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Paper No. 47

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD. and
SAMSUNG EWLECTRONICS AMERICA, INC.

Petitioner,

v.

RESONANT SYSTEMS, INC.

Patent Owner.

IPR2023-00992 (Patent 9,369,081 B2)
IPR2023-00993 (Patent 9,941,830 B2)

Record of Oral Hearing
Held: October 10, 2024

Before JAMES J. MAYBERRY, STEVEN M. AMUNDSON, and MICHAEL T. CYGAN, *Administrative Patent Judges*.

APPEARANCES:

ON BEHALF OF THE PETITIONER:

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The above-entitled matters came on for hearing on Thursday, October 10, 2024, commencing at 9:00 a.m., at the U.S. Patent and Trademark Office, 600 Dulany Street, Alexandria, Virginia.

1 P R O C E E D I N G S

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3 JUDGE AMUNDSON: All right, let's go on the record. Good
4 morning. Are we on the record?
5 COURT REPORTER: Yes, Your Honor. Thank you.
6 JUDGE AMUNDSON: Okay, thanks. Good morning. I'm
7 Administrative Patent Judge Amundson and with me on the panel are judges
8 Mayberry and Cygan. Today we have our final hearing in two IPR's
9 between the Petitioner, Samsung Electronics and the Patent Owner Resonant
10 Systems. First, IPR2023-00992 involving US Patent number 9,369,081.
11 And second, IPR2023-00993 involving US Patent number 9,941,830. Let's
12 get the party's appearances. Who do we have for the Petitioner?
13 MR. SHARIFAHMADIAN: This is Ali Sharifahmadian on behalf of
14 the Samsung Petitioners. Today my partner, Jeffrey Miller will be arguing
15 for the Petitioners.
16 JUDGE AMUNDSON: All right, very well. Thank you. And who
17 do we have for the Patent Owner?
18 MR. RUBIN: Good morning. This is Neil Rubin of Russ August and
19 Kabat and I will be arguing today on behalf of the Patent Owner, Resonant
20 Systems.
21 JUDGE AMUNDSON: All right, thank you and welcome to
22 everyone. Because we are conducting the hearing by video, we wanted to
23 start by addressing a few items. First, our main concern is your right to be
24 heard. If at any time during the hearing you encounter technical or other
25 difficulties that you feel undermine your ability to adequately represent your
26 client, please let us know immediately, for example, by contacting the team

1 members who provided you with the connection information. Second, when
2 not speaking, please mute yourself. Third, please identify yourself each time
3 you speak. This will help the court reporter prepare an accurate transcript.
4 Fourth, we have the entire record, including the demonstratives. When
5 referring to a demonstrative or an exhibit or a paper, please do so by
6 identifying the slide or page number. Also, please pause a little bit after
7 identifying the slide or page number to give others time to find it. Fifth, we
8 set forth the procedure for today's hearing in the order granting the requests
9 for oral argument.
10 But just to remind everyone the way this will work, the order granting
11 the requests for oral argument provided that each party will have 90 minutes
12 of total time to present arguments for IPR2023-00992 and IPR2023-00993.
13 Petitioner bears the ultimate burden of proof and will go first, and Petitioner
14 may reserve time for rebuttal. Patent Owner will go next, and Patent Owner
15 may reserve time for sur-rebuttal. But Patent Owner sur-rebuttal must be
16 limited to the issues in Petitioner's rebuttal. Also, please do not interrupt the
17 other party while that party is presenting its argument. If you have an
18 objection, please raise it during your argument. I will keep time, and will try
19 to give you a warning when you're nearing the end of your time. Are there
20 any questions before we proceed? All right, it looks like there are no
21 questions, so. All right, let me ask Mr. Miller, do you want to reserve any
22 time for rebuttal?
23 MR. MILLER: Yes, I'd like to reserve 30 minutes. I don't think we're
24 going to need the full 90 minutes, but we will see.
25 JUDGE AMUNDSON: All right, very well. You may begin
26 whenever you're ready.

1 MR. MILLER: All right, I'm going to share my slide deck, and I hope
2 this works. Are you seeing the slides?
3 JUDGE AMUNDSON: Yes.
4 MR. MILLER: It's the full screen slide?
5 JUDGE AMUNDSON: Yes.
6 MR. MILLER: Great. Okay, so as Mr. Sharifahmadian said, I'm
7 going to be arguing on behalf of the Petitioners here, Samsung Electronics
8 and Samsung Electronics America. And we're going to focus in on the areas
9 where the parties have made clear where the disputes lie. We're not going to
10 obviously tread over ground that it's going to have no impact on the final
11 outcome here. So on slide two here we just list where we're going. We're
12 going to give you a brief overview of the situation and we're going to go
13 through each of the grounds where there's a challenge to our proof.
14 So let's talk briefly about the instituted grounds. And as you noted at
15 the introduction, there are two different IPR's here. The both patents are
16 remarkably similar and so the grounds, not surprisingly, overlap quite a bit.
17 But for grounds 1A through U the challenged claims are claims one through
18 nine and 14 through 17 in the '992 proceeding. And then there's a separate
19 set of grounds where the issues overlap with the ground one and then there's
20 parallel grounds for the '993 proceeding. If it's okay with Your Honors,
21 when I point to proof in this case, in this argument today, I will almost
22 always be referring to citations to the record in the '992 proceeding. The
23 exhibits in each proceeding are the same, but as you can imagine, for
24 example, the '830 Patent, which is a continuation of the '081 Patent, some of
25 the line numbers don't line up exactly the same, but when I provide citations,
26 there will always be to the record in the '992 proceeding.

1 Okay, so I'm going to provide a brief overview of the two patents.
2 Again, the patents are, other than some minor wording and the claims are
3 essentially the same. Both patents are directed to what are called linear
4 vibration modules. There are essentially - there's, as far as I know, there are
5 two different types of vibration modules that you can put into an electronic
6 device, like a phone or other things. There are essentially rotational ones
7 that have an unbalanced rod that spins, and it creates vibrations due to the
8 unbalanced nature of the rod. And then you have what's at issue here, which
9 are these linear vibration modules, where some form of a weight moves back
10 and forth. And just for the record, I'm moving my hand in a linear fashion,
11 so you can see what a linear module does, how it operates. Those are not
12 unknown things prior to the filing of these patents, as we'll see.
13 But basically, in each patent, and I'm showing Figure 4A from each
14 patent on slide eight, at a very high level, the components of one of these
15 devices include a magnet, which moves, which is element 404. There's
16 some type of driving means, which in the case of this figure is a coil, and
17 that's element 420. And then you have capping magnets or something at the
18 end of this tube, which has a magnetic polarity. And as electricity goes
19 through the wire, it sets up magnetic fields, and it pushes the magnet from
20 one end to the other, back and forth into this tube, and that creates a
21 vibration. So, in other words, if your phone rings and you have it set to
22 vibrate, if your phone has one of these linear vibration modules in it, that's
23 what's going to be causing the vibration.
24 So, let's talk first about claim construction. There are some disputes
25 in this case about claim construction. Let me get into our view here. So, the
26 first issue is whether means plus function applies to certain of the claim

1 elements. As I'm sure Your Honors have noticed, in our petition, we put in
2 evidence under both for the disputed claim terms to be either non means plus
3 function or means plus function. We do believe that where there is a
4 dispute, that the claim should be construed as means plus function. But we
5 would not be surprised if you disagree. And of course, it's well within the
6 Board's right to disagree with us, because there is a presumption that they
7 are not means plus function because they, none of the claim terms use the
8 word means in them. At institution, there were two different opinions on an
9 institution. So, in the '992 two petition, the Board instituted based on its
10 view that terms such as control component were not means plus function.
11 And in the '993 petition, the institution's decision had determined that
12 Samsung had not met its burden of establishing that these terms were means
13 plus function. And so, like it did in the '992 petition instituted based on the
14 non means plus function construction.
15 As the Board, I'm sure, noticed the only evidence in the record of how
16 this, these claims and the prior art applies to them under non means plus
17 function is found in Samsung's petition. Resonant made no effort to rebut
18 any of that evidence. So if you should determine that these claim terms are
19 not means plus function, then there's really only one possible result here,
20 which is that Samsung wins. Now let's talk about the means plus function
21 constructions. And I'm going to focus on the control component
22 constructions because I think this is where the bulk of the dispute arises.
23 First as to whether or not it is means plus function, and then whether or not,
24 if it is, what the construction is. And I'll note that for purposes of this IPR
25 proceeding, the issues are pretty narrow for what that you actually need to
26 address. The Patent Owner spent a fair amount of time trying to argue about

1 some claim construction issues that we don't think apply here. They seem to
2 be really more directed to the infringement case and the parallel litigation.
3 So we're not going to focus on anything that may have some impact in the
4 litigation. We're only going to focus on what matters here.
5 So I'm on slide twelve. I've put out the competing constructions for
6 the control component limitation, which is found in claim one of the '081
7 Patent and several claims of the '830 Patent as well. So, as you can see in
8 the middle column, I've put for Samsung's construction, which is that the
9 structure is a processor and an H Bridge Switch. And I've highlighted here
10 providing a corresponding output to the H switch, the H Bridge Switch. The
11 second item is also an issue here, although not so much from a construction
12 point of view, but on the right hand side, you can see what Patent Owner has
13 set forth. They've got a lot of stuff in here, again, that I don't think you need
14 to get to today. But they do say in element b of their 112, paragraph six
15 instruction that you must provide a corresponding output to the power
16 supply. I think one of the issues we'll see is where it says so that the power
17 supply provides a corresponding output to the driving component. We have
18 that as well, but I'm going to go through the dispute now. So I'm on slide
19 13.
20 JUDGE AMUNDSON: This is Judge Amundson. I had just a
21 question about the Samsung's proposed construction of the control
22 component, and it concerns a preferred embodiment. And so, if I'm looking
23 at the '081 Patent, column eleven starting at around line 43, and the patent
24 discloses an embodiment that involves a simpler oscillator circuit with
25 additional circuitry. So, correct me if I'm wrong, but as I understand

1 Samsung's proposed construction for the control component, that
2 construction would exclude that preferred embodiment.
3 MR. MILLER: You said around line eleven, you said?
4 JUDGE AMUNDSON: Oh no, I'm sorry. Okay, I'm sorry. Column
5 11, '031 Patent, Column 11.
6 MR. MILLER: Yes.
7 JUDGE AMUNDSON: And then there's a paragraph that starts at
8 around line 43.
9 MR. MILLER: Okay.
10 JUDGE AMUNDSON: And then this base, well if you look at the
11 first sentence which reads, "Alternative, lower-cost linear-vibration modules
12 can be designed and manufactured by replacing the processor or
13 microcontroller 602 in Fig. 6 of the above-described linear-resonant
14 vibration module with a simpler oscillator circuit with additional control
15 circuitry." So, it's that embodiment I was asking about.
16 MR. MILLER: I see, yeah. So I think there's a problem there, which
17 is that, yeah, I would agree with you that it seems like they're trying to
18 provide you with some further, how shall I say it, an additional embodiment.
19 The problem is that there's really, other than saying that there's an oscillator
20 and it says that there's some additional control componentry. The word
21 control circuitry, it doesn't say what that control circuitry is. So that creates
22 all kinds of problems if this is a 112 paragraph six construction. Because
23 what is that control circuitry? So, and be that as it may, you know, even if
24 that were the construction, then, you know, my case is actually easier here
25 because we've very obviously made that that's all there is to it for 112(f)
26 instruction. Does that answer your question?

1 JUDGE AMUNDSON: I'm not sure. Okay. But your answer leads
2 me to a couple follow up questions. I'm not a person of ordinary skill in the
3 art, but it seems to me if I had an oscillator that produced a square wave and
4 then all I would really need to use that to control the H Bridge would need, it
5 would perhaps be just an inverter. Okay. An oscillator producing a square
6 wave and an inverter that sends the signal to two of the switches in the H
7 Bridge. Would that be, would that work?
8 MR. MILLER: It's possible it would work, but again they don't. You
9 know, you're applying, how do I say this? You're applying to something that
10 you assume might work. But the problem is that specification doesn't, that's
11 far more detailed than the specification provides. And you know, I would
12 agree that maybe if this is not 112, paragraph six that that might be a viable
13 option, but the problem is that if it is 112, paragraph six, saying control
14 circuitry, that's basically, you know, from here to infinity as to what the
15 possible control circuitry could be. And that's not how 112(f) typically
16 works.
17 JUDGE CYGAN: Counsel, this is Judge Cygan. So in your opinion,
18 the following paragraph, the one that follows the one Judge Amundson was
19 asking about, talks about the example of implementation where the user has
20 provided an input feature that allows the user to directly adjust the
21 frequency. In your reading, that's not sufficient structure?
22 MR. MILLER: Not under 112(f). I mean, what exactly is the
23 structure that's doing that? It doesn't say. It just says that we can have a
24 variable oscillator with some circuitry that varies the frequency. And again,
25 if that's --

1 JUDGE CYGAN: This would still require some - the oscillator would
2 still require an algorithm, is that what you're saying?
3 MR. MILLER: Yes.
4 JUDGE CYGAN: So even though it's an oscillator circuit, your
5 position is that an oscillator circuit doesn't have a defined structure in the art.
6 Therefore, it's going to require an algorithm because it's the type of feature
7 which is defined only by its function and therefore requires an algorithm. Is
8 that your position?
9 MR. MILLER: I think that's not exactly my position. My position is
10 that if this is a 112 paragraph (f) construction, you need to have some detail
11 there. But I would agree with you, if the claim is not means plus function,
12 then that may be sufficient.
13 JUDGE CYGAN: Thank you. Sorry to jump in on that.
14 JUDGE AMUNDSON: Oh, no, that's fine. All right, thank you. So,
15 Mr. Miller, one thing I'm still not clear is whether you agree or disagree that
16 Samsung's proposed construction of the control component does not cover
17 the oscillator embodiment disclosed in the patent.
18 MR. MILLER: Well, I guess there's two things to say to that. One is
19 that our construction, our 112(f) construction absolutely does read on one of
20 the embodiments, and it's possible that there may be an additional structure
21 that could be added on. But there's no question that our construction reads
22 on one of the embodiments described in the patents. I don't even think the
23 Patent Owner would disagree with that. So it could be that they disclose two
24 different structures, and if we're going to construe this under 112(f), they
25 would both be possible constructions.

1 JUDGE AMUNDSON: All right, I think I understand your position.
2 I'm just trying to square with the patent law principle that a claim
3 construction that excludes a preferred embodiment is rarely, if ever, correct,
4 but go ahead.
5 MR. MILLER: Yeah, I don't disagree with you. It's possible that we
6 should have identified two different structures as falling within 112
7 paragraph (f). But that doesn't mean that the one we've identified isn't one of
8 those. So anyway, and you also have to tie it to the function, which is one of
9 the things I'm going to get into the function that's recited. And so, we can
10 see that here, for example, on slide 14. Actually, let me, I want to go back to
11 slide 13. So the recycled function in this plane.
12 JUDGE CYGAN: This is Judge Cygan. Before we go further, just to,
13 not to belabor the point, but aren't you asserting obviousness against claim
14 two as well?
15 MR. MILLER: Yes.
16 JUDGE CYGAN: So, what is your opinion on the variable oscillator
17 circuit in claim two? Is your opinion that claim two is further limiting that
18 same control component by giving you a specific example that falls within
19 the scope of claim one because it's further limiting claim one? Or how are
20 you addressing this? If your proposed reading of claim one is not including
21 the oscillator circuit because there's not sufficient structure, how are we
22 getting claim two here?
23 MR. MILLER: I'm not sure I understand your question, but let me see
24 if I can answer it as best I can. So, our construction for control component
25 requires that there be an H Bridge Switch, which is a type of oscillator. And
26 claim two would further narrow our construction by saying that the H Bridge

1 Switch is variable and we've identified certain circuitry in our construction,
2 which is a microprocessor essentially. And so, claim two would require that
3 there be additional circuitry. So, I don't think that the term that the fact that
4 claim two recites something in addition affects the construction for the
5 control component really at all.
6 JUDGE CYGAN: So, your reading of claim two is that it's giving
7 additional limitations to the control component?
8 MR. MILLER: Yes.
9 JUDGE CYGAN: It's not replacing the control component even
10 though the language says the control component is one of.
11 MR. MILLER: Well, that's exactly right.
12 JUDGE CYGAN: Okay.
13 MR. MILLER: It's providing additional details of the control
14 component that's pretty standard claim in dependent claims.
15 JUDGE CYGAN: So, you're asking us to read the control component
16 recited in claim one as "one of." You're asking us to, read that as if it says
17 the control component "further includes."
18 MR. MILLER: Well, I don't know that I would go that I would say
19 that. I mean, there's a control component in claim one, and claim two says
20 that the control component is one of these things, and so it's just making it
21 providing more meat, putting more meat on the bones. As to what the
22 control component in claim one is not saying that the control component. If
23 the control component in claim one said explicitly that there was an H
24 Bridge Switch, and claim two says that the control component is a variable
25 oscillator that might fall within, create a problem like what you've identified,
26 but that's not what we're saying.

1 JUDGE CYGAN: I guess the thing I want to make sure I have your
2 take on is that Judge Amundson identified that there's really sort of an
3 alternative embodiment, this oscillatory embodiment which seems to be
4 completely separate from the processor type of environment. And now
5 we're looking at claim two. Claim two seems to say this component is the
6 oscillator, why is it not saying this? Why is claim two not pointing us to the
7 oscillator embodiment?
8 MR. MILLER: Well, I mean, as I said, I mean, so first of all, I don't
9 really disagree with you, but as I said, I don't know that the impact is really
10 any different because the construction that we put forward says that there's
11 an H Bridge Switch within the proposed construct, within the control
12 component of claim one. So all claim two is doing in the context of our
13 construction is making it more clear that there is some form of an oscillator.
14 But be that as it may, I mean that does one of two things. It either counsels
15 against the 112 paragraph (f) construction or we should have added an
16 additional structure into our control component construction.
17 JUDGE CYGAN: I think one of the issues that's arising here is that if
18 you're planning to claim two as an H Bridge construction, which is really
19 part of your main construction for claim one, the main means function, if
20 you go ahead one, slide to slide 14. This is your H Bridge. This is where
21 you're pointing for H Bridge support, correct?
22 MR. MILLER: Yes.
23 JUDGE CYGAN: This exact paragraph I noticed at the Western
24 District of Texas, it excised this specific set of lines from its claim
25 construction. So the Western District, when it was construing what was
26 required for the means function, it took all the language around it and left it

1 out of it. So it does seem to make some sort of claim construction
2 distinction if we're going to be relying on the H Bridge or the alternative
3 oscillator circuit. Can I get your opinion on the impact of the Western
4 District's construction as guiding us here?
5 MR. MILLER: So, I'm looking at the Western District construction
6 and it says the construction is a microcontroller, a processor, a
7 microprocessor or CPU that performs the algorithm shown in step 706
8 through 716 in Figure 7A with reference to all steps shown in 7B other than
9 step 734 and all steps shown in Figure 7C. So I'm not seeing where they
10 excise this, I'm sorry.
11 JUDGE CYGAN: If you take a look at -- sorry. It was in their
12 discussion of claim two at page 31 of exhibit 1053. Well, they were
13 discussing about whether the algorithm, what was required in the control
14 algorithm.
15 MR. MILLER: Okay, I have a document here.
16 JUDGE CYGAN: At the bottom of page 31 they cited the algorithm
17 at 710 to 724 of the '830 Patents and then at 732 to the '830. And that
18 seems to be going around the H Bridge. And they specifically, I believe had
19 a finding that the H Bridge was not required. Is that correct?
20 MR. MILLER: So, I don't remember if they said the H Bridge was
21 not required, but that in certain respects I think may be a little irrelevant
22 here. Well, maybe not relevant, but they still require that you output a signal
23 to an H Bridge. So, I'm not sure I'm answering your question, but I mean,
24 the first part is that Western District's construction really it does require that
25 the control component output a signal to an H Bridge because it includes

1 step 708 and whether or not it requires there be an H Bridge. I'm trying to
2 see where you're pointing to.
3 JUDGE CYGAN: I don't want to belabor the point on this.
4 MR. MILLER: Okay.
5 JUDGE CYGAN: I think I have your opinion on that.
6 MR. MILLER: Okay, I'm going to keep going here. So anyway, so,
7 and by the way, you know, we think it's, I won't belabor this either, but I
8 think that we won't belabor the, I'm not going to belabor the point as to
9 whether or not the H Bridge absolutely should be included in the means, I
10 think it does. But in terms of this IPR, if it's not required, if the H Bridge
11 itself is not required to be part of the control component, it actually makes
12 our petition even better because of one less thing that we have to prove
13 anyway. So let's focus on slide 13. And I want to go back to slide 13 to
14 show. So one of the issues with the claim construction, and I'm going to
15 bring it up again, is if you look at our construction, it talks about that the
16 claim requires that you both provide a corresponding output to a power
17 supply and provide an output to the H Bridge Switch. And I think this is
18 important because if you look at the function which we have above the two
19 proposed constructions, the function, and this is not in dispute, is a control
20 component that controls supply of power from the power supply to the
21 driving component to cause the movable component to oscillate at a
22 frequency and an amplitude specified by the user. Let's go to slide 13.
23 And so, slide 13, this is talking about the, this is where we find
24 support for our construction, for supplying the output key to the power
25 supply. So, this is the part of the function. And again, I hate to bounce
26 around so much, what's required by the recited function, stating that it

1 oscillates at a frequency and an amplitude. So, this is required by this
2 particular portion of the recited function. And then we get to slide 14. And
3 we were just looking at this before with Judge Cygan. And here we get the
4 support, the support for the corresponding structure for the function that is
5 required to get the movable component to operate and oscillate at a
6 frequency. So you can see here in this portion of the specification and the
7 992. I'm on slide 14, by the way, and in the 081 Patent, this is at column
8 seven, line 13 through 17. And providing this output d to the H Bridge
9 Switch is what controls the frequency. So we think that the function that's
10 recited in the claim requires this. Patent Owner disagrees.
11 But again, we frankly don't understand because the same functional
12 language relating to the amplitude they do want in the claim construction,
13 but the language reciting of the function on frequency they do not want in
14 the construction, and we do not understand how that could be. We'll submit
15 that our construction is correct in this regard. So, I want to move on to claim
16 three. So claim three depends from claim one, I believe, and it further
17 narrows the control component construction term from one and it, again, I'll
18 put our, I'll tell you what our construction is. Essentially, we think three
19 requires that there be some sensors that gather up data and that data that's
20 collected. And this is at a very high level, obviously, it converts that data
21 into something that can be understood like an integer, and it compares that
22 integer to a value, and then it makes some adjustments. Classic control
23 signal control system. Excuse me. So when we look at what the
24 specification teaches about this and figures, we can look at them on slide 17.
25 If you look at column seven, line 33 through 36 of the ‘081 Patent, this is
26 where the support for the converts the sensor output to an integer comes

1 from. We think that this is pretty is supported. Our construction is thereby
2 supported by what the specification structure is for performing the function
3 recited in claim three. So now I'm going to talk about our --
4 JUDGE AMUNDSON: This is Judge Amundson. I just had another
5 question about claim construction. It concerns claim four and the patents.
6 And I understand there's some ambiguity with claim four. I understand your
7 position. It doesn't matter which way it is, you win under either approach.
8 But as I understand what the two district courts that have addressed the issue
9 have done is they've said that claim four should depend on claim three
10 instead of claim one. Do I have that right?
11 MR. MILLER: I'm pretty confident that you do. I don't have it sitting
12 in front of me.
13 JUDGE AMUNDSON: All right, well, you know, just to make the
14 panel's life easier, would you have a problem or would Samsung have a
15 problem if the panel took the same approach as the two district courts?
16 MR. MILLER: I mean, I guess at a high level, probably not. I do
17 think that the claims say essentially the same thing. So, I guess for purposes
18 of this proceeding, without waiving our right to seek some other
19 construction and district court litigation, we can do that.
20 JUDGE AMUNDSON: All right. Thank you.
21 MR. MILLER: Obviously, there is an ambiguity, so. But for
22 purposes here, we can here and here only. We'll agree to that. Okay, so I'm
23 going to talk briefly about Fukumoto. So I'm on slide 20. This is an
24 overview slide. On the left hand side, we have an excerpt from Fukumoto.
25 And then on the right hand side, we have some of the figures from
26 Fukumoto. You can see in Figure 2 there's a CPU. We have a display unit.

1 We have the drive signal generation circuit, and then an oscillatory actuator.
2 And then Figure 3 shows a cross section. You can see that there's a coil 121.
3 There's a weight, which is element 122. And in this embodiment, it goes
4 underneath the screen of a PDA, so you can see the screen elements there.
5 So, the purpose in Fukumoto, and at least there's some preferred
6 embodiments, is that one it attempts to simulate a button push when you
7 press on a touchscreen. Not something, I think, at this point, day and age,
8 we're all familiar with.
9 Okay, so the disputed issues on the control component, putting aside
10 its construction, but assuming that the means plus function construction does
11 apply, issues are whether or not there is an H Bridge in Fukumoto's PDA.
12 Again, that issue goes away if you don't construe this to require an H Bridge.
13 The second one is whether or not Fukumoto discloses a power supply that
14 accepts an output from the control component, and then for some later
15 dependent claims as to whether or not there's a linear motor cap at both ends
16 by springs. So let's look at slide 23. So, on the left hand side of slide 23,
17 you can see that there's a portion of the specification column 14, lines 57
18 through 60, where Fukumoto talks about having this movable weight, 122,
19 that linearly reciprocates in the vertical direction when there's a magnetic
20 force applied. And that magnetic force is generated essentially by applying
21 an AC, or alternating current, which you call the drive signal, applied to the
22 coil.
23 So, I don't know if you can see my mouse cursor, but here are the
24 coils. And when AC current is applied to that, it creates vibration. So on
25 slide 24, we have some testimony from Dr. Wolfe's declaration. He was our
26 expert in this case, and he explains in his declaration that H Bridges were

1 very well known. He talks about, and it's in the record at exhibit, I forgot
2 the exhibit number. But there's two different exhibits, at least, of
3 commercially available H Bridge Switches available long before this patent
4 was sought, one from XR and one from Linear Technology. And so he
5 explains that these would have been well known. And if you look at
6 paragraph 188 of his declaration, he says that it is my opinion, and this is not
7 on the slide, by the way, but it's paragraph 188 of his petition, where he says,
8 it is my opinion that a POSITA would have viewed any of these well-known
9 options as equivalent, because each would convert input power into the
10 desired waveform.
11 So, I'm going to advance to slide 25. We deposed Dr. Goossen, who
12 is Resonant's expert, and he agreed with us that oscillators and H Bridge
13 Switches were well known before the filing date. And so, the fact that there
14 were, that something like a structure like Fukumoto would have an H Bridge
15 or equivalent really is, it's not really disputable. There has to be something
16 that can take DC power, like from a battery, and convert that into an AC
17 signal of some form, that it has to be there.
18 So I've advanced now to slide 27. So, and I think that this may be the
19 crux of the dispute with respect to this particular claim term. Which is, and
20 this is not a disputed portion of the claim construction, which is that the --
21 well, it's disputed only if means plus function applies. So if the claim term
22 is means plus function is indisputable, I'm sorry, if it's means plus function.
23 So, both parties require that the control component provide an output to a
24 power supply. And if you look at what Fukumoto does, we've reproduced
25 the portion of the specification here and here it says that the CPU, when it
26 determines that there's been a touch signal, once it's detected, it goes back

1 and it looks at essentially what I understand to be a lookup table to figure out
2 what the amplitude of frequency is going to be of the signal that drives the
3 magnet. And then if you can look at the highlighted portions toward the
4 bottom of this particular excerpt. On slide 27, it says the CPU outputs the
5 waveform data reads from memory to the drive signal generation circuit 14,
6 et cetera.
7 Advancing to slide 28. This is an excerpt from Dr. Goossen's
8 declaration. Again, that is Resonant's expert. He says that and this sort of
9 highlights of the dispute, by the way. He says nothing Samsung points to
10 indicates that the battery or other power supply is part of the drive signal
11 generation circuit, or even if it is, that the power supply would be receiving
12 any output provided by the CPU. We think that this is a bit of a nonsense
13 where we have never said that the battery is part of the drive signal
14 generation circuit, and we don't think it's particularly relevant. So if you
15 look at what Dr. Wolfe said in his declaration, and this is found in our
16 petition as well, and this is on slide 29 where we reproduce paragraph 189
17 from Dr. Wolfe's declaration, he says Fukumoto's CPU provides a
18 corresponding output to the power supply when it, quote, instructs the drive
19 signal generation circuit 114 to generate a drive signal, and in response, the
20 drive signal generation circuit 114 generates a drive signal using the
21 waveform data supplied by the CPU 113.
22 So, just to sort of summarize, it is and has always been Samsung's
23 position that this portion of the control component construction is met,
24 because in Fukumoto the CPU outputs a signal to the drive generation
25 circuit, telling the drive signal generation circuit what its AC drive signal is
26 going to look like. And it is and has always been our position that under a

1 mean plus function construction, the drive signal generation circuit is part of
2 the power supply. We said that on our petition, as you can, and as you can
3 see here, saying essentially the same thing that's in the petition. That's what
4 Dr. Wolfe said as well.
5 Now this is, I'm quoting here on slide 30 from the Sur-reply that
6 Resonant put in, and they're saying that we've changed our mapping, which
7 is not correct. Our position has always been that the drive signal generation
8 circuit 114 in Fukumoto is part of the power supply. And you can see that in
9 both our petition and in our reply. So, the petition, if you look at pages 22
10 through 23 in the 992, and it's actually on the same pages in the 993, we said
11 Fukumoto's CPU provides a corresponding output to a power supply when it
12 instructs the drive signal generation circuit 114 to generate a drive signal, et
13 cetera. And we reiterated that in the reply. So this was not a new argument.
14 JUDGE CYGAN: Counsel, this is Judge Cygan. Can you explain a
15 little bit about how the battery comes into this? Your Dr. Wolfe had talked
16 about using components to convert power from the battery as part of that
17 discussion. And I also wanted to get your thoughts on Dr. Wolfe's
18 discussion of the 1(c) limitation. 1(c) was the power supply, and I don't see
19 anything in Dr. Wolfe's testimony about the power supply being part of 114.
20 Can you talk to that a little bit?
21 MR. MILLER: Yeah, sure. So in our petition and in Dr. Wolfe's
22 declaration for the power supply, all we said was that there has to be a small
23 drive power is generated, and that means that there's a power supply. He
24 didn't point to anything in particular. And when the Board instituted trial,
25 you found that was sufficient, and we agree. I mean, obviously there's
26 power going on there. But it's also true that in, for example, paragraph 189

1 of his declaration, he said that. And I can go back to slide 29, where we
2 reproduce paragraph 189 of Dr. Wolfe's declaration. It's pretty explicit. He
3 says Fukumoto's CPU provides a corresponding output to the power supply
4 when it instructs drive signal generation circuit 114 to generate a drive
5 signal.
6 So, we think that that's very, you know, clearly says that the drive
7 signal generation circuit is part of the power supply. And in terms of the
8 battery, I think the battery is a little bit of a red herring. I mean, of course
9 the battery is part of the power supply, but in and of itself, it doesn't. Battery
10 is never going to be able to get a motor to move without anything, without
11 more. Right. It just produces a DC power. Right. That's not going to move
12 the battery. So obviously there's going to be more, which is why we didn't
13 say that the battery is the power supply, because it wouldn't work. Does that
14 answer your question?
15 JUDGE CYGAN: So, when we're looking at how to read the power
16 supply for limitation 1(c), what are we supposed to be reading as the power
17 supply?
18 MR. MILLER: Well, I mean, I think you can say, first of all, the fact
19 that there's a small drive power signal generated means that there is a power
20 supply. And at a minimum, the power supply is going to include both the
21 battery and the drive signal generation circuit under, if this is a means plus
22 function construction.
23 JUDGE CYGAN: Is that adequately brought out in the petition for
24 1(c)?
25 MR. MILLER: Well, we have to read the petition as a whole. And
26 the petition says under 1(c) small drive power is generated and under 1(f),

1 where there is admittedly far more discussion. It says, as we point out here,
2 that the CPU provides an output to the power supply when it instructs the
3 drive signal generation circuit to generate a drive signal. So, I mean, that's
4 our evidence.
5 JUDGE CYGAN: Thank you, Counselor.
6 MR. MILLER: Okay, I'm going to move on to the issues with claim
7 eight. So claim eight, at a very high level, requires that a housing be a tube
8 and that it be capped at each end by something that will repel the movable
9 component. And then it says that the movable component is a magnet that
10 has to slide within the tube and that the driving component is an
11 electromagnetic coil. So, this is Fukumoto again, and this is an alternative
12 embodiment which is found in Figure 83. And so, Figure 83 shows that you
13 have a movable component 813. And there is a spring on either side of the
14 movable component. You can see that there's a drive signal amplified by an
15 amplifier, et cetera. So Figure 83 is the patent talks -- excuse me.
16 Fukumoto talks about Figure 83 as being a modification of what we saw in
17 the earlier figures. And this is where we get some of our proof for this claim
18 element.
19 So, let's first of all start with paragraph 202 of Dr. Wolfe's declaration.
20 And he states that a POSITA would have been motivated to modify the
21 oscillator, the modify oscillatory oscillator 115, to accommodate two
22 springs. And he provides a couple of, you know, several reasons for that.
23 And so, the issue here is not so much that the two springs are not disclosed.
24 The issue is whether or not there was sufficient modification or motivation
25 provided. And we think that we put in motivation here. I think what you're
26 going to hear from the other side, and I'm on slide 35 of our presentation, is

1 sort of a combination of, well, that embodiment doesn't have a magnet and
2 we don't think it would work as well. The, we don't think it would work as
3 well, really is not the standard for obviousness, unless there's a solid
4 teaching away, because the cases are pretty clear that a modification, if a
5 modification, even if not great, is something that a POSITA would consider.
6 That is still obvious.
7 But putting that aside, I'm on slide 36 here we have some testimony
8 from Dr. Wolfe, and he pretty much debunks this idea that it wouldn't work
9 very well. So, he was asked at his deposition first of all, about Figure 83 not
10 using magnetic fields, because Figure 83 uses an electrostatic means of
11 moving the weight instead of magnetism. But he said, in response to that
12 question, the person of ordinary skill would understand that the cause of
13 electromagnetic forces is unrelated to the behavior of the spring forces. And
14 then there's again going to this idea of whether or not it wouldn't work as
15 well. Dr. Wolfe would ask, in order to have the same displacement, in other
16 words, movement of the magnet with two springs as you had in the
17 embodiment with one spring. He says, the question was, you would agree
18 that the force that causes the displacement would have to be greater. And
19 Dr. Wolfe said, yeah, that's the whole point, right? Is that if you can move
20 more mass with more force and that you can, with the same amount of
21 space, you can apply larger forces and therefore create a stronger vibration
22 effect, which would be one of the motivations to do this.
23 So, Fukumoto itself describes having the caps at each side of the
24 weight with a spring, just as claimed. And the fact that it's electrostatic, we
25 don't think really matters very much, because same reference, provides a
26 bunch of different alternatives. And Dr. Wolfe provided a reason for why

1 you might want to use those teachings from the electrostatic environment
2 and use them in the electromagnet.
3 JUDGE AMUNDSON: This is Judge Amundson. I just want to jump
4 in and say, I think you got about maybe five minutes left on your initial
5 request for the 60 minutes.
6 MR. MILLER: Okay, let me go for 15 more minutes. So, I'll have 20
7 minutes for rebuttal.
8 JUDGE AMUNDSON: All right, fine.
9 MR. MILLER: Thank you. I will try to go more quickly. So let's
10 talk about this is Fukumoto plus Ueda embodiment, and this is claim three.
11 So let me go back to slide 39, which is one of the figures from Ueda. There
12 are several figures in Ueda that look pretty much the same or very similar.
13 At a very high level this is a control system for being able to vary the
14 manner in which the motor that drives the vibration element here. And then
15 you have the linear vibration motor, and there's an output detector, which
16 sends a signal Dop to this, determining voltage, driving voltage, determining
17 unit, and then there's an order output determining unit, which is sort of like
18 what we want it to be. In other words, it's sort of the what you compare
19 things to. Then there's a position detector.
20 So paragraph 149 of Ueda. It talks about receiving a signal from that
21 order, from that detector. And that creates an DOP signal. And that is the
22 magnitude is the, the magnitude of the output is the DOP signal. Then
23 there's this position. So those are the two main signals that we are relying
24 on. I would also like, it's not in the slide, but I'd like to direct your attention
25 to paragraph 141 in Ueda that it provides details on the output determining
26 unit and the driving voltage determining unit, which is they receive this

1 information and make adjustments. So, here's on slide 42 is the portion of
2 Dr. Wolfe's rebuttal declaration. And this goes to the integer issue. And so,
3 he says that he basically says there's basically only two possibilities here. If
4 Ueda is applied in a system like Fukumoto, which is used as a CPU, is that
5 either it's going to output an integer or it's going to output a fraction. And
6 when you output, and then converting sensor output to integers would be the
7 most likely opportunity. But there's only really two choices.
8 And so according to Dr. Wolfe, if you're combining Ueda with
9 Fukumoto, it's going to, these sensors are going to convert their outputs into
10 digital signals, and every digital signal is an integer. So that's where we go,
11 and that's where we find support for this limitation. And if you look at Dr.
12 Goossen's deposition testimony, he was asked if you know if these output
13 ranges would ever have an integer based on the way he reads Ueda. And he
14 says, depending upon the measurement you're using, the magnitude could
15 happen to fall upon an integer value. So even in his view of the world, it
16 may not always output integers or convert things into an integer, but there's
17 going to at least be certain circumstances where there is an integer.
18 But we would say that that doesn't go far enough, because if you're
19 combining Fukumoto or Ueda with Fukumoto, it's going to convert the
20 sensor data into a digital signal, and therefore there's always going to be an
21 integer. Really, the only comeback to that is that, well, Ueda is an analog
22 system. And so therefore there would be, there's no integer. And in our
23 view, that is a simplification of an oversimplification of our position, and it
24 really misreads what we said. If you look at slide 45, in paragraph 184, Dr.
25 Wolfe's declaration, he makes clear that Fukumoto is using a processor.
26 And then in paragraph 337, he makes clear that a POSITA would have been

1 motivated to modify Fukumoto's PDA with Ueda's feedback control. So
2 Ueda would become, would be used in a digital manner. If combined with
3 Fukumoto, it would have to be. So that's where we get to and that's sort of
4 summarized in paragraph 16 of Dr. Goossen's responsive declaration. And
5 we've reproduced that at slide 46.
6 So let me talk briefly about 1G, which also applies to Grounds 1H, 1I,
7 and 2G-I. So this is the combination of Erixon with Fukumoto, and I'm on
8 slide 49. So Erixon is also a linear vibration module, and you can see that
9 there's a magnetic field that runs parallel to the motion. There's a coil,
10 there's a magnet, and there's a housing. So structurally quite similar to the
11 patents at issue here. So this relates to claim eight again. And this is
12 essentially where the linear vibration module has to be a tube. And Dr.
13 Wolfe. And the only issue here is motivation to combine. It's not disputed
14 that Erixon discloses a tube, so the only issue is motivation.
15 On slide 51, we reproduce paragraph 257 from Dr. Wolfe's
16 declaration, and he provides a litany of reasons why a person having
17 ordinary skill in the art would have been motivated to combine Erixon with
18 Fukumoto. In other words, to make it a tube. And I'll note that we have a
19 grounds where, I think it's Ground 1A where we say that Fukumoto is a tube.
20 It's just a flatter tube than what is in Erixon. So, this is really only in the -- it
21 should you find that Fukumoto is not a tube, which we don't think would be
22 correct. But be that as it may, if you find it's not a tube, then Erixon and
23 Fuller, which we'll discuss in a moment, also, they most definitely disclose a
24 tube.
25 Anyway, we think that we've provided adequate motivation to
26 combine, and we think that the analysis that Resonant has put in here is

1 pretty thin, and it kind of ignores what the gist of the patents. So, for
2 example, he was asked at his deposition if he made any attempt to figure out
3 what the thicknesses of the linear vibration module in Fukumoto was, and he
4 said no. We asked him the same question about Erixon, and he admitted that
5 he made no attempt to figure out what the dimensions or the length, excuse
6 me, of the motor were in Fukumoto. And so having failed to do that, it's
7 somewhat hard to understand how he thinks that there's an issue here.
8 So anyway, let's talk about Fuller briefly. Fuller on slide 55 is very
9 similar. Again, it's an elongated tube with a magnet, movable magnet, that
10 slides back and forth. Again, slide 57. We provided some additional
11 arguments as to why we think that we've adequately provided evidence of
12 motivation to combine Fuller with Fukumoto. And the same problem with
13 the analysis that Resonant provides, and that Dr. Goossen made no attempt
14 to figure out what the dimensions were. So it's hard to understand how he
15 could arrive at his conclusion that things would not necessarily work. But
16 the other point, which I think is important in the context of Fuller, is if you
17 look at paragraph 53 in Fuller. Fuller literally says in paragraph 53 that you
18 can scale his linear vibration module to be very small and it would still
19 work. So even if somehow this argument had merit, that you know that the
20 orientations are different, is that if you scale Fuller to be extremely small,
21 like he proposes here, you would not have any of the problems that Dr.
22 Goossen identifies as if you were to try to convert Fukumoto into a Fuller or
23 Erixon type tube
24 So they provide us some theories about why maybe you wouldn't want
25 to combine them. But again in order for something to be obvious, the
26 resulting structure doesn't have to be ideal or even better than what's being,

1 what's already out there. All it has to do is be something that a person
2 having ordinary skill in the art could do. And so, we think that we've met
3 our burden here. And I'll note that recently the Board issued an opinion in
4 K-Fee vs. Nespresso that basically said that bodily incorporation is not the
5 standard. And I kind of think that's what they're trying to say is the issue
6 here. By they, I mean Resonant, because they basically say that you have
7 Fukumoto, which goes up and down like this, and you have. It works on
8 Fuller that goes like this. And if you can convert to something like this,
9 you're going to somehow create issues with the screen that sits on top of the
10 vibrator. And again, that's not really the standard here. To the extent they're
11 trying to argue that that's a teaching away, I think that's wrong.
12 First of all, the claims say nothing about where this thing is going to
13 be situated. Fukumoto certainly doesn't limit itself to bouncing up and down
14 between the screen. And again, with Fuller, it says, I can make this thing
15 really, really small. So it's not even consistent with what Fuller says.
16 So let's talk about Grounds 1M real quick. So this is Dong. So, Dong
17 is also a linear vibration module, as you can see on slide 61. And again, I
18 don't know if you can see my cursor. But the weight or the magnet, just like
19 in the patent and in all the prior art we've been looking at, it goes back and
20 forth like this. So it's a linear vibration module. And Dong talks about
21 having this weight or counterweight, and one of the materials it identifies as
22 being useful here is tungsten, which is important for a reason. We'll get into
23 it in a minute. Ogusu is another reference that we're combining here. It's
24 also a linear vibration module. It bounces back and forth like this. You
25 have these yokes. And, again, I hope you can see my cursor, because it's not

1 always so clear where the yokes are, but they kind of surround the magnet
2 anyway, so that's Ogusu.
3 So let's talk about claims 14 and 19. So, first of all, the combination
4 is Fukumoto, in view of Ogusu and Dong. And you can think of Ogusu is
5 sort of the glue that brings in Dong, because what Ogusu does, it talks about
6 having a yoke made of ferromagnetic material. And some non-
7 ferromagnetic dust or particles or powders. Excuse me. So there's
8 ferromagnetic powder, and there's this non ferromagnetic and ferromagnetic
9 material positioned between the magnetic electromagnetic coil and a
10 magnet, and this forms a magnetic circuit. And Ogusu basically says that
11 the reason you do that is that it increases. It basically makes the vibration
12 module work better. And as doctor, Dr. Wolfe says, this would motivate a
13 POSITA to try to figure out -- to arrive at a way to make the motor work
14 better. And then that brings you to Dong, because Dong uses tungsten as a
15 counterweight in its. On its magnets. And Dong, it's well known. This is
16 not disputed. Tungsten is a paramagnetic material. And it's also not
17 disputed that a paramagnetic material will reduce magnetic reluctance,
18 which is what the claim requires.
19 So, anyway, so we can see on slide 65 that Ogusu essentially provides
20 the motivation that will lead you to Dong. And we have some testimony
21 from both Dr. Goossen and Dr. Wolfe here, talking about how the use of
22 paramagnetic materials in magnetic devices was well known long before this
23 patent was filed. So on the left hand side, we have Dr. Goossen. He agrees
24 that paramagnetic materials were well known by 2009. Dr. Wolfe on the
25 right-hand side shares the same thing. And Dr. Goossen agrees that they can
26 be very useful. Again, that was well known. We have this testimony

1 reproduced on slide 67. So now let's look at or compare Dong to what's in
2 the patents at suit here.
3 So on slide 68, we reproduce Figure 24D or B, from the patents, the
4 '081 Patent, and the '830 Patent. And you can see that there's these two
5 disks that are placed on either side of the magnet, and this reduces the
6 magnetic flux. And what these paramagnetic materials do is they make it
7 easier for magnetic, for flux to go through things. So it kind of -- this is --
8 my e mag professor in college probably yell at me, but it kind of sucks the
9 fields into it. And so it improves efficiency, so it makes the system work
10 better. And you can see that on the right hand side of this figure, Dong puts
11 this tungsten counterweight on either side. And so, at the end of the day, the
12 structure in Dong is actually remarkably similar to the structure that's
13 described in the patent. And so when we go to slide 69, you can see sort of
14 an exploded view of some of the components in Dong. And you can see that
15 not only is it similar in some respect, it might be better, because if you can
16 see element 16, is the magnet an element? I think it's 115 this is the tungsten
17 counterweight. And so in Dong, it completely surrounds the magnet. So the
18 Patent Owner's contention that the tungsten components will never form
19 part of the magnetic circuit, it's just plainly wrong.
20 Going back to slide 68. And figure six, there are these flux lines that
21 are shown, and the Patent Owner and Dr. Goossen say, wow, those are all
22 that are shown. So that must mean that's all there is. But I think that is
23 based on what we see in this figure from Dong. That's just plainly wrong.
24 Okay, let's go to – I know I'm running out of time, so I'm trying to go
25 fairly quickly here, but this, I believe, is the last section. So Saiki. So this is
26 directed to the claims that require modulation. So here we have a portion of

1 Saiki which talks about having these multiple signals that get combined or
2 added to perform to drive a motor, a vibration module. And you can see the
3 way their signal ends up looking in the figure at a very high level. What
4 happens here? And this is described on column 15 lines 24 through 37 of
5 Saiki. Is that Saiki forms the wave by adding together eight component
6 waves. So, and then the results on the right side, slide 72. So we're talking
7 about claim 16 here. So in the PO response on the left side of slide 74. The
8 Patent Owner states that the plain and ordinary meaning of modulated by, in
9 light of the specification, refers to one signal that is mixed or multiplied by
10 another signal.
11 So we don't know if there, and trying to seek a lexicography
12 construction here or what. But when they put this proviso in light of the
13 specification, and we'll get into why we don't think they're right about what
14 the construction should be. But putting that aside, on the right hand side, we
15 see Dr. Goossen's declaration where he says the same thing. The
16 modulation refers to mixing or multiplying one signal to another. On slide
17 75 we see a portion of the specification of the '081 Patent where they
18 basically say that there's basically one embodiment, where we talked about
19 there being a essentially limitless number of vibrational behaviors. And on
20 the right-hand side, you can create complex vibrational things, complex
21 vibrational patterns. But we don't see anything in the specification here or
22 anywhere else that's been cited to that indicates an intent to narrowly limit
23 the type of modulation that can be used or the types of signal processing that
24 can be used, as in the claim.
25 And so, we put a declaration in from Dr. Wolfe, responding to this,
26 and he notes, and this is reproduced on slide 76, that he's rebutting Dr.

1 Goossen, and particularly taking issue with Dr. Goossen's statement in his
2 declaration that says that the modulation in the patents can produce
3 interesting vibrational modes. And he asserts that this is somehow the
4 opposite of what Saiki is teaching. But as Dr. Goossen points out, first of
5 all, to a POSITA, multiplying frequencies does not produce results that are
6 any more interesting than any other signal mixing technique. And what's
7 really interesting here, if you look at Figure 22B from the '081 Patent, and
8 you compare that to what's in Figure 17A, in Saiki, the signals look almost
9 exactly the same. So it's kind of hard to square Patent Owner's view that
10 there's no modulation taking place when the end result in Saiki is essentially
11 the same as what you did, what the patent produces.
12 So just a couple more things here. So, first of all, modulation is an
13 extremely broad concept. We put in some dictionary definitions. But
14 essentially it's basically varying a carrier wave in any way you want to by
15 amplitude modulation, frequency modulation, etcetera, and so on. Slide 78,
16 Saiki teaches that there's a primary oscillation frequency that's modulated by
17 a modulating oscillation frequency. And the Patent Owner disagrees. And
18 at the top of slide 78, you can see they say simply adding frequency P2 to
19 the primary oscillation frequency P1 doesn't meet the claim limitation. But
20 again, first of all, all the claim requires is that there be signals modulated. It
21 doesn't provide any specificity as to what that modulation must be. And
22 Saiki explicitly says that what it's doing is adding, and we think that that's
23 modulation.
24 So with that, I will just present my last slide, in which we've
25 reproduced some additional testimony from Dr. Wolfe, where he says points
26 to Dr. Goossen's reference to amplitude modulation, etcetera. But Dr.

1 Wolfe notes that FM and PM phase modulation do not require mixing or
2 multiplying. So again, we don't think that the defense based on modulation,
3 that there's no modulation here is correct. And with that, I will -- Patent
4 Owner can take over.
5 JUDGE AMUNDSON: All right, thank you. So I think I have you at
6 about 80 minutes into the time. So, Mr. Rubin, would you like to reserve
7 any time for sur rebuttal?
8 MR. RUBIN: I'll reserve 15 minutes.
9 JUDGE AMUNDSON: Okay. Now, before we start, I just wanted to
10 see if I understood the situation here. I see in the record that there's a
11 statutory disclaimer for claims 15 and 16 of the '081 Patent. Do I have that
12 right?
13 MR. RUBIN: I believe you're right, yes. Not for the '830 patents. So
14 those corresponding claims are still at issue.
15 JUDGE AMUNDSON: Right. I just want to double check that so
16 they're not at issue, 15 and 16. Claims 15 and 16 are not at issue in the 992
17 IPR, but claims 15 and 16 are at issue in the 993 IPR.
18 MR. RUBIN: I believe that's correct. And I guess before I represent
19 that definitively, I should double check that. But I trust that you're
20 accurately reciting the disclaimer that we filed.
21 JUDGE AMUNDSON: All right, so with that, you may begin
22 whenever you're ready.
23 MR. RUBIN: Thank you. Good morning, Your Honors. This is Neil
24 Rubin, and I'm pleased to be here today on behalf of the Patent Owner,
25 Resonant Systems, Inc. May it please the Board. And let me try to -- oh,
26 shoot. So I was going to share my screen. I just realized that I would need

1 to restart Webex in order to do that. I trust that the Board has the
2 demonstratives in front of them and will be fine following along with their
3 own copies if you follow the slide numbers. My apologies for the technical
4 issue. So, starting with slide one of our demonstratives.
5 As the Board is aware, there's a large number of grounds at issue
6 today involving many preferences and many issues raised by the parties. I
7 would note that Petitioner's presentation today did not seem to mention, and
8 neither do their slides, grounds 2A through 2I so it seems that they concede
9 that those grounds will fall for the same reasons that the corresponding
10 Grounds 1A through 1U, will if indeed the Board finds that those grounds
11 fail. So, I won't address the second set of grounds in detail unless there are
12 questions. But much like presenters, I'm sorry, much like the Petitioners, I
13 will start by addressing claim construction issues, and then we'll walk
14 through the reasons that we believe particular grounds of the petitions fail.
15 So we could turn to slide four. So I'll begin with the claim
16 construction issues. Now, there are five claim construction issues that are
17 raised in the petitions. I'll address each of those as came up towards the end
18 of Petitioner's presentation. It does seem like there might be a claim
19 construction issue concerning modulation or modulated, and I'll address that
20 later when we get to the ground that that applies to. Turning to slide five,
21 we see that the competing constructions in this IPR for control component,
22 and as has come up in the presentation today, there are a bunch of
23 constructions that have been offered by different parties, have been adopted
24 by the PTAB and by district courts that the Board could draw from here.
25 Indeed, Samsung itself has offered two different constructions and different
26 proceedings.

1 I think there are some clear points of agreement, however, that I'll
2 start with number one, everybody who has actually taken a definitive
3 position one way or the other, agrees that this term is subject to means plus
4 function treatment. That under the Federal Circuit's Williamson versus
5 Citrix case, that there's a lack of necessary structure recited in the claim, and
6 that we need to look to the structure in the specifications. And in particular,
7 all of Samsung's proposed constructions that they actually advocate for
8 require that. And the Board and the Western District and Eastern District of
9 Texas have both done that. There's also agreement that you can satisfy this
10 term with a processor programmed with an algorithm.
11 Now, one point of disagreement is that we believe that the
12 specification clearly points to an oscillator circuit and microcontroller as
13 other alternatives that satisfy or that perform the function recited for this
14 claim limitation, and we think that those should be included as alternatives
15 in this construction to the extent that the Board actually decides that issue.
16 I'd note that in the Sony IPR institution decisions, the Board does not seem
17 to have actually taken a position one way or another on that aspect of the
18 claim construction because it wasn't necessary to the outcome. The Board
19 here, I think could do the same, just decline to address whether there are
20 alternatives to a processor.
21 And then the second difference here shown, highlighted in red, is that
22 Samsung's construction to the Board requires an H Bridge Switch and
23 requires providing an output to the H Bridge Switch. And we believe that
24 the correct construction would not include those requirements. The Board
25 may or may not need to decide that issue, depending on how it decides some
26 of the arguments that we raise. Just to walk through the constructions that

1 have been offered in other venues. Here on slide six, we have Samsung's
2 district court construction, which did not include any requirement regarding
3 an H Bridge Switch. There hasn't been a construction by the district court in
4 this case because it stayed pending the resolution of this decision for these
5 proceedings.
6 On slide seven, we see the construction of a different panel of this
7 Board in the Sony, I'm sorry, in the Sony IPR institution decisions. There,
8 the Board found that an H Bridge Switch, or at least providing the control
9 value to an H-bridge switch circuit was a required part of the algorithm.
10 They also found some other requirements, including operating a timer and
11 flipping polarity, changing direction of the current, which none of the parties
12 in this case argued for.
13 JUDGE CYGAN: Counsel, this is Judge Cygan. Could you just
14 briefly explain why you don't consider the H Bridge Switch to be required in
15 construction?
16 MR. RUBIN: Sure. So we could turn to slide 16, please. So, there
17 are two things that we would point to. Number one, the output to the H
18 Bridge Switch is described is not described as part of the control routine
19 within the algorithms that are described in the specification. I think that the
20 term is a control component that the control routine would be the part of the
21 specification to point to. Also, if you could turn to slide three, where we see
22 the actual language of the claim in the recited function, the recited function
23 for the control component, and this is in the last indented portion of the
24 claim. It's a control component that, quote, controls supply of power from
25 the power supply to the driving component, and then it continues to cause a
26 movable component to oscillate at a frequency and an amplitude specified

1 by one or more stored values. So although the way that we parse this is that
2 the supply of power from the power supply has to cause oscillation at a
3 frequency, but that a control component does not itself need to control the
4 frequency so the part that the control component has to control is the supply
5 of power from the power supply. And so the H Bridge Switch is not part of
6 the function that the recited function that the control component directly
7 needs to perform.
8 JUDGE CYGAN: What about the remainder of that control
9 component clause "to cause the component to oscillate a frequency and the
10 amplitude specified by the user input"? Isn't that really bringing in the
11 frequency?
12 MR. RUBIN: So our interpretation of this recited function is that that
13 can be indirect, that is that the, what's required in this function is that the
14 oscillation at a frequency be the result of the control of the supply of power.
15 But it may be that some components outside the control component are
16 involved in producing that result, and that the only things that are expressly
17 the only function that directly needs to be the only control function that
18 directly needs to be performed by the control component is the control with
19 supply of power from the power supply. If the Board parses that language
20 differently than you may find that additional structure, like the H Bridge, is
21 required.
22 JUDGE AMUNDSON: This is Judge Amundson, is it possible that
23 the H Bridge, instead of being part of the control component, could be part
24 of the driving component?
25 MR. RUBIN: Well, I think it's not something that we've really
26 considered. The parties have agreed that it's the electromagnetic coil or an

1 electromagnetic. That it's sort of the actuator side of things rather than this
2 other circuitry. So, I wouldn't agree with that interpretation. I see where
3 Your Honor is coming from.
4 JUDGE AMUNDSON: All right, thank you.
5 MR. RUBIN: So, I think we were on slide eight. It'll be the next
6 slide. This is the Western District of Texas construction. Resonant versus
7 Apple. There are some questions that Your Honors had for Petitioner's
8 counsel. One thing that I would point out is that we do not read this
9 construction as requiring an H Bridge. There's, I probably should have
10 highlighted on slide eight directly after the second part of yellow
11 highlighting here is the word or so the Western District found that the
12 corresponding structure is the steps in the figures or the steps in the
13 corresponding text. Now, it's true if you turn to slide eleven that the
14 corresponding text does require output to the H Bridge Switch. But we don't
15 see that requirement anywhere in the figures.
16 Turning to slide twelve, we see the District Court construction
17 Resonant versus Sony. And this construction largely matches the
18 construction that we proposed here in our response. And I think the only
19 difference is that under the Eastern District of Texas construction, a
20 microcontroller has to have corresponding algorithm. And our construction
21 here, our position here is that the microcontroller, like the oscillator circuit
22 does not need to have a recited algorithm. I don't think that that distinction
23 matters to any of the issues that the Board actually needs to decide.
24 Turning to slide 13. This is portion of specification that the Board
25 asked about earlier today, and we think that it's quite clear that this
26 paragraph that this comes from identifies the a quote simpler oscillator

1 circuit, a processor, a microcontroller as interchangeable alternatives. And
2 now there is discussion later in this paragraph that the oscillator circuit may
3 not have all of the functionality of a processor embodiment, but there's no
4 suggestion that we see in this paragraph that it does not, that the oscillator
5 embodiment does not perform the recited function. If the Board reaches the
6 issue of whether there can be an oscillator, we think that it should find that
7 that is a permissible alternative for the structure here.
8 Now, counsel made some comments earlier that if the oscillator is
9 permitted as an embodiment of the control component, then they should win
10 because they said or at least their expert said some things about oscillators in
11 the prior art. We disagree. I think it's very clear, and I haven't heard any
12 argument otherwise, that all of the modifications to or combinations
13 involving Fukumoto in the petition point to the CPU. I think it's element
14 113 of Fukumoto as what's performing at least portions of the algorithm
15 steps that are required under any of the means plus function constructions.
16 So I don't think they should be permitted here at oral argument to say, oh, by
17 the way, you could just replace all that with an oscillator.
18 Slide 14 just says more about that portion of the specification. Slide
19 15, precise part of claim two which, as was discussed with my friend earlier
20 today, expressly requires. It expressly says that a possible embodiment in
21 claim two, and thus in the necessarily broader claim one or control
22 component, is a variable oscillator circuit with additional control circuitry.
23 So it's just clear, unless you're going to read this part of a dependent claim
24 out of the claim that it's not appropriate to limit control component to the
25 processor.

1 We previously discussed, slide 16. So that's what I have prepared to
2 say about control component and the independent claims. In slide 17 we
3 turn to control component and the dependent claims. Now, I point out that,
4 well, here both sides agree that however you interpret claim four, which I'll
5 get to, that the same construction for control component should apply at least
6 to claims three through six. I'd note that neither the PTAB in the Sony IPR
7 nor the courts that have considered these claims has adopted a different
8 construction for claims for control component in claims three and four,
9 because nobody asked them to. The disagreement here between the parties
10 is primarily whether this term should be limited to require use of integers,
11 conversion, and comparison to integers. It's true that, as Samsung points to,
12 there is discussion in the specification of integer values, but some of the text
13 that they point to in the construction on the right-hand side of slide 17 also
14 just refers to values, doesn't say integer values.
15 And so, for example, in the '081 Patent, that would be column eight
16 lines two through nine. So because of that we would disagree that it's
17 appropriate to limit the construction just to integer values. But we're
18 presented with kind of an unusual situation here that I think it's clear that
19 under the construction they're advocating for, that their position on these
20 claims fails. As to obviousness, and we're arguing for a construction where
21 it doesn't fit. We'll discuss that more later. I'll briefly address some terms
22 that the parties seem to agree don't actually matter to the outcome. On slide
23 18 we have the constructions for driving component. The parties agree that
24 it's something like a coil or electromagnetic, electromagnet, I should say. I
25 think our construction is correct because it acknowledges the language that's
26 used to describe each of the embodiments in the specification, rather than

1 limiting it to just some of the descriptions of just some of the embodiments.
2 And so slide 19, we see an example of this. Figure 10 labels the component
3 an electromagnet which is a broader class of structures than just
4 electromagnetic coils.
5 Turning to slide 20, the movable component. And what's interesting
6 is that Petitioners, I don't think in the record, actually offer an affirmative
7 argument for their construction. They recited that they never explained why
8 it's right, ours is wrong. Our position would be that movable here is not
9 reciting a function, it's reciting a physical characteristic, and so the
10 presumption against it being a means plus function term is not open. But I
11 don't think it matters to the merits here, whether of the asserted ground,
12 whether it's a moving weight or a moving component.
13 Turning to slide 21, the dependency of claim four, again, Petitioners
14 don't seem to ever take a position which is correct. I guess today they've
15 conceded that our position, that the Board could adopt our position. We
16 think that for one skilled in the art familiar with the conventions of patent
17 claim drafting, that they recognize there's some error here, typographical or
18 drafting, and the most parsimonious explanation for that is that it should say
19 claim three, not claim one.
20 So now we'll turn to the substantive issues with each of the grounds.
21 So, all of the assertive grounds fail for two reasons that we've identified.
22 Number one is the failure to satisfy the requirement of an output to the
23 power supply. And then the second is to the extent that the Board construes
24 control component is requiring an H Bridge or requiring an output to an H
25 Bridge, Samsung failed to show that that is obvious under the error.

1 So, turning to slide 23, all the proposed and adopted constructions for
2 control component and I submit any correct construction requires if what
3 they're pointing to as the structure is a processor, that that processor be
4 programmed to provide a corresponding output to the power supply or
5 something extremely close to that. And as I'll discuss the petition failed to
6 identify power supply in Fukumoto or in the combinations that would have
7 an input to accept such a corresponding output.
8 Turning to slide 24, the Petitioner had the burden at the outset to show
9 with particularity why the patent Petitioner challenges is unpatentable. Here
10 we cite the Federal Circuit Harmonic vs. Avid case. It's also expressly in the
11 statute. It's not enough to just cite to a whole bunch of stuff and have some
12 unclear mapping of the terms, and then later on give the key to allegedly
13 understand it all in a way that’s not apparent from actually reading the
14 petition. And here we also cite Ariosa from the Federal Circuit saying that
15 it's inappropriate to, or at least that it's appropriate for the Board to reject
16 reply submissions that present a new contention for how the prior art maps
17 on the claims.
18 Turning to slide 25. I know that my friend views this differently, but
19 we think it's quite clear that the reply is rewriting the petition on this issue.
20 In fact, in order to do that, in the reply which we quote here, they excerpt
21 just a portion of the sentence which they say shows that, oh, we were really
22 pointing to circuit 114 all along as a power supply or as part of the power
23 supply. And here in parentheses, the portion of the sentence they point to is
24 Fukumoto's CPU provides the corresponding output to the power supply
25 when it, quote, instructs the drive signal generation circuit 114 to generate a
26 drive signal. But on slide 26 we see the entire sentence. And I would

1 submit that really, in order to decide this issue of what, if anything, the
2 petition actually says about the power supply, the Board should look at the
3 entire sentence and indeed at the entire discussion of control component
4 under the means plus function construction on pages 21 through 23 of each
5 of the petitions.
6 And so just focusing on this sentence in slide 26 highlighted the part
7 left out of the reply, which they did include in their slides today, to be fair.
8 So the petition says that Fukumoto's CPU provides the output to this power
9 supply when these two things are done, the instruction, the circuit 114 is
10 instructed, and in response the circuit 114 generates the drive signal, there
11 would be no reason to include the second half of the sentence if, as they
12 argue in the reply, the CPU provides the corresponding output to the power
13 supply when it simply does the instructing.
14 JUDGE CYGAN: So, counsel, can I ask you how you read the
15 petition on 23? That sort of concludes it? The "as discussed above."
16 MR. RUBIN: Absolutely. So address this in slide 28. Well, actually,
17 so there are two very similar sentences at the top of page 23.
18 JUDGE CYGAN: I'm sorry, I'm looking at the 993 case here.
19 MR. RUBIN: That's the one I'm looking at right now. Essentially the
20 same text appears at the top of page 23 in both of the petitions. Or maybe
21 part of one of the sentences is on page 22, but it's essentially the same thing.
22 So there are two very similar sentences here in the 993 petition. Looking at
23 there's the, as discussed above a POSITA would have understood or found it
24 obvious that the Fukumoto's power conversion from the battery into the
25 desired waveform is equivalent to the algorithm step of providing an output
26 to the H Bridge Switch. The next paragraph has one sentence. At least, the

1 first few lines of which are shown here on slide 28. Essentially the same
2 thing, just some minor changes in wording. And so, there are two things to
3 note here. Number one, both in the sentence that Your Honor asked about,
4 which talks about power conversion from the battery. But I think more
5 clearly in this sentence on this slide, which talks about converting the power
6 supply from the battery, the source of power that the, shall we say, power
7 supply that's being identified here is the battery. Now, there is mention,
8 there is reference in this sentence, I think quite clearly to the circuit 114. It
9 says, it refers in the first line of what's quoted here to circuitry, and it refers
10 to that circuitry in the second and third lines. Producing an AC drive signal.
11 What is the circuitry that produces the AC drive signal? Well, just two
12 sentences before this. It's the drive signal generation circuit 114, which in
13 Fukumoto's embodiments is supplying the AC, is generating the AC drive
14 signal. Which is shown going directly to element 115. Which I believe is, I
15 forget exactly what it's called, but essentially the actuator.
16 So the circuitry generating an AC drive signal referred to here is 114
17 and what this sentence says is that that is equivalent to the H Bridge. Not
18 that it's part of the power supply. I think that just looking at the discussion
19 in pages 21 through 23, the fair reading of what's there is that the power
20 supply, the thing that is the source of the power supply is the battery. At
21 least that's an example of what it could be, the only example provided. And
22 that 114 is being mapped to the H Bridge, or is allegedly equivalent to the H
23 Bridge.
24 JUDGE CYGAN: Counsel, is there any reason that we couldn't still
25 read the generation circuit at the power supply, even, you know, despite the
26 fact that it's getting the power supply, if we need one portion as power

1 supply, would it be okay that it's receiving power from somewhere else, but
2 it could still be a power supply for the claim purposes.
3 MR. RUBIN: So, I think that I would agree that Petitioners could
4 have presented a petition where element 114 was a part of the power supply,
5 and that there's something else involved in the supply of power, some further
6 upstream source of power, be it a battery or wall plug or something like that,
7 at least conceivably. I don't think that that's foreclosed by a claim that's
8 construed, but that's not what is actually in the petition. And if we go back
9 to line 27, I'm sorry, slide 27, where the place where you would expect that
10 they would clearly identify what the power supply is when the term is
11 introduced in element 1C of the claim. There's no mention of 114 at all. All
12 this pointed to is the fact that there's drive power or small power, so there
13 must be some power supply. Later on, they take the example of a battery.
14 But I think really, to satisfy the statutory requirement of pointing out with
15 particularity the power supply, allegedly including element 114, it should be
16 here, and it's clearly not. And as I've gone through, I don't think it's in pages
17 21 through 23 under a fair reading, and it's not sufficient to point out with
18 particularity that you can swipe sentences in some different way in the reply
19 and say, well this is what we really meant to say when I don't think any fair
20 reader just presented with pages 21 through 23 would say, the 114 is part of
21 the power supply.
22 JUDGE CYGAN: To clarify, I guess you're reading on this issue is
23 pointing to essentially the same portion of a sentence in the petition as it's
24 going back to with the reply. The original sentence in the petition now
25 seems to indicate that the circuit 114 is the intermediary between the signals
26 that are coming in and the drive signal, which is going out to the driving

1 component, which is at least in the right place for what the patent claim is
2 requiring. And if I understand correctly from the patent, the way that the
3 power supply coming out of the power supply, the way that the supply of
4 power from the power supply is being controlled, is by a signal going to the
5 power supply. So, the power supply is sort of in the middle, but the control
6 is coming at the CPU end of it. Why would it be wrong to read describe
7 signal generation circuit in that manner? In view of the Petition's statement
8 that the CPU is outputting instruction on how to generate the drive signal,
9 and then coming out of it is the drive signal. If we were considering that to
10 be the control power supply, what's the flaw with that?
11 MR. RUBIN: Again, I don't think that that's an argument that's set
12 forth in the petition. I think that that's --
13 JUDGE CYGAN: Dialing it back to simply the language. That one
14 sentence in the petition, the "additionally" sentence that is quoted later, and
15 you pointed out the full context of it is inconsistent with the drive signal
16 generation circuit being a power supply that's as claimed.
17 MR. RUBIN: So, I think another issue, and we can look at slide 26 to
18 all be looking at the same language, is that the clause that they point to in
19 reply, the highlighted part here. It doesn't really identify that output. I
20 mean, when you look at the providing the corresponding output, all right,
21 there's a verb instructs, but there's no or I should say, it doesn't identify an
22 output between the CPU and circuit 114, the output that is identified the only
23 output that I see here is the drive signal.
24 JUDGE CYGAN: What about the instruction from the CPU to the
25 drive signal generation circuit?

1 MR. RUBIN: Well, they don't point to an instruction. There is the
2 verb instructs. So maybe implicitly as part of that there is an instruction, but
3 they don't -- they never say here there's an instruction that we're saying is the
4 output. But again, I think it doesn't make sense to include the highlighted
5 part of this sentence if as they're now saying, the provided corresponding
6 output is complete when the circuit 114 has been instructed. So, you know,
7 I'll grant that maybe they could have presented some different mapping that
8 might have merit or not. And as they try to do in our view in the reply, but I
9 don't think that that mapping is fairly in the petition.
10 JUDGE CYGAN: Okay. Thank you, counsel.
11 MR. RUBIN: Okay. Just turning briefly to slide 29, we showed that
12 with our expert's declaration and contemporaneous evidence that batteries of
13 the sort that would have been used in the systems described in the prior art
14 would be, for example, alkaline cell batteries. And I don't think that
15 Petitioners have even tried to argue that the batteries that a POSITA would
16 have understood would be used with Fukumoto, or would accept an output
17 from a CPU.
18 Turning to slide 30, I'd like to address the requirement of the H Bridge
19 or the output to the H Bridge. Under Samsung's construction, and Samsung
20 construction requires these. And importantly, there needs to be an
21 equivalent to the H Bridge. There has to be an equivalent to it has to be an
22 H Bridge or its equivalent in the purported combination. There has to be an
23 output to an H Bridge or its equivalent in the purported combination. And
24 particularly for that second part, Samsung does not even attempt to show
25 that the algorithm steps that would produce outputs to oscillators or inverters
26 would be equivalent to the algorithm step to produce an output to an H

1 Bridge Switch. So counsel does not contend that Fukumoto or any other
2 reference on any of its grounds teaches an H Bridge. It also does not
3 contend that H Bridge specifically would be obvious. Rather, they point to
4 this class of purportedly well-known and purportedly equivalent structures.
5 And there's no showing that a version of Fukumoto with an oscillator
6 circuit or with an inverter would have its processor perform a step equivalent
7 to providing the output to an H Bridge Switch. In particular, we can look at
8 Dr. Wolfe's declaration filed with the petitions exhibit 1003, and specifically
9 I'll refer to the exhibit 1003 from the 992 petition, paragraph 184 counsel, I
10 think in its argument, in his argument, referred to the prior art circuits
11 discussed in paragraph 184 and also discussed in paragraph 186. I believe
12 that counsel said this morning that those were H Bridge circuits. I don't
13 think that's what Dr. Wolfe says. It describes these oscillator circuits. But if
14 you look at the XR circuit in paragraph 184 that generates an ac signal by
15 itself based on the resistor capacitor values and constant voltages not even
16 apparent from the Wolfe declaration what an output from the processor
17 would be.
18 There's certainly no showing that it would be an equivalent output to
19 an output to an H Bridge in the asserted patent or in the challenge patents.
20 And much the same is true for the circuit discussed in paragraph 186.
21 There's no showing that there would be an output to that circuit that would
22 be equivalent to an output to an H Bridge under the applicable legal
23 standards. So for these reasons, Samsung has failed to show that there's
24 additional reasons. These additional reasons, Samsung has failed to show
25 obviousness under any of the asserted grounds under Samsung's construction
26 of control components.

1 All right, so now we can move on to some of the ground specific
2 arguments starting on slide 31. So here we address the question of whether
3 there's a motivation to combine embodiments of Fukumoto, specifically
4 embodiments that we show on slide 32. The electromagnetic embodiment
5 and the electrostatic embodiment. Taking the two springs from the
6 electrostatic embodiment and modifying the electromagnetic embodiment
7 based on that. Turning slide 33, the position in the petition seems to be that
8 you don't actually need to show a motivation to combine. It's just, we
9 presume by the fact that they're in the same reference, and they cite the
10 General Electric vs. Raytheon for that position. But if you fairly read that
11 Federal Circuit opinion, that's not what it says. That's not the, it's not the
12 issue that was presented there. And so, you know, to the extent that the
13 Federal Circuit did address combining two embodiments from one reference,
14 it would be dicta. And what the Federal Circuit is really saying is, you don't
15 have to redo the work that the reference actually does. The combinations
16 that are actually present in embodiments of the reference, and In re Stepan,
17 which we quote here, makes it clear that even when you've got two
18 embodiments of one reference, you still need to show motivation to combine
19 and a reasonable expectation of success.
20 And so I won't belabor this, but in slides 34 through 37, we have our
21 expert, Dr. Goossen, walking through each of the purported motivations for
22 combining these embodiments and showing that they fail as a technical
23 matter. That the purported benefits or motivations don't line up with what
24 the reference actually teaches. On slide 38, we have testimony from this
25 deposition of Petitioner's expert where he acknowledges that the force, the
26 relationship between force and the displacement of the spring is determined

1 by the spring constant of that spring. And so thus the force that can be
2 applied is really independent of the number of springs, because you can
3 achieve the same force with any number of springs if you adjust those spring
4 constant accordingly.
5 Let's turn to slide 39, please, where we address the, or again,
6 addressing the requirement of an integer, converting to an integer, and
7 comparing that integer under the proposed construction for control
8 component from Samsung for claims three through six and the arguments
9 here apply to all of the grounds that are offered against claims three through
10 six. So this is dispositive as to those claims under Samsung's construction.
11 JUDGE AMUNDSON: This is Judge Amundson. If the Board, for
12 claim three, if the Board adopted Resonant's proposed construction, what's
13 your argument as to why Ueda fails to teach the claim limitation?
14 MR. RUBIN: We don't offer one for this that's specific to claims
15 three through nine. I'm sorry, claims three through six. There's still the
16 arguments we've already discussed that apply across all grounds. But it is an
17 admittedly peculiar situation where we are advocating a construction that
18 would tend to support a construction or a conclusion that our claims are
19 obvious.
20 JUDGE AMUNDSON: All right, thank you.
21 MR. RUBIN: And Samsung is advocating the opposite. Strange
22 times we live in. So their construction requires converting a signal into an
23 integer and comparing that integer to a specific value. The petitions rely on
24 Ueda as allegedly teaching this, and the reliance on Ueda as teaching this is
25 crystal clear in the petitions. So in each of the petitions on page 50, this is
26 the first full paragraph, they say, quote a POSITA would have been

1 motivated to use Ueda's feedback control with Fukumoto's linear oscillatory
2 actuator. And then on page 51, they say, quote, Ueda teaches a processor
3 programmed with the additional algorithm steps. A POSITA would have
4 been motivated to use Ueda's feedback control, which includes those
5 additional steps with the linear oscillatory actuator of Fukumoto. Close
6 quote.
7 So although in the reply they argue, oh, what we really meant is you
8 would use Ueda's feedback control with Fukumoto's processor. That's not
9 what's in the petition. The petition said Ueda teaches a processor with these
10 steps. Now, we think that's clearly not true. And as we say here on slide 40,
11 aside from reciting Samsung's proposed construction, integers are never
12 mentioned, even implicitly in Ueda. In the petitions and Dr. Wolfe's
13 declaration, I should have added here. In any of the other prior art that
14 Samsung relies on for these grounds, there's just no mention of integers at
15 all.
16 Turning to slide 41, in Ueda, there's also no mention of processors, no
17 mention of digital signals or algorithms. In contrast, Ueda contains the word
18 voltage 369 times. It consistently teaches an analog system with analog
19 feedback control, not a digital system. And not something implemented on a
20 processor. So the motivation to combine the actual combination suggested
21 in the petition just fails because Ueda does not teach what they argue, what
22 they rely on as teaching. And turning to slide 42, unsupported arguments
23 about being implemented in a general-purpose processor are untimely new
24 arguments, and also are even in the reply are unsupported by anything
25 beyond conclusory statements from their expert.

1 My friend pointed to some testimony from Dr. Goossen concerning
2 what if the output just happens to be an integer some of the time? It's only
3 relevant in the first place if you accept that you teach his implementation on
4 a general-purpose processor. But more importantly, the construction
5 requires a step of converting to an integer, not a step of converting to a
6 fraction. That may sometimes happen to be an integer. That's a different
7 algorithmic step. Anyway, these are new arguments not permitted under
8 Wasica Finance or Intelligent Bio-systems, which we cite in our Patent
9 Owner's response.
10 Turning to slide 43, we're at the section where we address the
11 motivation to combine with Erixon or Fuller. So I should point out, as I say
12 here on this slide, and as I think was clear in our patent owner response,
13 these arguments apply not just to Grounds 1G through 1L, but also 2G
14 through 2I. Our sur-reply doesn't mention 2G through 2I. All the arguments
15 do apply there. I guess part of the downside of a petition with so many
16 grounds is it's hard to keep them all straight. But the second set of grounds
17 involving Erixon fall for the same reason discussed here on slide 44. So,
18 Petitioners point to case law saying that combinations for obviousness do not
19 need to bodily incorporate disclosures from one reference into another. I
20 think they, without saying exactly which case vs. Nespresso case it was.
21 There was a reference to such a case this morning. But we're not saying that
22 the petition fails because it doesn't rely on bodily incorporation. We say that
23 it fails actually because it does, or at least that it relies on a the articulated
24 motivation and articulated combination is a quote, simple substitution, and a
25 POSITA would not have been motivated to make that simple substitution.

1 They haven't argued for something other than a simple substitution, and thus
2 the arguments fail.
3 So, turning to slide 45, Fukumoto, Erixon, and Fuller references
4 described structures with particular orientations of their vibrators, vibrating
5 modules, and with movements along particular axes, for reasons that a
6 POSITA would have understood and would have recognized the importance
7 of. So if we turn back to slide 32 for a moment, we can see the orientation
8 of the vibrating electromagnetic element in Fukumoto, and that is oriented
9 along and parallel to the screen and relatively thin in the direction
10 perpendicular to the screen. POSITA would recognize that's important to
11 achieving the system described and turning back to slide 45. As our expert
12 Dr. Goossen explains, the direction of vibration is also shown as
13 perpendicular to the screen. And that's important to achieving the key
14 perceptic sensation that is the goal of Fukumoto. And although we haven't
15 been specifically discussing issues for the ground two set of grounds, the
16 same is true for Fukumoto's embodiment that the direction, that the
17 movement in the direction where the device is thin is essential to achieving
18 the goals of Ogusu.
19 Turning to slide 47, the Erixon tube shaped vibrator is shown as being
20 as moving along an axis where the tube is long. And in addition to what's
21 shown in the figure on this slide, Petitioners also rely on the centering
22 magnets that would be at either end of the tube. And a POSITA would
23 understand that being longer in this direction is significant to the
24 construction and function of this vibrator. Now, Petitioner could have
25 argued for some other orientation or shape or some modification of
26 Fukumoto's vibrator based on Erixon rather than simple substitution. Maybe

1 we'd be in a different place and be making different arguments. But
2 Samsung chose to argue for simple substitution. And there's a suggestion
3 that because Dr. Goossen didn't measure or calculate exactly what the
4 dimensions would be, that his opinions aren't credible. Well, actually the
5 law says that you shouldn't assume that patent figures are precisely to scale.
6 The reasons that the motivation to combine fails don't depend on precise
7 calculation of dimensions.
8 Turning to slide 48. Likewise, Fuller's tube-shaped vibrator moves
9 along the axis where the tube is on the bottom and a POSITA would
10 understand that that's significant. And in the reply, they point to the
11 disclosures in or the teachings in Fuller that this structure could be scaled to
12 be, quote, very small. And I think today we heard extremely small. And the
13 POSITA would understand that that's -- perhaps you could scale it to be
14 extremely small, but that would be contrary also to what is required in
15 Fukumoto, because making the mass and the vibrator really small means that
16 you don't have the same haptic sensation.
17 So they have failed to demonstrate a motivation to combine with
18 simple substitution. I think we heard today, the counsel said, well, we
19 showed that they, that is, the Petitioner showed that a POSITA could have
20 made the substitution, but that's not the law. The law is clear that what
21 Petitioners needed to show is that a POSITA would have been motivated to
22 make the modification and to articulate the reasons they would have been
23 motivated, not merely could have. And this is clear from, for example,
24 Belden vs. Berk-Tek cited in our response.
25 Turning to slide 49, this is where we address the grounds that involve
26 the Dong reference, and the arguments here apply to all grounds for claim

1 14. If you find these issues in our favor, claim 14 survives. What claim 14
2 requires is not merely that there be a paramagnetic material, or tungsten
3 whatever, but that there be flux paths that comprise a paramagnetic material
4 that be quote shaped and positioned to reduce the reluctance of one or more
5 magnetic circuits. And so what they need to show is a motivation to modify
6 the other art to do that. And the petitions rely on Dong and I should actually
7 correct what's said on this screen. The petitions point to Dong as having
8 paramagnetic material. Now I think if you carefully look at the petitions and
9 the supporting declaration, they never even say that the tungsten in Dong
10 reduces the reluctance. They merely say the Dong teaches using tungsten,
11 and that according to them, a POSITA would understand that adding
12 tungsten to Fukumoto would reduce reluctance.
13 All right, now, in the reply, they argue for the, I believe for the first
14 time that Dong shows tungsten that reduces, that the -- tungsten in Dong
15 reduces reluctance. What's interesting is that they don't present that from
16 their expert. They do present an expert declaration in support of the reply.
17 But even that reply declaration doesn't say that the tungsten and Dong
18 reduces their reluctance. Instead, they make attorney arguments. And I
19 think that's peculiar. So if we look at the actual expert evidence in the
20 record which we see on slide 51, Professor Goossen says that the
21 counterweight is not part of the magnetic circuit. And he points to the
22 drawings that we have back on slide 50, which show the magnetic field lines
23 going through the magnets 16 and 17, and do not show any magnetic field
24 lines or any magnetic circuits that go through the tungsten counterweight.
25 JUDGE AMUNDSON: This is Judge Amundson. I had a question on
26 that figure, figure seven from Dong shown on slide 50. And as I understand

1 Samsung's position, they say, okay, Figures 6 and 7 shown on slide 50.
2 Figures 6 and 7 just show the permanent magnet 16 and the counterweight
3 15 in the center position. But that structural element, the permanent magnet
4 and the counterweight, that's going to go horizontally in the direction
5 relative to the paper, okay. It's going to go horizontally back and forth. And
6 so, when it's going horizontally back and forth, those flux lines will go
7 through the tungsten counterweight. What's your response to that?
8 MR. RUBIN: Well, a few responses to that. Number one, as I just
9 explained they don't actually argue in the petition that any magnetic circuit
10 involves the counterweights in Dong. They argue that Dong discloses the
11 use of a tungsten counterweight. A POSITA would understand that using
12 tungsten in Fukumoto would reduce reluctance. It's a subtly different
13 argument. And so, what you're just pointing to is a new argument in the
14 reply. It's also entirely a turning argument. And, you know, apparently,
15 we're to believe that somebody merely looking at those figures in Dong
16 would be motivated, would say, oh, I see there's tungsten here, and would
17 look beyond the magnetic field lines that are actually shown in Dong, look
18 beyond the function that the tungsten really is performing in Dong and say,
19 oh, well, we could put tungsten in a different place in this other vibrator.
20 And because we know tungsten is a paramagnet, it would reduce reluctance.
21 But it’s just not. I don't think that it's credible to argue that Dong teaches or
22 would motivate the full limitation that's required in claim 14 of placing the
23 paramagnetic material in a flux path and that it be shaped and positioned to
24 reduce reluctance. Right.
25 I mean, you know, either attorneys can say that, incidentally, that that
26 happens when you move it in a particular way, but I think that falls. And

1 they can say that in the reply. I think that falls short of showing that a
2 POSITA would actually be motivated, and it gets peculiar that their expert
3 doesn't even say.
4 JUDGE AMUNDSON: All right, thank you. I think you're about 70
5 minutes into your initial allotment that you requested.
6 MR. RUBIN: All right, thank you. And so the actual expert
7 evidence, the credible evidence, is what's shown in slide 51, the testimony of
8 Professor Goossen that Dong does not show, or in fact, shows that the
9 counterweight is not part of the magnetic circuit. And so I think what
10 they're left with as an argument is just people knew about tungsten. It's an
11 element in the periodic table. People knew that there are paramagnets. We
12 don't dispute that paramagnetism was known more than 15 years ago, or
13 whatever matters here. I mean, what's interesting is that to illustrate where
14 you would put the pragmatic material, what do they point to? They point to
15 the figures in our patent. Right. We saw a figure, I think it was 24A this
16 morning.
17 So I don't think it's sufficient to show obviousness just to say, hey, this
18 element is known. Paramagnets are known. So you would therefore place a
19 paramagnet in the flux circuit, or in the magnetic, within the flux lines to
20 reduce the reluctance of a magnetic circuit. When there are hundreds of
21 other elements, you know, hundreds of other, innumerable ways you could
22 shape things. It's just, it's not a sufficient motivation to combine.
23 All right, now we can go to slide 52, addressing our last argument for
24 today. And so this is concerning claim 16. The grounds involving
25 combinations of Fukumoto with Saiki. And these arguments apply to all of
26 the grounds against claim 16. So if you find in our favor on these issues,

1 claim 16 survives. So on slide 53, we see the claim language requires,
2 number one, a primary oscillation frequency, number two, a modulating
3 oscillation frequency, and requires that that first frequency be, quote,
4 modulated by the second frequency. It doesn't just require some output
5 that's interesting or that, you know, looks vaguely like some figure in the
6 patent. It requires two frequencies and one being modulated by the other.
7 The petition says what those are in Saiki, it's the petition identifies P1 as the
8 primary oscillation frequency and identifies P2 as the modulating oscillating
9 frequency. So to satisfy claim 16, P1 must be modulated by P2. What Saiki
10 actually says, though, and what the petition points to as allegedly modulating
11 is the fact that P1 and P2 are added. And incidentally, there are other
12 frequencies that are added, but they don't point to those.
13 On slide 54, we have the testimony of Professor Goossen explaining
14 that modulation requires, as he puts it, mixing or multiplying, something
15 more than just addition. And there's a bunch in the record about modulation
16 now, thanks to the reply. But none of it suggests that adding two signals is
17 modulating one by the other. If two of us happen to talk at the same time, I
18 apologize. I've spoken over one or the other of Your Honors today. I wasn't
19 modulating your voice, or vice versa. We were just both talking at the same
20 time. Adding two frequencies is both of them being present at the same
21 time, not one modulating the other. So perhaps you might view this as a
22 claim construction issue. We don't think that it needs to be formally
23 construed. We think that there's no, we're not arguing with lexicography.
24 We think that it can be the term in the claim can be given its plain meaning.
25 On slide 55, we see some evidence from the reply on what that plain
26 modulation meaning would be. I will say that if the Board were to adopt a

1 construction, I think the Board could just adopt the construction based on the
2 definitions that were presented in the reply. Both parties have had notice
3 and an opportunity to address those constructions. Petitioner entered them
4 into evidence and we responded. So I don't think that further briefing would
5 be required on construction of this term. We don't think that it even needs to
6 be construed per se. But if you look at the definitions that are offered by
7 Petitioner on slide 55, it's a long definition, but it clearly requires a
8 characteristic of a carrier being varied in accordance with the modulating
9 wave. So, under this definition, to meet the claim language, under their
10 theory, you would need to find that signal P2 is modifying some
11 characteristic of signal P1, and that's not happening, they're just adding.
12 On slide 56, we see the other definition that they offered in their reply.
13 Again, this definition requires varying characteristics of one of the signals.
14 And also Dr. Wolfe's reply declaration talks about examples of AM
15 amplitude modulation, FM frequency modulation, phase modulation, none
16 of those. All of those, I should say, involve varying some characteristic, the
17 amplitude or frequency or phase of one signal of a carrier based on another
18 signal. None of those, and nothing that they point to as modulation in the
19 reply or elsewhere involves simply adding and so there's no evidence in the
20 record that a POSITA would actually consider a Saiki to be modulating P1
21 by P2. Because the proposed combination doesn't meet claim 16, these
22 grounds should be rejected.
23 JUDGE CYGAN: Counsel, why in the combination, isn't a signal
24 amplitude being varied through addition?
25 MR. RUBIN: Well, so the amplitude of the P1 signal is present
26 unaltered in the, the output. It may be that the, so, I mean, if you look at,

1 you look at, say, a Fourier transform, the frequency domain representation of
2 the signal that P1 frequency is present unaltered with the same amplitude
3 that it had before these other signals were added.
4 JUDGE CYGAN: But wouldn't that be the same case if you're
5 modulating a signal, aren't you looking at the output of the modulation as
6 being the varied part? You're not talking about the original signal not being
7 modulated, even though you've changed its frequency. We're talking here
8 about the modulation being what you've done to get it resolved, correct?
9 MR. RUBIN: Well, so what's claimed here is that as a process is a
10 thing that's being done, not merely an output that's being achieved. So I
11 guess it may be that if you look at the envelope of the resulting signal, you
12 know, you look at the maximum value, instantaneous value of the signal
13 from adding the two signals, that maximum instantaneous value will be
14 greater than the amplitude of P1. But that's not because you're changing the
15 amplitude of P1. You're forcing the amplitude of P2. You're adding those
16 signals.
17 JUDGE CYGAN: But I don't really see the distinction between
18 sending a signal into a box that's multiplying it and maybe changing,
19 doubling its frequency. The output is the modulated output. You still have
20 the same signal going in. If instead of a multiplying box, you have an
21 adding box, the output that comes out is the addition of the two signals. You
22 still have the same original input going in. In both cases, I don't know how
23 you're distinguishing adding from multiplying in terms of saying, well, you
24 still have the original signal in there someplace. I'm not sure that it really
25 matters what happened to the original signal as much as what you've done
26 with it.

1 MR. RUBIN: Well, certainly the result of multiplying P1 and P2
2 would be different than the result of adding them. In particular, the
3 frequency that's present in that product would be would be shifted by the
4 process of adding the two signals. I'm sorry, multiplying the two signals. I
5 mean, I guess I would answer that. We have Dr. Goossen, Professor
6 Goossen saying that one skill in the art would understand that addition is not
7 modulation. And Samsung and its expert had the opportunity to rebut that
8 presented a bunch of evidence. Dictionary definitions, examples of types of
9 modulation, as allegedly would be understood to be modulation by one skill
10 in the art. Is there any examples of addition being considered?
11 JUDGE CYGAN: And I take that point. I'm trying to square with the
12 dictionary definitions, which are our other evidence in the case on this, we
13 have Dr. Goossen's statements, which are limiting it to multiplication. And
14 then we have dictionary definitions which really seem to include varying
15 amplitude. I'm trying to understand if there's a really good reason why that
16 is not sort of coming back and including addition at that point and being a
17 little bit broader than what Dr. Goossen is saying.
18 MR. RUBIN: Well, I guess another response I would give is that the
19 definitions say, vary, not merely produce an output that is different. What I
20 mean by that, so vary in accordance with so I would take that to mean vary
21 as a function of, you know, as the modulating signal changes with over time,
22 the characteristic of the carrier signal should correspondingly change. And I
23 don't think that that's what's happening when you're adding. I don't think the
24 time or the format would, you know, lends itself to me presenting a bunch of
25 trigonometry identities and saying, you know, what it means to add or

1 multiply sines and cosines. But I don't think that the example meets what
2 these definitions mean when they say varying in accordance with.
3 JUDGE CYGAN: Thank you, Counsel.
4 MR. RUBIN: So for all these reasons, and as I have eaten well into
5 my 20 minutes, I respectfully ask the Board reject all of the grounds, and the
6 petitions confirm the patentability of the challenge claims. Thank you very
7 much.
8 JUDGE AMUNDSON: All right, thank you. All right, Mr. Miller,
9 you can begin whenever you're ready.
10 MR. MILLER: I have a very short rebuttal. I think the issues are
11 pretty well framed based on what the parties have both argued and the
12 questions we got. But I do want to point out a couple of things. So at the
13 beginning of Mr. Rubin's presentation, he said that the slides and my
14 argument didn't address the second set of grounds. Grounds 2A, 2B. And I
15 do want to point out that in our slides, so if you go to slide 18, I'm not going
16 to reproduce them here. We don't need to waste time on that. It indicates
17 that the arguments that begin on slide 18 also apply to Grounds 2A through
18 2I, and then when you go to slide 37 we indicate in our slide deck that
19 Ground 1D, the arguments there also apply to Grounds 1E, 1F, and then 2D
20 through F.
21 And then on slide 47, where we're talking about Grounds 1G, we
22 noted that that also applies to Grounds 1H and 1I and then Grounds 2G
23 through I and then for Ground 1J I forgot, I didn't make a note of which slide
24 that is, but I won't waste your time. That also applies. That discussion also
25 applies to Grounds 1K through 1L and 25J through L. I'm sorry, 2J through
26 L. And it's Ground 1M, which is on slide 59. The arguments there apply to

1 Grounds 1M and 1O and then Ground 1S. That also applies to Ground 1U.
2 So with that, I don't really think I need to respond to anything else, unless
3 you have any, the Board has any specific questions for me. I think that our
4 original argument, response to everything that was said and all the questions
5 that were, that Your Honors asked, I think framed the issues quite nicely.
6 JUDGE MAYBERRY: Counsel, this is Judge Mayberry. If you don't
7 mind, I do have one question.
8 MR. MILLER: Of course.
9 JUDGE MAYBERRY: If you could assuage my concerns. It has to
10 do with the generation circuit 114.
11 MR. MILLER: Yes.
12 JUDGE MAYBERRY: And what jumped out at me in reviewing
13 things is specifically at the bottom of page 20 of the petition. I think it's the
14 992 petition.
15 MR. MILLER: Okay, I'm looking at the 992 for the '081 Patent.
16 JUDGE MAYBERRY: Okay, great. I think I am too, as well. And
17 what we have is an annotated version of Figure 2.
18 MR. MILLER: Yes.
19 JUDGE MAYBERRY: And it shows some red stuff.
20 MR. MILLER: Yes, I see that.
21 JUDGE MAYBERRY: It indicates that the red stuff is the control
22 component, which includes the drive signal generation circuit.
23 MR. MILLER: That's correct.
24 JUDGE MAYBERRY: It seems that that's picture at least here.
25 Presenting the drive signal generation circuit aspect is part of the control
26 component, not the separately claimed power supply.

1 MR. MILLER: So, this figure is directed to the arguments based on a
2 non means plus function construction. And we read it differently than we
3 do, than we do for the means plus function construction.
4 JUDGE MAYBERRY: Okay, thank you.
5 MR. MILLER: Other than that, I have nothing further.
6 JUDGE AMUNDSON: All right, looks like there are no further
7 questions from the panel. Well, thank you very much. And so. All right,
8 let's turn it over to Mr. Rubin. And remember, the sur-rebuttal's got to
9 respond to the rebuttal.
10 MR. RUBIN: I will be extremely brief. I stand corrected by counsel
11 that the slides do refer in small text, which I apologize for overlooking to the
12 second set of grounds. But I think that actually reinforces the real point I
13 was making, that I think everybody agrees that each of, each of the grounds
14 in the second set will rise or fall for the same reasons as one of the
15 corresponding grounds from the first set. So that's all I have to say in sur-
16 rebuttal unless there are any further questions. Again, we respectfully ask
17 that the Board affirm the patentability of our claims. And thank you very
18 much.
19 JUDGE AMUNDSON: All right, it appears that there are no further
20 questions from my colleagues. And so that concludes our hearing. Thank
21 you to both parties for your time and helpful presentations. The case is
22 submitted and the hearing is adjourned. But please stay on the line to see if
23 the court reporter would like assistance with any spellings. All right, so
24 thank you again.
25 (Whereupon, the proceedings at 12:00 p.m. were concluded.)

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