board has repeatedly held, when the proposed combination renders the reference inoperable for its intended purpose, here a dual relief cavity -- and in this case, it actually eliminates it entirely -- then it wouldn't have been obvious to combine the references as Petitioner has proposed. In addition to that, it also would change the principle of operation of Grill because it no longer has that dual relief cavity that Grill is directed to.

Now, Petitioner, on Slide 49, attempts to argue for the first time on reply that, well, the dual relief cavity, that's not actually specific to a cross section of the wiring groove, that's instead you need to think about it in three dimensions. You need to think about it along the wiring groove instead. And there's several problems with that argument.

First, if you look at Grill, you will never see Grill describing a dual relief cavity or dual relief pattern along the wiring groove. It's only disclosed and only described as a cross section of the wiring groove.

Second, we asked Petitioner's expert about this and we asked him if it ever depicts this three-dimensional view that they're talking about, and he said, no, that's not depicted anywhere. And the reason for that is because Grill was focused on a dual relief cavity, which is a cross section of the wiring groove.

And, third, as Dr. Glew testified, the reason for the cross section of the wiring groove is because that's the critical dimension invention the designers were concerned with.

Now, if you turn to Slide 50, you'll see Petitioner's argument and they try to repeat it again here during their opening discussion. They're focusing on this one sentence here in Grill and that's -- the sentence actually is cropped out here. Let's look at a more complete quote of it on Slide 47.

And we just spoke about it a minute ago. That sentence -- that last sentence that's quoted at the bottom, it says, inside a description of the preferred embodiments. That is expressly discussing Figure 5H. And what it's saying is that the "smaller area via pattern" that's shown there in blue, "substantially overlaps with the features of a larger area wiring pattern" that's shown there in yellow.

Instead, Petitioner, on Slide 50, invents a whole new dual relief pattern that it's not described anywhere. And we asked Petitioner's expert -- and this is on

Slide 51 -- how he even got there, how is he interpreting this sentence such that that even makes sense. And we asked him, what do you mean by features? What do you interpret that to mean? He says, that means openings. And we asked him, what do you mean by substantially? And he says, that can means completely.

So if you read the sentence here reconstructed as Petitioner's expert reads it, it reads dual relief patterns in which all openings of the smaller area pattern completely overlap with the openings of the larger area pattern.

So according to their expert's interpretation, you actually have the same pattern both in the wiring pattern and in the via and they completely overlap with each other such that not only do you eliminate the dual relief pattern, but you actually also eliminate either the via or the wiring pattern. You're left with one or the other.

Again, their attempt to distort the plain language of Grill and read in new disclosures and intended purposes of Grill is just simply unsupported.

So the second reason a person of skill in the art wouldn't have combined the teachings of Grill and Aoyama as proposed by Petitioner is that Grill actually teaches away from using carbon-based photoresists. Grill is directed towards -- or Grill talks about trying to use specific carbon-based dielectrics inside of its layers as opposed to other materials.

And that raises a problem because when you start to etch away, for example, other carbon-based photoresists you might also be etching away part of the carbon-based dielectrics that are in the layers themselves, which is of course undesirable. So Grill teaches away from that.

The problem Petitioner runs into is that that material is the same type of material that's used for the photoresists in Aoyama. And not just generally in Aoyama, but in the particular teachings that the Petitioner is pointing to in Aoyama to try to use to apply to Grill.

And as the Federal Circuit has held because Grill teaches directly away from using those carbon-based resists and using those carbon-based materials or etch stops, that a person of skill in the art would not have been motivated to combine those teachings.

And this is on Slide 53. The teaching that Petitioner points to is at the top there. This concept of widening out layer 47 such that you can have and ultimately create, as shown in the upper right-hand corner there, a wiring groove and a through hole that are the same shape. But the problem is -- the reason why it has this particular shape, the reason why they both have the same width, is because of this particular layer, layer 45, which is a carbon-based etch stop.

And if you remove that carbon-based etch shop, Dr. Glew has shown what happens, you actually have a through-

hole that is now the thickness of what the wiring groove was and you have a wiring groove that's even wider. And we talked before about how the thickness of that wiring groove, the width of that wiring groove is the critical dimension for designers.

And as the Federal Circuit has reminded us in W.L. Gore you have to consider the prior art reference as a whole, you can't simply pick and choose these teachings ignoring what they relate to, how they're actually implemented in the underlying reference. Because when you remove the photoresist, it no longer functions the way intended.

Now, on reply, again, Petitioner attempts to introduce another new argument, this is on Slide 54. Realizing the problem that it had with Aoyama, Petitioner attempts to introduce two brand-new references saying, well, here's some examples of a wider hole without a carbon-based etched up layer. As the Federal Circuit has held in Intelligent Bio-Systems and this Board has repeatedly held, that's improper to all of a sudden on reply attempt to introduce brand-new references to substitute out or change their argument for what they are proposing should actually be combined.

Now, if you look at Petitioner's Slide 80, they referenced before you heard Petitioner's counsel say for perhaps the first time that layer 45 is the same or is an equivalent to layer 58. That's just something they haven't

argued before. And it's also something that, frankly, needed to go into their petition. If they were going to argue that they -- that the purpose that layer 45 was serving as the etch stop is now being replaced by layer 58, that's something they needed to actually have described in their petition. It's too late to start doing it on reply. It's too late to start doing it at oral argument according to the Federal Circuit.

Now, the second issue -- or, I'm sorry, the third issue for why a person of skill in the art wouldn't have combined these references relates to the thickness of the resist over the via. And this is shown on Slide 55 of the Petitioner's slides -- I'm sorry, Patent Owner's slides.

Here, again, Grill expressly warns against the concern where you have a thicker resist layer over the via relative to the thickness of the resist over other parts of the -- over other places where the resist is. And you can see that comparing the red line to the blue line in the figures in Grill Figure 2A.

The same problem exists in Figure 18B. The same figure that Petitioner is pointing to to attempt to borrow its teaching from Aoyama, again, showing that that same problem exists in Aoyama, again, demonstrating that person of skill in the art wouldn't have been motivated to combine these teachings because Grill expressly teaches away.

Now, you heard Petitioner's argument during their

opening argument attempt to point to the '696 patent as an excuse for why this is okay. That type of hindsight reasoning saying, well, here it is in the '696 patent so it must be okay, is completely improper. You have to look to the Grill reference to see whether or not a person of skill in the art would or wouldn't have been motivated to combine these teachings. And looking at the Grill reference, it expressly teaches away from it. That case law supporting that is cited there on Slide 56.

You also -- if you turn to Slide 57, you'll see that Petitioner is trying to come up with a new argument saying, well, the thicknesses of the resist aren't -- it's not overly thick over the via, it's actual somewhat similar to the rest of the thickness over other portions. Well, we asked Petitioner's expert about this. And we asked him, those particular teachings that you're relying on here, those particular thicknesses, what do they apply to? Do they apply to Figure 5, which is what you're relying on? He said, no.

He said, Column 8:24 to 31 describes Figure -- we asked him does Column 8, line 24 to 31 describe Figure 5, he says, no, it says Figure 6A. So, again, Petitioner's mixing and matching disclosures here without even explaining a basis for it and their own expert is admitting that it's improper.

Petitioner also brought up this issue of premature thinning in their opening argument about whether or not

silicon nitrite etches at a faster or slower rate than silicon oxide. Remember what Petitioner's counsel just said, he said it just depends on whatever you're using to etch it, whether or not one will go faster than the other.

And it, frankly, doesn't matter. They're missing the point. It doesn't matter whether or not it's going to etch two times as fast or two times as slow. The issue is that Petitioner's proposed combination moves layer 62 out such that layer 58 is exposed to yet an additional etch. And the concern that Dr. Glew identified was in doing that, you might prematurely thin layer 58 and Petitioner just fails to even try to account for that in their petition.

And, again, on reply, they try to bring up the layer thicknesses. And they cite to these same numbers here that are shown at the top of the slide and Dr. Smith's response still applies there. Those numbers that they're now trying to use again, those apply to Figure 6, they're not described as applying to Figure 5.

So in conclusion, Grill is not entitled to its earlier filling date, it's not prior art to Claims 10 and 13 of the '696 patent, and person of skill in the art would not have been motivated to combine the teachings of Grill and Aoyama. Petitioner's attempts on reply to backfill arguments are, a, improper and, b, fall for the reasons we discussed today. And for each of these reasons that Petitioner fails to meet its burden to show by a preponderance of the evidence

that the claims are unpatentable and we ask the Board to so find that.

I think Mr. Baughman has one additional point to add.

MR. BAUGHMAN: Your Honor, if I might use our last minute.

JUDGE CHAGNON: Yes.

MR. BAUGHMAN: Turning to Petitioner's Slide 42, I know that there's been an argument and there was a suggestion that we agreed that 509 wasn't acting as a mask, it's not true. The testimony from Dr. Glew is clipped here on Slide 42. If you actually look at the beginning of his answer, he's talking about the figure here.

He said he didn't opine about it before, he thought he understood it, but the answer starts out with, I don't see a pathway. And then we see here beginning at the quote that's included on 42, as I see in Figures 22(b) and (c) it certainly doesn't negate what's actually shown and stated expressly in the patent itself.

Turning to Petitioner's Slide 43, the suggestion that 509 can't be a mask is made by Dr. Smith by suggesting if look at the top row of figures here on the right, that all wiring patterns go straight from front to back with no break. We know that's not how wiring patterns work. They start and stop with the purpose of wiring patterns is to connect things.

Dr. Smith says, on Slide 44, he can only understand this to be referring to obscure, restrictive and difficult to imagine circuit layouts. How about a circuit layout where the wire ends and includes a via? We can see those on Pages 2 and 3 of the petition. There are plenty of patterns in which that occurs.

The only last thing I'll note is that there are no cross sections that are indicated on Slide 43. If you look at other drawings from Dr. Smith, he does show what cross section is being shown in Exhibit 1049, paragraph 29, and Exhibit 1002, paragraph 232.

Thanks, Your Honor.

JUDGE CHAGNON: Thank you.

Counsel, you have just over 31 minutes. I'll set the clock for 31 and we'll add ten seconds or so in our head, if we need it.

MR. YOCHES: Thank you.

Well, I can't possibly address everything two fast talking attorneys went over. And what I would do I guess is encourage the questions on where they think -- where the Board thinks there's an issue, but I'll point out two things that I think pervade the presentation you heard.

One is there's a lot of positions, a lot of arguments that have been ascribed to us that are just not true. Rather than go through all of them, you've got our papers and I recommend that you -- if you want to see what

our arguments actually say, that you look at the papers.

The second thing I'll just point out because it occurred at the end is a large argument was made that, well, we misrepresented the record because Dr. Smith was talking about layers with regard to Figure 5 of the particular Grill reference or 6A and got 5 and 6A confused. But the fact of the matter is, when you look at Grill, 6A is an extension of 5. So you can use the same dimensions for both because they're talking about the same structure.

I guess we'll start at the beginning with regard to the claim construction issue. And I think the Board, in a sense hit the nail on the head, which was it is the Patent Owners who are trying to change the Board's construction here. And they're trying to change the Board's construction in a curious way because it's not in any of their papers.

They seemingly want to suggest that whenever you have a vertical -- whenever you have a vertical sidewall of a buried layer that must be a mask. And I believe that's the position they're taking. And I think the question was asked and I think the answer was pretty much the affirmative. And if that's the case, then everything's a mask. The word "mask" has no meaning in that particular case.

And more to the point --

JUDGE ARBES: I'm sorry, Counsel, why does it have no meaning then?

MR. YOCHES: Because every layer then is a mask.

It doesn't -- everything that does not get in the way is a mask. So you've got -- every time you start building up a semiconductor, you've got tons of masks. And that's not the way it's used in the art because there's no reason under their logic that you would stop at two of the masks. The one example that was shown you'd have five masks in that case because there were five layers over there.

JUDGE ARBES: But if that's not how the term is normally used, that is how the patent uses it at least some of the time.

MR. YOCHES: Some of the time and I would agree with that. The fact of the matter is, if sidewalls of a buried layer were considered a mask, you would think that their expert would find one reference, one book, other than the patent itself, or one paper that said that and he did not. There's nothing in his declaration that says anybody other than him, in this particular case, considers the sidewall to be a mask.

JUDGE ARBES: Let me pose a hypothetical. Let's say that the specification only used it in the manner of the three examples we've been talking about, where they talk about the two layers both acting as a mask, there were no seven examples. Would you agree then that when the claim uses acting as a mask, it can encompass the two layers then?

MR. YOCHES: Yes, I would agree that if the specification was consistent and it was unmistakable, which

is what the test is, that the Patent Owner was acting as his own lexicographer in redefining that term, then yes. If that were the case, I would agree with you, but that's not the case here.

And the examples that were given, the four examples where they took one of our examples and said it was inconsistent with their examples because in their example, the third modified embodiment, for example, both taught that there were two layers acting as a mask in one layer, but they were talking about different layers.

And there's nothing more confusing, if you will, then in one device where layer 359 is a single mask, even though it shares flush edges with a bunch of lower masks, and those lower masks, two of them together are considered a mask.

JUDGE ARBES: Can we talk about one of those examples. In your Slide 153, for example --

MR. YOCHES: Okay.

JUDGE ARBES: -- Patent Owner made the point that in Figure 6B under -- in your theory, the mask would be 108 at the top, at least when we're talking about the right side. The mask would be 108, but the specification says that 104A is acting as a mask. How do you reconcile that with your position?

MR. YOCHES: Well, I think there's two ways and, in fact, I think this works against the Patent Owner.

The specification I don't think was saying that the only thing that ever acts as a mask on the left hand -- or on the -- on both sides is 104, but in the context of what was being described here, they were talking about etching away the 105 and the 108 so that 104A was acting as a mask.

But they -- the Patent Owner says, well, if it's acting as a mask on the left, look, it's 104A over on the right it must therefore be a mask there too. However, if that were true, then 108 and 105A would be a mask and they're clearly not masks. In the context of that, the entire disclosure there, they're only talking about what happens after you etch away 105A and 108.

JUDGE ARBES: But, I guess, why does this support your position because it seems to me that in order for your position to be supported by this, it would have to say that 108 is a mask?

MR. YOCHES: It would have to say -- if they were talking about the entire both sides of it, then, yes. But this context was only talking about the left-hand side and the left-hand side is 100 -- if it were their position, it would have said 104A and 110.

JUDGE ARBES: Okay. So in your position then, it should say then that 104 is a mask on the left and 108 is a mask on the right?

MR. YOCHES: Yes, if it were going into that kind of detail. The fact is, you have all these inconsistencies

throughout this patent that do not allow you to take three examples and use that to redefine what acting as a mask is.

JUDGE ARBES: Counsel, are these -- let me ask a broader question here. Are these really inconsistencies or are they more indicative of the broad usage of this language, that this acting as a mask means something more than the narrow way that you're using it?

MR. YOCHES: I don't think it's the narrow way it's using it, I think it's the way it was in the definitions that was mentioned here, which is it's actually masking something and preventing certain etchant from reaching it.

The question I think you're asking is so, therefore, does everything that lines up act as a mask perhaps because it doesn't get in the way and the answer is not necessarily. And let me give you an example.

What if one of the buried layers was, in fact, etched by this etchant, is it acting as a mask or not because it's kind of absorbed the etchant there? I don't know. Their misuse of what a mask is raises all these quandaries.

JUDGE ARBES: I'm sorry, can you explain that point a little bit more? What if one of the buried layers --

MR. YOCHES: Well, take this example here on 124. And they would say that 559, 558A, 555A and 554A, I believe, are all masks.

JUDGE ARBES: We're talking about Figure 26(b)?

MR. YOCHES: Yes.

JUDGE ARBES: Okay.

MR. YOCHES: So that would be their position; right?

JUDGE ARBES: Yes.

MR. YOCHES: My point is -- and I've misstated it. So 554 is what's being etched. So they would have three masks here, 559, 556A, and 555A.

My question is, what if 556A were actually respondent to the etchant, is it a mask or not a mask?

JUDGE ARBES: I'm sorry, 556A?

MR. YOCHES: Yeah, it's the middle one.

JUDGE ARBES: 555A?

MR. YOCHES: No, they're saying 555A is a mask. Or let's say 555A, any of those --

JUDGE FITZPATRICK: I think you misspoke a moment ago. I think you meant to say 556B when you, in fact, said 556A. So maybe repeat your argument.

MR. YOCHES: I'm on 26(a). I'm sorry, on the left-hand side.

JUDGE FITZPATRICK: Okay. I thought you were on 26(b). Okay. Now I'm there with you. I'm on 26(a).

MR. YOCHES: 26(a) you have three layers there with flush edges. And according to the claim construction that the Patent Owner is urging, all of those would be masks. Why? Well, because somehow they don't get in the way, I guess, of what is going to be etched here on 554.

But are they masks if they're only resistant to the etchant? What if they're not resistant to the etchant? In other words, what if 556A for example actually reacted to the etchant, is it still a mask? What if 555A reacted to the etchant, is it a mask?

JUDGE ARBES: Doesn't the term "mask" imply that it is resistant to the etchant?

MR. YOCHES: Well, their argument is it just has to have a flush edge. That's -- the fact of the matter is, again, if there was some teaching out there that suggested that that flush edge was a mask, acted as a mask, you would think there would be at least one textbook out there that said that.

The other issue that I think is important here is when you talk about Slide 47 of our slide deck, they rely so heavily on, this comes from nowhere. There's no books -- no book has this picture on the left, there's no support for that. It's not even an anisotropic etch. You have the etchant going in all directions here.

And here's the other point that's missed here because if you look at the dimensions of what layer 1 and layer 2 would be taking what Dr. Smith said in viewing Grill, the layer 1 is about a thousand nanometers. The layer 2 is 20 to 50 nanometers. So you're talking about anywhere from a 20- to 50-to-1 ratio there and the question is, what possible effect would that have? Virtually none.

The other question that if you look at this figure is they suggest that if you didn't have layer 2, that somehow the substrate would look different. But I don't know how it would look different in the sense because, I guess, if something would be stronger, but something would always be there. The layer 1 is not floating up there.

JUDGE FITZPATRICK: What if we switched those numbers hypothetically and layer 1 was the very thin layer and layer 2 was the thick layer?

MR. YOCHES: I don't think it would make a difference because these are anisotropic etches which are, as Dr. Smith testified, again, without rebuttal, he testified that it's as vertical -- you can make it as vertical as you want to within the measurement technique. He did testify --

JUDGE FITZPATRICK: I think I misunderstood your point then. A moment ago I thought you had implied that layer 2 is too thin to make a difference?

MR. YOCHES: No, that was -- I'm sorry, I didn't mean it to --

JUDGE FITZPATRICK: I'm saying so if you switched it, if layer 1 was the thin layer -- I'm just wondering hypothetically if there's a situation where layer 1 is not thick enough to resist the etching despite its being made of etch-resistant material.

MR. YOCHES: I guess your question would be if it's not going to resist the etchant, then it's going to be etched

away, in which case, you're going to be exposing layer 2.

JUDGE FITZPATRICK: Well, maybe layer 2 was also acting as a mask in the hypothetical?

MR. YOCHES: Right. And if layer 1 is etched away, and then layer 2 now acts as a mask, but that's not the situation that we're dealing with with regard to the '371 priority document.

JUDGE FITZPATRICK: Okay. So because it's shown, it's shown to still exist, it survived and the layer below played no role; correct?

MR. YOCHES: Let me be very specific about this because I'm not trying to suggest that there is no situation ever at all in which something might or might not occur. I'm saying in the Dual Damascene arena that we're talking about, which is the '371 reference, that is highly anisotropic. Meaning it's highly vertical where the etchant is going. Meaning the sidewalls play no effect.

And that is what Dr. Smith's testimony is. And I urge you both to read Dr. Smith's testimony, but also -- it's in the record -- to read his deposition transcript too because what the Patent Owner has done is taken little bits and pieces from different parts of it and put it together to try and show there's an inconsistency. And let me give you one example.

There was a quote from the deposition transcript that somehow Dr. Smith said, oh, there's no way to avoid

lateral movement. And I think we might find it. But what Dr. Smith, first of all, says is he didn't understand the question most of the time, but all he really was saying was that, you're right, there might be some lateral removal -- there might be some lateral removal, but that has nothing to do with whether or not the sidewalls are acting as masks or not.

But they position that right after a statement about whether the lateral sidewalls are acting as masks to suggest that the two things are related, they're not, they're two different lines of questions.

If we turn to Slide 32 of our deck, let me just explain what this is because I think it was misrepresented. This is the -- what happens if you have misaligned the layer 359 in the '371 priority document. And so the way to look at this is you got the top view looking down, which is the multicolored one, second column. The third column, the middle column, is what the brief layer 359 looks like, it doesn't change. Layer -- or the fourth column over is layer 358. And then the last column is what's being etched.

And if the question is what is defining the area for etching? The area for etching is being etched here on the last line -- the last column is exactly what 359 was defining. And 358 was etched away so that it didn't get in the way. That's what the '371 patent says. So that it did not -- it was widened to prevent it from narrowing what would

be the contact hole.

And if we can turn to -- excuse me -- Dr. Smith's textbook, in particular when he's talking about what was being shown there, which I believe is Slide 53. He's not saying there's anything wrong with this, nor is he saying that he made a mistake. That was just a complete misrepresentation.

What he says in the highlighted portion of 54 is it was not meant to depict what the final result would be. And he explains why. He's not labeled it in terms of what they are, but the processes that are used to transfer the layers.

The Patent Owner has said, oh, this must be a structure. He told them it's not a structure, he explained it's not a structure, he explained it's just showing sequential processes and they ignored him. And that, if you look at the arguments that they're presenting most of the way through, is pretty much the same thing that's occurring on most of their arguments.

There was -- unless we have more on this part, I'd like to jump to some other issues.

Patent Owner has complained that with the procedure that, you know, the Board, panel, and following the Federal Circuit has set out that somehow they're disadvantaged. Well, they had a solution. They could have asked for a sur-reply. IPB asked for a sur-reply in the other, they didn't here for strategic reasons. So they can't be free to

complain that somehow they're disadvantaged.

We couldn't have possibly anticipated what all their arguments were because, as you can see, claiming priority is a claim-by-claim basis. So we wouldn't have known which claims they're claiming priority on. They only claim priority on two of their claims, but how would we have known that until they actually did it.

How would we have known what their arguments were going to be? So what we did was we said, we don't have the burden, but here is what we think is in the real priority document that would support an earlier date. So they actually not only knew the argument, they responded to it. And they chose for strategic reasons not to ask for a sur-reply.

Can we get Slide 42 of their deck?

Now, what we saw, without going through it again, is that in two successive steps that the Grill priority document showed, you had an unetched layer 12 and then you also had a resist layer 62 and then one step later 62 is gone and 12 is etched.

And the argument that Dr. Smith explained, again, pretty clearly, is that a person of ordinary skill in the art reading this would understand that the two things happen at the same time, they're the same essential material using the same etchant.

The only statement that was added here, which is

the one at the bottom, only says that the pattern's second resist layer 62 is absent because it is typically removed by the etching process. That is not new matter, that is exactly what was shown, it's just stating it in different terms, exactly what was shown in the priority document.

And there's nothing here that supports the argument that somehow what was added was that the two -- the etching and the patterning -- I'm sorry, the etching and the removal had to occur at the end at the same time. So what was added here, this one little sentence, doesn't support what they now say the claims mean.

Let me get Slide 66 of ours. So what Dr. Smith explained when asked in his deposition and in the declaration that he provided, was two different terms of using because two different things are happening.

In the case on the left where you're transferring the pattern, in other words, you're etching 12 concurrently with removing the pattern layer, that's two different steps. One is a removal where you're not trying to pattern anything, you're just trying to get rid of everything. And the other is an actual patterning which is controlled in time.

So one overlaps the other one, but it doesn't have to end at the same time. And all he was saying is in this case on the right where you're talking about at least concurrently, you have two separate patterning steps and you can't really control which one is going to end or -- and

begin first or second and end first or second, but they do overlap, they do occur at the same time, it just doesn't matter. And that's why partially concurrently is different there.

There is no attempt to equate partially concurrently with concurrently. And there's an explanation in our papers and an explanation in the declaration about why they're different.

So in the time remaining, let me address the motivation to combine issues.

So the first question is the dual relief cavity. Again, if you go to Grill, on Slide 77, and ask what the dual relief means, it just means that -- at the bottom it says there -- all features of a smaller area, the via, significantly overlap with the features of the larger area, the wiring pattern. That's what happens in our combination. The features of the smaller area entirely overlap, but I would argue that entirely is a subset of substantially.

There's nothing inconsistent here. And, indeed, the wiring pattern is different from the contact pattern, necessarily so, because there's an additional dimension here. I don't think there's any argument about that. But the important part here is that there is no suggestion that what the combination that is being proposed here would make anything about Grill unworkable.

There's no suggestion that you would somehow defeat

this purpose of the dual relief pattern. And as explained, all that was shown in the patent was a special case of the general categories. So the dual relief is broader than just that one picture.

The second issue with regard to the carbon layer, they -- it doesn't really matter what they're arguing when they're saying that something would happen with the carbon layer if it were brought over because we're not suggesting you bring the carbon layer over. That's not in any of our petitions. That wasn't in any of the papers we filed.

So all of these wonderful drawings they have about what would happen if you did or didn't do it are pretty much irrelevant. And to the extent that carbon layer performs a function, it performs a masking function, that is performed by layer 58, which is already in Grill so there's no reason to bring it over.

And on the last issue, and I think there's a misunderstanding, which is of the thickening of that film, the point is that the additional thickening that is added by the combination is insignificant. And we've given the figures and we've explained why those figures are accurate because Figure 6A is just an extension of Figure 5.

And the point of referring to the '696 patent is simply to say that if such a small change were a problem, it would be the same problem in the '696 patent. And the point is the '696 patent doesn't suggest it's a problem at all. So

it's not that we're looking backwards with regard to this, it's just that we're showing that there's evidence there that it's really not a problem.

So I know I have three minutes left, but unless there are any questions?

JUDGE FITZPATRICK: I don't have any questions, Mr. Yoches. Thank you.

JUDGE CHAGNON: Thank you so much for your presentations.

Did you --

MR. BAUGHMAN: Your Honor, if I may, I do have one objection to state for the record very briefly.

JUDGE CHAGNON: State it with no additional argument, please.

MR. BAUGHMAN: Understood.

And I'm reluctant, but it was something we raised before the hearing. On Slide 47, Petitioner's counsel made an argument about criticizing layers 1 and 2 of the drawing based on the dimensions of those layers.

There had been a demonstrative that contained that argument. We had objected to it. It had been taken out of the deck. So it's a discussion that we talked about before. It's a new argument. We didn't have a chance to respond and we would have pointed to dimensions, for example, the figures on Slides 149 and 150.

Thank you, Your Honor.

JUDGE CHAGNON: Thank you everybody for your presentations today. This is very helpful. And this hearing is adjourned.

Thank you.

(Off the record at 4:02 p.m.)

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