

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APTIV SERVICES US, LLC,
Petitioner,

v.

MICROCHIP TECHNOLOGY, INC.,
Patent Owner.

IPR2024-00646
Patent 9,471,074 B2

Record of Oral Hearing
Held: June 27, 2025

Before JON M. JURGOVAN, CHRISTOPHER L. OGDEN, and
JASON M. REPKO, *Administrative Patent Judges*.

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The above-entitled matter came on for hearing Monday, June 27, 2025, commencing at 10:02 a.m. PDT, at the U.S. Patent and Trademark Western Regional Office, 26 South Fourth Street, San Jose, California.

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

10:01 a.m.

JUDGE OGDEN: Good morning. We're convened for oral arguments in IPR2024-00646, and this relates to challenges to the patentability of claims of US Patent No. 9,471,074.

I am Judge Ogden. Also appearing remotely are Judges Jurgovan and Repko.

Let's get started with appearances for counsel from both parties who will be arguing today. And if anyone else is attending in person or remotely with you today but will not be speaking, please also identify them. For example, if you have a client in attendance, please identify them.

Following the hearing, I'll ask you to also confer with the court reporter to make sure that there are no questions regarding the spelling of names or terms.

So let's start with Petitioner.

MR. ARJOMAND: Good morning and good afternoon, Your Honors. I am Mehran Arjomand of Morrison & Foerester. With me are Eric Wiener and Stephen Liu, also of Morrison & Foerester.

Also remotely is my colleague Alex Yap of Morrison & Foerester. Also remotely is Paul Margolis of Petitioner Aptiv Services US, LLC.

JUDGE OGDEN: Thank you. And who will be arguing today for Petitioner?

MR. ARJOMAND: Your Honor, I'll be arguing, as well as my colleague, Stephen Liu.

JUDGE OGDEN: Okay. Thank you.

For Patent Owner?

1 MR. JENSEN: Yes, Your Honor. Travis Jensen from Orrick,
2 Herrington & Sutcliffe, Lead Counsel for Patent Owner. And I have with
3 me in person today as well, from Microchip, Jared Crop. There may be one
4 remote attendee, Jay Stewart, also from Microchip. And I will be arguing.

5 JUDGE OGDEN: Thank you.

6 Welcome to the USPTO San Jose Office. Before we begin, I want to
7 take this opportunity to address counsel and clients with some preliminary
8 matters.

9 We've reviewed the briefs submitted in this case, and we'll have them
10 available to us on our computers. In the interest of fairness, we have to limit
11 our considerations to only the arguments and evidence that have already
12 been presented in the record.

13 I note that recording of any PTAB hearing is prohibited. A court
14 reporter will provide a transcript of the hearing, and that will become part of
15 the record of the proceeding.

16 So to make sure that the transcript of the hearing is clear, I'd like to
17 ask you to speak directly into the microphone when talking, and to identify
18 any specific slide numbers you're referring to or any places in the record that
19 you'd like to direct our attention to.

20 Please note that this is a public proceeding, and it is being streamed to
21 enable public attendance. It's based on the revised hearing order, which is
22 Paper No. 36 in this proceeding.

23 Each party has 45 minutes total to argue their cases, but we also
24 received Petitioner's request for Steven Liu to participate in the oral hearing
25 under the Legal Experience and Advancement Program, or LEAP program.
26 So Petitioner will receive an additional 15 minutes of argument time during
27 the hearing, bringing their total to 60 minutes.

1 And we remind Petitioner that LEAP practitioners must have a
2 meaningful and substantive opportunity to argue during the hearing. That
3 said, there's no specific requirement in terms of time. It can be shorter or
4 longer than 15 minutes, as long as it's a substantive opportunity to argue on
5 behalf of Petitioner.

6 Petitioner will open the argument and can reserve rebuttal time, which
7 may not exceed more than half of Petitioner's total time. And Patent Owner
8 will then respond to Petitioner's arguments and can reserve sur-rebuttal time,
9 also not to exceed more than half of Patent Owner's total argument time.

10 And please remember that your arguments should be limited only to
11 those arguments that have previously been presented in your briefs.

12 We do note that Patent Owner has filed objections to some of the
13 Petitioner's demonstrative slides, to the effect that certain of the slides
14 contain material that has not previously appeared in Petitioner's brief,
15 according to Patent Owner. So we will consider those objections, but for the
16 purposes of this hearing, we're not going to prohibit Petitioner from using
17 the challenged slides.

18 To the extent that we agree with Patent Owner that anything presented
19 here today is beyond the scope of what has been argued in the briefs, we will
20 disregard that material. And we remind the parties that the demonstratives
21 are not to be -- they're not considered as evidence in this case.

22 And to the extent that there are any other objections to arguments by a
23 party today, we ask that the parties hold those objections until it's your time
24 at the podium.

25 We also note that both parties have filed motions to strike certain parts
26 of the opposing briefs and supporting declaratory testimony. Petitioner also

1 filed a motion to exclude certain deposition testimony by Dr. Greg Taylor.
2 We will address those motions at a later date.

3 Behind me is the clock, and I will maintain that clock. I'll set it up for
4 each party with the requested time allotment. The light on the clock will
5 change to yellow when you're nearing the end of your time, whether
6 opening or rebuttal time. And when the light is red, you've run out of time,
7 and the timer will begin to count upward.

8 If you do run into -- if you've reserved rebuttal or sur-rebuttal time
9 and you begin to run into that time, I won't cut you off. Just note that the
10 timer will be ticking upward and that that will be deducted from any rebuttal
11 or sur-rebuttal time later on.

12 So let's start with Petitioner. Do you wish to reserve any rebuttal
13 time?

14 MR. ARJOMAND: Yes, we do, Your Honor. Twenty-five minutes.

15 JUDGE OGDEN: Twenty-five minutes. Okay. That will mean
16 you'll have, I believe, if I did the math right, 35 minutes for your initial
17 opening time, so I'll set that on the timer. You can allot that time as you see
18 fit between yourself and Mr. Liu. You can begin when you're ready.

19 (Pause.)

20 MR. ARJOMAND: Your Honor, we have a printout of our
21 demonstratives. Would you like that?

22 JUDGE OGDEN: We have a copy of the demonstratives, so we don't
23 need a printout. Thank you.

24 (Pause.)

25 JUDGE OGDEN: You can begin when you're ready.

1 MR. ARJOMAND: Okay, great. Thank you. May it please the
2 Board. Petitioner Aptiv Services US, LLC, respectfully submits that the
3 challenged claims are unpatentable.

4 Turning to slide 1, this slide provides the two instituted grounds in
5 this proceeding. The first ground is based on the Al-Shyoukh reference.
6 The second ground is based on the Rincon-Mora patent and the Rincon-
7 Mora paper.

8 Turning to slide 2, this provides a road map for Petitioner's
9 presentation in its opening today. First, we will discuss claim 1B, directed
10 to a g_m -enhanced current buffer driver. Second, we'll discuss the limitation
11 claim 1C relating to biasing ratio. And third, we'll discuss the motivation to
12 combine issue relating to the enable/disable function in claim 1D.

13 Now, turning to slide 5, this presents claim 1, and it highlights the two
14 claim limitations at issue with respect to the g_m -enhanced current buffer
15 driver issue that I previously mentioned. Specifically, claim limitation 1B
16 recites a g_m -enhanced current buffer driver, and limitation 1C provides for a
17 g_m boost of the current buffer driver.

18 The Patent Owner argues that the g_m -enhanced refers to a separate and
19 distinct mechanism of increasing g_m from a g_m boost. We, of course,
20 disagree. In our view, the '074 patent never talks about a separate
21 mechanism.

22 So turning to slide 6, this provides the mapping that we presented in
23 our petition on the limitation related to g_m -enhanced. We indicated that the
24 Al-Shyoukh buffer is g_m -enhanced because it receives a g_m boost from a
25 current feedback circuit comprising transistor M24 and transistor M25.

1 And for Rincon-Mora, we made a similar argument. We believe that
2 our position is well-supported based on the specification of the '074 patent
3 and the drawings as well.

4 First, with regard to the written description of the '074 patent, here on
5 slide 7, what you see, Your Honors, is that every time g_m is discussed in the
6 '074 patent, it's always in the context of g_m boost. So these three passages at
7 column 2, lines 1–9, column 4, lines 14–20, and column 5, lines 3–7, all
8 refer to a g_m boost.

9 There is no mention of g_m enhancement in the written description of
10 the '074 patent, except for the claim language and except for a summary of
11 the claim language in column 1 of the written description.

12 So there is absolutely no support in the written description of the '074
13 patent for a separate and distinct g_m -enhancement mechanism, like Patent
14 Owner argues, but I think there's more to that, Your Honors. If you take a
15 look at what Patent Owner argues in terms of what is g_m enhancement, the
16 '074 patent actually contradicts Patent Owner's view.

17 Let me turn to slide 8 here. Slide 8 here shows on the left Figure 3D,
18 and on the right, it shows a passage describing Figure 3D at column 5, lines
19 8–10. And what this passage says, it says that the g_m -boost stage 218 may
20 comprise a number of transistors.

21 I won't recite all the transistors that are provided here, but they're
22 highlighted in Figure 3D on slide 8. I think what's important for you to
23 understand, or to focus on, is transistors 368, 370, and 382, which are on the
24 upper-left side of Figure 3D and are highlighted.

25 Turning to slide 9, when you look at what Patent Owner's argument is
26 for this separate g_m -enhancement mechanism, they basically divide Figure

1 3D into two sets of transistors. One set of transistors, shown in yellow, is
2 directed to the g_m -boost circuitry in Patent Owner's view.

3 The other set of transistors are shown in pink. As you can see from
4 this slide, they believe that those are directed to the g_m -enhancement
5 circuitry, specifically, transistors 368, 370, and 382.

6 That splitting of Figure 2 and putting transistors 368, 370, and 382 as
7 part of a g_m -enhancement mechanism, not a g_m -boost circuitry, directly
8 contradicts the '074 patent. As I described in slide 8, the '074 patent
9 specifically explains that transistors 368, 370, and 374 are part of the g_m -
10 boost stage.

11 JUDGE OGDEN: Is it possible that the g_m -boost stage could be
12 described in kind of a broad way, such that maybe some of those transistors
13 actually -- maybe only some of those transistors perform a boost function
14 and maybe others perform some other function, but this is just kind of how
15 they broadly define the stage 218?

16 MR. ARJOMAND: I don't think so, Your Honor, respectfully. I
17 think their specification is very clear what they view as the g_m -boost
18 transistors. As shown here on slide 8, every transistor is highlighted as part
19 of the g_m -boost stage.

20 And if you go through the operation of the circuit, which I'm happy to
21 walk you through, all of these transistors that are highlighted here impact the
22 g_m of the buffer driver transistor 384. I think that's particularly evident in
23 slide 10, Your Honor.

24 So here, slide 10 shows again Figure 3B on the left. And on the right,
25 it shows a passage from the '074 patent. And this passage actually, I think,
26 helps to clarify my point even more, Your Honors. It's talking about the g_m

1 of transistor 384. That's the g_m that the '074 patent is focused on
2 specifically to boost that g_m .

3 In this passage, it says that there are two sources of currents that are
4 coupled to that transistor 384. One is the bias network or the current that's
5 associated with the bias network. That's shown in blue. The other is the
6 current feedback that's shown in salmon color.

7 I direct you now to the sentence that is provided in purple at the end
8 of this passage. It says that, these currents are ratioed in transistors 368 and
9 370 to provide a sufficient amount of current for the driver transistor 384.

10 So what this passage makes clear is that the current feedback is
11 associated with transistors 368, 370, and 382, specifically in the discussion
12 of boosting the g_m of the buffer driver transistor 384.

13 In contrast, when you take a look at slide 11, again, Patent Owner's
14 view of Figure 3B, transistors 368, 370, and 382 are highlighted in pink.
15 And if you take a look at the passage that's in slide 11 -- this is from the
16 POR, page 18 -- they specifically say that those three transistors do not rely
17 on current feedback.

18 So once again, we have a situation where Patent Owner, in creating
19 this g_m -enhancement mechanism, is relying on splitting Figure 3B that we're
20 seeing here on slide 11, but it's directly contradicted by the '074 patent
21 itself. They're pointing to transistors that they say are part of the g_m -
22 enhancement mechanism, but when you look at the specification, those
23 transistors in multiple places refer to it as being part of the g_m boost.

24 So it's not just that broad statement that I showed you in slide 8, Your
25 Honor. Multiple passages confirm that these transistors, particularly
26 transistors 368 and 370, are associated with g_m boost.

1 Now, let me turn to slide 12. Slide 12 is again showing Figure 3B.
2 It's showing the same passage that I mentioned to you just a moment ago at
3 column 5, lines 15–24, of the '074 patent.

4 In this slide, what we're highlighting is that the patent talks about
5 transistors 368 and 370 providing a sufficient amount of current. And why
6 is that important?

7 If you take a look at slide 13, this provides Patent Owner's view of the
8 g_m -enhancement mechanism. Specifically, in their view, what they're
9 saying is that -- I'm reading from the right of the slide here, from the POR,
10 pages 22 to 23. What it says is that -- what they're saying is that the g_m
11 boost changes the overall magnitude of the standing current, whereas g_m
12 enhancement changes the allocation of where the current is going.

13 So in their view, allocation is associated with transistors 368 and 370.
14 It's not associated with magnitude or amount. But as I've shown you in the
15 previous slide, slide 12, the patent is very clear, the '074 patent is very clear
16 that those transistors 368 and 370 are directed to the amount of current being
17 provided.

18 We presented all these arguments in our reply. Patent Owner came
19 back, and they said that, well, there are other places for support for our view
20 of this g_m -enhancement mechanism that's nowhere in the '074 patent.

21 So here on slide 16, on the right, it shows a passage from the Sur-
22 reply at pages 5 to 6. At the bottom, they say that they rely on more than
23 just Figure 3B. They rely on expert testimony, claim language, and Rincon-
24 Mora, but when you look at those additional sources of support that they're
25 pointing to, we think that those are also just as deficient as their arguments
26 that are based on Figure 3B.

1 So first of all, with respect to Rincon-Mora, this is slide 17. This is
2 the one passage, I believe, in the POR, Your Honors, where they discuss
3 Rincon-Mora in the context of g_m boost and claim scope or claim
4 construction.

5 And here, all they're saying is that Rincon-Mora discloses a g_m -boost
6 technique. There's nothing here in this passage to suggest that Rincon-Mora
7 somehow supports this g_m -enhancement mechanism that they've contrived
8 from the '074 patent.

9 Turning to slide 18, Your Honors, this is a passage from Dr. Taylor's
10 testimony regarding the g_m -enhancement mechanism. This is paragraph 79.

11 I won't take the Board's time in reading this into the record, but I will
12 tell you that there's no reference to the '074 patent in this paragraph. This is
13 completely generated by Dr. Taylor. There is nothing that he points to
14 support his analysis of this g_m -enhancement mechanism other than his own
15 speculation.

16 I will just jump ahead, given the time, to say that Patent Owner spends
17 a lot of time arguing that there's a difference in claim terms here, so that
18 they should be given a difference in meaning. And we think that they have
19 overplayed their hand on that point, as this slide 22 shows.

20 The case law is actually pretty clear on this, that there's a general
21 presumption that different phrases have different meanings, but it's not a
22 broad-line rule. And that's from the Uniloc case that we've cited in our
23 papers.

24 And then we've also indicated here on slide 22 that if Patent Owner is
25 utilizing different terms that are being claimed interchangeably, then the
26 presumption has been met. And we feel that we've clearly -- or the

1 presumption has been rebutted, I should say. We feel clearly that the
2 presumption has been rebutted in this instance.

3 So just to summarize, we think that -- this is slide 23 -- our
4 understanding of g_m boost is consistent with g_m enhancement, or the g_m -
5 enhanced current buffer driver in limitation 1B, and is consistent with the
6 plain and ordinary meaning of the claim language.

7 We think it's consistent with the '074 patent, which doesn't describe
8 any separate mechanism for increasing g_m , and it's consistent with the
9 relevant case law.

10 In contrast, Patent Owner's interpretation, up here on slide 24, there's
11 no description in the '074 patent of a separate g_m -enhanced mechanism.
12 They over-rely on a rebuttable presumption that different terms have
13 different meanings.

14 So unless Your Honors have any further questions, I will turn over the
15 lecture to my colleague, Stephen Liu.

16 MR. LIU: Good morning and good afternoon, Your Honors. May it
17 please the Board. My name is Stephen Liu, representing Petitioner Aptiv.
18 I'd just like to start by thanking the Board for this opportunity to argue under
19 the LEAP program.

20 I'll be covering the biasing ratio and the enable/disable claim
21 limitations. If it's all right with the Board, I'd like to actually go out of
22 order and start with the motivation to combine, the enable/disable issue.

23 JUDGE OGDEN: Certainly.

24 MR. LIU: I just want to start out by saying the proposal, as laid out in
25 the petition, is to add an enable/disable function to the biasing circuitry of
26 the Al-Shyoukh and the Rincon-Mora voltage regulators.

1 Both of these voltage regulators use biasing circuits. That's
2 undisputed. And when the voltage regulators are not in use, those biasing
3 circuits will continue to supply a voltage to the transistors that they bias.
4 That's also undisputed. As a result, letting the biasing circuits continue to
5 run will drain current and lead to power loss. That's undisputed.

6 So it's not a big leap for a POSITA to look at this and conclude that
7 turning the biasing circuits off will save power. We laid this out clearly in
8 the petition, which explains at pages 22 to 26 why a biasing circuit with an
9 enable/disable mechanism, like the one disclosed by the Ivanov reference,
10 would be suitable for use with Al-Shyoukh.

11 In particular, we explain that one of Al-Shyoukh's chief concerns is
12 power efficiency, and Ivanov provides a solution for improving power
13 efficiency by shutting off circuitry that is not being used.

14 We provide a similar explanation at pages 62 to 66 of the petition for
15 Rincon-Mora, again emphasizing that a POSITA would readily recognize
16 the power-saving benefit of disabling circuitry that's not in use.

17 And that's exactly what enable/disable is. It's just an on/off switch.
18 There's no dispute that this was an extremely common and well-established
19 technique in the art. The record reflects that both experts agree on this.

20 Going to slide 47, we see that the '074 patent also treats this
21 enable/disable technique as a routine and almost trivial component. What's
22 shown here is the entirety of what the patent has to say about enable/disable.

23 At column 4, lines 43–54, the patent talks about the bias circuit. In a
24 single sentence at the end of this paragraph, it notes that node M of Figure 3
25 is the enable signal coming to the regulator circuit so that the module can be
26 turned off when disabled. And in Figure 3, as we've highlighted here, that
27 node M is represented in a single-line segment.

1 This is it, one sentence and a one-line segment. This is what Patent
2 Owner contests would have been obvious to add to the Al-Shyoukh and
3 Rincon-Mora voltage regulators, a technique that's so routine that the patent
4 spends all of 21 words on it.

5 On these facts, the Federal Circuit tells us that there is motivation to
6 combine. Shown here on slide 49 is the Federal Circuit's holding in *Intel v.*
7 *PACT*, which extends a line of cases going back to *KSR*. According to the
8 Federal Circuit, if there's a known technique to address a known problem
9 using prior art elements according to their established functions, then there is
10 motivation to combine.

11 Here, we have a known technique, enable/disable. We have a known
12 problem, wasted power due to active bias circuitry that is running while the
13 device is not being used. And we're using prior art elements according to
14 their established functions. This is exactly how the enable/disable technique
15 has been used conventionally.

16 Patent Owner's arguments don't rebut this straightforward conclusion.
17 First, the prior art doesn't teach away. Patent Owner argues that these
18 circuits already achieve good low-standby currents, so a POSITA would not
19 be motivated to make further improvement.

20 But that's like saying, if you have a leaky faucet, but it's less leaky
21 than other faucets, you wouldn't be motivated to stop or reduce that leak
22 even though you know it's important to save water.

23 Moreover, the correct legal standard on teaching away, shown on slide
24 52 here, requires that something in the references actively discourages the
25 combination, not that it has the appearance of preferring another solution.

26 What I've shown here on slide 52 is a holding from a *Meiresonne* case
27 from the Federal Circuit, which states that: a reference that merely expresses

1 a general preference for an alternative invention, but does not criticize,
2 discredit, or otherwise discourage investigation into the claimed invention,
3 does not teach away.

4 Shown above that quote is an excerpt from the Rincon-Mora patent,
5 Exhibit 1013, at column 1, lines 25–30. This is the lone disclosure that a
6 Patent Owner relies on to demonstrate a supposed discouragement of an
7 enabled terminal. All Rincon-Mora says here is that some LDO voltage
8 regulators in the previous art to Rincon-Mora incorporate a separate enabled
9 terminal.

10 This in no way criticizes a separate enabled terminal, discredits it, or
11 otherwise discourages it. If anything, the fact that these references, both Al-
12 Shyoukh and Rincon-Mora, are so highly concerned with reducing current
13 highlights power efficiency as a concern that would interest and motivate the
14 POSITA.

15 Second, Patent Owner blames our expert for not performing a
16 comprehensive cost-benefit analysis, but the general existence of tradeoffs
17 doesn't preclude a combination. Rather, the tradeoffs are left to the
18 knowledge and skill of a POSITA to address when implementing the
19 combination.

20 Third, Patent Owner attributes alleged drawbacks to our
21 enable/disable reference, Ivanov, for speed. They claim Ivanov isn't fast
22 enough and that its on/off switch introduces some delay in the function of
23 the circuit.

24 Now, as an initial matter, we're not relying on the exact
25 implementation disclosed in Ivanov, but on its general enable/disable
26 technique. Furthermore, there's not really any evidence that Ivanov's
27 exemplary circuit is too slow. And there's no stringent speed requirement

1 expressed by Rincon-Mora or Al-Shyoukh that would go to discourage a
2 combination with Ivanov.

3 The second alleged drawback Patent Owner raises has to do with
4 Ivanov's currents. Patent Owner argues that because Ivanov's
5 enable/disable circuit itself requires some current to operate, this somehow
6 rebuts motivation. But there's no dispute that even with those currents, there
7 will be a reduction in power loss.

8 That's shown here on slide 61. This is the passage from Ivanov on
9 which Patent Owner relies. It's Ivanov Exhibit 1005, column 5, lines 39–58.
10 It describes two different currents as far as Ivanov's enable/disable circuit.
11 The first ranges from 0.1 to 5 microamps, and the second, highlighted in
12 blue at the bottom, ranges from 1 to 2.

13 If you were to take the low end of some of these currents, 0.1 plus
14 one; 1.1 microamps. On the high end, you have two plus five; seven
15 microamps. Both are significant reductions from the quiescent currents that
16 are reported by Rincon-Mora and Al-Shyoukh on which the Patent Owner
17 relies.

18 Moving on to slide 62, this is an example of a data sheet for a
19 commercial product that was available as prior art to the '074 patent. What
20 this data sheet represents -- on page 3 of Exhibit 1030, which is the data
21 sheet, we highlight two lines.

22 The first is the quiescent current of this commercial device when it's
23 operating in the LDO, or low drop-down, voltage-regulated mode. That
24 quiescent current is 29 microamps, somewhat comparable to the 20 and 23
25 microamps figures reported by Rincon-Mora and Al-Shyoukh.

1 This part has a shutdown mechanism where you shut down the device,
2 turn off the bias circuitry, and you get that down to 5 microamperes. Which
3 is, again, comparable to the ranges disclosed by Ivanov.

4 JUDGE OGDEN: I've got a question about these ranges. Is there
5 evidence that the 20-some-odd microamps range is considered undesirable,
6 or is this so minimal that nobody would care about it? What does the
7 evidence show in that respect?

8 MR. LIU: There's no evidence either way, Your Honor, at least
9 within the Al-Shyoukh and Rincon-Mora references.

10 What we do know is that both are concerned with reducing the
11 quiescent current, and that the solutions presented in Rincon-Mora and Al-
12 Shyoukh contribute to that goal, but adding an enable/disable isn't a
13 replacement to their mechanisms.

14 It is an addition, so you would get a further reduction, which we think
15 a POSITA would find valuable because, again, the emphasis is, both
16 generally in the art and within these references, on saving power.

17 JUDGE OGDEN: I can imagine, though, that there's a point where
18 the amount of current is so low that no reasonable person of ordinary skill in
19 the art would really care about it or would really have a reason to reduce it
20 further.

21 Does the record suggest where that point would be?

22 MR. LIU: No, Your Honor. Patent Owner argues that 20 and 23
23 would be that point, but that's based on a misreading of the Rincon-Mora
24 reference, which I'm happy to get into.

25 I also want to remind the Board that although Al-Shyoukh and
26 Rincon-Mora do report these 20 and 23 microamp values, those are based on

1 specific test chips that the authors fabricated and tested. And of course,
2 Petitioner isn't relying on those test chips.

3 They're relying on the circuit topology of Al-Shyoukh and Rincon-
4 Mora, which provide for a reduction in quiescent current, but we don't know
5 how much, because that depends on the particular implementation that this
6 invention would be used for.

7 If the Board would like to hear our position on Patent Owner's
8 reading of Rincon-Mora, I'm happy to jump there.

9 JUDGE OGDEN: Sure, yes. You have about eight minutes of time.
10 I just want to make sure that you have time for the other point that you're
11 going to make.

12 MR. LIU: Thank you, Your Honor. In that case, I'll save that point
13 for rebuttal if it comes up.

14 I want to end on motivation to combine, moving back, taking a bigger
15 picture look at this. It's important to keep in mind what exactly is being
16 proposed here.

17 Adding an on/off switch to a circuit will drain power when it's not
18 shown. It's a conventional technique being applied for its conventional
19 purpose, which we submit is obvious.

20 Moving to the biasing ratio issue. Your Honor, I'd like to start just by
21 looking at the claim language, because the limitation 1C that the parties have
22 been discussing is not limited just to its biasing ratio.

23 We've reproduced claim 1 on slide 31 and highlighted the relevant
24 language. The limitation 1C is a biasing circuit coupled to the current buffer
25 driver to set a biasing ratio for g_m based on the current buffer driver.

26 To understand this, we think we have to look at the specification
27 where the specification describes how the biasing circuit couples to the

1 current buffer driver. That's shown on slide 32, which is actually the same
2 passage that Mr. Arjomand described in the context of the g_m - enhancement
3 issue.

4 This is the one place in the specification that talks about a bias circuit
5 coupling to a current buffer driver. The point where that happens is
6 transistor 396, which we've highlighted in blue on the bottom left. The
7 voltage that is biasing the gate of that transistor is being provided from the
8 bias circuit at node G. The bias circuit itself is not shown on this figure, but
9 its output is represented through node G.

10 What the patent tells us is that the transistors 368 and 370, highlighted
11 in purple on the top left, the current passing through those transistors comes
12 from two sources, one from bias and one from current feedback.

13 Those two currents are ratioed in transistors 368 and 370 to provide a
14 sufficient amount of current for the driver transistor 384. This is the entirety
15 of the patent's description of how the biasing circuit couples to the current
16 buffer to set a biasing ratio.

17 JUDGE OGDEN: I was wondering if you could clarify what it means
18 by ratioed exactly.

19 MR. LIU: We don't think it's perfectly clear, Your Honor. I'll start
20 by saying we don't think it's -- I'm sorry. My display has turned off, but we
21 don't think it's necessary to understand exactly what a biasing ratio is in
22 order to apply the obviousness ground that we presented in the petition.

23 To the extent it helps in understanding the patent, we would view the
24 biasing ratio -- view the word ratio to mean a ratio of blue current that comes
25 from bias to red current that comes from the current feedback, which both
26 are present in transistors 368 and 370 as part of that purple current.

1 JUDGE OGDEN: When it says that the currents are ratioed in
2 transistors 368 and 370, what does that mean that transistors 368 and 370 do
3 in the context of the act of ratioing as a verb?

4 MR. LIU: We read it as there is a ratio of blue to red that is existing
5 in transistor 368 and that is mirrored over to transistor 370.

6 JUDGE OGDEN: You're saying that it's just saying that there is a
7 ratio that exists between the current that you indicate in pink versus the sum
8 of the currents you indicate in blue and orange?

9 MR. LIU: That's correct, Your Honor. The sentence doesn't -- it's
10 written passively. It doesn't say that the transistors 368 and 370 are doing
11 something actively to provide a ratio. It's more that these currents are just
12 being ratioed.

13 JUDGE OGDEN: And your position is that that is the biasing ratio?

14 MR. LIU: I'll have to respond in two pieces, Your Honor. First, we
15 don't think it's necessary to construe. We haven't provided an affirmative
16 construction of the term biasing ratio because this exact circuitry that we're
17 talking about is present in the prior art. So whatever biasing ratio means in
18 this context, it would be present in both Al-Shyoukh and Rincon-Mora.

19 That said, to the extent it's necessary to understand the term biasing
20 ratio in relation to the circuit, we would submit that it would be the ratio of
21 the bias current to the feedback current that is present in transistors 368 and
22 370.

23 JUDGE REPKO: I have a question about that. The second part of
24 that sentence on your slide: to provide a sufficient amount of current with a
25 driver transistor but not enough to increase the current. Is that basically like
26 an allocation?

1 MR. LIU: No, Your Honor. That relates to the nature of the bias
2 current. It's a fixed value because it's determined entirely by the voltage
3 that's provided by the biasing circuit to transistor 396.

4 So it's just saying that the amount of current that 368 and 370 could
5 provide to 384 is going to be capped -- not capped -- limited in terms of the
6 amount of bias current they can draw as part of the current they would draw.

7 JUDGE REPKO: How do you do that to-provide part? So there's
8 two things there to provide. And it gives you an upper bound, doesn't it, to
9 provide an amount of current but not enough?

10 MR. LIU: Yes, Your Honor.

11 JUDGE REPKO: Should we consider that when we're reading the
12 claim?

13 MR. LIU: We think it's helpful in understanding this circuit. I
14 wouldn't say that it is necessary for understanding the biasing ratio term, but
15 more overall what is happening in terms of the current that's making its way
16 from transistor 370 to 384.

17 JUDGE REPKO: So it's not definitional in your view; it's providing?

18 MR. LIU: No, Your Honor. With respect to limitation 1C, we don't
19 view this as definitional.

20 JUDGE REPKO: Okay, thank you.

21 MR. LIU: I would add, though, Your Honor, that in terms of this
22 overall passage, whether or not it's definitional, this is all the patent has to
23 say about this claim limitation. We think it's sufficient for obviousness
24 purposes that this exact mechanism is present in the prior art.

25 I just want to briefly touch on --

1 JUDGE OGDEN: Just know that you're cutting into your rebuttal
2 time, which is fine. You can use as much of your rebuttal time as you want
3 to.

4 MR. LIU: Yes, Your Honor. Thank you. I want to briefly touch on
5 two more things before reserving the rest for rebuttal.

6 The first is that we just want to note, in the institution decision, the
7 Board found this rationale that the circuitry present in the section of the
8 patent that we were just looking at matches the circuitry that is present in Al-
9 Shyoukh and Rincon-Mora. So that's what we've highlighted here on slide
10 37. This is from page 23 of the DI.

11 Against this context, it's critical to note, Patent Owner has never
12 engaged with our interpretation of the column 5 passage in the '074, nor did
13 they contest that the same mechanism is present in the prior art.

14 Patent Owner's Counsel may stand here and tell you that they do
15 contest it, but it's not in their briefing. They never discuss that passage.
16 Instead, their argument is entirely based on biasing ratio meaning something
17 completely different. And I'll address now why that's wrong.

18 I'm displaying slide 42, which excerpts part of a footnote in Patent
19 Owner's Sur-Reply at pages 13 to 14, which is probably the most succinct
20 characterization of what Patent Owner views biasing ratio to be. They've
21 gone ahead and calculated a biasing ratio for Figure 3B of the patent, which
22 is the size ratios of transistors 378, 380, 394, and 402, which we've
23 highlighted in yellow in Figure 3B.

24 These transistors are not coupled to the biasing circuitry. They're not
25 part of the biasing circuit. The patent is very clear that the biasing circuit is
26 the circuit that provides the voltage at node G, which we've highlighted in
27 purple.

1 This can't possibly be a biasing ratio that's set by a biasing circuit
2 coupled to a current buffer driver. These transistors are part of the current
3 feedback circuit. The patent is very clear about that.

4 In the end, what we have here is an uncontested mapping of the actual
5 passage in the patent that discusses a biasing ratio and how it's set by a
6 biasing circuit coupled to a current buffer driver. Instead, Patent Owner tries
7 to change the meaning of the term biasing ratio in a way that doesn't match
8 the claim language because this, again, has nothing to do with the biasing
9 circuit.

10 The bottom line is, whatever biasing ratio means, the prior art has it
11 because the circuits are the same. And Patent Owner hasn't done anything
12 to rebut that.

13 With that, if there aren't any more questions, Your Honors, we'll
14 reserve the rest of our time.

15 JUDGE OGDEN: Okay. Thank you, Mr. Liu. Petitioner will have
16 about 21 minutes left for rebuttal time.

17 MR. ARJOMAND: Thank you, Your Honor.

18 JUDGE OGDEN: Mr. Jensen, would you like to reserve sur-rebuttal
19 time?

20 MR. JENSEN: I would, Your Honor. Could I reserve 15 minutes,
21 please?

22 JUDGE OGDEN: Certainly. So you'll have 30 minutes of your
23 initial time. Let me put that on the clock. You can begin when you're
24 ready.

25 MR. JENSEN: Thank you, Your Honor. May it please the Board.
26 Travis Jensen for Patent Owner Microchip.

1 I'd like to start the discussion today with the g_m -enhancement
2 limitation. I'm on slide 83. This is a reproduction of claim 1, and you can
3 see the two highlighted passages identify where the relevant claim language
4 appears.

5 It recites the g_m -enhanced current buffer driver in limitation 1B. And
6 separately in limitation 1C, it references the g_m boost of the current buffer
7 driver.

8 We don't dispute that the prior art, either Rincon-Mora or Al-
9 Shyoukh, discloses the latter, that is, the g_m boost. Petitioner, I think,
10 glossed over what the starting point for the analysis should be, which is the
11 claim language itself that we just saw.

12 On slide 84, we cite some Federal Circuit cases that establish what, I
13 think, is not in dispute, that there is a presumption that the use of different
14 claim terms connotes different meanings. And that's the starting point for
15 the analysis.

16 When Petitioner was presenting, you may have noticed they jumped
17 right to the specification, without considering that where you begin is that
18 the terms are presumed to mean different things. And then you can refer to
19 the specification, not to try and contradict that, but to see if the specification
20 confirms, in fact, that presumption.

21 And as we've explained in our briefing -- and this is on slide 85 --
22 those two terms, g_m boost and g_m enhancement, do in fact have different
23 meanings. They connote different ways of increasing g_m , different
24 mechanisms that are at play to increase the g_m .

25 We've described that as the g_m boost changes the overall magnitude,
26 the size, of the standing current. That is to say, you can just pump more

1 current through the relevant transistors, in particular transistor 384, to
2 increase the g_m .

3 g_m enhancement refers to a different mechanism that we've described
4 as an allocation of where current is being deployed, and that doesn't change
5 the total magnitude of current that is being used, it's just redirecting it or
6 rerouting it where it can be most effective.

7 We included an analogy here to a stereo speaker system. So if you
8 have a left speaker and a right speaker in a stereo system, if you want to get
9 more volume out of those speakers, one way to do that is to turn up the
10 volume knob. That will raise the volume coming out of both speakers.

11 Another way to affect the volume would be to turn what's labeled
12 here as a balance knob. That's to say, you could steer the power or the
13 current to the left speaker or to the right speaker.

14 The total amount of current or power being used by the system as a
15 whole doesn't change, but you'll get a lot more volume out of one speaker
16 versus the other. And we analogize that to the g_m boost and g_m
17 enhancement.

18 Let's talk a little bit about -- this is on slide 88, Your Honors. This is
19 essentially -- I'll call it a composite. It's assembling the Figures 3, 3A and
20 3B, which collectively form the entire circuit.

21 I want to focus on the way in which the g_m enhancement works
22 because I think it's helpful and important to understand that. And we've
23 highlighted transistors 368, 370, and 382 as the primary transistors that
24 contribute to the g_m enhancement.

25 What's happening underneath the g_m -boost label here is transistor 396,
26 and there's no dispute that that transistor is essentially a biasing transistor.

1 So it has a biased voltage on the gate which sets a fixed amount of current
2 that is being sourced through that transistor.

3 And what happens here is you have transistor 384. That's controlled
4 by node C, and that's underneath the arrow there. Node C is the gate node
5 on transistor 384.

6 That's like the balance knob in the speaker analogy. If you were to
7 change the voltage on node C, that will affect how much current is being
8 pushed through transistor 384. And of course, the current that goes through
9 transistor 384 will affect or be balanced by the current that is being sourced
10 through the path over here on the left, which has transistor 382.

11 So the combination, you can see the combination of these two currents
12 go into transistor 396. And again, that's a fixed amount of current.

13 So if you turn the amount of current going through 384 down, that's
14 going to increase the current that needs to compensate for that or reallocate
15 or redirect the amount of current that is coming through the other branch.
16 And that includes the current that's coming through transistor 368.

17 Because transistor 368 and 370 form a current mirror, whatever
18 current is going through transistor 386 will be mirrored through the
19 corresponding current-mirror transistor here, which is connected directly.

20 This is important. That transistor right there that is now pumping
21 more current, the current that transistor 370 is contributing, goes right on to
22 the gate of transistor 380. And that's transistor 380 as the output transistor.

23 So by turning the knob on node C for 384, you're reallocating or
24 redistributing the current such that it can charge or, as the case may be,
25 discharge the gate of transistor 380, which directly affects the current on the
26 output.

1 And that's a completely different mechanism. That reallocation is a
2 completely different mechanism than just saying, we're going to push more
3 current through the whole system or we're going to just push more current
4 through transistor 384. So there are two distinct mechanisms at play here.

5 And the circuit diagram, this is something that an engineer or a person
6 of skill in the art would immediately gravitate to, unlike many other patents
7 that have, I'll say, more maybe conceptual-level illustrations.

8 The '074patent provides a full-circuit schematic that an engineer, an
9 analog, a circuit designer would understand. And they would be able to look
10 at that and see that there are two mechanisms at play here.

11 I would direct Your Honors to one other thing in the petition where if
12 we look at -- this is Paper 1. Starting on page 4 is Petitioner's summary of
13 the '074patent. And one of the things that they talk about is g_m boost.

14 If we go to page 7, this is again where Petitioner is discussing the
15 '074patent. The bottom paragraph, and especially the last couple of
16 sentences in this paragraph, Petitioner describes -- they talk about the current
17 mirror and transistor 368 and 370. That's what we were just looking at that
18 Patent Owner contends contributes to the g_m by g_m enhancement. They go
19 on to say these transistors increase g_m boost in this other way.

20 They have unwittingly acknowledged, before they knew that this was
21 going to be an issue, that there are multiple g_m mechanisms at play, multiple
22 different ways to increase the g_m , disclosed right in the '074patent. It's this
23 other way. And I don't think they got it exactly right here, the way that they
24 describe it, but they're not too far off.

25 The reason why they wanted to conflate these two things, I would
26 submit to Your Honors, is it's clear that neither Rincon-Mora nor Al-
27 Shyoukh disclose a g_m -enhancement mechanism. But this idea that they've

1 suggested, that there is only one way to increase g_m that is disclosed in the
2 '074 patent, is simply incorrect. And it's acknowledged right in their own
3 papers, in the petition. It's also acknowledged by their expert.

4 If we go to slide 93, this is in Dr. Chen's reply Declaration where he
5 says, thus, the g_m -enhancement effect described by Dr. Taylor would be
6 negligible because it depends on BGS increasing.

7 He's not disputing that such a thing exists as a g_m -enhancement
8 mechanism, or what he calls a g_m -enhancement effect. He's simply
9 quibbling with the magnitude or how big of an impact that would have. And
10 that's not at issue here, how big of an impact it would have. It's just, does it
11 exist?

12 JUDGE OGDEN: I sort of read this as just saying that, assuming that
13 there is a separate g_m -enhancement effect, it would be negligible. Is that a
14 fair reading of this?

15 MR. JENSEN: I don't think that's quite what he's saying, particularly
16 if you take this in combination with the description that we just looked at in
17 the petition, where the Petitioner also acknowledges that there are various
18 different ways or mechanisms at play to increase the g_m , and if you look at
19 the circuit diagram that we had just walked through that shows there is this
20 reallocation at play.

21 And let me go back to that -- I'm sorry, Your Honor.

22 JUDGE OGDEN: Yes. Before we move on to something else, I just
23 want to go back to the part of the petition that you had up and that we were
24 looking at, where it said that there was some other way to do a g_m boost.

25 That's not quite the same -- that other way that they're referring to is
26 not exactly what you identify as the g_m enhancement, involving the

1 particular transistors and point that you showed on an annotated version of
2 Figure 3B?

3 MR. JENSEN: That is correct. If you look on page 7, it does discuss
4 the impact that transistors 368 and 370 play in providing this other way of
5 increasing g_m . And those are two of the transistors that we have highlighted,
6 368 and 370, right here.

7 I agree with you that they don't go quite so far as to describe this
8 other way as the exact articulation that we provided for g_m enhancement.
9 But I think that the fact that they have acknowledged that there are other
10 mechanisms at play, including ones that use transistors 368 and 370 to
11 increase g_m , is significant, and it's tantamount to an admission that there is
12 another way.

13 We call that, and the claim calls that, g_m enhancement. But it's not a
14 one-to-one exact description, I agree.

15 JUDGE OGDEN: There still could be multiple ways -- I could see
16 how there could be multiple ways of doing a g_m boost, even if there's a
17 separate phenomenon that we refer to as g_m enhancement.

18 So that argument still sort of -- that argument for Patent Owner still
19 kind of needs to assume that there is a distinction between g_m boost and g_m
20 enhancement, right?

21 MR. JENSEN: I believe that's correct, yes. Another point that we
22 make in our papers that you can sort of distinguish between these two
23 mechanisms that are at issue is the fact that their effects are cumulative.
24 They can be added to one another much in the same way that, going back to
25 the speaker example, you could have the speakers at a certain volume.

26 Using, let's say, 100 Watts of power, each speaker has 50 Watts that
27 it's using to output the volume. And then you can turn the balance knob and

1 shift 100 Watts to the left speaker and zero Watts to the right speaker such
2 that the left speaker then has the higher volume output.

3 Similarly, you can max out your g_m -boost technique. You're pumping
4 as much current as you can through the system. And then you can turn node
5 C, which is essentially the balance knob, the g_m -enhancement knob, to
6 allocate that current.

7 It's already at the max, but you reallocate it in a way that it puts it
8 where it does the most good. And effectively, that's by pumping that current
9 through transistor 370, right onto the gate node of transistor 380, without
10 using any more power or any more current from the power source or ground.

11 JUDGE JURGOVAN: Counsel, I have a question. This is Judge
12 Jurgovan. That is, does a person of ordinary skill in the art understand what
13 boost enhancement is -- I'm sorry -- what enhancement is compared to
14 boost?

15 MR. JENSEN: I think they do, Your Honor. And Dr. Taylor walks
16 through that in some detail. The starting point for his analysis is with the g_m
17 boost.

18 And he goes back, using the very prior art that they rely on, the
19 Rincon-Mora reference, which introduced that concept of -- they call it a
20 transient boost circuit. I's box 40 in Rincon-Mora at Figure 3. Rincon-Mora
21 does a good job of describing how that mechanism operates. From that time
22 forward, that term, I would say, became more or less a term of art.

23 As you kind of walk through the progression, that reference was from
24 1996 or 1997. And the date, the priority date here is 2013, I believe. So
25 there was a long passage of time there during which this concept of g_m boost
26 became part of the language or part of the jargon of a POSITA.

1 The g_m enhancement, on the other hand, was not necessarily a term of
2 art. It was introduced by the '074 patent, and that's why it's important to
3 look at this through the lens of a person of ordinary skill in the art examining
4 the figures, the circuit diagrams, to understand what that mechanism is, what
5 role it plays, and how it can be combined or accumulated on top of g_m boost.

6 JUDGE JURGOVAN: Thank you.

7 MR. JENSEN: Let me turn now, if I could, to the motivation to
8 combine topic. So there's two grounds at issue here, the primary references
9 of which are Al-Shyoukh and Rincon-Mora. There's no argument that either
10 of those anticipates the independent claim.

11 For both of those references, they rely on Ivanov. They combine with
12 Ivanov. They have a number of other references shown on slide 52, but the
13 only ones we care about for purposes here are the combination with Ivanov.

14 The reason they combine with Ivanov, and there's no dispute about
15 this, is that Rincon-Mora and Al-Shyoukh do not have claim element 1D, the
16 enable/disable function. Their expert, Dr. Chen, acknowledges this readily
17 at his deposition. This is on slide 54.

18 On slide 55, I think it's important to spend just a moment on the legal
19 framework here that we're starting with. Combining references in an
20 obviousness analysis, it's well established that that's an issue on which the
21 petitioner bears the burden of proof. And it is improper, as the *In re*
22 *Magnum* case states, to shift that burden onto the patentee, or the patent
23 owner, to prove non-obviousness.

24 So the burden lies with them. And if there's any question, or the tie
25 goes to the runner, the tie would go to the Patent Owner here in this case
26 because they bear the burden.

1 JUDGE OGDEN: For a teaching away argument, doesn't the Patent
2 Owner have at least the burden of production to show that there's a teaching
3 away that would then shift the burden to the Petitioner to show that there's
4 no teaching away?

5 MR. JENSEN: So yes, with a caveat. And the caveat is that there's
6 really, I'll say, two maybe related points here, but they are distinct. One is
7 that in the first instance, the Petitioner bears the burden. If they fail to meet
8 that burden at the outset, the Patent Owner prevails.

9 You mentioned teaching away. That's the second point. If the only
10 argument that Patent Owner was making was a teaching away argument,
11 yes, you need to look at what you call the burden of production, I think.
12 Patent Owner would have to come forward with some evidence of teaching
13 away.

14 And we're pursuing both of those arguments here. We're not relying
15 exclusively on teaching away. We think that they fail at the outset. They
16 don't get across the start line, but even if they do, even if you were to
17 consider that they did, the references themselves, the prior art, the data
18 sheets, et cetera, would counter that in spades.

19 So there's kind of two related but distinct arguments there, and that
20 goes back to slide 55 in terms of shifting the burden. It's improper to shift
21 the burden onto the Patent Owner, but if the Patent Owner affirmatively
22 takes up the banner of teaching away, yes, obviously, they need to come
23 forward with what they contend is the evidence of teaching away.

24 On slide 57 and 58, we reproduce the Petitioner's motivation to
25 combine argument from the petition. Slide 57 is for the Rincon-Mora
26 reference, and slide 58 is quite similar for the Al-Shyoukh.

1 Notably, both of these arguments are a single paragraph. Typically, in
2 an obviousness case, it's not uncommon that the motivation to combine is a
3 significant issue in the case. And that's something that seems to have been
4 phoned in here or sort of an afterthought. It's entirely generic. And if you
5 actually look at the citations that they give, we posit that they actually
6 support the Patent Owner. And I'd like to walk through why that is briefly.

7 Their argument that it would have been obvious to add an
8 enable/disable signal is a hindsight-driven exercise. It fails for two primary
9 reasons, the first of which is it rests on the false premise that there is
10 somehow some need in Rincon-Mora or Al-Shyoukh for an enable/disable.

11 Second, and this is an independent basis, even if there were arguably
12 some need because there's a very small amount of current, and you're trying
13 to get that even lower, they don't take into account any of the drawbacks,
14 trade-offs, or countervailing factors. And the case law says you have to do
15 that. You don't have to do a comprehensive, as they suggest, analysis or
16 evaluation of every possible trade-off, but you can't completely ignore all of
17 them in your analysis.

18 On the first point, and this is, is there a need at all in Rincon-Mora or
19 Al-Shyoukh for an enable/disable, the references themselves teach that there
20 is not. If we look at, for example, the Rincon-Mora reference, we can see
21 right in the abstract -- this is slide 20 -- Rincon-Mora is talking about an
22 improved low-dropout voltage regulator.

23 It has a transient response boost circuit, and it requires no standby or
24 quiescent current during zero-output current load conditions. It doesn't even
25 say low. It says no standby or quiescent current.

26 It's right in the abstract of the primary reference saying, we do not
27 need enable/disable. There is no reason for it. They're very proud of their

1 circuit design they came up with. They're sort of pounding their chest a
2 little bit maybe, saying, we've solved the problem.

3 And they go on to explain, we jump ahead -- well, they repeat it on
4 slide 24. This is in the background of the invention. This isn't a one-off
5 statement that they make. They repeat it throughout the reference. They go
6 on in the background of the invention to say, hey, there's some voltage
7 regulators out there that do incorporate a separate enable terminal.

8 And the reason why they're discussing this is as a point of contrast to
9 say, yes, out there in the art, and we don't dispute this, there are voltage
10 regulators that have a separate enable terminal. But we, as they just said,
11 have achieved no standby quiescent current. We don't need it. That's their
12 invention. We are unlike these other voltage regulators in the prior art that
13 needed an enable/disable terminal.

14 It goes on -- this is slide 26 -- in the background of Rincon-Mora,
15 talking about known techniques. Those are other prior art techniques before
16 Rincon-Mora that did require -- that did have more quiescent current than is
17 desired during zero-load current conditions. Those are the ones that need an
18 enable/disable signal.

19 And it goes on. I won't walk through and read every single one of
20 these. Al-Shyoukh is similar.

21 JUDGE OGDEN: Is it actually true, though, that there's zero
22 quiescent current? And if so, where do -- there's a slide, I believe slide 61
23 from Petitioner, that said that -- sorry, this is about -- there was a quote from
24 Ivanov. I think this is the right slide.

25 I think that there was a range of 20 to 23 microamps, and I think that
26 that was from Rincon-Mora. Is that right?

1 MR. JENSEN: I've got Petitioner's slide 61 up here. So for Rincon-
2 Mora, there's the Rincon-Mora patent, which is primarily what they rely on.
3 They pair that with the Rincon-Mora publication. And the Rincon-Mora
4 publication is the one that says, hey, the overall circuit has 20 microamps of
5 quiescent current.

6 Their expert, when I asked him about this at the deposition, I said,
7 why do you have both of these references? Are they sort of one and the
8 same?

9 And he said -- let me see if I can pull this slide up here. What he said
10 was, at slide 32 in Petitioner's slides, I asked him, would it be fair to say
11 that, in your view, the disclosure in the Rincon-Mora patent applies to the
12 Rincon-Mora paper? And he said, yes, that's why I see them as one.

13 So the fact that the Rincon-Mora patent says, look, there is no
14 quiescent current, if you apply that teaching or disclosure to the Rincon-
15 Mora paper that says, hey, it's 20 microamps, that's effectively saying --
16 that's Rincon-Mora saying 20 microamps is tantamount to zero.

17 It's so low, it's negligible. And the Rincon-Mora paper even uses that
18 word. You can do a word search, and it says it's negligible. So they're
19 essentially equating those.

20 And this goes to, I think, one of Your Honor's questions about, is
21 there some evidence of -- is 20 microamps a lot of current? Is it a little bit of
22 current?

23 The Rincon-Mora references, and Al-Shyoukh as well, themselves
24 disclose over and over and over again that that is an exceedingly small
25 amount of current, tantamount to zero. If you look at Al-Shyoukh, the title,
26 it says low quiescent current.

1 It goes on to say that it's, I think, 20 microamps. Rincon-Mora was
2 23 microamps. But they're effectively saying, look, we've solved the
3 problem. It's de minimis. It's so low, it just doesn't -- it doesn't move the
4 needle. It doesn't matter. We have declared victory over that problem.

5 If we look at the slide that Your Honor asked about, Petitioner's slide
6 61, they correctly acknowledge that Ivanov, if you were to add an
7 enable/disable circuit, that circuit itself consumes quiescent current. And
8 they don't disagree that it consumes as much as seven microamps of
9 quiescent current.

10 If you were to look at, let's say, the Al-Shyoukh figure, so that would
11 be Al-Shyoukh -- here's an example, Al-Shyoukh. This is slide 37. This is
12 Figure 8 from Al-Shyoukh. They're saying you would connect that up to
13 this VB1. So you'd add seven microamps of current there. But guess what?
14 There's also a VB2, and that has a different bias voltage. There's VB over
15 here, another bias voltage. So now you need three biasing enable/disable
16 circuits, one for each of the three bias voltages.

17 If you come back here, if you're already at seven microamps and you
18 multiply that by three, now you've added more current than you've been
19 able to save. But more importantly, if you were to look at Rincon-Mora
20 Figure 3 -- let me see if I can find an example of that.

21 Okay, here we go. Rincon-Mora, Figure 3. And the same holds true
22 in Ivanov. In Rincon-Mora, they're saying, hey, you hook up the
23 enable/disable to this I bias right here. And I bias, that's part of transient
24 boost circuit 40 in yellow.

25 And the parties dispute: where is this power being consumed? Let's
26 say it's the 23 microamps. The power that's being consumed is not -- the

1 one thing the parties agree on is, no matter how you read the Rincon-Mora
2 patent, this box 40 in yellow consumes no standby current, zero.

3 There's a dispute about what other components consume power, but
4 the op amp would have some quiescent current. So even if you hook up an
5 enable/disable to I bias, you have done nothing to reduce the current or the
6 power being consumed in, for example, the op amp over here on the left.

7 And given that even Petitioner concedes that this box 40, when
8 Rincon-Mora says there's no quiescent current being consumed, they say,
9 oh, I was only talking about box 40 -- even if that's the case, Patent Owner
10 still wins. Why would you add -- what is the motivation to add an
11 enable/disable circuit that consumes any power, let alone seven microamps,
12 to hook that up to a circuit that all the parties agree consumes no quiescent
13 current?

14 Far from reducing the amount of quiescent current being used, it
15 would add to it. And you would think that during prosecution, when the Al-
16 Shyoukh reference was being -- it was used as the basis for a rejection, the
17 thing that overcame the rejection was the addition of the enable/disable
18 limitation.

19 If it were as trivial or as much as a no-brainer as Petitioner contends,
20 that this was everybody and their dog knew about this and knew to do it, you
21 would expect that the Examiner who was looking at the exact reference that
22 we're looking at here would have said, that's really trivial. That doesn't
23 move the needle. That doesn't change anything.

24 I would submit to Your Honor that that's one of the very reasons that
25 the objection or rejection during prosecution was overcome, because the
26 addition of an enable/disable function as posited by the '074 patent was not
27 trivial. It was not obvious.

1 It may have been -- and we're not fighting the fight over whether a
2 person of ordinary skill in the art could have done it, whether there would
3 have been a reasonable expectation of success that it worked. We're focused
4 on the why. Why would you do this?

5 They have presented no reason other than they simply say, oh, it was
6 it was used in other circuits. I see I'm eating into my time, but I'll go just a
7 little bit longer because I want to address their citation to the Intel case and
8 that line of reasoning.

9 So if we jump to -- let me find the slide number here. Okay, let's go
10 to slide 75. They cite the *Intel* case for the proposition that, essentially, we
11 don't need to provide a motivation to combine.

12 We need to show that enable/disable was a known technique and a
13 suitable option. The prior art that we've looked at, whether it's Al-Shyoukh,
14 Rincon-Mora, or the data sheets -- let me just point Your Honors to that.

15 That's at pages 64 and 65 of our POR where we cite a number of data
16 sheets, Exhibits 2011, 2019, 2020, 2012, and 2016, which show a number of
17 data sheets where, even when those voltage regulators applied an
18 enable/disable function, it only reduced the quiescent current to essentially
19 the same levels that we're talking about here for Rincon-Mora and Al-
20 Shyoukh, 20 to 23 microamps.

21 The key here for the *Intel* case is there has to be sort of -- a known
22 problem. Well, it was known through the disclosure in Rincon-Mora and
23 Al-Shyoukh themselves that quiescent current was not a problem, that it had
24 been solved.

25 The other reason that their *Intel* case fails and is distinguishable -- and
26 we heard, I think, a concession from distinguished opposing counsel on this
27 point -- is that *Intel* dealt with a situation where you had a microprocessor

1 and a cache. And the question was, well, can you use a different cache that
2 had some other feature or property about it? And they said, oh, yes, you
3 could replace.

4 These caches were essentially interchangeable. It did not deal with a
5 situation like we have here where neither prior art reference has an
6 enable/disable in the first place and you're just saying, we could use a
7 different enable/disable circuit or function. They're trying to add
8 enable/disable in the first instance, which is unlike the scenario in the *Intel*
9 case.

10 I think with that, in view of the time, I'll rest on the papers on the
11 biasing circuit issue and reserve the balance of my time for sur-rebuttal
12 unless the Board has any questions.

13 JUDGE OGDEN: I don't think so.

14 MR. JENSEN: Thank you.

15 JUDGE OGDEN: Thank you, Mr. Jensen. Patent Owner will have
16 about ten and a half minutes left for sur-rebuttal time.

17 Let's go back to Petitioner. You have about 21 minutes of rebuttal
18 time. You can begin when you're ready.

19 (Pause.)

20 MR. CROP: That was connected. It was the second one.

21 (Pause.)

22 MR. ARJOMAND: I apologize, Your Honor. Technical difficulties.

23 JUDGE OGDEN: No problem. Take your time.

24 (Pause.)

25 MR. ARJOMAND: Sorry about that, Your Honor. I'd like to briefly
26 address Patent Owner's arguments regarding the g_m-enhancement issue.

1 Patent Owner's Counsel indicated that we had jumped straight to the
2 specification and not addressed the claim language, but I think we were very
3 clear in our analysis that, even if the claim terms are considered to be
4 different and they have different names, that presumption was strongly
5 rebutted in this case in view of the fact that the specification consistently
6 talks about a g_m boost.

7 It doesn't mention at all g_m enhancement except for that one passage
8 in column 1. And in fact, when you look at the specification, it directly
9 contradicts Patent Owner's view of this g_m -enhancement mechanism.

10 Patent Owner mentioned that the petition, Paper 1, at page 7
11 mentioned this other way. And this is a new argument, Your Honors. It
12 wasn't made in any of their papers. But I think, Judge Ogden, as you
13 recognize, they weren't saying, and they could not say, that that other way
14 somehow equates to their g_m -enhancement mechanism.

15 I also think, just like with their issue regarding different meanings of
16 the claim terms, they've kind of overplayed their hand here. If you take a
17 look at Paper 1, again on page 7 that they're referring to, it refers to Dr.
18 Chen's first declaration. Specifically, that's Exhibit 1002. And it refers to
19 paragraphs 36 and 37, which I have up here.

20 What Dr. Chen makes very clear in his paragraph 36 is, he explains
21 that there's three ways of increasing the g_m of buffer driver transistor 384.
22 Initially, he talks about that there is a boost based on those feedback
23 transistors. Then he talks about the boost associated with transistor 394.
24 That's the second way. And then he talks about the third way, which is
25 associated with transistors 368 and 370. There is no other way.

26 The petition makes it very clear that there are three ways of increasing
27 the g_m of transistor 384. And those are consistent with our view that g_m

1 boost should be understood the way we understand it, and g_m enhancement is
2 simply the result of that g_m boost.

3 JUDGE REPKO: I have a question about your statement of the patent
4 contradicts Patent Owner's argument. The argument is basically that if the
5 voltage on node C rises, the current through 384 is reduced and then the
6 excess current is redirected. It's like an allocation.

7 Do you agree with that assessment in the circuit diagram? What
8 exactly contradicts?

9 MR. ARJOMAND: Yes, sir. Thank you, Judge Repko. Let me just
10 direct you to slide 21. This slide shows on the left Figure 3B as annotated
11 by the Patent Owner.

12 So Patent Owner has shown here a number of different currents. I
13 think for our purposes, the two currents that you should focus on is I-source
14 follower and I-mirror. Their view, as you had noted, was that if the voltage
15 at the gate for transistor 384 drops, that could potentially increase the current
16 in I-source follower, which would reduce the current in I-mirror or vice
17 versa, depending on the load at node N.

18 The problem with their analysis and why this figure contradicts the
19 '074Patent is that it doesn't take in account the feedback current that's
20 coming from what they've labeled as node Z to transistor 394. So as I just
21 pointed to you, with regard to Dr. Chen's testimony in his first declaration,
22 the third way.

23 The third way that there's a boost of the g_m for transistor 384 is that
24 when the node at transistor 394 goes high, for example, in response to an
25 increase in the load, that draws current from transistor 384 that increases the
26 g_m of transistor 384. That's the second way.

1 The third way that the g_m of transistor 384 is increased is that the
2 current from transistor 368 is being drawn to transistor 394. I showed you in
3 some of our previous slides, there's a current that's shown from node Z
4 going to transistor 394. That drawing of the current from transistor 368 to
5 transistor 394 is mirrored in transistor 370, and then that increases the g_m of
6 transistor 384.

7 The analysis that Dr. Taylor has provided here and what Patent Owner
8 is arguing doesn't take into account at all that feedback current from
9 transistor 368 to transistor 394 in response to a change of the load.

10 JUDGE REPKO: Now, I'm not sure how that contradicts their
11 argument, though, if you think about it as there are multiple ways, but the
12 patent doesn't necessarily identify one of them as enhancement.

13 Is that your argument there? Because the patent doesn't use the word
14 enhancement to label some of these scenarios, you're just going to call all
15 three the enhancement?

16 MR. ARJOMAND: Well, certainly, in response to Judge Jurgovan's
17 point that this is -- g_m enhancement is not a term of art; that's what Patent
18 Owner's Counsel has said. If that's the case, you would expect that the
19 specification would discuss what the g_m enhancement is.

20 What has happened here is that Dr. Taylor has acted like an
21 archaeologist and has gone through Figure 3d. And he's thought that he's
22 identified something that could be g_m enhancement, but his analysis doesn't
23 add up with Figure 3d and the way it operates because specifically, as I
24 mentioned, there is a current, a feedback current, that's being drawn from
25 368 to transistor 394.

1 And that feedback current isn't reflected in this analysis. There's
2 another current here that should be shown. So, his whole analysis of this
3 allocation doesn't make sense.

4 JUDGE REPKO: I have no further questions on that. Thanks.

5 MR. ARJOMAND: Okay. I just would like to also add for the record
6 that Patent Owner Counsel's argument regarding g_m boost is a term of art
7 was not presented in their papers. That's also a new argument.

8 So unless there are any further questions, I'll turn over the lectern to
9 my colleague, Stephen Liu.

10 MR. LIU: Your Honors, I'd like to start by addressing Patent
11 Owner's alleged evidence of teaching away in the Rincon-Mora reference.

12 Shown on slide 50 here are excerpts from the Rincon-Mora patent.
13 The first excerpt shown at the top is at column 1, lines 12–17, and that's also
14 reproduced at the bottom. I'll address why in a second. The second excerpt
15 is from column 2, lines 4–7.

16 Patent Owner argues that when Rincon-Mora refers to a no-standby
17 current that is the standby current of the entire LDO voltage regulator,
18 they're only able to read it that way by parsing out language in between that
19 clearly associates the no-standby-current phrase with the transient response
20 boost circuit that Rincon-Mora has.

21 As you can see in the first excerpt, the full sentence is, more
22 particularly, the present invention relates to a current efficient LDO voltage
23 regulator incorporating a transient response boost circuit, which may be
24 added to selectively apply current to a slew rate limited node, and yet
25 requires no standby current during zero-output current load conditions.

1 The second sentence actually doesn't even mention the whole LDO
2 voltage regulator. It clearly associates no-standby current with a transient
3 boost circuit.

4 What Patent Owner has done, and this is how they presented this
5 passage in the POR at pages 27 and again at 59 to 60, they insert ellipses to
6 omit the transient response boost circuit portion of this. But if you add the
7 ellipses that way and then you try to parse the sentence, it no longer makes
8 any grammatical sense. The way you would read it is, more particularly, the
9 present invention relates to a current efficient LDO voltage regulator,
10 requires no standby current.

11 If you go back to their brief, they actually had to add a that in brackets
12 to make it make sense. But of course, the reason it doesn't make sense is
13 because there's a passage being excerpted.

14 Moving on to slide 51, Rincon-Mora actually makes the point that is
15 made very clear in expressed terms. Shown here on slide 51 is first a
16 passage from the Rincon-Mora patent at column 4, lines 41 to 48.

17 This paragraph is talking about no-load conditions. I-load is zero
18 amps. It notes that I-boost, which is the current contributed by the transient
19 boost circuit, is zero. That's right. When it talks about no-standby current,
20 it's talking about I-boost being zero.

21 At the end of the paragraph, it notes that this yields low quiescent
22 current. It's not saying that the quiescent current of the overall regulator is
23 zero. It's saying that it is low because the I-boost contribution is zero.

24 The second passage shown here is from the Rincon-Mora paper at
25 page 37. Here the paper states, during low-load current conditions, the
26 current setback to I-boost is negligible. I heard Patent Owner's Counsel

1 refer to the use of the word negligible within the context of this paper. Here,
2 you can see it's clearly referring to the I-boost current.

3 Later in this paragraph, it states, consequently, the current through the
4 emitter follower is simply I-bias when load current is low. This I-bias is still
5 present.

6 So when it talks about a 23-microamp quiescent current, that includes
7 this I-bias. It's not saying that 23 microamps is tantamount to zero. What
8 it's saying is the contribution of I-boost is actually zero.

9 Now, taking a step back –

10 JUDGE OGDEN: Mr. Liu, Patent Owner pointed to some other
11 passages in Rincon-Mora other than the one that you have on your slide. I
12 think there was something in the abstract that also said that there was no-
13 standby quiescent current.

14 I'm looking at Patent Owner's slide 23. I think there were at least a
15 couple of other places that kind of said something similar, but I was
16 wondering if you could address those, too.

17 MR. LIU: Yes, Your Honor. I'll just pull up the slide.

18 JUDGE OGDEN: I think, for example, on slide 23, they were quoting
19 the Rincon-Mora abstract.

20 MR. LIU: Your Honor, I think you see the same language here. The
21 Patent Owner's analysis suffers from the same exact problem. Of course,
22 they have highlighted transient response boost circuit, but the argument they
23 made ignored that.

24 Again, the language in the abstract is no different from the two
25 passages I was showing on our slide. It refers to an improved low-dropout
26 voltage regulator that incorporates transient response boost circuit. You can
27 see when it goes on to talk about no-standby quiescent current, that's

1 referring back to the transient response boost circuit, not the voltage
2 regulator as a whole.

3 JUDGE OGDEN: It's not completely clear to me that that's what it's
4 talking about here. Maybe I'm reading it wrong, but it seems to be referring
5 to the whole LDO voltage regulator.

6 MR. LIU: Your Honor, if you were to diagram this sentence, we
7 would say that the which-is-added-to and the while-requiring clauses both
8 extend from transient response boost circuit.

9 If it's helpful, Your Honor, this language in the abstract almost
10 exactly tracks the column 1 language we were looking at in the previous
11 slide, which is perhaps less ambiguous as to what it's referring to when it
12 says no-standby quiescent current.

13 JUDGE OGDEN: Okay, I think I understand how you're reading
14 that. Thank you.

15 MR. LIU: Now, this misreading of Rincon-Mora that Patent Owner
16 performs, that's the entire basis for their claim that Rincon-Mora has
17 somehow declared victory over this problem of power consumption.

18 At no point does Rincon-Mora actually say this is sufficient or this is
19 good enough. What Rincon-Mora says is this is good. It is an improvement.

20 I also want to quickly address their argument about --

21 JUDGE JURGOVAN: Counsel, before you move on, I'd like to ask a
22 question about -- I think Rincon-Mora is saying that it's zero-load class and
23 current flow is 23 microamps.

24 How do we know that the addition of enable/disable would actually
25 lower that number, or in other words, there would be some advantage in
26 making the combination?

1 MR. LIU: Thank you, Your Honor. First, I want to, I think, correct
2 part of the question. Again, we disagree that the -- I'm sorry, maybe I
3 misunderstood.

4 The point I was making earlier today about the current added by the
5 enable/disable circuit, at most -- we disagree that this would even get this
6 high, but for sake of argument, at most this would be seven microamps,
7 which is less than 20, as reported by Al-Shyoukh, or 23, as reported by
8 Rincon-Mora. There's no dispute about whether the current would actually
9 be reduced.

10 Even in the worst-case scenario taking -- again, we don't rely on the
11 exact limitation that Ivanov discloses, but that implementation that Ivanov
12 discloses as an example at most could have seven microamps of running
13 current, which is going to be a reduction of the best-case optimized test chip
14 that Al-Shyoukh and Rincon-Mora have presented in their papers.

15 JUDGE JURGOVAN: Okay. And how do you respond to Patent
16 Owner's contention that the addition of the enable/disable would itself result
17 in some leaked current?

18 MR. LIU: Your Honor, that's exactly what these 1.17 microamp
19 values are. That's the current that Patent Owner contends the addition of
20 this enable/disable circuit would add.

21 We submit that it's clearly less and undisputedly less than the
22 quiescent currents, again, reported in the optimized test chips that Rincon-
23 Mora and Al-Shyoukh are describing in their papers.

24 JUDGE JURGOVAN: Thank you.

25 MR. LIU: Patent Owner also pointed to -- I'm sorry, this was in
26 Patent Owner's slides.

1 JUDGE OGDEN: Just to let you know, you have about two and a
2 half minutes left of your total time.

3 MR. LIU: I'd like to then address Patent Owner's discussion of the
4 *Intel* case. We think Patent Owner gets the standard wrong. Motivation to
5 combine doesn't require showing some need for this exact improvement or
6 that there's some categorical improvement that happens.

7 What *Intel* teaches us is, again, if there's a known problem, which in
8 this case is that letting a circuit that brings power run will be inefficient in
9 terms of power, a known technique for solving that, that's all you need for
10 motivation to combine.

11 The attempt to distinguish *Intel* on the basis that in *Intel*, the proposed
12 combination involves some sort of swapping out of two components is a
13 non-issue here. We have additive effects.

14 One is the solution that's specific to how the voltage regulator itself
15 operates that's presented in Rincon-Mora and Al-Shyoukh. That tends to
16 reduce quiescent current. We have another solution that reduces quiescent
17 current even further. A POSITA would have easily recognized that that is
18 an obvious solution and invaluable solution.

19 As a last point, I just wanted to briefly touch on Patent Owner's
20 reference to three different bias voltages that are being provided to the Al-
21 Shyoukh circuit.

22 We don't disagree that there are different bias voltages being
23 provided, but we would refer the Board to page 25 of the petition and
24 paragraph 68 of Dr. Chen's opening declaration, which explains why a
25 person of ordinary skill would have been able to use one Ivanov biasing
26 circuit in order to accommodate all three of these voltages.

1 There's not any issue of tripling an enable/disable mechanism or
2 anything like that, which I should also note is a completely new argument
3 that Patent Owner has raised today.

4 I see that my time is up. With that, Your Honors, we will rest on the
5 papers.

6 JUDGE OGDEN: Okay. Thank you, Mr. Liu. Thank you, Petitioner.
7 Patent Owner, you have ten and a half minutes of sur-rebuttal time.
8 You can begin when you're ready.

9 MR. JENSEN: Let me start with the motivation to combine issue.
10 I'm on Patent Owner's slide 23 here, and this is the abstract that has the
11 language about no standby or quiescent current.

12 We submit that this is referring to the voltage regulator as a whole, but
13 I want to explain why even if this passage were interpreted to be saying that
14 the only thing that has no standby or quiescent current is the transient
15 response boost circuit, that Patent Owner still wins. And in fact, I think
16 Patent Owner's argument may even be stronger if this passage is read to
17 simply be referring to only the transient response boost circuit in Rincon-
18 Mora.

19 If we look at the Rincon-Mora circuit on slide 22, there's no dispute
20 that box 40, highlighted in yellow, is the transient response boost circuit.

21 If that circuit, as Petitioner submits, is what requires no-standby or
22 quiescent current, then why would anyone in their right mind add an
23 enable/disable to reduce what is undisputedly already a zero-quiescent
24 standby current circuit? Because they're saying the thing that you want to
25 shut off, or where you want to add the enable/disable is you hook it up to
26 this high-bias circuit. That is plainly inside the box 40.

1 There is simply no motivation whatsoever to add a disable circuit, like
2 Ivanov, that undisputedly requires its own quiescent standby current, as
3 much as seven microamps, to try and disable a circuit that already consumes
4 zero microamps.

5 The other thing that Petitioner ignores or gets wrong is that, under
6 their interpretation where box 40, the transient response boost circuit,
7 consumes no quiescent current, all of the remaining 23 microamps of
8 quiescent current in the Rincon-Mora paper must be consumed somewhere
9 else in the circuit, for example, in this op amp up here.

10 They have not even proposed disabling the op amp or adding an
11 enable/disable to reduce the op amp quiescent current, which under their
12 theory has got to be what's consuming the lion's share of the quiescent
13 current.

14 If they had wanted to do that, if they wanted to power down or disable
15 the entire circuit, the entire voltage regulator, what they would need to do is
16 they would need to hook up the enable/disable up here on the power supply
17 voltage and turn that off or shut that down, but that's not what they
18 proposed.

19 And there's good and valid reasons why you wouldn't want to do that,
20 but the broader point here is it doesn't matter if you interpret Rincon-Mora's
21 disclosure about no standby or quiescent current as applying to the entire
22 voltage regulator, in which case there would be no reason to add an
23 enable/disable at all because it's already zero, or if you interpret Rincon-
24 Mora's disclosure to be saying, the thing that the transient response boost
25 circuit, box 40, is what has no standby or quiescent current, because that's
26 precisely where Petitioner proposes connecting the enable/disable.

1 So we think it's correct to read the Rincon-Mora passages as applying
2 to the entire voltage regulator, but Petitioner loses either way and maybe
3 even worse under their interpretation of what has zero-quiescent current.

4 Turning to Al-Shyoukh, let's look at the Al-Shyoukh circuit in Figure
5 8. There's one here on -- let's go to slide 36. Similar to Rincon-Mora,
6 they're proposing to hook up to this VB1 an enable/disable circuit, but they
7 run into the same problem. Even if you were to disable VB1, you haven't
8 done anything to disable the op amp over here that would be dissipating
9 quiescent current or the rest of the circuit that's controlled by the bias
10 voltage VB2.

11 If you look at the passage I believe they cited on page 25 of the
12 petition, I didn't see anything there about saying you could use the same
13 circuit to control all of those.

14 In fact, the reason you couldn't, and the reason they have three bias
15 voltages to begin with here, is because each of these bias voltages are a
16 different voltage. If VB1 and VB2 were the same voltage, there wouldn't be
17 VB1 and VB2. You would just have a single bias voltage.

18 So it's implicit in the provision of three separate bias voltages that you
19 have to have three separate voltages that would need to be biased and
20 controlled by separate enable/disable circuitry to provide the different
21 voltages.

22 One of Your Honors -- well, let me move on in the interest of time
23 here to another point. Were there any other questions on the motivation to
24 combine before I switch gears?

25 Okay, let's turn to the g_m enhancement. Let's go to Petitioner's slide
26 21. On Petitioner's slide 21, this is reproducing a part of the '074 circuit
27 diagram. It's illustrating various current flows.

1 The I-boost current flow is shown in green. That's essentially the
2 approach where you're just pumping more current, more I-boost through
3 transistor 384. You can think of that as kind of the brute force approach,
4 which helps, but it only gets you so far in terms of increasing g_m . At a
5 certain point, other things start to get out of whack if you try to force too
6 much current through there.

7 The purple arrow there, the ISF, the I-source follower, that current is
8 also going through 384. That can be redirected as necessary or reallocated
9 and then mirrored up through 370 and put back onto the node, the node 380,
10 to charge or discharge that node more quickly and increase the g_m .

11 What we heard from Petitioner was their own expert talked about the
12 various different mechanisms that can be used to increase g_m . And I would
13 submit, Your Honors, that Petitioner made our case for us by pointing out in
14 their own expert declaration -- the discussion, I believe, was at paragraphs
15 36 to 37 -- that there is, in fact, disclosure of multiple different mechanisms,
16 multiple different ways that are at play here.

17 And you don't have to agree 100 percent with Patent Owner that, for
18 example, only transistor 370, 368, or 382 contribute to g_m enhancement.
19 The point is and the important takeaway is that there are different
20 mechanisms at play, different ways recited in the claim, described in the
21 patent, shown in the figure, to increase g_m . One of them is the well-known
22 g_m boost.

23 And I think I heard them say that that was a new argument that we
24 said the term g_m boost goes back to Rincon-Mora. That is incorrect.

25 I would cite Your Honors, for example, to page 21 of our POR in the
26 claim construction section where we're discussing g_m boost. And the first

1 thing we talk about is, hey, look at Rincon-Mora. That's the origin. That's
2 where this comes from.

3 We describe that at length even more in various other sections of the
4 petition where we provide a summary of Rincon-Mora. So the idea that
5 somehow it's a new argument that we're saying g_m boost has been around or
6 known for a long time is incorrect.

7 The other point that I would make on g_m boost here is, if we go to
8 Petitioner's slide -- here's a good one, Petitioner's slide 12. This is the same
9 figure, but they just highlighted it a little bit differently here. And they have
10 a passage from the patent.

11 The passage here says, the current feedback 210 comprises transistors
12 378, 400, 402, and 376. Those are the transistors that they've highlighted, I
13 think they called it, in a salmon color. It's these four here on the left.

14 These are the current feedback transistors. Those are the ones that
15 play a role in g_m boost. Those feedback transistors are totally different and
16 separate from the transistors 368, 370, and 382 that we say are g_m
17 enhancements.

18 I see my time is up, so I will rest. Thank you, Your Honors.

19 JUDGE OGDEN: Okay. Thank you, Mr. Jensen.

20 We thank everyone here who has participated today.

21 We'd like to especially thank our LEAP practitioner, Mr. Liu, for
22 appearing today and participating in the oral hearing. The PTAB benefits
23 from your participation. We appreciate your willingness to take part and the
24 willingness of your firm and your client for allowing you this opportunity.

25 We will take this case under advisement and issue a decision in due
26 course. This proceeding is adjourned.

1 (Whereupon, the above-entitled matter went off the record at 12:05
2 p.m.)

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