UNITED STATES
INTERNATIONAL TRADE COMMISSION

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In the Matter of | Investigation No.

CERTAIN LIGHT-BASED PHYSIOLOGICAL MEASUREMENT DEVICES AND COMPONENTS THEREOF | 337-TA-1276

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REVISED AND CORRECTED TRANSCRIPT

OPEN SESSIONS

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MASIMO 2029
Apple v. Masimo
IPR2024-00242

UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

Before the Honorable Monica Bhattacharyya

Administrative Law Judge

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In the Matter of Investigation No.

CERTAIN LIGHT-BASED PHYSIOLOGICAL MEASUREMENT DEVICES AND COMPONENTS THEREOF 337-TA-1276

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EVIDENTIARY HEARING

Monday, June 6, 2022

Volume I

The parties met via remote videoconferencing pursuant to notice of the Administrative Law Judge at 9:30 a.m. Eastern.

Reported by: Linda S. Kinkade RDR CRR RMR RPR CSR

MASIMO 2029
Apple v. Masimo
IPR2024-00242

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MASIMO 2029
Apple v. Masimo
IPR2024-00242

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MASIMO 2029
Apple v. Masimo
IPR2024-00242

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*** Index appears at end of transcript ***

MASIMO 2029
Apple v. Masimo
IPR2024-00242

P R O C E E D I N G S

(In session at 9:30 a.m.)

JUDGE BHATTACHARYYA: Good morning everyone. This is Monica Bhattacharyya, Presiding ALJ. We're here for the evidentiary hearing in certain light-based physiological measurement devices and components thereof, Investigation No. 337-TA-1276. With me is my Attorney Advisor Ted Jou.

Could counsel please enter their appearances.

MS. SWAROOP: Good morning, Your Honor. Sheila Swaroop, counsel for Complainants Masimo and Cercacor.

JUDGE BHATTACHARYYA: Good morning. I believe you're on mute.

MR. MUELLER: I'm sorry, Your Honor. Good morning. Joe Mueller on behalf of Respondent Apple.

JUDGE BHATTACHARYYA: Good morning. We're starting out on the public record.

As we discussed last week, there should be a designated person for both Complainants and Respondent who can confirm when we're ready to go on the confidential record at certain points during the hearing.

Ms. Swaroop, who is the designated representative for Masimo?

MS. SWAROOP: Yes, Your Honor, I can make those representations today.

JUDGE BHATTACHARYYA: Thank you. Mr. Mueller,

MASIMO 2029
Apple v. Masimo
IPR2024-00242

for Apple?

MR. MUELLER: Yes, Your Honor. Sarah Frazier will be our designated representative on that issue.

JUDGE BHATTACHARYYA: Thank you. We do have some members of the public here, including, there's a Call In User 1. I'd ask call in User 1 to mute their line, if it's not muted already, and also at some point when they call in to identify themselves as a member of the public.

There's also a person on the line, Arjun Jaikumar. I'd ask that that person also indicate if they are a member of the public or affiliated with Respondent or Complainants. We don't have to hold up the hearing for that. At the moment I'll just assume that both those people are members of the public.

(Clarification by reporter.)

JUDGE BHATTACHARYYA: All right. Thank you. I wanted to follow up on a couple of items from our pre-hearing conference last week. There was a question about deposition designations. As I believe you received an email last week from my attorney advisor, I'm not going to require that all deposition designations that have been discussed be admitted into evidence. Each party should move to admit their deposition designations by the close of their case, whether it's their case-in-chief or...

Any questions about that?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

MR. MUELLER: No, Your Honor. Thank you.

MS. SWAROOP: Thank you, Your Honor.

JUDGE BHATTACHARYYA: The other item that was discussed last week had to do with sequestration. As I also believe you heard from my Attorney Advisor, each party will be permitted a corporate representative designated by that party to not be sequestered. Are there any questions about that fact?

MR. MUELLER: Does the sequestration apply before opening statements or after opening statements? There was some email correspondence on this. We'll, of course, do whatever Your Honor directs.

We have had in most of our cases actually the sequestration kicks in before the witnesses begin to testify as opposed to the opening statements, but whatever Your Honor's preference is, of course we'll strictly adhere to that.

JUDGE BHATTACHARYYA: Ms. Swaroop, do you have a preference?

MS. SWAROOP: Yes, Your Honor. Masimo would prefer that the sequestration begin with opening statements, and I think, as we had provided to Your Honor's Attorney Advisor with some authority, suggesting that if witness testimony is going to be referred to in the opening, that the sequestration should go into effect at that time. And I

MASIMO 2029
Apple v. Masimo
IPR2024-00242

plan to refer to witness testimony in my opening, and I understand from Apple's slides that they intend to as well.

JUDGE BHATTACHARYYA: Mr. Mueller, is that correct, does Apple intend to refer to the anticipated content of witness testimony?

MR. MUELLER: At a very high level, Your Honor. We're not going to get into any of the details of what any particular witness will say.

JUDGE BHATTACHARYYA: The sequestration will go into effect for the opening statements as well.

MR. MUELLER: Your Honor, I would just note for the record that our corporate designee from the fact witness group is Dr. Paul Mannheimer.

JUDGE BHATTACHARYYA: Thank you.

And Ms. Swaroop, I assume it's Mr. Kiani, as you indicated last week?

MS. SWAROOP: Yes, it is, Your Honor.

JUDGE BHATTACHARYYA: Is there anything further before we proceed with opening statements?

MR. MUELLER: Yes, Your Honor, two quick things. To the extent that Masimo does attempt to introduce certain deposition designations today, we do have some outstanding objections. We can take those up later if it more convenient for Your Honor.

Also, on the witness list for today, although I

MASIMO 2029
Apple v. Masimo
IPR2024-00242

suspect we won't reach him, is Mr. Scruggs. We have some pretty significant objections to the anticipated testimony from Mr. Scruggs.

Again, it may be easier just to take those up later today, particularly in light of the fact that we may not reach him today, but we're happy to discuss it now if Your Honor would prefer.

JUDGE BHATTACHARYYA: I would appreciate a preview of the issues that are going to come up, but rather than take away time from the hearing, if you could send an email copying Masimo's counsel just summarizing what you believe at a high level the disputes are going to be, that would be helpful.

MR. MUELLER: Will do. Thank you, Your Honor.

JUDGE BHATTACHARYYA: Thank you. Shall we proceed with opening statements?

MS. SWAROOP: Your Honor, Complainants are ready to begin.

JUDGE BHATTACHARYYA: Okay. You may proceed.

OPENING STATEMENT BY COMPLAINANTS

MS. SWAROOP: Good morning, Your Honor. Masimo and our team here in California are happy to be here to begin this evidentiary hearing. We're looking forward to presenting our case to you and to having you hear from our witnesses and consider our evidence.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

This ITC investigation and the five patents at issue mean a lot to Masimo. These patents resulted from the ingenuity of many Masimo and Cercacor engineers, some of whom you will hear from.

These inventions relate to three areas of physiological monitoring. The first is a sensor design for light-based measurements that was not only unique but went against conventional thinking about how to obtain reliable measurements. You'll hear that this design actually resulted in improved measurements.

The second is a novel sensor design with features to project light into tissue to allow more of the tissue to be irradiated which increases the relevant information in the detected signals.

Your Honor, I apologize. There appears to be some sound or some background. If the person could mute, that would be appreciated. Thank you.

And the third invention is a novel accuracy enhancement system that introduces a thermal mass that stabilizes and normalizes temperature to allow a single thermistor to be used to correlate to the temperature of multiple LEDs.

This is done to compensate for measurement errors resulting from subtle changes to the LED operating characteristics.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Now one of the parameters we will discuss throughout the hearing is a noninvasive measurement of oxygen saturation of a person's blood. The evidence will show the challenges of obtaining reliable oxygen saturation measurements from a person's wrist.

This investigation presents very important issues affecting Masimo's domestic industry, and we appreciate your efforts to carefully consider the issues here.

I'd like to start first with introducing you to Masimo. The evidence will show that Masimo is a pioneer in the area of noninvasive monitoring of physiological parameters. You'll hear from our first witness, Joe Kiani, about Masimo's history of innovation.

Mr. Kiani will explain how he started Masimo in 1989 to solve a bane of pulse oximeter measurements, measuring through motion and low blood flow. You will hear how the innovations developed at Masimo revolutionized noninvasive monitoring.

And if we could go to our first slide here, which is on the screen.

The evidence will show that Masimo developed and introduced many innovative products in the professional care settings and that Masimo consumer presence began to grow many years ago.

The timeline here identifies various

MASIMO 2029
Apple v. Masimo
IPR2024-00242

medical-grade, consumer products that Masimo has introduced throughout the years. You will hear about Masimo's iSpO2, the first consumer pulse oximeter for the Apple iPhone that Apple itself carried in the 2012 time period.

You will hear about Masimo's other consumer products including the Masimo W1 Watch that was released in 2021.

In addition to being Masimo's founder and CEO, Mr. Kiani is also an inventor on three of the five patents at issue in this investigation.

If we could go to our next slide.

We refer to these as the Multi-Detector Patents and they are part of the '501, '502, and '648 patent group. You will hear from Mr. Kiani about this invention.

The evidence will show that the claimed sensor design, which has a convex protrusion that covers all of the detectors and deforms the skin, was completely counterintuitive. These patents also claim specific structures of the sensor that minimize the amount of light that goes directly from the LEDs to the detectors without interacting with the tissue.

Our next slide here, we have a figure from the Multi-Detector Patents. This is Fig. 3C that Mr. Kiani will talk about. And you can see here we have a sensor, and there's a protrusion that's labeled as element 305, and you

MASIMO 2029
Apple v. Masimo
IPR2024-00242

can see a series of four windows or openings that are labeled as 320, 321, 322, and 323.

The photodetectors are below those openings and receive light from the emitters. The patent also explains that these windows can include shielding to reduce noise from ambient light.

You will hear that this invention came about when Masimo was researching how to obtain better light-based signals for very difficult and more sensitive noninvasive physiological parameters, such as total hemoglobin, carbon monoxide, and even glucose.

In addition to giving better measurements for more difficult parameters, you will hear that this patented sensor design also improved light-based measurements in more difficult sites.

The next patent in this investigation is the '745 patent, which you'll hear referred to as the light-shaping patent. You'll hear from Ammar Al-Ali, who is the inventor on this patent, and Mr. Al-Ali will explain his invention.

If we go to our next figure.

What we see here is Fig. 7A from the '745 patent, which shows one embodiment of the invention. And you can see here we have an LED that's shaded in red at the top there, and then there's a light diffuser that spreads out and can also shape the light so that more tissue is

MASIMO 2029
Apple v. Masimo
IPR2024-00242

irradiated before it reaches the photodetector. The photodetector is shown there in blue as element 710.

There's also light block that's shown as item 706 in green that's between the LEDs and the photodetector.

The evidence will show the -- this improved the measurement particularly on more difficult sites.

The third inventor you'll hear from is Mohamed Diab. He joined Mr. Kiani to start Masimo. Mr. Diab is an inventor on the '127 patent, which we refer to as the temperature patent.

Mr. Diab will explain how this patent allowed for the measurement of parameters that no other company has been able to measure. This patent introduced using a thermal mass for the LED package and the sensor that stabilizes and normalizes temperature, so that a thermistor can be used to correlate to the temperature of multiple LEDs and, in turn, correlate to the changes in wavelength of emitted light.

The basics of this are shown in our next slide, which include Figs. 12 and 14 from the '127 patent.

What we see here on Fig. 12 on the left is a diagram of the emitter substrate, and it shows a thermal mass in the middle with multiple LEDs thermally coupled to that mass. A temperature sensor, you see that on the right, is also shown thermally coupled to the thermal mass.

The temperature sensor measures the temperature

MASIMO 2029
Apple v. Masimo
IPR2024-00242

of the thermal mass and uses that to estimate all of the operating wavelengths of the LEDs.

Fig. 14, which is on the right, from this patent, illustrates one example of a PC board that includes metallized layers that act as a thermal mass so that the measurement by the temperature sensors can provide meaningful information about the operating wavelengths of the LED.

The evidence will show that this feature results in increased accuracy, because the measurement of physiological parameters depends on the particular wavelength of the LEDs.

The inventors pursued this to help them measure new physiological parameters that are difficult to obtain. This technology is used in Masimo's rainbow« sensors, which measure a variety of parameters with light-based measurements.

You'll also hear from several witnesses about Masimo's extensive activities in the United States to use these three patent groups in its products. For the Multi-Detector Patents and the light-shaping patent, the evidence will show Masimo's efforts in the United States to design, develop, and manufacture the Masimo Watch.

You will hear from Mr. Kiani, Mr. Al-Ali and Bilal Muhsin, the CEO, about Masimo's activities in

MASIMO 2029
Apple v. Masimo
IPR2024-00242

developing and launching the Masimo Watch that is commercially called W1.

You'll hear about the details in the Masimo Watch project from Stephen Scruggs, an engineer at Masimo who, along with others, designed and developed the watches we are presenting for the technical prong requirement.

The evidence will show that this has been an ongoing project for years. Masimo's design and development activities have taken place in the United States, so that Masimo could develop a medical-grade product that delivers reliable measurements. This is in contrast with other pulse oximeters that are not reliable.

Now my next slide is going to include Masimo confidential business information. So I just want to make that clear so that we can have the appropriate people leave the Webex meeting, and that would include Apple's corporate representative.

I apologize. Yes, that would include Apple's corporate representative as well.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Moving back to the public record.

MS. SWAROOP: I'd now like to discuss patent validity with respect to the Multi-Detector Patents.

Now we don't know exactly what Apple's validity defense will be and what exactly Apple will present to you, and that's because Apple's pre-hearing brief for the five claims in this group includes dozens of references for background and for motivation to combine, and Apple's invalidity grounds uses a combination of numerous references.

So we will see the reveal along with you when Apple decides to finally unveil what the bases are for its invalidity defense.

The best we can discern is that Apple now appears to be relying on two primary references in its combinations. One, based on a patent that we refer to as Lumidigm, and one based on foam sensor heads from a student project at Kansas State.

So let's talk about Lumidigm first. The evidence will show that Lumidigm's focus was obtaining a spectral signature across a band of wavelengths to identify the wearer. Lumidigm then provides a wish list of wide-ranging

MASIMO 2029
Apple v. Masimo
IPR2024-00242

use cases that range from fruit ripeness, identifying counterfeit documents, oxygenation, a mood meter, a lie detector, used as a TV remote, a barcode scanner, a smoke detector, a guitar tuner, an alcohol monitor, and more unrelated wishes.

For Kansas State, the evidence will show that an undergraduate student following conventional wisdom designed a basic sensor for a summer project. The foam sensor head lacked the unrecognized benefit of the convex protrusion that we talked about earlier. It merely conformed to and did not disturb the tissue. Also, it was never commercialized or developed beyond an undergraduate student's summer project.

When Apple does unveil its invalidity combinations based on Lumidigm or the Kansas State student project. You will hear from our expert why the references they choose to present to you are missing fundamental features of the claims and why the combinations would not have been obvious and would still be missing claimed features.

Apple's own evidence will also support the nonobviousness of the claimed sensor configuration.

Another defense you may hear from Apple on is an assertion that Masimo's patents are somehow unenforceable due to prosecution laches. The publicly available prosecution history of this patent family refutes that

MASIMO 2029
Apple v. Masimo
IPR2024-00242

defense and shows the activity Masimo took to move its patents toward issuance. You will hear no expert from Apple testify that the record of prosecution showed any kind of unreasonable delay by Masimo.

Apple's pre-hearing brief also does not identify any Apple witnesses who will speak about any prejudice that Apple has suffered as a result of any alleged delay.

Apple's opening slides include a timeline labeling various time periods as a delay, but that simply ignores the public record of the prosecution history that actually was taking place during that time period.

And now I'd like to turn to the light-shaping patent and the evidence there. As that patent, as I had previewed earlier, this patent changes the shape of light from the detector so that it irradiates more of the tissue and improves overlap in the area being measured.

The evidence will show that Apple implemented this feature in the infringing Series 6 and later watches with its MLA lens.

Masimo will present tests of the infringing watches that show that light entering the Apple MLA lens is a different shape from the light that exits the MLA lens.

We can go to our next --

MR. MUELLER: If we could go on the confidential record, please.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

MS. SWAROOP: Your Honor, this is not --

MR. MUELLER: I apologize for interrupting. I just want to be careful about going on the Apple confidential record for any discussion of the technical details of the Apple products.

MS. SWAROOP: Your Honor, I plan to discuss testing that was conducted by Masimo. This is not Apple confidential information and was not identified as containing Apple confidential information in our discussion over these slides.

MR. MUELLER: I'll take Ms. Swaroop's word for it, but to the extent there's oral discussion that's going to move into the details of the products, we would ask that we go on the Apple confidential record, and I believe there is a slide coming up soon that will also require we go on that record.

JUDGE BHATTACHARYYA: Ms. Swaroop, do you know what Mr. Mueller is referring to?

MS. SWAROOP: I do, Your Honor. It's related to the '127 patent, and I plan to go on the confidential record for that portion.

This particular portion is information that is not confidential to Apple, and I plan to discuss the test results on our slide, which Apple has not identified as containing any Apple confidential information.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

MR. MUELLER: Just that, Your Honor, we have no objection. I just want to be careful that, if it goes beyond that, we move on the confidential record.

JUDGE BHATTACHARYYA: You may proceed, Ms. Swaroop.

MS. SWAROOP: Thank you, Your Honor.

If we could go to our slide here.

This slide shows light-shaping testing of the Apple Watch that was done in this investigation. And you can see here that there were three different LEDs that were tested: the red, the green, and the infrared in the third row.

And so in these tests Masimo obtained images of the light as it exited the LED, images when the light entered the MLA lens, and that's what we see in the second column as the light -- as it enters the MLA lens, and then the third column we see what the light looks like after it has exited the MLA lens. And so that's the third column.

And the evidence will show, if you look at the second column and the third column, that there's a change in shape, when we go to the second column, before the light enters the MLA, and the third column, after the light has exited the MLA. And so this change in shape, we believe, confirms Apple's infringement.

An the issue of validity, Apple has said it will

MASIMO 2029
Apple v. Masimo
IPR2024-00242

present an invalidity defense based upon its original watch, the Series 0. But Apple's evidence of this watch is not corroborated. Apple's opening slides will show you dates and images of the Series 0 watch that appear nowhere in the exhibits identified for those slides.

Apple's expert also relies on documents that do not corroborate the prior art status or structure of that watch. But, regardless, the evidence will show this watch lacked the ability to measure oxygen saturation.

The evidence will also show that Apple's other references for validity, such as Iwamiya, did not disclose use for measuring oxygen saturation.

And Sarantos, the evidence will show that that reference is discussing a configuration for use with irrelevant wavelengths of light that are not used for measuring oxygen saturation.

Similar to the Multi-Detector Patents, Apple has claimed it will present a defense of prosecution laches, and, again, the publicly available prosecution history of this patent family refutes that defense and shows the activities Masimo took to move its patents towards issuance.

Again, Apple has identified no expert on this issue, and no witness that will speak to any prejudice Apple has faced.

I now will be addressing Apple confidential

MASIMO 2029
Apple v. Masimo
IPR2024-00242

business information in addressing the '127 patent, so, Mr. Kiani will need to leave the room.

JUDGE BHATTACHARYYA: We're moving on to the Apple confidential record.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: We're moving back to the public record. You may proceed.

MS. SWAROOP: Thank you, Your Honor.

Apple's validity defense for the '127 temperature patent is based on obviousness, but the evidence will show that no combination of prior art shows a thermal mass thermally coupled to the LEDs and the thermistors so that the thermistor's temperature measurement can meaningfully estimate operating wavelengths of the LEDs.

Now you're going to see in Apple's slides a mention of a Scarlett reference in connection with the thermal mass claim language for the '127 patent. But Scarlett is not one of the references Apple is relying upon for its obviousness grounds. It's merely one of the many state-of-the-art references that appear throughout Apple's pre-hearing brief.

You will also hear evidence of commercial success, awards for Masimo's rainbow« technology, and teaching away in the prior art, all of which support nonobviousness of this invention.

The last point I'd like to address is the remedy Masimo is seeking for Apple's activities. Masimo is seeking both a limited exclusion order and a cease and desist order

MASIMO 2029
Apple v. Masimo
IPR2024-00242

against the Apple Watch Series 6, Series 7, and any Next Generation Apple Watch that includes these same light-based physiological monitoring features that infringe Masimo's patents.

However, what is very important to note here is that Masimo is not seeking exclusion of every Apple Watch. As we will show, Apple has sold other watches with different back surfaces before it introduced the sensor design and the blood oxygen feature that began with Series 6. We're not seeking any remedy in this investigation regarding those other watches.

Apple has sold tens of millions of those other watches, and the remedies we are seeking here would not impact Apple's ability to import and sell those watches.

Our ask is not a prohibition on Apple's ability to import tens of millions of watches from its factories in Asia if it chooses to do so. Rather, Apple should not be allowed to import and distribute watches with the pulse oximetry sensor of the Series 6, Series 7, and future watches, because those watches infringe the Masimo and Cercacor patents that protect our domestic industry, and that is a violation of Section 337.

We welcome the opportunity to present our evidence to you. Thank you, Your Honor.

JUDGE BHATTACHARYYA: Thank you.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Mr. Mueller, you may proceed.

OPENING STATEMENT BY RESPONDENT

MR. MUELLER: Thank you very much, Your Honor. Good morning, and thank you again for your time and consideration at this hearing.

Let me begin by noting some of the folks who will also be presenting witnesses over the course of this hearing. They include my colleagues Jonathan Cox, Sarah Frazier, Nina Garcia, Derek Gosma, Mark Selwyn, and Cindy Vreeland.

On behalf of all of them and also the folks who are helping us behind the scenes here, and, most importantly, on behalf of our client, Apple, we do want to thank you for your time and your consideration. Apple respects this agency and this process, and we're going to do our best over the course of the hearing to present the best possible evidence on the issues before Your Honor.

Let me also show you some pictures right now of the Apple engineers who will testify live over the course of this hearing.

Mr. Brian Land is the head. He is the Chief of the Health Sensing Hardware Group within Apple. He has been working at Apple for over 15 years, and, as I mentioned, he bears lead responsibility for developing the health sensing hardware within the Apple Watch.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Along with Mr. Land we have five of his colleagues. Dr. Paul Mannheimer, who, as I noted, will be our corporate designee at this hearing. Dr. Vivek Venugopal, Dr. Saahil Mehra, Dr. Steve Waydo, and Dr. Ueyn Block, five Ph.D.s, and the gentleman who runs the group, Mr. Land.

Why have we brought these six engineers to testify before Your Honor? Well, the first reason, of course, is that Apple does respect this agency and this process, and the second reason is Apple firmly believes that the facts in this case are decidedly on its side and wants to provide Your Honor with the best possible evidence of all the issues Your Honor needs to decide in this investigation.

Now let me take down their pictures for just a moment and turn a little bit to the issues at the heart of this case.

As Ms. Swaroop mentioned, Masimo and Cercacor, who I'll refer to for simplicity as Masimo, are requesting an import ban on the Series 6 and Series 7 watches. Now Ms. Swaroop just suggested that it may not be that big of an impingement on Apple because there are other watch models. In fact, these are the two leading and most advanced models of Apple Watch, and Masimo is trying to sever the supply chain of those devices to the United States.

Now the agency has the power to effect that

MASIMO 2029
Apple v. Masimo
IPR2024-00242

supply chain cut, but the question is, is there a proper basis for doing so in this case. And we believe the evidence will conclusively show there is no proper basis for an import ban of any type, let alone against these particular devices.

In fact, this case is being used at Masimo for an improper legal purpose and an improper business purpose. And let me explain what I mean.

Back in 2020 Masimo filed a District Court action in the Central District of California against Apple alleging trade secret misappropriation and patent infringement. That case is proceeding today.

Now there's very significant problems with the claims in that case. I'm not going into the details now, but we believe there are profound problems with the trade secret allegations, the patent claims have been stayed pending IPR proceedings where literally dozens of claims have been invalidated by the Patent Office during the IPR proceedings.

Those merits issues for another day for another court, but I note that, because of the relevance to this particular investigation, is that it was initiated explicitly because of Masimo's dissatisfaction with the pace of the District Court case.

And, Your Honor, respectfully, we believe that

MASIMO 2029
Apple v. Masimo
IPR2024-00242

initiating an investigation on those grounds is not a proper purpose, and, moreover, it led to Masimo prematurely filing this case, its complaint in this case, long before any mature domestic industry existed for at least four of the five patents-in-suit, and for all five of them we believe there's no domestic industry meriting an exclusion order in this case.

Now from a business perspective, there too we find that the case that's being brought for what we believe to be an improper purpose. For four of the five patents in this case the alleged domestic industry product is the so-called Masimo Watch, which has recently been given by Masimo the name W1.

That watch cannot be purchased, cannot be purchased, in any store in the U.S. today, let alone at the time when the complaint was filed.

Now as Your Honor knows from earlier briefing in this case, we believe the law is clear that, in the absence of special circumstance, the relevant time for assessing whether there's a sufficient domestic industry is the date of filing of the complaint. And we believe the evidence will show beyond a shadow of a doubt there was no legitimate domestic industry as of that date, nor is there one today, with respect to the Masimo Watch.

And what we believe is happening is Masimo is

MASIMO 2029
Apple v. Masimo
IPR2024-00242

trying to clear a path for a hoped-for aspirational product, clear a path by banning the import to the U.S. of the leading Apple Watch models.

Now, again, there's just no proper basis for doing that. And you can see, as you get into the substance of the patent issues, what we believe the evidence will show to Your Honor is that, with all of the patents-in-suit, Masimo has been trying to stretch disclosures and written descriptions that were directed to clinical products of the type that Masimo has focused on historically. They have had some consumer products, but far limited offerings as compared to their clinical products.

These patent disclosures were drafted in the context of their historical focus on clinical products, and they have tried to stretch them by drafting claims to cover consumer products like the Apple Watch.

Now the reason why that's significant is the clinical setting is quite different than the consumer wearable setting. In the consumer wearable setting, as you will hear from the six Apple engineers who will testify to Your Honor, there are very special engineering challenges that are associated with consumer devices.

Apple engineers are forced to engineer their sensors within the context of a very small form factor, a small device, that needs to coexist with a huge array of

MASIMO 2029
Apple v. Masimo
IPR2024-00242

other components within those devices, many of which have nothing to do with the health senors, but can interact with those sensors through electromagnetic interference or vibrations or other forms of effect.

It is a tremendous engineering challenge to have to design health-sensing hardware in the context of these multipurpose devices, which reside in a beautiful, attractive design, industrial design, that Apple has placed a special focus on.

These patents don't teach anything about how to achieve the engineering challenges that Apple has faced, yet Masimo is trying to assert claims that were drafted to stretch and stretch, to cover these types of consumer products, and, as Your Honor, we believe, will find, based on the evidence, we believe the evidence will show, Your Honor, the stretch is, A, not far enough to establish actual infringement, and, B runs headlong into prior art.

The basic problem they face, Your Honor, is that by stretching these claims they have drafted them to cover the lowest common denominator technology that can be common to both clinical and consumer products, but that type of technology has been known long before these patents were filed, indeed, in some cases, decades before these patents were filed.

And also, as I said, they didn't stretch quite

MASIMO 2029
Apple v. Masimo
IPR2024-00242

far enough. There are distinctions between each of the asserted claims and the Apple Watch. So we believe the claims are both invalid and not infringed.

And, to boot, as I mentioned earlier, the domestic industry contentions in this case, I think Ms. Swaroop suggested at one point that there's a burden on Masimo from having to put in evidence on undisputed issues.

Let me be clear. Domestic industry issues are hotly contested. We think for four of the five patents-in-suit, there's nothing remotely close to domestic industry as of the time of the complaint nor even today, and for the fifth product there are severe problems in the economic reporting data. And also for that product there's no competition whatsoever between the Apple Watch and the rainbow« sensors. So there is, indeed, a dispute on those issues as well.

In short, to justify this sort of supply chain cut, they would need to establish a proper factual basis on all of these different issues, and we think the evidence will show, again and again, they cannot meet their burden.

So, with that, Your Honor, I'll turn to the evidence, some more specific evidence, which I'll try to preview and contextualize. I'll start with just a few words about Apple.

Apple, of course, has been around for decades.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

It was started in the 1970s in California by Steve Jobs and Steve Wozniak working out of a garage initially. The company has grown over the years, and today employs over 100,000 employees across the U.S. and overseas as well.

But the research and development is headquartered in California, including at the headquarters building that you see right here. And it is, by any definition, an American business success story.

Over the years Apple has focused on industrial design, and I say that not just as a history lesson, but because this has particular salience and relevance to this investigation, Your Honor. Over the years Apple has gone to great lengths to create products that look attractive, in some cases they believe beautiful, and are very easy to use. But at the same time, at the same time, have immense computing capabilities within them, hugely powerful devices, but in these attractive, easy-to-use packages.

And achieving all those goals takes the talent of thousands of engineers, including the six who Your Honor will hear from. They helped design the Apple Watch or different parts of the Apple Watch.

The original Apple Watch, the Series 0, was released in 2015. Mr. Land, the head of the Health Sensing Hardware Group, was at the company at the time, and he will explain to you some of the work that he personally did in

MASIMO 2029
Apple v. Masimo
IPR2024-00242

connection with the Series 0 watch.

The Series 0 watch had a wide array of software capabilities. It allowed for users to customize the apps that they could use on the watch, as just one example. Music can be downloaded to use the watch, the original watch, as, effectively, a wrist-worn iPod.

It also also some health functionality, including calorie tracking, standing and exercise apps, and it had a heart rate sensor that Mr. Land himself worked on.

It also had LEDs and photodiodes for various purposes, including heart rate sensing, and it had a curved back crystal. Your Honor is going to hear a fair amount about the back of the Apple Watch, including the accused Series 6 and Series 7 models. But Your Honor will hear that the shape, a dome shape of the watch, has been constant since the Series 0.

And the reason for that domed, curved shape, there are multiple reasons, one of which has to do with charging. Your Honor may have seen that the Apple Watch can be placed in a charging cradle. The dome fits snugly in the cradle and is designed to align the watch with the charging hardware components so that the charging can occur in an efficient way. There was a very practical reason for that dome shape. Again, that was part of the original Apple Watch.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Over the years the Apple engineers have made various improvements to the Apple Watch, the Series 1 and 2, Series 3, Series 4, 5, and then we arrive at the Series 6 and 7, the accused products in this investigation, achievements over the years by various Apple engineers to move the ball forward.

Now I'm just going to note here, those achievements owe absolutely nothing to Masimo trade secrets, Masimo proprietary information. Any suggestion that the Apple engineers took Masimo information to put in the hardware or software of the Apple Watch is false. Your Honor will hear that firsthand from six different Apple engineers.

The Series 6, among the improved features and functions, included a processor and altimeter, a new and better display, a new operating system. It also supported some features used in the earlier models.

It included a blood oxygen sensor. This was the first Apple Watch to include a blood oxygen sensor. Your Honor will hear precisely how that sensor was developed. It took years of hard work, including by the folks who have come here to testify before Your Honor.

It also, the Series 6, supported features available in some earlier models, including health functionality.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Series 7, another advance in the display, some improved durability and environmental sealing. As Your Honor will hear, the watch is a waterproof device designed for swimming and other activities that could expose the device to water or moisture, other contaminants.

It is designed explicitly not to have holes in it, which would allow water or other contaminants to enter into the structure. It is a sealed structure. It always has been. It has no openings.

The Series 7 also has the WatchOS 8 operating system, a new advance in the operating system, and it retained the blood oxygen sensor and other features like the heart rate monitor from the Series 6.

Now, if we look at the full range of Apple models, they represent years upon years of hard work by many, many, many engineers within Apple. And there are, of course, far more features in these devices than just the health-sensing hardware. There's a whole panoplea of features and functions available to Apple Watch users. Even within the context of the health-sensing hardware there's far more than just the blood oxygen sensor.

So what is occurring in this case is Masimo is targeting a sliver of the function in the overall watch and arguing that sliver justifies an import ban on the entire Series 6 and the entire Series 7. And we believe the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

evidence will show no such thing.

Now if we shift to Masimo, the evidence will show that Masimo has focused over the years to clinical products for doctors' offices and hospitals and home settings under the care of a clinician. Now let me be clear. They have released certain consumer products over the years, not every one of their products was purely for a clinical setting, but the majority of their business has been in the clinical setting, a substantial majority.

And even their consumer products, we believe you will see, are far different from the consumer wearables like the Apple Watch.

Here's some examples of Masimo products. Credit where credit is due. We think Masimo has made some valuable contributions to the clinical setting, and we respect the work that they have done in connection with public health in that setting.

But it's a different setting than the consumer wearables marketplace. The engineering challenges are different. The technological solutions to those challenges are different. And there's a fundamental disconnect between patent applications drafted in the context of products like the ones you see here and the Apple Watch. And they can't bridge that gap, we believe, without running headlong into the prior art, and, even if they do, they haven't stretched

MASIMO 2029
Apple v. Masimo
IPR2024-00242

far enough in terms of how they have drafted the claims to capture the Apple Watch. There is no infringement.

So let me turn to the patents, the '127, '745, and the collection of related patents, the '501, '502, and '648, which we call the Poeze patents, after one of the named inventors, and we believe that for all of these patents you will see the same pattern, this pattern of trying to stretch disclosures, drafting claims directed to lowest common denominator technology that was known years before these patents were filed or the parent applications.

And even despite that, even despite the stretch, failing to stretch far enough to actually establish infringement of the Apple products. In all five of these patents, we also believe that there's not going to be a showing of a sufficient domestic industry to carry Masimo's burden on that important issue.

So let me, for an example, the timeline of the prosecution of these patents, the timeline for the '745 patent.

We believe that the timeline tells the tale for this patent and for others as well. If you look at the chronology, Your Honor, the Apple Series 0 watch, the very first Apple Watch model, was released on April 24th, 2015. The provisional application that Masimo filed for the '745 patent was not filed until July 2nd of 2015. And then the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

application that actually issued as the asserted '745 patent was filed in March of 2020, years after various Apple Watch models had been introduced.

If we look at the timeline for the Poeze patents, the '501, the '502, and the '648, again, the pattern is perhaps even more pronounced. Here we have the original provisional application filed in 2008. I'll try to highlight that, if I can, with a laser pointer. Then there's a variety of applications filed in the intervening period before the three applications that issued as the '501, '502, and '648.

But if Your Honor looks at the dates, the dates for each of those applications in that interim period occurred shortly after an Apple Watch release. Apple Watch Series 0, April 2015, next application, December of that same year. Apple Watch Series 4, released September 2018, four more applications filed by Masimo starting in December of 2018. Apple Watch Series 5 released, September of 2019, two more applications filed starting in December of 2019. And then three more applications filed in 2020 shortly after the Series 6 watch was released in September of 2020.

Masimo may claim this is a coincidence. We believe the evidence will show it was not a coincidence at all.

The '127 patent, claim 9, is a good first example

MASIMO 2029
Apple v. Masimo
IPR2024-00242

of how Masimo has had to draft claims directed to lowest common denominator technology in an effort to bridge the gap between clinical products and consumer wearables like the Apple Watch.

If you look at the claim limitations, they claim basic components, like a plurality of light-emitting sources, temperature sensor, a detector capable of detecting light. These are all old as the hills.

And what the claimed innovation here is to use something they call a thermal mass along with a temperature sensor thermally coupled to the thermal mass and capable of determining a bulk temperature for the thermal mass.

So the purported innovation here is to regulate the bulk temperature using this thermal mass as a regulation component.

Now from the joint technology tutorial presented to Your Honor, and this is the joint tutorial, it is known, has been known for long, a long, long time, that by adjusting the temperature -- the temperature of an LED device can effect the wavelength of the light, the temperature and the wavelength of the light have a relationship, and there can be variation of that wavelength based on temperature. That was known.

Webster is just one example of a well-known treatise from 1997 that teaches that same idea, variation of

MASIMO 2029
Apple v. Masimo
IPR2024-00242

wavelength based on temperature. So that's clearly not a patentable concept.

Now the claims use this term, a thermal mass, a thermal mass, and that particular phrase, a thermal mass, is an unusual combination of words that they are accusing -- may shed some light on what they mean by it -- what they are accusing are copper substrate portions within the Apple Watch on which certain components reside.

But Your Honor will see evidence that the substrate technology used in sensor devices, again, has been known for decades. One example is Mendelson from 1991, which was a blood oxygen sensor which had a substrate, and if a substrate qualifies as a thermal mass, Mendelson had it.

Scarlett is another example. This one shows copper lines through the substrate, copper pathways, like the copper pathways that are accused in the Apple Watch. Again, these types of basic structures have been known for years and years, decades and decades.

So even the purported innovation of that patent, we believe the evidence will show that, if a thermal mass to regulate bulk temperature can be satisfied by mere PCB or other forms of substrates, there's no possible way that they can survive scrutiny in light of the prior art, the claims are invalid.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

If we turn to the '745, again, we see a similar pattern, claims that recite lowest common denominator technology in an effort to bridge the gap from the clinical setting to the consumer wearables setting.

This is the patent which Ms. Swaroop referred to, which changes the shape of light, according to the disclosure. It involves components like a plurality of light-emitting diodes, a plurality of photodiodes, light block processor. These are basic old components.

But the key purported innovation here is to take light from a light-emitting diode, which is emitted in a, quote, first shape, to put that light through a material configured in a particular way, according to the claims, to change the light from a first shape into a second shape.

So the purported innovation here literally is running light through a component to change the shape of the light. That's the purported innovation.

And that is no innovation at all. Just one example is the Iwamiya patent filed by Casio Computer. This was filed back in 2010, twelve years ago.

Here you can see, Your Honor, in red are light-emitting units. The light in these units passes through various structures, including this annular light guide. That's that ring-shaped component in yellow below. The light that comes out the other side is in a new shape, a

MASIMO 2029
Apple v. Masimo
IPR2024-00242

ring. That's exactly one of the shapes that is claimed as inventive in the '745 patent.

So Iwamiya teaches this basic idea of passing light through a structure such that it arrives out the other side in a different shape.

Again, there's many examples of this. This is simply one.

Another example is the Fresnel lens in the original Series 0. In the Fresnel lens, there was a grooved Fresnel lens. It was a grooved lens that was used in the Series 0. And for one of the light-emitting diodes or LEDs, the one in red that you can see in the top left-hand corner, the light would pass through some of the grooved sections of the lens, and it would come out the other side in a crescent shape.

So, again, if that's the purported innovation here, changing light from one shape to another by running it through a structure, the Fresnel lens in the Series 0 is certainly an example of that.

Ms. Swaroop suggested there was some dispute as to the date. There will be no dispute. The Series 0 watch was released to great public fanfare in 2015. The Apple witnesses will testify to exactly that. This is not a fact that can be reasonably contested. It was a public, commercial release to the world, and we'll certainly put in

MASIMO 2029
Apple v. Masimo
IPR2024-00242

evidence on that point, but the Fresnel lens in that device did change the shape of certain light emitted by light diodes.

Again, we would never claim that's a patentable invention, but, if that's the contention, the Fresnel lens invalidates.

Now if we turn to the Poeze patents, '501, '502, and '648, once again, we see the same pattern. These are the so-called Multi-Detector Patents according to Masimo. And these claims are long, but if you look at any portion of them, this is just old technology.

LEDs, photodiodes, a convex surface are just some examples, storage device, a strap. The length of the claims should not be taken as any indication of their innovation. Again, every single part of these claims was old as the hills.

Here's what they submitted as patent, prior art to the Patent Office, page after page of prior art references, which speaks to how crowded this field was, speaks to some of the rudimentary features they were trying to claim as patentable.

Even though they submitted all this prior art, they didn't submit enough. We will show Your Honor many prior art references that were not before the Patent Office. Those include the ones you see here. These are all

MASIMO 2029
Apple v. Masimo
IPR2024-00242

physiological sensors, including some blood oxygen sensors, and they all include multiple detectors.

The purple components that we colorized here, Your Honor, are all photodiodes. As you can see, every one of these devices has multiple detectors for detecting light, multiple photodiodes, and it goes on. Here's another slide of additional photodetectors from over the years.

If you look at the dates, Your Honor, you can see some are from the 1970s, 1978, into the '90s, into the 2000s, and, again, it continues.

So multi-detectors, there's nothing patentable about multiple detectors. Reference after reference after reference speaks to that.

Ms. Swaroop said we have disclosed dozens of patents and other publications as state of the art evidence. She is exactly right. We certainly have. And there's a good reason for that. These patents are directed to technology that was taught many times over in decades that preceded these patent applications.

To the extent that the contention here is that the convex surface requirement is somehow a patentable advance, it's not. Again, you can see it over and over again, including the Smart reference from 1971, the Cramer reference from 1978, on and on and on.

And if we -- even if we focus on particular

MASIMO 2029
Apple v. Masimo
IPR2024-00242

combinations of these old components, Your Honor will see that we have evidence of that too. One example is the Lumidigm patent.

You will hear live testimony from Dr. Robert Rowe, a former engineer at Lumidigm. He is one of the named inventors on the Lumidigm prior art reference that you see here, which is directed to an electro-optical sensor.

Now, Ms. Swaroop mentioned that there's a lot of different use cases disclosed in the Lumidigm patent, and she is correct about that. One of the use cases is blood oxygen sensing, and you can see the highlighted text here, blood oxygen sensing using light detectors with multiple diodes.

You can see here the multiple photodiodes and the multiple emitters on the right, the emitters in red, the diodes in purple, and there's an explicit disclosure of using these types of configurations and structures within a watch. Fig. 8B shows using the multiple detector sensor taught by Lumidigm in a watch.

To the extent there's some critique by Masimo of the sufficiency of the disclosure of Lumidigm's teaching with respect to a watch, well, if they argue that, they are going to have a big problem with the Poeze patents, which have a threadbare disclosure of actually using their sense technology within a watch. The Lumidigm disclosure is at

MASIMO 2029
Apple v. Masimo
IPR2024-00242

least as much if not more than what's in Poeze.

But what is clearly in Lumidigm are multiple detectors, multiple photodiodes, and a convex protrusion. It teaches a compound curvature on the optical surface.

So even if one looks at the combination of all these old elements recited in these long claims, Lumidigm taught it.

Moreover, Professor Steven Warren from Kansas State University, who is one of our two independent technical experts in this case, he will explain to Your Honor, not only all the prior art references that we've looked at from third-party publications and patents and so on, but also that one of his undergraduate students created a blood oxygen sensor using multiple detectors.

So, again, the shorthand that Ms. Swaroop used to refer to the Poeze patents was the multiple detector patents. Here is an undergraduate student project that had multiple detectors used for blood oxygen sensing. That too is prior art to the Poeze patents.

Now if we look at the Asserted Patents, not only is there prior art problems, there's also section 112 problems. For several of the claims that are asserted in this case, the stretch that's been executed by Masimo during the drafting of those claims has gone so far as to disconnect the claims from the written descriptions within

MASIMO 2029
Apple v. Masimo
IPR2024-00242

the patents.

There is an insufficient written description to demonstrate possession of the claimed invention and enablement of those inventions and section 112 problems. We'll get into the details of those over the course of the case.

Now as I said, for each of these patents we see this pattern of stretching and covering -- drafting claims directed at lowest common denominator technology in an effort to bridge the gap from clinical to consumer wearables, but the stretch was not far enough.

There is no infringement with respect to the Apple Watch because distinctions remain as to each of the patents in the case.

For the '127 patent, there's a requirement of a thermal mass -- I talked about that earlier -- a temperature sensor thermally coupled to the thermal mass and capable of determining a bulk temperature for the thermal mass.

Now at this point, Your Honor, I'm going to go on the confidential Apple record before I discuss the next slide, so I would ask that Masimo and the public be excused.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: We're moving back to the public record.

MR. MUELLER: May I proceed?

JUDGE BHATTACHARYYA: Yes, you may.

MR. MUELLER: Thank you, Your Honor.

The domestic industry requirement, of course, Your Honor is well familiar that it requires there be a domestic industry that exists or is in the process of being established. And we believe these requirements are not met for the asserted domestic industry products in this investigation.

Now, I won't belabor this, because Your Honor has received extensive briefing on the issue, but we do believe the law is clear that the relevant time for assessing the satisfactoriness of a domestic industry is at the time of the filing date of the complaint.

Among the cases that set out that point is a Certain Thermal Plastic Encapsulated Electric Motors case, which says, ordinarily, the relevant date at which to determine if the domestic industry requirement is satisfied is the filing date of the complaint.

And as this case proceeds to explain, the Commission has explained that it will consider

MASIMO 2029
Apple v. Masimo
IPR2024-00242

post-complaint evidence regarding domestic industry only in very specific circumstances, i.e., when a significant and unusual development has occurred after the complaint has been filed.

No such event has occurred here. In fact, there's not even an allegation of a significant and unusual development occurring after the complaint. So we believe the relevant time for assessing the domestic industry is the date of the complaint.

But at whatever point Your Honor assesses it, even today, there is no proper domestic industry for these patents.

To take the Masimo Watch, which is the asserted domestic industry product for four of the five patents, the evidence will show it's a bit of a moving target for us to even figure out when the so-called project started. Witness testimony has varied. And the details of the research and development period really remain opaque to us in important respects. What exactly happened in the years before the amended complaint was filed in July of 2021 is a bit of a mystery.

I'm sure we're going to hear testimony on this subject from the Masimo witnesses, but, as Your Honor is aware, we have been fighting furiously to get information on this subject for months and months and months and months,

MASIMO 2029
Apple v. Masimo
IPR2024-00242

and it's been a continual moving target in terms of what the physical product or products are that evidence this development and the details about how those products work or don't work, who developed them, or didn't develop them. It's a question mark.

Even if we look at the period for after the complaint was filed in July of 2021, it's clear that R&D continued. There was no finished Masimo Watch when that complaint was filed -- not even close.

Even as of today you cannot buy this Masimo W1 watch in any store in the U.S. It is not on the open marketplace. It's not a commercial product in competition with the Apple Watch even today, even today, and certainly not as of the time of the complaint.

Your Honor, at this point I am going to go into Masimo confidential information, so I would ask to go on the Masimo confidential record.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Why don't we take our morning break at this time. We're on break for 15 minutes.

(Whereupon, the proceedings recessed at 11:06 a.m.)

(In session at 11:22 a.m.)

JUDGE BHATTACHARYYA: We're back on the record. We're on the public record.

Is Apple's counsel ready to proceed as well? I believe you're muted still.

MS. SWAROOP: Still can't hear you.

MR. MUELLER: Thank you. We're ready to proceed, Your Honor.

JUDGE BHATTACHARYYA: Ms. Swaroop, are you ready to call your first witness?

MS. SWAROOP: I am, Your Honor. Before we do that, we do have evidence that is being received without a sponsoring witness. So we would like to move that in now before we begin our examination of our first witness. We did provide a list to Apple's counsel yesterday based on Your Honor's rulings. I do think we have agreement with regard to the list.

JUDGE BHATTACHARYYA: The procedure we normally follow is that you send it to the Bhattacharyya337 email

MASIMO 2029
Apple v. Masimo
IPR2024-00242

address so that I can have a copy to look at it, and then I'll confirm on the record if there's no opposition and let the evidence in.

Do you want to do that now or we can do it -- it's up to you.

MS. SWAROOP: Yes, Your Honor. We do have a list electronically.

MR. MUELLER: Your Honor, I would just need to confer with some folks to cross-check those numbers, so the email procedure would be helpful to us.

MS. SWAROOP: Understood, Your Honor. We will send the email and take care of this later. So I guess we are ready to begin with our first witness. Mr. Joseph Re will be conducting the examination.

For our first witness Complainants call Joe Kiani.

JUDGE BHATTACHARYYA: I just wanted to make sure the court reporter is still with us. Great. Thank you.

MR. RE: Good morning, Your Honor. Pleasure to be here. If my voice sounds a little funny, I am a COVID survivor. It's only my second day back in the office.

JUDGE BHATTACHARYYA: I'm glad to have you back.

MR. RE: Before I begin with Mr. Kiani, there were some outstanding objections. I believe we are to deal with those at the time I am going to introduce them rather

MASIMO 2029
Apple v. Masimo
IPR2024-00242

than argue about their admissibility in advance.

JUDGE BHATTACHARYYA: That's fine, if that's the procedure -- that's fine.

MR. RE: Yes. There are four objected to exhibits that I do want to introduce despite the objection, and I'm ready to respond if argument is required.

JUDGE BHATTACHARYYA: Okay.

MR. RE: Thank you.

JUDGE BHATTACHARYYA: Welcome, Mr. Kiani. Do you understand that you're under an obligation to tell the truth here today?

THE WITNESS: Yes, Your Honor.

JOSEPH KIANI,

having been first duly sworn and/or affirmed on his oath, was thereafter examined and testified as follows:

DIRECT EXAMINATION

BY MR. RE:

Q. Good morning, Mr. Kiani. For the record, could you please give your full name and spell your name?

A. Yes. My name is Massi Joseph E. Kiani, M-A-S-S-I, Joseph, E, and K-I-A-N-I.

Q. What are your current positions?

A. I am chairman and CEO of Masimo and Cercacor.

Q. For how long have you been the CEO of Masimo?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Since inception. Since 1989 where I started Masimo in my garage.

Q. Could you briefly tell us about your formal education?

A. Yes. I have my bachelor's and master's from San Diego State University in electrical engineering.

Q. And the master's, what was your master's degree on at San Diego State?

A. Advanced signal processing, adaptive filters, AI.

Q. When you said you started Masimo in 1989, what was your main purpose in starting Masimo?

A. I wanted to solve the motion artifact problem with pulse oximeter.

Q. What exactly, briefly, is pulse oximetry?

A. Pulse oximetry is the noninvasive measurement of arterial oxygen saturation and pulse rate using two wavelengths of light passing through a tissue and looking at the pulsatile information and normalizing that from the bulk or the DC information.

Q. Now you mentioned this motion problem. Explain to me what exactly is the motion problem.

A. Well, the assumption pulse oximetry makes, the invention of pulse oximetry back in '72 with Dr. Aoyagi, is that whatever pulsates is what we're interested in.

During motion the venous blood starts pulsating

MASIMO 2029
Apple v. Masimo
IPR2024-00242

at your frequency of motion. Venous blood is typically less than 10 millimeter mercury or your arterial is probably 100, 120. So it's a Jell-O pool of blood.

So when you start moving, the venous information starts getting in the signal, and it confused a conventional pulse oximeter to give a normalized average of arterial and venous saturation.

Q. And in addition to motion, what other major problem did you learn about in tackling this motion problem?

A. Low perfusion. Low perfusion is when there's low blood flow to the extremity. When your hands are cold, you have low perfusion. I usually have cold hands, and that's why I noticed the problem early on as an engineer with the motion and low perfusion.

It's not just a low signal-to-noise problem. When you have low perfusion, because your hand typically is your radiator trying to keep you cool, when you have cold hands, you're not getting enough really -- you're not getting a lot of arterial blood supply.

So the venous saturation becomes really low, like 50 percent, versus when you're hot, it could be 97.

So when you move, when you have low perfusion, it really shows the problem of motion with pulse oximetry.

Q. Mr. Kiani, you can stare at the camera. It looks like you're probably looking at a screen of me.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Yeah. I'm looking at you. Sorry.

Q. Look at the camera. That's much better.

And who else was part -- why was this motion problem significant in the hospitals?

A. Well, when the patients were first monitored for pulse oximetry it was in the operating room where patients are sedated and not moving, but when patients started going outside the OR and being monitored in the ICU, intensive care unit, or neonatal unit, or recovery room, they don't stay still.

So when they began moving, they realized 70 to 90 percent of the alarms were false alarms due to motion artifact and low perfusion.

Q. And what other were some of the effects of these caused by motion problems in patients?

A. Well, crying wolf made clinicians ignore the alarm. They were finding a lot of patients dead in bed, literally, because they ignored the alarm.

And the neonatal intensive care unit where you're not just worried about too little oxygen, but you're worried about too much oxygen, because the baby's eyes aren't developed yet, a lot of babies were getting severe eye damage. Two thousand a year were becoming blind. In fact, Stevie Wonder is blind from ROP, retinopathy of prematurity, in the neonatal ICU.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Can you say that word, ROP, more slowly for the court reporter? What does it stand for?

A. Sure. Retinopathy of prematurity, so eye damage due to prematurity, but it's really due to gyrations in the oxygen in the neonatal ICU because they didn't have a trustworthy pulse oximeter.

Q. And who joined you in this endeavor to begin tackling the motion and low perfusion problems?

A. Mohamed Diab. Six months after I started Masimo, Mohamed joined me, and he -- I started Masimo with a $40,000 loan on my condo, and I wanted Mohamed to join, but he said until you raise money from third parties, I'm not sure I'm going to give up my job to join you, because I had raised by then $80,000 from other people, and Mohamed joined me.

Q. What did Mr. Diab do when he joined Masimo?

A. He developed the circuit and wrote the software. Eventually he became our chief technical officer.

Q. And what techniques did you begin to use to tackle this motion problem with pulse oximetry?

A. Well, I had studied, my master's work, area of adaptive filters, which had been used in antisubmarine warfare and satellite communication, and adaptive filters were incredibly a useful tool because they could adapt to the noise.

So when they saw noise coming at a certain

MASIMO 2029
Apple v. Masimo
IPR2024-00242

frequency versus another frequency, it would adapt its coefficients to cancel. Because the problem -- canceled the noise frequency. The problem is motion is happening in the same window that we're looking for a signal, which is from 30 beats per minute to 300 beats per minute.

So adaptive filters, which I thought would work, ended up working along with things we call parallel engines and improved sensor design and hardware design to actually get rid of the motion artifact problem and the low perfusion problem.

Q. I'd like to delve in quickly to some of your early products. If you could -- there's a book in there -- you can look at the book if you need to see the original.

We'll put it on the screen to try to save some time, but, in particular, I'd like to direct your attention to Complainants' or CX Exhibit 1370. If you can just tell me what that is.

A. That is our 25th year anniversary annual report from our incorporation.

Q. And I'd like to take you to page 4 of that report, which begins a multipage timeline.

Do you see that?

A. I do.

Q. I wonder if you could briefly describe some of your early products that are represented by this timeline.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Yes. So after our founding in '89, we show here in 1995, for the first time we showed Masimo pulse oximetry at the Society of Technology and Anesthesia and introduced an OEM board called the MS-1 that we wanted companies that made patient monitors to incorporate to have Masimo SET level pulse oximetry.

Q. And how were your products initially received bought these boards?

A. Well, everyone was blown away at what we could do. The industry had tried for years to deal with the motion artifact problem and had concluded that it was impossible to solve. It was just inherent limitation of pulse oximetry.

So when we showed people we could actually measure-through-motion and low perfusion, everyone was just blown away, and it was highly regarded.

Q. And then after 1995 I see some entries for some -- your own products.

Do you see those? In 1998, '96, do you see those?

A. Yes.

Q. What did you begin to do with your boards after you introduced the MS1?

A. Well, first of all, by 1996 is when the first time the product shipped to consumers, when this case being

MASIMO 2029
Apple v. Masimo
IPR2024-00242

the clinical consumers, and through an OEM we called Contron from England, but you see the LNOP sensor, which is our low noise optical probe sensor that was introduced then, later we created or own standalone device with the help of a company called Ivy Biomedical where we could show standalone pulse oximeter with our technology rather than a multiparameter patient monitor. And then NEC created the standalone as well.

Q. I'd like you to take a look at what is page 35 of this annual report, particularly the right side.

If you could briefly explain, what is this chart shown in your annual report?

A. Well, by now numerous clinical studies had come out showing the advantages of Masimo SET. This was the most comprehensive done by Dr. Steven Barker. I think it was in 2002 that this came out.

And he compared Masimo SET to all of the available commercial pulse oximeters at the time. And he looked at their sensitivity versus their specificity, and this is what is known as a ROC curve, a receiver operating characteristic curve, which plots on the y-axis the sensitivity, on the x-axis one minus the specificity. An ideal product should go straight up. You can see we're pretty close to that. That red is Masimo SET.

For example, at a 95 percent sensitivity, we have

MASIMO 2029
Apple v. Masimo
IPR2024-00242

about a 3 percent false alarm rate, where, if you just keep going right, they get a lot worse, 30, 40, 50 percent false alarm, and some of them are worse than the flip of a coin. These are random number generators.

Q. For the record, I need you to define what's the difference between the sensitivity of a device and the specificity of a device.

A. Yes. Sensitivity is the ability to pick up true alarm, a true event. Specificity is the ability to reject false events. So you would like to have a product that's 100 percent sensitive and 100 percent specific.

Q. I'd like you to take a look at what has been marked as Complainants' Exhibit 0777.

If you could just identify this document for the record.

A. Yes. This is what we referred to as bibliography. It summarizes some of the studies on SET, Masimo SET pulse oximetry, and rainbow« pulse, which is this multiwavelength blood constituent sensor that you put on your site to measure 12 parameters.

Q. And tell me how many articles and studies have confirmed the superiority of Masimo SET technology?

A. Over a hundred. Over a hundred. And what's really unique here is in clinical world usually, whatever you create, a third of the studies say they're better, a

MASIMO 2029
Apple v. Masimo
IPR2024-00242

third say they're worse, a third is neutral. In our case, over a hundred said it was positive and a couple neutral.

Q. Now you mentioned the LNOP, the low noise optical probe.

If we can go back to that, 1370, page 4, and blow up that 1996 entry.

A. Yes.

Q. Is this -- tell me more about this sensor. Is this a single patient use? What kind of sensor are we talking about here.

A. If you zoom out of the picture --

Q. 1996.

A. Go back to 1996 LNOP, if you go look at that, just go -- so what you see is it's an adhesive, single patient use sensor, and that white bump you see there, that's actually the invention there. That's a cavity that the digit can sit on to minimize the impact of motion.

Q. How did you market this as assisting with your Masimo SET performance?

A. Well, it was part of the system. We were trying to solve this problem of motion artifact, as I mentioned, and what we figured out that, if you put the soft tissue into this cavity, you minimize the optical perturbation of the site.

Q. And so it's the subject of a patent, I

MASIMO 2029
Apple v. Masimo
IPR2024-00242

understand?

A. Yes. In fact, the name of the sensor is the title of the patent, low noise optical probe.

Q. For the record, it's Complainants' Exhibit 1586. If we can call that up.

Is this the patent on that sensor?

A. Yes, it is.

Q. And if we can go to Fig. 4, I'd like you to describe for the record what's shown in Fig. 4 of this '818 patent.

A. Yeah. Basically, the dashed lines is the body of the sensor, where you see the flesh, the 128 is sitting on, 130 is the LED that's shining through the tissue going to the photodetector 126. And you see the photodetector is recessed, and it's actually in a cavity where the tissue can sit on underneath where you have these protective dashed line barriers to make sure you don't get light piping but you get the light from the LED to the photodetector.

Q. And 128, is that the finger or tissue?

A. Yes.

Q. Okay. And the detector is 126 in the bottom of the well, is that what you're saying?

A. Yes.

Q. Okay. And what did other sensors at that time do, which made this a patentable invention, in your mind?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Well, everybody else in the industry would bring the detector right up to the 128, the patient finger in this case, and have -- try to be as planar and flat as they could with the sensors, the detector and the LED.

Q. How did the medical device industry react to Masimo's entry into the pulse oximetry market?

MR. MUELLER: I'll object for lack of foundation as to what other folks may have reacted to. Mr. Kiani can talk about his own reactions, but I would object on lack of foundation grounds and hearsay grounds to the perspective of third parties.

JUDGE BHATTACHARYYA: Mr. Re, did you want to respond?

MR. RE: I'll rephrase.

Q. What did you personally experience when you introduced your products in the medical device industry?

A. Well, after our patent was published, everybody became all of a sudden quite smart. What they couldn't do for over a decade before in solving the motion problem, everyone all of a sudden seemed to have a solution.

So several companies violated our patents. We ended up suing Nellcor, which is the market leader, about 90 percent market share at the time, and once we won that litigation, everybody else except for two, a Chinese company called Mindray and a European company called Philips, we had

MASIMO 2029
Apple v. Masimo
IPR2024-00242

to sue them. They wouldn't stop. And ultimately Mindray settled right before trial, and Phillips went to trial, and we won that litigation, both with the jury and the judge.

Q. I just want to go back to the Nellcor case.

What was the outcome of the Nellcor patent infringement case?

A. Yeah, the Nellcor case, the court ordered that 040505 CI, which was the technology generations for Nellcor, had infringed our IP, and the Federal Circuit court ordered their injunction of those products.

MR. MUELLER: I'm sorry. I'm just going to move to strike testimony about court decisions from other cases involving patents not asserted in this case. I object and move to strike Mr. Kiani's testimony characterizing decisions from other bodies on a patent not in this suit.

JUDGE BHATTACHARYYA: Mr. Re?

MR. RE: The court can take judicial notice. This is all public information in court filings, at the Federal Circuit, in the Central District of California, everything Mr. Kiani mentioned is all of public record.

JUDGE BHATTACHARYYA: The objection is overruled as to weight, not admissibility.

Q. Does Masimo or you have an estimation of how many patients a year are monitored with Masimo technology?

A. Yeah, over 200 million patients are monitored

MASIMO 2029
Apple v. Masimo
IPR2024-00242

with Masimo pulse oximetry now.

Q. And as CEO of Masimo, can you tell me how your products made a difference in health care today?

A. Yes. Dramatic. We have helped reduce blindness in the neonatal ICUs. These are all documented by clinical studies, the outcome studies. We have helped save lives on postsurgical patients that were on opioids.

And recently, even with COVID, when patients couldn't be admitted to the hospital because there were too many patients in the hospital with COVID, they used our technology to send the COVID patients home, and a study had just come out showing 70 percent reduction in mortality.

No other pulse oximeter has ever shown outcome improvement except Masimo's.

Q. And has Masimo received awards for its technical achievements?

A. Yes. Numerous awards. Over 50 awards.

Q. In fact, if you can just, for the record, tell me what is Exhibit 1378, if we can call that up.

A. Yeah, this is some of the awards we've received for our inventions, the latest one being FDA granting us, basically, as one of eight companies that could help the epidemic, the opioid epidemic.

Q. And since you solved this motion and low perfusion problems, has Masimo continued to invest in

MASIMO 2029
Apple v. Masimo
IPR2024-00242

research and development in other areas?

A. Yes. Absolutely. Masimo's founding was all about innovation. I was 24 when I started Masimo. So we had to prove ourselves. So we have continued to, not only advance pulse oximetry, even though we made it 30 times better than what was out there before, but we had then taken the two-LED pulse oximeter to multi-LED we call rainbow« to measure 12 parameters noninvasively for the first time, including noninvasive hemoglobin, noninvasive carbon monoxide, methemoglobin, that have all been shown to save lives dramatically in hospitals.

Q. I wonder if you can just briefly describe, who is Cercacor, your other company?

A. Yes. In 1998, at the behest of shareholders and our board, we spun off a company called Masimo Laboratories at the time that we named Cercacor, which means closer to the heart. And Cercacor or Masimo Labs was to go work on nonvital signs measurements, like rainbow«, like measuring hemoglobin and hopefully noninvasive blood glucose, and that's what Cercacor is.

Q. And what's the -- is there a legal or technical relationship between Masimo and Cercacor?

A. Yes. At the time of the spinoff and later updated, we have a cross-licensing agreement between the two companies. So, basically, the two R&D organizations, Masimo

MASIMO 2029
Apple v. Masimo
IPR2024-00242

and Cercacor, can collaborate, because whatever they invent it's shared amongst each other for the various projects.

Q. And for the record could you identify Complainants' Exhibit 1612?

A. Yes, that is the latest cross-license agreement between Masimo Laboratories or Cercacor and Masimo Corporation.

Q. So tell me, today, or since the relevant periods in this case, what are the projects that Cercacor works on relating to this case?

A. Well, Cercacor is who developed rainbow«. rainbow« platform was supposed to be the platform that helped us to get to noninvasive glucose, but along the way we checked for measurements that were maybe slightly easier but a lot harder than pulse oximetry, like carbon monoxide, like hemoglobin. And we delivered. Those things worked and they have been in the market for over 15 years some of them.

Q. Well, let's call up that exhibit, the timeline, Complainants' Exhibit 1370, and let's take a look at pages 6 and 7 of the timeline, because it does go many pages.

Can you show us from looking at the timeline in Exhibit 1370 what are some of the parameters and products introduced through the rainbow« research platform?

A. Yes. Beginning 2005, with SpCO, that's the noninvasive way of measuring carbon monoxide. Nothing else

MASIMO 2029
Apple v. Masimo
IPR2024-00242

is like it out there still. And it helps firefighters and people that may have been in a situation where they could have inhaled smoke and carbon monoxide to detect when their CO has gotten dangerous.

Q. Are you aware of any other companies that offer products in competition with these parameters shown in this timeline dealing with SpCO and methemoglobin and hemoglobin? Are you aware of any other competing commercial products?

A. No. No. Over the years we've seen announcements from a few companies, but nothing in the market. We are still the only company with these parameters. And, like I said, noninvasive hemoglobin has been proven to now reduce mortality by 30 percent in hospitals.

Q. Why is it called rainbow«?

A. Because we went from a two wavelengths of light to more than seven, like the colors of the rainbow, so we call it rainbow«.

Q. And did you patent some of the research that came out of the rainbow« research and development?

A. Yes. Absolutely.

Q. I just need you to identify for the record joint Exhibit 1, if we can call that up.

Can you identify that for the record?

A. Yeah, that is actually the '501 patent that's in this case that describes some of the inventions that we did

MASIMO 2029
Apple v. Masimo
IPR2024-00242

with rainbow«.

Q. And you're a named inventor on here?

A. Yes, I am.

Q. Can you identify for the record Joint Exhibit 2?

A. Yes.

MR. MUELLER: I'm sorry. I apologize for interrupting here. I do want to make an objection based on that last answer.

The alleged domestic industry products in this case for these patents are not the rainbow« sensors. So I'm going to object to testimony in which Mr. Kiani is trying to link these patents and suggest that the rainbow« sensors practice them.

The alleged products for these patents are the Masimo Watch, the alleged product I should say, for domestic industry. There's no contention in this case linking the Poeze patents to the rainbow« sensors, and it's far too late to make that now. So I object.

JUDGE BHATTACHARYYA: Mr. Re?

MR. RE: I'm doing no such thing. I'm just laying out basic facts. I haven't gone anywhere near the subtleties that Mr. Mueller is alluding to. I'm just setting forth facts. I'm not making any argument.

JUDGE BHATTACHARYYA: Is Masimo making a contention that the '501 patent covers the rainbow« sensor

MASIMO 2029
Apple v. Masimo
IPR2024-00242

products?

MR. RE: No. It's the research of the rainbow« that led to where we're going later in time. Correct. This is way earlier. I'm just introducing -- these are the patents that are in the investigation. Mr. Kiani is an inventor. I was just trying to make them of record. I wasn't trying to do anything further yet.

MR. MUELLER: Your Honor, so long as there's no contention by Masimo that the Poeze patents, the '501, '502, '648, practice the rainbow« sensor products or that those products are the domestic industry, then we can keep going.

JUDGE BHATTACHARYYA: Mr. Re, as I understood it, you would agree with that --

MR. RE: Yes, I do.

JUDGE BHATTACHARYYA: -- statement? All right. Then we can proceed.

Q. So the third patent is the -- can we identify for the record Joint Exhibit 3, which is the '648 patent, and call that up.

This is the third, as Mr. Mueller calls it, the Poeze patents?

A. Yes.

Q. And you're an inventor on all three of these, right?

A. Yes. Yes, I am.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. And who are these other gentlemen that are co-inventors with you?

A. Well, these were, some of them, my former colleagues, but my colleagues from Cercacor. You'll see, for example, Marcelo Lamego, who went to Apple in Cupertino; Sean Merritt, Cristiano Dalvi, who have now gone to Rockley, who is Apple-funded. But, yeah, these are my colleagues at the time at Cercacor.

Q. Could you just briefly explain how the ideas, the research that's embodied and disclosed in these patents, tell me, what was it you were doing that led to the disclosures of these three patents?

A. Yeah. We were trying to measure noninvasively hemoglobin and glucose, which are much more difficult measurements than oxygen. Just getting to the signal is really challenging. And we had come up with this idea of the active pulse.

Instead of your natural pulse, that can be very small from point 1 percent of the signal to maybe 4 or 5 percent, we wanted to create an active pulse, so we created our own pulsation to create maybe 5 to 10 percent signal, AC signal.

Well, during that experimentation, one time the active pulse detector hammer had been left in, and when it pushed up against the digit we noticed the signal got

MASIMO 2029
Apple v. Masimo
IPR2024-00242

stronger, which was a surprise to us.

And that led us to this idea that, hey, maybe we should use actually a protrusion instead of the opposite, which we always had done, which was the cavity. And then, of course, along with that came problems of protrusion. There was now light piping issues, and so we had to account for it. But, yes, that's how this idea came about.

Q. Why were you surprised by the strengthening of the signal when applying an active pulse?

A. Well, because usually if you press against your digit you see it become white, the capillary blood bed pushes out of the way. So we thought that's going to cause the signal to go away, where actually at the right level it actually increases it. You can go too far and do what I just said or too little where it won't impact it. But at the right height you actually get a bigger signal.

Q. I'd like you to look at Fig. 3C of the Poeze patents, what we call multidetector patents, whatever.

Could you just tell me what you mean by the protrusion by looking at Fig. 3C?

A. Yeah, the protrusion is the 305, and you can see how it kind of comes up, it's got those four windows, 320, 322, and 21, and 3, where the four detectors are underneath it where the light would go through from the top portion where the LED would shine through the digit if your finger

MASIMO 2029
Apple v. Masimo
IPR2024-00242

were inside this alligator clip. And that's where we protected the light from piping as well with those windows and the recession. Again, that, 305, is the protrusion.

Q. And you said that when you use the protrusion it caused problems with light piping, is that what I understood?

A. Yeah. It made it worse. So we had to take extra care to make sure that the light that you see by the detector has gone through the tissue, and that's where we basically created, again, this well, this time, you know, with obviously a cover, as a reasonable product, and we made sure that only the light that went through the tissue went to the photodetector.

Q. I understand you prepared a demonstrative to explain the ill effects of light piping; is that right?

A. Yes.

Q. If you can call up that demonstrative.

A. Yeah. So what you see here, on the left side, this is a reflectance mode. You see the light emitter diodes on the left, and the detector on the right. What you want is the light to go down to the tissue and come back up to the detector. But if you don't design this properly, you get light that goes from the LED directly to the photodetector, without going through the tissue.

And the same phenomenon exists also with the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

transmissions. This is adhesive transmission sensor around the finger, and you can see how the light, instead of going right to the detector, some of it, if you're not careful, will go around and get to the detector without going through the tissue, which causes inaccuracies in the measurement.

Q. And if we go back to Fig. 3C, did I hear you or understand you, did the hole or the well, did that go all the way to the tissue in Fig. 3C?

A. It did. It did. And then down to the floor of the detector, with optical barriers in that well, the walls, to make sure only the light through the tissue gets to that photodetector that's sitting at the bottom of that hole.

Q. And did you have a reason or understanding why you know the industry did not understand the ill effects of light piping?

A. Yes. Yes. During the '90s, early '90s, we were developing the measured pulse oximeter, our main competitor, Nellcor, came with the first time a new improved sensor, and they had built it so it reduces the problem of emissions, electromagnetic radiation that by putting a Faraday shield around the detector, but because they weren't aware of the light piping, that bump created the cavity, like a fiber, so more light went from the LEDs to the detector and was causing all kinds of errors out there, but they didn't understand it. And so their improved product actually made

MASIMO 2029
Apple v. Masimo
IPR2024-00242

things worse.

Q. Okay. I'd like to change subjects now and talk about your consumer products.

What was Masimo's first consumer-focused product?

A. The iSpO2.

Q. And what is the iSpO2?

A. I think as the name maybe suggests it's a product that the pulse oximeter that connects to the smartphones, like an iPhone or tablet or iPad, and we have it in two versions, one with the finger sensor clip attached to the cable, that goes right to the phones, and one with a connector that allows you to plug in 50 different sensors we make from neonate to adult, from ear to forehead and finger to it.

Q. And did that technology that you incorporated with the iPhone, did that have your medical-grade technology in it?

A. Oh, yeah. I will not market any pulse oximeter that doesn't have our Masimo SET performance or very close to it, because I've seen the outcome difference. That's why for years we would not enter into this consumer stuff, because it would be toys, it wouldn't work. So, yeah, once we got the power consumption down, remember, the MS1 board I showed in '95, that consumed 4,500 milliwatts, so that could not be made into a wearable or a consumer product. So it

MASIMO 2029
Apple v. Masimo
IPR2024-00242

was down to -- when we got the power down to about 20 milliwatts, we began to make these consumer products and products that were wearable.

Q. I'd like you to look at Complainants' Exhibit 1511.

A. Yes.

Q. Would you identify for the record what is Exhibit CX-1511?

A. This is a press release, an announcement, that we also sent through what we call Livewire, which is an electronic email database of our customers, where we announced the availability of iSpO2, a debut of it, at the Consumer Electronics Show in January of 2013.

Q. And when you say Consumer Electronics Show, you showed this product at that show that year?

A. Yes.

Q. Prior to going to the Consumer Electronics Show, what other shows did you go to before then?

A. Only the clinical ones, like the anesthesiologist conference or critical care conference or nursing conference. This was our first time going to kind of a public consumer type of a marketplace.

Q. And did the iSpO2 device with the iPhone, did that attract some media coverage at CES?

A. That was a big hit. There was numerous, like 15,

MASIMO 2029
Apple v. Masimo
IPR2024-00242

20 different articles written about it, and put on the news about the availability of a medical-grade Masimo SET pulse oximeter for the first time available on these kinds of devices.

Q. And if I could show you Complainants' Exhibit 1512, could you explain for the record what is this exhibit showing?

A. Yeah, I think this is just some of the -- kind of like the cutouts of some of these articles that had come out, 21 articles that had come out as of January 10th, 2013.

Q. And did Apple take notice of the notoriety you were receiving with your consumer product for use with the iPhone?

A. Yes. Within two to three months they contacted us, and they said you guys are the platinum of noninvasive monitoring, we want you to come down to Cupertino, we want to learn more, we'll sign your NDA, we want to work with you to integrate your technology into our products.

Q. Did you have such a meeting?

A. Yes, we did. I was personally there.

Q. And did Apple send you an agenda for the meeting?

A. Yes, they did.

Q. I'd like to show you an exhibit, which Apple has objected to, so I'm alerting Mr. Mueller, it's Exhibit 1539.

Could you --

MASIMO 2029
Apple v. Masimo
IPR2024-00242

MR. MUELLER: Actually, before we put it up, we might want to go on the Apple confidential record here to discuss the details of this, the Apple/Masimo confidential record for both parties.

JUDGE BHATTACHARYYA: Let's move on to the confidential record for both Apple and Masimo.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

BY MR. RE:

Q. When did you become interested in a wrist-wearable pulse oximeter?

A. Actually from the very beginning. When I started Masimo, I hoped to one day build a wrist-worn pulse oximeter, because I hoped to one day take the product out of the hospital into home for sleep analysis, for detecting babies that are about to die from sudden infant death syndrome, to even taking it to the gym, take it to people who are exercising. So that's been something since practically 1990, 1991 that I was --

Q. And why weren't you able to do it back then and just go on to the wrist?

A. As I mentioned, the power. Our technology, we do so much signal processing with the adaptive filter, it used to take a very sophisticated sharp chip from analog devices that consumed about 3,000 milliwatts. Fortunately over time these chips have gotten better and smaller and more power.

So, look, if I wanted to do conventional pulse oximeter, I could have made a wrist-worn device 30 years ago, but to make something that works accurately, reliably, continuously, it needed to be Masimo SET or very close, and that's what we were waiting for. And eventually we did get the power down to do that.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. When did you start getting -- submitting -- spending serious resources towards pursuing a wrist pulse oximeter?

A. Right around the time we had the low power pulse oximeter, so around 2013, 2014, I remember 2014 we began actually a project at Cercacor to develop a wrist-worn pulse oximeter.

Q. And let's take a look at a document numbered CX-1482, if we can call that up.

Would you identify this document?

A. Yes. This is a Cercacor presentation on what we called the wrist-worn pulse oximeter or wearable rainbow«.

Q. If we can go to the picture, just the picture, on page 114, could you identify that physical?

A. Yes, mind you, this is a prototype, so it was okay to have all these cables dangling out, because this is for data collection. But the sensor is where that black part is on the wrist where it shines the LED, multiple LEDs, multiple detectors, to pick up, not just SpO2, but hopefully hemoglobin and CO and other measurements.

Q. What's the year of this presentation?

A. This presentation is 2016, I believe.

Q. And I'd like you to look at a physical exhibit that's in your room. If you look over at the table to your right, if you can call up and hold Complainants' physical

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Exhibit 139 and let me know if you recognize that device. Do you see it? Do you see the table next to you? To your right.

A. Oh.

Q. To your right. There we go.

A. I see, yes. This.

Q. Yes. What is CPX-139?

A. This is the actual physical representation of what's in that picture.

Q. And this is 2016, the presentation, if I remember, you said?

A. That is correct.

Q. Okay. I'd like you to go to the next exhibit, CX-1483.

Do you see this document?

A. Yes.

Q. I'd like you to go to the picture on page 2 ending in 120.

Could you tell me what that is?

A. Yeah. This is -- we were trying to see how the measurement would work if it actually transmitted the signal straight from one end of the wrist to the other side. This is a transmission wearable wrist pulse oximeter, the giant black thing there is the photodetector, and the little circuitry someone is holding with their finger are the LEDs

MASIMO 2029
Apple v. Masimo
IPR2024-00242

on the other side.

Q. And what year is this watch prototype?

A. 2017.

Q. And can you look to your right, there's a physical, CPX-140, can you call that up, show it on the screen?

What is that physical?

A. Yeah, this is the actual, I guess, hardware manifestation of that image that you just saw.

Q. For the record, that picture on CPX-140 was ending in 120, the picture of this physical.

I'd now like you to look at CX-1520. If you could identify this document for the record.

A. Yeah, this is, I think, a presentation at Cercacor called the Hummingbird Project.

Q. And if you look at the picture on the page 15, ending in 086, could you describe that for the record?

A. Yes, that's just another update to what the wrist-worn pulse oximeter prototype looked like.

Q. And what was the point of this prototype?

A. It's to test the accuracy of it, not just in room air, but under the saturation, where we brought in volunteers, and by having them read a mixture of nitrogen and oxygen, we dropped them from room air of 100 percent to 70 percent.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. I'd like -- what's the benefit of using a watch versus a product like the PPG we talked about in Exhibit 691?

A. Well, we wanted something unobtrusive, because, as I mentioned earlier, in one of the biggest, I think, cases where this kind of product could be useful is for detecting opioid overdose. But of the hundred thousand people that died from opioid overdose last year, 80,000 were illicit users. In talking to some of those people, they were not going to wear a finger sensor that told everyone -- signaled that they were potentially addicts.

So a watch could be something that's unobtrusive, it looks like something anyone would wear, and yet, if in the middle of the night opioid overdose stopped them from breathing, an alarm could go to wake them and eventually maybe to an ambulance to come rescue them.

Q. Exhibit 1493, do you recognize that document?

A. Yes, that's a Team Meeting presentation in December 2018.

Q. And I'd like you to go to page 10 of this presentation of 2018, at the very top, can we just blow up the first few lines on the Engineering Goals da Vinci.

A. Yes.

Q. And next to develop wrist-based hardware solution, what is designated in this presentation?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. That it's been 100 percent completed, that we have validated that we can measure SpO2 accurately with our wrist-worn pulse oximeter.

Q. And was there also research going on on this subject at Masimo concurrently with Cercacor?

A. Yes. Yes, there was a friendly rivalry, a cooperation, but, yes, Masimo was working on their own version as well.

Q. And where does all this research and development occur with Masimo and Cercacor?

A. Masimo and Cercacor are literally two blocks from each other in Irvine, California.

Q. Okay. How involved were you with regard to the Masimo Watch project, you personally?

A. Well, as I said, from almost the beginning I wanted to have it. Towards the end, meaning the last several years, I became personally really involved, because I wanted to now see it come to market.

We were going after this opioid epidemic problem, and I really thought this watch could be a lifesaver.

Q. I'd like you to -- we're going to go on the CBI portion. This is Masimo confidential information.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Moving to the public record.

MR. MUELLER: May I proceed, Your Honor?

JUDGE BHATTACHARYYA: Yes, you may.

BY MR. MUELLER:

Q. Mr. Kiani, over the life of the company, fair to say that Masimo has focused, not exclusively, but has focused on the clinical setting?

A. Yes, that is correct.

Q. And, fair to say, the vast majority of the Masimo revenues over the years have been in that clinical setting?

A. Yes.

Q. Now you identified for Her Honor in your testimony earlier several products that you described as consumer products, right?

A. Yes.

Q. I think there's the SpO2 monitor, right?

A. iSpO2, yes.

Q. The MightySet; is that correct?

A. That is correct.

Q. And another one you mentioned was the Radius PPG, correct?

A. Yes, that is correct.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Now, to be clear, all of these products that you described involve fingertip sensors, correct?

A. Correct.

Q. So let me just show you an example. This is the Radius PPG. If you could turn to, in your binder, sir, this is CX-0691. I believe it's at tab 2 in your binder.

A. In my direct binder?

Q. There should be another binder titled "Cross-examination."

A. I have not opened it yet.

Q. You can go ahead and open it, sir.

A. Okay.

MR. RE: I also get a copy, I assume? There's two sets.

MR. MUELLER: Yes.

MR. RE: Can you give us just one moment?

MR. MUELLER: Sure.

MR. RE: The witness is down the hall. We did not open the box, and it's being opened now in the witness room.

MR. MUELLER: Thank you.

THE WITNESS: This reminds me when my daughter took the LSAT remotely.

I have opened it.

Q. Take your time, and if you could, please, turn to

MASIMO 2029
Apple v. Masimo
IPR2024-00242

tab 2 in the binder, which is CX-0691.

A. Yes, I see that.

Q. This is a brochure for the Radius PPG, correct?

A. Yes, sir.

Q. And that's one of the consumer products that you identified for Her Honor, right?

A. Yes.

Q. And you see in this brochure, on the cover here, we have a woman wearing a hospital gown with the Radius PPG on her wrist, correct?

A. Yes.

Q. Now if you could please, sir, turn to the very next page, we see the full setup for the Radius PPG, correct?

A. "The full setup," what do you -- oh, yeah, I see that, on the left page showing it working with Root.

Q. Let's just make sure we understand. The Radius PPG sensor is actually located on the fingertip, correct?

A. Yes, where it says Masimo right there at that end, yes.

Q. And then it's connected by a cable to a device strapped to the wrist, correct?

A. Correct.

Q. And that is transmitting to this host device we

MASIMO 2029
Apple v. Masimo
IPR2024-00242

see here on the right; is that right, sir?

A. Yes, that is correct.

Q. Now, again, this is a consumer product, meaning it doesn't need to be prescribed by a doctor, correct?

A. That is correct, but in this particular case we're showing it's being used in a hospital.

Q. Fair enough. And you would agree, sir, and I'm not criticizing the product, but you would agree this is not something that a user could wear walking down the street or jogging.

A. That's not true. People do use it in that fashion today.

Q. Okay. So your position is this product right here could be used in the way that a consumer wearable product could be used for jogging or exercising; is that your position?

A. Yes. In fact, on the next page you see this woman laying down at home, not in a hospital. In fact, that's from our commercial with Morgan Freeman using it at home.

Q. Sir, I didn't say at home. I referred to jogging.

A. Yeah, yeah, but it's the same. In fact, you made the distinction that the Apple Watch doesn't work for motion. This works through motion and low perfusion. So,

MASIMO 2029
Apple v. Masimo
IPR2024-00242

yes, people do wear it. They jog with it. We have athletes who exercise with it and can tell the power of their exercise by when their oxygen drops during their exercise.

So, yeah, this is worn. It lasts about four or five days, with that single puck, with that battery. And people can wear it continuously. They can take a shower with it.

This is meant for untethered, wearable device for both home and hospital, and, I guess, jogging, as you make it sound --

Q. Understood. Just as a technical matter, at all times in the use cases you're describing, the user would have a finger clip sensor attached to a cable running down their hand attached to that device strapped to their wrist, correct?

A. That's not a finger clip sensor. That's an adhesive wearable sensor. I don't want -- I'm not arguing with you. I'm just trying to make sure you clarify. The fingertip is that alligator-style clip.

Q. It's a finger sensor, finger adhesive sensor, attached to a cable running down their hand attached to a device strapped to their wrist, correct?

A. That's correct.

Q. Okay. Now let me ask you to focus now on the three patents on which you are a named inventor which are

MASIMO 2029
Apple v. Masimo
IPR2024-00242

asserted in this case. I'm going to refer to them by their last three digits, '501, '502, and '648.

Do you have those in mind, sir?

A. I do.

Q. And if I call those -- I believe the gentleman's name is Poeze. Is that the correct pronunciation?

A. Yeah, he was the first named inventor, Jeroen Poeze.

Q. So if I refer to these as the Poeze patents, you'll know what I mean?

A. Yes, although you mispronounced his last name, I'll know what you mean.

Q. What's the correct pronunciation?

A. Poeze.

Q. Got it. Okay. Let's look at Fig. 3 in these patents. This is a figure that you looked at with Mr. Re, I believe.

Just so the record is clear, one of these three is JX-1.

A. Do you want me to look at my binder or your binder you gave me?

Q. You can look at the Cross-Examination Binder. There's a hard copy of JX-1. I believe it's at tab 3.

A. Yes, I found it.

Q. You can also look at the screen. We'll pull it

MASIMO 2029
Apple v. Masimo
IPR2024-00242

up in a moment here. If you could turn in the binder while we're pulling it up here to Fig. 3.

A. Fig. 3, yes. C, D, E, which one?

Q. This one right here, Fig. 3C --

A. Perfect. That's the one Mr. Re showed me.

Q. That's right. Now this is showing a finger clip sensor, correct, sir?

A. Yes, this is a finger clip sensor.

Q. And so the way this would work is a user would insert their finger into this device and then close it down, right?

A. Yes.

Q. And that region at the bottom center of the screen where it's labeled 322, 323, 320 and 305, you talked about that earlier with Mr. Re, correct?

A. Yes.

Q. And you told us about how the tissue would be on top of that sensor, correct?

A. Correct.

Q. And there's the holes that go all the way down to where the photodetectors reside, correct?

A. Correct.

Q. And readings are taken from those, correct?

A. Yes. You either accumulate or you parse, but, yes, you take those detector signals and measure what you

MASIMO 2029
Apple v. Masimo
IPR2024-00242

need to measure, in this case oxygen or hemoglobin or glucose.

Q. Now you would agree with me that nowhere in these patents is there a similar description, similar level of detail, for a watch, correct?

A. No, not for a watch. Although there is a wristband device, but there is a lot of description about this being used in different parts of the body, like the forehead, the ear, and the like. Different sizes of patients, from neonates to adults.

Q. Sir, stay with my question. Not a watch, right?

A. Well, there's a wrist-worn device, but because this would connect to a wrist-worn device, I assume that is not considered a watch, but, yes, there is a wrist-worn device shown.

Q. Sir, stay with my question. Not a watch.

A. Yes, not a watch. It doesn't have the clock.

Q. In fact, sir, as you told us earlier, Masimo, and apparently Cercacor, did work on watches in the mid 2010s, correct?

A. Well, once we reduced the power consumption of our algorithm, our set board, yes, we began trying to make wearables and consumer products.

Q. And the reduced power consumption that you're describing occurred in the mid 2010s, right?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. That is correct. To the best of my memory, that's when it happened.

Q. And because you developed it in the mid 2010s, of course you didn't have possession of those particular ideas back at the time of the Poeze patents when they were filed, correct, sir?

A. That's not true. Back even in '91 I had this idea of making a watch out of our technology.

Q. Well, sir, I understand you had the idea. You had the aspiration. You hadn't actually pulled it off and come up with the engineering solution until much later, correct?

A. Well, the engineering solution included power reduction and size reduction of our pulse oximeter technology. So we were working towards that. Hospitals don't need the power or size reduction because those devices get plugged to the wall by the bedside.

So the reason we were pushing and pushing to reduce the size, reduce the power, so we can make it portable, wearable consumer version.

Q. I understand that was your goal, sir, but you just told me a couple minutes ago that you solved the power consumption problem in the 2010s, correct?

A. Yeah. I don't have the exact date in my mind, but, yeah, right kind of before we began working on iSpO2,

MASIMO 2029
Apple v. Masimo
IPR2024-00242

and then MightySet on the watch we had gotten the power down to a level where it could be wearable and battery-operated.

Q. In the 2010s, correct?

A. Yes, sir, to the best of my memory, yes.

Q. Now because you came up with that in the 2010s, you were not in possession with that in 2008, correct?

A. I'm sorry. What are you -- oh, when we -- well, they're related. If you actually read the patent, it talks about putting the sensor anywhere on the body.

You're focusing on the watch. We focus on pulse oximetry, where in the body you could put it. And what this invention showed is that in difficult situations -- in this case hemoglobin or glucose where the signals are tiny -- or are or on the finger or maybe in situations where maybe on the forehead or wrist where the pulse ox is strong but that site is bad, this invention comes in handy to make the measurement.

Q. Sir --

A. We were in possession of it, yes.

Q. Sir --

A. With the power -- sorry.

Q. I didn't mean to interrupt you. Did you finish your answer?

A. No. I would say we were in possession of one piece, but we needed the other piece, the power consumption

MASIMO 2029
Apple v. Masimo
IPR2024-00242

to come down, to then put it together to make things like iSpO2 and eventually the watch.

Q. Sir, you were not in possession as of 2008 of the engineering solution to putting a pulse oximeter in a watch, correct?

A. Well, not all of the -- not all the components of it, but some of it, yeah, that's what this patent shows.

Q. Sir, you could not build a watch with a pulse oximeter in it; you did not have possession of that idea in 2008, correct?

A. We did not have feasibility until maybe 2016, 2017.

Q. Now the patent was filed, the original patent in the Poeze patent family, was filed in 2008, correct?

A. The provisional was filed in 2008, that's correct.

Q. And, in fact, it was filed on September 20 -- I'm sorry. I'll retract that.

It was filed in 2008, but the three patents that are asserted in this case in that same family were filed about 12 years later in September of 2020, correct?

A. I know that's -- I think when they fished. I don't know when they were filed. You'd have to talk to our lawyers. Obviously the disclosure is identical, all that changes are the claims, and I don't know when those claims

MASIMO 2029
Apple v. Masimo
IPR2024-00242

were first sought after.

Q. Well, let's pull up the Joint Exhibit that we were just looking at a moment ago, and let's look at the cover.

So we have here the '501 patent. This is one of the three asserted in this case, correct?

A. Yes.

Q. And let's go down to the filing date, which is in the left-hand side, midway down. And do you see, sir, it was filed on September 24th of 2020?

A. Yes, I see that. That's when those claims were filed.

Q. And let's take a look at JX-2, the '502 patent. We'll take you to the filing date for this one. September 24th, 2020. Do you see that, sir?

A. Yes, I do.

Q. Very same day, right?

A. Yes.

Q. And let's go to JX-3, the '648 patent, and do you see, sir, that was filed on the very same day as well?

A. Yes.

Q. So you'd agree that the three patents in this family that are asserted in this case were filed on September 24th, 2020, right?

A. Yes.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Now that's 12 years after the original provisional application, correct?
A. Yes.
Q. If we go back to the release dates of the Apple Watches, do you see the Series 6 was released on September 18th, 2020?
A. Yes, I do see that.
Q. Very shortly before these applications were filed, correct?
A. Yes, correct.
Q. And, in fact, if we go to RX-0333, which is tab 14 in your binder, sir.
A. Yes, I see the press release from Apple announcing the watch, Series 6.
Q. On September 15th of 2020, correct?
A. Yes.
Q. That's nine days before these three patent applications were filed, right?
A. Yes.
Q. And it's fair to say, sir, you know of no reason that these three patents could not have been filed earlier than September 24th, 2020, right?
A. Well, I think there were reasons it was filed then. I have a vague understanding of some of the reasons, but you should ask the lawyers who did it to why they did it

MASIMO 2029
Apple v. Masimo
IPR2024-00242

when they did it.

Q. Well, let me take you to your deposition. This is RX-1204. Let me take you to your deposition transcript at page 175, lines 14-17.

MR. RE: Objection. One moment. Mr. Kiani, do you have a copy of your deposition with you? It should be in one of your notebooks.

THE WITNESS: Well, yeah. Which tab am I looking at?

Q. Tab 1 in your Cross-Examination Binder. Take your time. Let me know when you're on page 175.

A. Yes.

Q. Are you there, sir?

A. I am.

Q. Line 14.

Question. And is there any reason that you know of that these three patents could not have been filed earlier than September 24th, 2020?

Answer. No.

Were you asked that question and did you give that answer, sir?

A. Yes, that is correct. That is my understanding at the time. I did not know.

Q. All right. Thank you, sir. You can put your deposition transcript aside for the moment.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Let me ask you about whether what was known in your view and what was not known with respect to the -- these three patents on which you're a named co-inventor.

LEDs, light-emitting diodes, with multiple wavelengths had been used in physiological measuring devices before 2008, correct?

A. Yes.

Q. Before 2008 there had been physiological measuring devices with multiple LEDs emitting different wavelengths of light, correct?

A. That was Masimo's invention, rainbow«.

Q. Before 2008, correct?

A. That is correct.

Q. And those were in public sale before 2008, correct?

A. Correct.

Q. And there was also physiological devices with multiple photodiodes before 2008, correct?

A. Correct.

Q. So, in fact, there were multiple detector physiological devices before 2008, correct?

A. That's correct.

Q. Now you weren't the first to invent photodiodes configured to receive light attenuated by the tissue of a user, right?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. That is correct.
Q. In fact, that was an old idea?
A. Yes, absolutely. Sorry.
Q. I'm sorry. I didn't mean to interrupt.
A. I apologize. I was just saying that concept, of course, dates back to even the oximeters before pulse oximeters, before Aoyagi invention, yes.
Q. You'd agree with me, sir, that Masimo wasn't the first to invent a user-worn device that could take physiological measurements from photodiodes, right?
A. That is correct.
Q. Nor the first to invent a user-worn device that could transmit measurements wirelessly, right?
A. Yes, I believe -- I believe that's correct, yes.
Q. Nor the first to invent a user-worn device with a touchscreen, correct?
A. Yeah, I think so. I think you're right. We were the first, but I don't believe this patent was first to disclose that.
Q. It came before this patent; is that right, sir?
A. Yes, the way you asked it, yeah.
Q. And, of course, wrist straps for various types of devices have been around forever, right?
A. Yes, they have.
Q. Now let's talk a little bit about light piping, a

MASIMO 2029
Apple v. Masimo
IPR2024-00242

subject you discussed at some length with Mr. Re.

Light piping is another problem that you have con fronted over the course of your time at Masimo, correct?

A. That is correct.

Q. And you and your colleagues viewed that as a substantial challenge to overcome, right?

A. Yes. Trying to measure either during motion or very low perfusion situations light piping becomes a problem.

Q. If I understood your testimony earlier, you had achieved mechanisms and techniques for dealing with the light piping problem by the early to mid-'90s, correct?

A. That is correct.

Q. And, in fact, you were offering for sale products -- if you could remind me -- was it LPN sensors?

A. LNOP.

Q. Got it. You were offering those as of 1994, I think you said?

A. 1996.

Q. I'm sorry, 1996. So the light piping techniques that you had developed were in public sale as of 1996, correct?

A. Not all of them, the particular design that we had at the time dealt with light piping, but that design wouldn't have worked for what we were doing later, which is

MASIMO 2029
Apple v. Masimo
IPR2024-00242

in this patent.

Q. Now I want to ask you a very specific question. In your direct testimony with Mr. Re earlier today, you did not show Her Honor any portions of the '501, '502, or '648 patent specifications that describe techniques for dealing with light piping, correct?

A. Yes. I wasn't asked that, but it's in here, and there's a lot of discussions about it.

Q. Protrusion, I believe you touched on that subject also, right, sir?

A. Yes, I did.

Q. You would agree that convex protrusions were known long before these three patents, the '501, '502, and '648 were filed for, correct?

A. No. I believe, to my understanding, we were the first to actually do this convex protrusion when we actually made these products that are the subject of the 2008 filing.

Q. When you say made these products, you understand the only domestic industry product being alleged for these patents in this case is the Masimo Watch, do you understand that, sir?

A. I do. It surprises me because we do use these in other domestic industry products, but, yes, I've learned that this morning.

Q. And you're not trying to change the position now,

MASIMO 2029
Apple v. Masimo
IPR2024-00242

are you?

A. I don't know if we can, but I don't think it's true.

Q. Okay. In any event, the Masimo Watch was not in existence in 2008, correct?

A. No, it was not.

Q. Masimo hasn't licensed these three patents to any other companies, correct?

A. That is correct.

Q. And these three patents have not been recognized, these patents themselves, '501, '502, '648, have not been recognized in any industry journals or publications, correct?

A. Yes. Other than discussing them for our case, I've not seen anything.

Q. All right. I want to talk a little bit without getting into the details, you have also, your company, I should say, has also filed a lawsuit against Apple in the Central District of California, correct?

A. That is correct.

Q. And we won't get into the details today, that's for another court, but you have made trade secret allegations and patent allegations in that case, correct?

A. That is correct.

Q. Now the patent allegations were stayed or paused

MASIMO 2029
Apple v. Masimo
IPR2024-00242

pending review of those patents in the Patent Office through what are known as IPR proceedings, correct?

A. Yes, I believe Apple filed 20 plus IPRs against -- I think ten patents we filed in that case.

Q. And you were dissatisfied with the fact that the case was stayed, correct?

A. Yes. Obviously, as any plaintiff, I'd like the case to move forward.

Q. And that was one of the reasons why you filed the complaint that led to this investigation, right, sir?

A. Yes, it is. It is. As I said earlier, unfortunately, District Court patent cases I've learned take several years.

Q. Now some of the patents in the District Court case that were subjected or became the subject of IPR proceedings are related to the '501, '502, and '648 patents in this case, correct?

A. Correct.

Q. And you understand the Patent Office has made some determinations about those patents in the IPR proceedings, right?

MR. RE: Objection, Your Honor. This is an argument that was not made in the pre-hearing briefing. I see no relevance. And very confusing to untangle if Mr. Mueller is suggesting that somehow these IPRs bolster

MASIMO 2029
Apple v. Masimo
IPR2024-00242

his case with regard to the patents that are in this case where all the IPR information was, in fact, submitted to the Patent Office. I don't see the connection in how this argument was previously made in the pre-hearing brief.

MR. MUELLER: I'd say two things, Your Honor. One, Mr. Re referred to other litigation this morning that has absolutely nothing to do with this case. I objected. Your Honor overruled my objection with respect to the Nellcor case, for example.

In distinction with those cases, which have nothing to do with this case, these IPR proceedings are directly connected to the same family members of these three patents. In fact, 383 of the 384 claims that have been reviewed by the PTAB in the IPR proceedings have been invalidated, 383 out of 384.

So, yes, we do think that bolsters our case on invalidity, that 383 out of the 384 claims that have been reviewed by the IPR proceedings that relate to the patents in this case have been invalidated.

So I would say that, Your Honor. But I would also say, what I would also say is, to the extent -- same limitations -- I've just been given a note by Ms. Frazier making the point that these also include claims with some of the same limitations at issue in this case.

It also goes to the motive for Masimo filing this

MASIMO 2029
Apple v. Masimo
IPR2024-00242

case, namely, the stay for some of these same patents.

So I actually think there's a direct connection, a direct nexus, between these IPR proceedings and the results of those IPR proceedings in this case.

The last point I would make, Your Honor, is the only patents -- or the patents in this particular case have not yet gone into IPR proceedings. So you will be the first to assess the invalidity of these particular claims, but of the 384 related claims, 383 have been invalidated.

MR. RE: Your Honor, my objection was it wasn't in the brief. I objected. Where is that -- how is that responsive to the fact that this argument has never been made.

Ms. Frazier, on Friday, her sole reason for participating on Friday was to hold us to the briefing and the disclosures. Where was there any argument about the relevance of these IPRs with regard to the claims at issue in this case. I saw nothing about that. And I think it's complete -- I think she used the word sandbag -- when you make a very complicated argument like this as if this bolsters your invalidity case.

And the reason why I discussed Masimo's leadership in the field of pulse oximetry is because Apple sought our help. And they're making a nonobviousness argument.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

So there's a big difference. And what I heard Mr. Mueller just say, since I got overruled on something I think was irrelevant, let me do something that's irrelevant too. That is not proper advocacy. Where in your brief did you make any argument about this connection between the IPRs and the claims at issue, that's what I -- this is why it's a new argument to measure, as I sit here.

MR. MUELLER: I would just say -- I'm sorry.

JUDGE BHATTACHARYYA: Go ahead.

MR. MUELLER: Very, very briefly. Number one, I'm not making the same objection. The Nellcor case, for example, has utterly nothing to do with this case, whereas these IPR proceedings involve related patents in the same family. Point one.

Point two, I don't have a pincite for Your Honor right now on the pre-hearing brief, but I believe this has been part of the expert reports. The expert reports of our technical experts have cited these IPR proceedings, so this is a preserved position.

But, in any event, Your Honor, we can take it up later on, if it would make things easier right now. But I do want to say, quite clearly, this is not the same thing as citing to Nellcor. These are the same patents in the same family, and they have been invalidated far over 99 percent of the time.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

JUDGE BHATTACHARYYA: Let's take a short recess. One minute.

(Brief interruption.)

JUDGE BHATTACHARYYA: We can go back on the record. I'll wait for Mr. Mueller.

I am overruling the objection. The question can be asked.

Mr. Kiani, to the extent you have knowledge, you should answer.

A. Yes, Your Honor. My understanding is that the patents in the District Court case are broader, and what I've learned is that, when we filed these patents, we included some of the prior art that Apple had found along with the IPR filings. So the Patent Office could view these new claims we were asking in view of all of it.

So I don't understand Mr. Mueller's comments about what's happened on the IPR side as it relates to this, because these are narrower claims.

Q. Mr. Kiani, the record will speak for itself, but you do not contest my suggestion that 383 of the 384 reviewed claims in this family have been invalidated by the Patent Office, correct?

A. Well, I never knew the numbers, sir, but I also know it's on appeal with the Federal Circuit Court of Appeals. So I don't think it's complete. Besides, that

MASIMO 2029
Apple v. Masimo
IPR2024-00242

prior art on those patents that were broader have been given to the Patent Office when they issued these with narrower claims.

Q. Again, the record will speak for itself.

You would agree with me, Mr. Kiani, that there are no IPR proceedings yet involving the three patents in this family in this investigation, correct?

A. Yes. I don't get to ask the questions, but I don't know why Apple didn't file them.

Q. Well, sir, you understand Her Honor will be the first to assess the invalidity of those claims, right?

A. I am happy that she will.

Q. And I understand that you will be appealing the earlier decisions, but you are not contesting my recitation of the fact that 383 of the 384 claims have been invalidated to date, correct?

A. I don't know, sir, but I will take your word for it.

Q. Okay. Now, the '501, '502, and '648 patents are not directed to, for example, a method for transmitting email from a user-worn device, correct?

A. Correct.

Q. They are not for text messaging, credit?

A. Correct.

Q. They are not for sending or receiving text

MASIMO 2029
Apple v. Masimo
IPR2024-00242

messages or emails from a wrist-worn device, correct?

A. Correct.

Q. They are not for electronic payments?

A. No, they are not.

Q. Not for GPS?

A. No.

Q. Not for music or podcasts?

A. No.

Q. Not for an altimeter?

A. No.

Q. Not for a compass?

A. No.

Q. Not for magnetic charging, sir?

A. No.

Q. Not for microphones or speakers?

A. No.

Q. Not for Wi-Fi -- I'm sorry.

A. The product does have speakers and I think a microphone, but, no, no, the patents are not about that.

Q. And the patents are not for Wi-Fi or cellular conductivity, correct, sir?

A. Not the claims in this case, no.

Q. Now these three paints, the '501, '502, and '648, are also not directed at an industrial design for a watch, correct?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. That's correct.
Q. And you understand what an industrial design is, right?
A. Yes.
Q. And you understand that for consumer products industrial design can create significant engineering challenges, fair?
A. Fair.
Q. And this patent does not teach ways to overcome the industrial design related engineering challenges in a watch, correct?
A. Not -- not the look of the product, no.
Q. Now the Masimo Watch, we're going to talk about some of the confidential information about that product shortly, but your position is the Masimo Watch is now ready for at least a limited release; is that right, sir?
A. It is in limited release, yes.
Q. Well, to be clear, you can't buy it in a store yet, correct?
A. That's the definition of a limited market release, yes.
Q. Just so the record is clear, you cannot buy it in the store yet, right?
A. Oh. No, you can't. You can get on our website and order one provided you agree to give us feedback on the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

product, and if we make any substantial changes that you'll let us take it back if we want to give you a new one. That's the agreement.

Q. Now you just held up what I believe you're contending is one of those watches; is that right, sir?

A. That is correct.

Q. Now I took your deposition a while back. Is that the same watch you were wearing that day?

A. Yes, it is.

Q. All right. And you would agree with me that that watch looks an awful lot like the Apple Watch.

A. It looks similar. It's got that same ugly Casio square shape, but it is what it is.

Q. It looks a lot like the industrial design of the Apple Watch, correct?

A. Correct, from afar.

Q. Now that watch, the Masimo Watch watch that you're wearing, even this limited release that you just described -- we're going to come back to that -- has only occurred very recently, right?

A. What has occurred very recently?

Q. This limited release that you just described.

A. Yes, May 2nd is when we did it, yes.

Q. May 2nd, do I have that right?

A. Yes, sir.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. So that's a little over a month ago.
A. That's correct.
Q. Now, the Apple Watch, the original Apple Watch, was released in 2015, correct?
A. Yes. You're welcome to sell all you want of that.
Q. And the Series 6 and the Series 7 for which you're seeking an import ban were released in 2020 and 2021, right?
A. Yes, that's correct. I think September of each year.
Q. And, of course, those dates are before the May limited release date that you just gave us, correct?
A. Yes.
Q. And we can agree on this, sir. Apple could not have copied the look of the Masimo Watch, because when Apple created the Apple Watch models at issue in this case the watch didn't exist, correct?
A. Correct.
MR. MUELLER: At this point, Your Honor, I'm going to ask to go on the Masimo confidential record.
(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

MR. RE: Thank you, Your Honor.

BY MR. RE:

Q. Mr. Mueller showed you where the Radius PPG was connected or next to Root. Do you remember that discussion?

A. Yes, I do.

Q. And then you directed him to the next page where there was a woman sitting at home with the Radius PPG on it, right?

A. Yes.

Q. Now can you explain what I think you were trying to explain during your cross-examination on whether the Root, is that a home device or is that for the hospital?

A. The Root is for the hospital. At home you use a phone, a smartphone to see the information.

Q. So the consumer doesn't buy that larger item shown on page 2.

A. No, I don't believe they would. That's overkill for them.

Q. Right. And so in the picture with the person at home, they could use Radius PPG with the iPhone?

A. That's correct.

MR. MUELLER: I'm going to object to the leading, Your Honor.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

BY MR. RE:

Q. Okay. Does the Radius PPG require Root?

A. No, it does not. It can work with any Bluetooth device.

Q. And what are Bluetooth devices that work with Radius PPG?

A. Well, a whole host of them, from the iOS phones, to the Android phones, to the tablets that you can buy. So, yeah, any of them.

Q. Okay. One other thing. You had early in your testimony, I think it might have been before the lunch break, you and Mr. Mueller were having a debate about evidence of whether, you know, Apple could have gotten ideas from Masimo. Do you remember that?

A. I do.

Q. And you kept saying I don't have any direct evidence, it's only circumstantial, right?

A. Yes.

Q. What did you mean by that?

A. Well, no other company except the one that took 30 of our engineers, including or CTO, who was an inventor of the three patents in this case came up with a convex-shaped sensor for monitoring pulse ox.

So that's one of the evidence as I think leads me to believe that they took it from us. And also other

MASIMO 2029
Apple v. Masimo
IPR2024-00242

companies that do copy Apple, of course they are going to copy Apple, and we're going to have more people with these convex-based sensors. Before then, nobody else had it.

Q. And Mr. Mueller also asked you about that meeting that occurred in May 3rd, 2013. Do you remember that?

A. Yes.

Q. And --

MR. MUELLER: I'm sorry to interrupt. If we're going to get into that, if we could go on the Apple-Masimo confidential record.

MR. RE: I won't get into the content of the meeting. I didn't intend to. I just want to ask one question.

Q. Was there any agreement signed prior to the meeting at Apple in May of 2013?

A. Yes. Apple asked us to tell them confidential information, a product roadmap, how and why it worked, so we insisted on an NDA, and we had a nondisclosure agreement between us for that meeting.

Q. And was confidential information exchanged pursuant to that signed NDA?

A. Yes.

MR. RE: I have no further questions, Your Honor.

MR. MUELLER: Just briefly, Your Honor.

MR. RE: Oh, is there two rounds for every

MASIMO 2029
Apple v. Masimo
IPR2024-00242

witness?

JUDGE BHATTACHARYYA: If you brought up something in redirect that Mr. Mueller wants to respond to, then that's acceptable.

MR. RE: Okay. Thank you.

RECROSS-EXAMINATION

BY MR. MUELLER:

Q. I'll keep this brief.

Mr. Kiani, you just heard a reference to this meeting you had with Apple, correct?

A. Correct.

Q. And some information that was provided, right?

A. Yes.

Q. Now you were at that meeting, correct?

A. I was.

Q. And, sir, as you said earlier, you have no direct evidence whatsoever of copying by Apple of the features at issue in this case, correct?

A. Correct.

Q. Now you were at the meeting, so, presumably, if there had been such information at the meeting, you would have told us about it earlier, correct?

A. No one has asked what we discussed at the meeting. I'm happy to answer your questions on that.

Q. My question is simply, you have no direct

MASIMO 2029
Apple v. Masimo
IPR2024-00242

evidence whatsoever of any copying of the features at issue in this case, correct?

A. That's correct.

Q. Now last question. You mentioned this convex or a convex sensor was an indication of something improper by you, right, or by Apple?

A. By Apple, yeah.

Q. Do you understand, sir --

A. If I may say, I wasn't getting into the legalities of it. You asked about circumstantial. I guess Mr. Re asked about what's circumstantial on copying, and the convex was one of them.

Q. Sir, you understand the convex shape on the back of the watch was in the Series 0 in 2015. Do you understand that?

A. Marcelo started January 2014 at Apple.

Q. Sir, you understand the Series 0 is not accused of infringement in this case, correct?

A. Correct.

Q. You understand there's no contention by Masimo, not one, that the Series 0 infringes any of the five patents in this case, correct?

A. Correct, nothing until Series 6 and 7 in this case.

Q. And the Series 0 had a curved rear of the watch,

MASIMO 2029
Apple v. Masimo
IPR2024-00242

correct?

A. Not exactly like Series 6 and 7, but yes.

Q. And it had sensor technology within it, correct?

A. Not for pulse oximetry.

Q. It had curved sensor, a curved back surface and sensors within it in the Series 0, correct?

A. It is different, and that's why we're not alleging those including Series 4 and 5 in this particular case.

Q. Sir, please --

A. I'm agreeing with you, but I'm just clarifying that they're different. Sorry.

Q. Please, sir, stay with my question. The rear of the Series 0 was a domed back crystal, correct?

A. Yes.

Q. And there were physiological sensors in that device, correct?

A. Not -- yes, but not pulse oximetry, yes.

Q. And it's not accused of infringement in this case, right?

MR. MUELLER: Thank you, sir. No further questions.

(Clarification by reporter.)

THE WITNESS: I believe I said they're not in this case, ma'am.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

THE REPORTER: Thank you.

JUDGE BHATTACHARYYA: Mr. Kiani, thank you so much for your testimony.

THE WITNESS: Thank you, Your Honor. Thank you for your time.

MR. RE: Thank you, Your Honor.

MR. MUELLER: Your Honor, while we're switching to the next witness, Mr. Selwyn will do the cross-examination of the next witness.

JUDGE BHATTACHARYYA: Thank you.

MS. SWAROOP: Your Honor, I think during the course of the morning session we did send Your Honor a list of the exhibits that we would like to have moved in without a sponsoring witness. We're happy to do that now or to move to our next witness.

JUDGE BHATTACHARYYA: If it's all right with you, why don't we move to our next witness and do that at the end of the day. Is that all right?

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

For our next witness, Complainants call Mohamed Diab, and Mr. Lateef will be conducting the examination of Mr. Diab.

MR. LATEEF: Just waiting for the witness, Your Honor, to get to the witness room.

JUDGE BHATTACHARYYA: Mr. Diab, are you ready to

MASIMO 2029
Apple v. Masimo
IPR2024-00242

proceed?

THE WITNESS: I am. Sorry. I had to take off my jacket.

JUDGE BHATTACHARYYA: Do you understand that you have an obligation to tell the truth here today?

THE WITNESS: I do.

MOHAMED DIAB,

having been first duly sworn and/or affirmed on his oath, was thereafter examined and testified as follows:

JUDGE BHATTACHARYYA: You may proceed.

DIRECT EXAMINATION

BY MR. LATEEF:

Q. What do you do, Mr. Diab?

A. I am an engineer at Masimo.

Q. And what is your current position at Masimo?

A. I'm a fellow scientist.

Q. What year did you start working at Masimo?

A. 1989.

Q. And how long have you been working at Masimo?

A. Ever since.

Q. Okay. Where did you attend college?

A. Cal State Fullerton.

Q. And what degree did you earn there?

A. Bachelor in electrical engineering with emphasis

MASIMO 2029
Apple v. Masimo
IPR2024-00242

on computer engineering.

Q. What year did you graduate?

A. 1986.

Q. Briefly could you tell us the kind of work that you did at Masimo in the 1990s?

A. Sure. At that time we were working on our first pulse oximeter, and I was involved in the hardware design, the sensor designs and the algorithm designs. The algorithm is what takes the signal from the sensor, calculates pulse rate, saturation and other parameters.

Q. Great. Did you work on measuring carboxyhemoglobin when you were at Masimo?

A. Yes. We have started a project at Masimo to work on the carboxyhemoglobin and other parameters that are considered, they call them hemoglobin species, oxygen is one of them, carboxy is another when it binds with hemoglobin, methemoglobin, and total hemoglobin as well.

Q. Can you explain the importance of measuring carboxyhemoglobin --

A. Yes.

Q. -- noninvasively?

A. Carboxyhemoglobin, carbon monoxide, when it binds with oxygen, with hemoglobin, it has the affinity of 200 times what oxygen does. In other words, it displaces the oxygen. It won't let the oxygen bind with the hemoglobin.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

So it turns the hemoglobin into a dysfunctional hemoglobin, and, hence, the carbon monoxide poisoning that we hear. And it's very hard to diagnose because it looks like a flu. People with a high carbon monoxide poisoning, they go to the hospital, they look bright red and they look like they have a flu.

Firefighters suffer because of that. And many times when you have to buy appliances, like you buy a furnace that doesn't have good combustion, people get carbon monoxide poisoning.

Q. What research did you do with respect to carboxyhemoglobin?

A. We looked into, first of all, how it interacts with tissue, and I spent quite a bit of time looking into the theory behind it. Then we moved into a computer simulation trying to understand can we build a device that will measure carboxy noninvasively, carboxyhemoglobin in the tissue noninvasively, with reasonable accuracy that is relevant to the field.

And the result of those simulations, which took about a year, is that, yes, we could, and we also figured out that we can measure the other parameters, the methemoglobin and total hemoglobin as well.

Q. With respect to carboxyhemoglobin, who else worked with you on developing that technology?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. We hired Mr. Marcelo Lamego after two years of my work on that one, and after that eventually we created a team, we called it the rainbow« team, and the name rainbow« came from the number of wavelengths or number of LEDs that were needed in the sensor.

Typically, if you look at our oxygen sensor, it has two of them, it looks red, this one has many of them, so we called it rainbow«.

Q. We're going to start a section that discusses Masimo CBI.

Could we please go on the Masimo CBI record?

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Moving back to the public record.

BY MR. LATEEF:

Q. Okay. Could you take a look at Joint Exhibit 007?

A. Okay.

Q. Can you tell me what this is?

A. Yeah. So this is a United States Patent No. 7,761,127. I am an inventor on this patent.

Q. Okay. And who owns this patent?

A. I believe initially it was Masimo Laboratories. That's the company we spun off in 1988. But today's Cercacor, it was renamed to Cercacor.

Q. Okay. And does this patent relate to your work on measuring carboxyhemoglobin?

A. Yes.

Q. Okay. Can you explain at a very high level how?

A. Okay. So this is a patent that describes a sensor that can take 16 LEDs with many novel features, and the part that I just explained about how we can predict the wavelengths using the thermistor and the thermal mass is described in this patent.

Q. Okay. Let's take a look at Fig. 2A. And can you

MASIMO 2029
Apple v. Masimo
IPR2024-00242

describe what is shown here?

A. This is something you may have seen in a hospital. It's called a clip sensor. This is a sensor that goes and clips on the digit, and it has LEDs in it. It may be a measure -- oxygen saturation or other parameters for rainbow«.

Q. Let's move to Fig. 4. Can you explain what we're looking at here?

A. So this is an expanded view of that particular sensor. So if you were to break it up and open it up and look inside of it, this is what you're going to see. On the left there is a cable. On the top and the bottom there are those shelves, the top and the bottom shelves. Then in the middle there is -- there are a couple of pads, very flexible pad.

And if you look at 600, that's where the assembly is, and this is what we were talking about before.

Q. Okay. And 600 is now on the screen. Do you see that?

A. Yeah. This is like a 4x8 millimeter. This is our first revision of it, just to give you have a sense of the size, 4x8 millimeter.

Q. Let's go to Fig. 6. And can you explain what we're looking at here?

A. So this is the same sensor assembly but zoomed

MASIMO 2029
Apple v. Masimo
IPR2024-00242

in. And what you see on the right side, you see the LEDs. Those are little, look like sugar cubes. Those are the LEDs. Our sensor design can accommodate 16 of them.

Q. Okay. Let's go to Fig. 12. Could you explain this figure to us?

A. Sure. This is a block diagram of that thermistor. So you see -- not thermistor -- of the assembly. This is the block diagram, top-level block diagram.

You see the LED on the left, the light emitter. In the middle you have the thermal mass, which is really the substrate, described here as a substrate. The emitters pump the heat into the thermal mass, and when we described that energy right here with two arrows. And on the right side you have this temperature sensor, which in our case, as an example of one embodiment, was a thermistor, and it is attached to the other side of the substrate.

Q. Can you explain what a thermistor is?

A. A thermistor is a device that it changed its resistance with temperature. So if you measure the resistance, you can look up what the temperature is, and it's really accurate.

Q. Thank you. Can we turn to Fig. 14 in the patent?

Can you explain what we're looking at here on Fig. 14?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Sure. So this is really a cross-section across that emitter assembly, and it shows the composition of the board itself.

So the board typically is made of material called FR-4. It's some kind of a material that is used in all of the computer boards. If you have a computer at home and you look and you open it up and you look at the board, it will be probably an FR-4 board. It's used widely in the computer industry in electronics.

You could see sandwiched in between -- first of all, the top layer, we call it the component layer, that's where the LED goes, and this is a metallized layer, conductive, probably copper.

Then there are layers 2, 3, 4, and 5. These are inner layers. Also they are made out of, typically, copper. They are metallized layers. And there is a bottom layer where we attach the thermistor.

Q. Okay. And are these layers connected in any way?

A. Absolutely. You have to connect them; otherwise, the heat will not flow because the FR-4 is a very good insulator. It is made out of fiberglass.

So we have via, we call via or through holes that connect each one of those layers to the next. So the heat will be generated on the top where the LEDs are, and it flows down through all of the layers.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Is --

A. Through those conductive holes.

Q. Yes. Does this structure keep the temperature of this thermal mass constant?

A. No. No. As actually you've seen it before in the simulation, the temperature is not constant. It actually follows the temperature of the LED in sync, and that actually is the main trick.

Q. And maybe you can explain again how, despite the changes in the temperature, the thermistor is related to the wavelength of the LEDs.

A. Well, what happened right here is that, I'm going to use an example to help us analogy -- to help us in this, we have attached those LEDs thermally to the thermal mass.

And I'm going to use an example of people in an elevator and you want to know the height of the people. Actually what you want to do is how high their hair or their head, their scalp, from the base floor.

So how do you do it? We first ask them to take off their shoes, stand, normalize them, have them stand barefoot on the elevator. And then we find out what is the level of the elevator, the tenth floor. So the floor of the elevator is akin to the thermistor in a thermal mass temperature. That's where things are standing.

And then every person has their own different

MASIMO 2029
Apple v. Masimo
IPR2024-00242

height, just like those LEDs, each one has its own junction temperature. But once you do that, you calculate the height of each one of those, and you can say, okay, well, the height of this person from the first floor is their height from the floor of the elevator plus where the elevator is.

So that's pretty much what we do with our invention. We find out that we can measure the temperature of the thermal mass and then calibrate each LED independently to figure out what is the wavelength of each one of them, and we validated our results two ways, one, with a spectrophotometer, and two, with the results of the studies that we have done.

Q. Thank you. Let's now talk about the Masimo products. Are there Masimo products that use this wavelength correction?

A. Yes. All of rainbow« sensors use wavelength correction except for a couple of them. One is an acoustic sensor, and the other one, it's called Light Set 1, but the rest of them all use temperature correction.

Q. Okay. Let's talk about the rest of them. These rainbow« sensors, what kind of products do they connect to?

A. They connect to the board, rainbow« device essentially, and those they have what we call MX board, and there are many revisions of those MX boards, 1, 3, 5. I don't know where we are right now, but the temperature of

MASIMO 2029
Apple v. Masimo
IPR2024-00242

each one of them as well as the wavelength as well as the signal coming from each LED is taken inside the board, processed, corrected, based on what the wavelength is, and then some kind of a calculation is done to come up with saturation, carboxyhemoglobin, methemoglobin, pulse rate, or what other parameter we have.

Q. Okay. Can you tell me the name of some of the rainbow« products?

A. Well, the very first one that we have released is RAD-57. I'm very proud of that one. That was the very first device that were able to measure noninvasively carboxyhemoglobin in the human body.

Q. Okay. Going back to the sensors, do all rainbow« sensors besides the two that you mentioned have some common features?

A. Yes.

Q. Okay. Let's talk about those common features. Let's talk about the LEDs. Do all rainbow« sensors have --

A. Yeah, they all have LEDs. That's really common. Typically pulse oximeter sensor that you see in the hospital, the one with the red color, they have two, one red, that you see. These all have more than two. Typically eight or more.

Q. Okay. And do these sensors all have thermistors?

A. Yes, they all do have thermistors with a thermal

MASIMO 2029
Apple v. Masimo
IPR2024-00242

mass.

Q. And do all of these have detectors as well?

A. Yes, they have at least one or more detector.

Q. Okay. And what do the devices like the RAD-57 do with the signals from the sensor?

A. Could you repeat? I'm sorry. I couldn't hear you.

Q. Oh, I'm sorry. What do the rainbow« devices such as the RAD-57 do with the signals from these rainbow« sensors?

A. Okay. So, basically, we isolate what we call a photoplethysmograph signal. It's really the heart -- that's how we can isolate it from the rest of the signals.

We isolate that, and it's really not trivial to get a reliable one. We have -- let's say you have an LED. You're going to have eight of those signals. We have a temperature coming in. We do the correction for the wavelengths, and these get adjusted. And at the end we have a calculation that is done based on that. And then there is a display that shows up.

Q. You mentioned some calculations that are done. Did you write any code for this wavelength correction?

A. I wrote actually the original code for all of rainbow« including the wavelength correction.

Q. Okay. And is there code in the production

MASIMO 2029
Apple v. Masimo
IPR2024-00242

releases of the Masimo devices?

A. Well, the software folks took my code and obviously they said, okay, we need to modify, restructure it. And so my code on its own is not there, it's the modified version of it is there, and obviously there were more additions over the years.

Q. And does the --

JUDGE BHATTACHARYYA: I'm sorry to interrupt. It's time -- it's about time for our afternoon break. If you just have a few more questions for the witness, then we can finish that first, but, otherwise, we should take the break now.

MR. LATEEF: We can take the break now.

JUDGE BHATTACHARYYA: All right. Then we're in recess for 15 minutes.

(Whereupon, the proceedings recessed at 3:21 p.m.)

(In session at 3:35 p.m.)

JUDGE BHATTACHARYYA: We are on the public record.

Mr. Lateef, you may continue.

BY MR. LATEEF:

Q. Okay. Mr. Diab, you have a binder in front of you, and I'd like you to take a look at what should be in your first tab, CPX-125. Sorry. 152.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Okay.
Q. Do you recognize this?
A. This is part of the software that does the wavelength correction in the rainbow« product.
Q. Okay. You can put that away.
Could you next take a look at CX-678? It's also on the screen in front of you.
A. 678, okay.
Q. Yes, it's also on the screen. Okay.
Do you recognize what this is?
A. Yes. This is the RAD-57 Operator Manual, that's the device we introduced in 2005.
Q. And do you know the date of this Operator's Manual?
A. Probably a later date than 2005. It should be very similar.
Q. If we can move forward a couple pages.
A. I think 2018, something like that. But the original one was very similar to this.
Q. Okay. And let's go back to talking about the sensors again, the rainbow« sensors that we were discussing.
Where are the emitters placed in a rainbow« sensor?
A. Well, the emitters are placed on what we call an emitter assembly, which we discussed this a little while

MASIMO 2029
Apple v. Masimo
IPR2024-00242

ago. Those are -- have been placed on a flex circuit, which then in this case has the emitter assemblies as well as the photodiode.

And in the picture, the expanded picture that we have shown originally -- or not originally -- earlier of that clip sensor, you could see that flex circuit, and then the hierarchy will go higher and higher and higher until you have the whole sensor.

MR. LATEEF: We're now going to go back on some Masimo CBI information. Could we go back on the Masimo CBI?

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Let's move to the public record.

CROSS-EXAMINATION

BY MR. SELWYN:

Q. Good afternoon, Mr. Diab.

A. Good afternoon.

Q. You are one of the cofounders of Masimo, correct?

A. Correct.

Q. And at Masimo you've been chief technology officer, chief scientist, and fellow scientist, correct?

A. Correct.

Q. You're not aware of any evidence that Apple ever copied the '127 patent, correct?

A. I have not looked at any evidence myself.

Q. You're not aware of a shred of evidence that Apple copied the '127 patent, correct?

A. I said I did not look into that, so I cannot form an opinion about it.

Q. You're a named inventor of the '127 patent, correct?

A. Correct.

Q. But you're not here to suggest that Apple Watch uses or practices the '127 patent, correct?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. I have not looked at any piece that has to do with the Apple Watch to make or form any opinion.

Q. So you have not compared the claims of the '127 patent on the one hand with any Apple product on the other, correct?

A. No, I have not.

Q. And you're also not here to suggest that Masimo practices or uses the '127 patent, correct?

A. I'm sorry. Could you repeat that question?

Q. Sure. You're not here to suggest that Masimo is using or practicing the '127 patent, correct?

A. That is incorrect. We are using and practicing the '127 patent in all of our rainbow« sensors.

Q. Well, sir, you have not compared the claims of the '127 patent to any Masimo product; isn't that true?

A. I think I did. I think Masimo uses all of those in the patent. Actually all the aspects that we described, all the embodiments, nearly all of them that we described in the patent uses them. So how could we not practicing the patent?

Q. Mr. Diab, do you remember giving a deposition in this case?

A. Yes.

Q. Can we have on the screen, please, Mr. Diab's deposition at page 77, lines 9-14?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

MR. LATEEF: Should we now open the cross binder or materials that you gave him?

MR. SELWYN: Certainly. Feel free.

MR. LATEEF: Mr. Diab, there should be an envelope near you with the materials.

Q. Mr. Diab, if you open the binder, tab 11, your deposition, and I'd like to direct your attention to page 77, lines 9-14, which are on the screen.

We asked this question and did you give this answer:

Question. Have you ever compared any Masimo product against any claim in the '127 patent to see if that product practices each element of the claim?

Answer. No, I did not.

Were you asked that question and did you give that answer?

A. I think I did, but that's for the claims. I was talking about the patent. The patent itself, the text of the patent, which I helped wrote, and I know that we have worked on all of those, do practice the patent. I don't think I looked at the claim in details. But for the patents, absolutely.

Q. Mr. Diab, you testified today about some mechanical aspects of Masimo's products, like adhesives, correct?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Yes.

Q. You're not familiar with the mechanical aspects of the '127 patent, correct?

A. No. My work was more on to related to the wavelength correction and light piping issue, the mechanical aspect of it. I understand how the adhesive works. I understand how the die attached work. I understand that there is a cure that they use in the oven. I understood all of that obviously because of my interaction, but I'm not an expert or somebody who is, you know, really familiar with the process itself.

Q. Sir, the first time that you read the '127 patent since it issued was the week before your deposition in this case, correct?

A. Since it was issued, yes.

Q. And you did not review any prior art patents or publications before you applied for the '127 patent, correct?

A. I myself did not review, no. I wrote a disclosure, and we sent it to our lawyers.

Q. You're not aware of anyone at Masimo investigating whether there were any products on the market already that could estimate wavelength shifts before you applied for the '127 patent; isn't that true?

A. I don't know if -- you're asking me about if

MASIMO 2029
Apple v. Masimo
IPR2024-00242

somebody at Masimo was aware 15, 17 years ago? I do not remember that. I have no idea to remember it.

Q. But you do know that the concept of wavelength shift was well-established before the '127 patent, correct?

A. Yes.

MR. SELWYN: Your Honor, I think at this point we need to go on to the confidential Masimo business record.

JUDGE BHATTACHARYYA: Moving on to the Masimo confidential record.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: We're moving back to the public record.

REDIRECT EXAMINATION

BY MR. LATEEF:

Q. Mr. Diab, did you ever investigate whether a board with one metallic layer could provide a thermal mass?

A. Yes.

MR. SELWYN: Objection, Your Honor.

JUDGE BHATTACHARYYA: I'm sorry. I didn't hear the objection.

MR. SELWYN: It's beyond the scope.

JUDGE BHATTACHARYYA: Mr. Lateef, can you respond?

MR. LATEEF: He asked the witness about the number of layers that are in the Masimo sensor and about the dimensions of that regarding a thermal mass, implying that a smaller thermal mass would not provide the benefit of the '127 patent. I'm merely responding to that.

JUDGE BHATTACHARYYA: Mr. Selwyn, anything further?

MR. SELWYN: I asked no question to which that question that was just posed would be relevant to.

JUDGE BHATTACHARYYA: I agree. The question is

MASIMO 2029
Apple v. Masimo
IPR2024-00242

outside the scope of the cross. So that portion of the testimony is stricken.

BY MR. LATEEF:

Q. Mr. Diab, you mentioned test stations earlier. Do you remember that?

A. Yes.

Q. Are there test stations that check the characterization of the current Masimo sensors?

A. Yes. We have that on every single sensor. It's tested before it's shipped. The -- and it's the same technique that was used on the old version of the sensor and the new version of the sensor. There is no sensor that leaves Masimo production without being characterized, and the characterization validates whether the equation is working or not. If it doesn't, it gets thrown out.

So that is our validation of whether it's ceramic or not. Every single sensor gets characterized and validated that the wavelengths that comes out correspond to the equation that we put inside the sensor.

MR. LATEEF: I have no further questions, Your Honor.

MR. SELWYN: No questions, Your Honor.

JUDGE BHATTACHARYYA: Thank you. Mr. Diab, thank you so much for being with us.

THE WITNESS: Thank you, Your Honor.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

MS. SWAROOP: Your Honor, Complainants' next witness will be Mr. Ammar Al-Ali, and Mr. Jensen will be conducting that examination.

MR. MUELLER: Your Honor, Sarah Frazier will be conducting the cross-examination.

JUDGE BHATTACHARYYA: Thank you.

MR. JENSEN: Good afternoon, Your Honor. This is Steve Jensen.

Mr. Al-Ali, are you comfortable and do you have your book?

THE WITNESS: Yes. Good afternoon.

MR. JENSEN: May we begin, Your Honor?

JUDGE BHATTACHARYYA: I'll swear in the witness first before we proceed further.

Mr. Al-Ali, did I pronounce it right?

THE WITNESS: That's correct.

JUDGE BHATTACHARYYA: Welcome. Thank you for coming. Do you understand you're under an obligation to tell the truth here today?

THE WITNESS: I do.

AMMAR AL-ALI,

having been first duly sworn and/or affirmed on his oath, was thereafter examined and testified as follows:

JUDGE BHATTACHARYYA: Thank you.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

DIRECT EXAMINATION

BY MR. JENSEN:

Q. Mr. Al-Ali, could you please state and spell your name for the record?

A. Ammar Al-Ali, A-M-M-A-R, A-L hyphen A-L-I.

Q. And who is your current employer?

A. Masimo Corporation.

Q. When did you start at Masimo?

A. I started April 1995.

Q. Could you just briefly explain your job history at Masimo since you started?

A. Yes. I started at Masimo in '95 as a software engineer, and then moved from that to manage the engineering department. I worked in the early days of '95 to about 2000 on the Masimo saturation algorithm.

And then after that our RAD system, which is a medical device, and then after that I worked on the rainbow« system, and lately I've been working on wearable technologies.

Q. And what are your current responsibilities at Masimo?

A. Right now I oversee the technology development of the company.

Q. Okay. And you mentioned wearables in your previous answer. Did there come a point in time when from

MASIMO 2029
Apple v. Masimo
IPR2024-00242

your technology perspective the Masimo wrist pulse oximeter project became more formal?

A. Yes. I started looking into measuring the wrist somewhere around 2014, 2015. Did some feasibility work there. And then started again in 2017 to 2018. And in 2019 we actually put a complete team to go after it, expanded the team so we have enough support from all disciplines of the engineering department.

Q. And did you file any patents back with that early work that you did?

A. Yes. I did file a patent on 2015 based on that initial work.

Q. And can you find in your book Complainants' Exhibit 4? Or we'll also pull it up on the screen. And let us know if you recognize that patent.

A. Yes, I do recognize that patent.

Q. And is this one of the patents that you were referring to that stemmed from the work you mentioned in 2014 and 2015?

A. That's correct. This was from the 2015 time, yes.

Q. And you're an inventor on this patent, right?

A. Yes, I am.

Q. What was your involvement in this patent?

A. I am the designer for the and the inventor for

MASIMO 2029
Apple v. Masimo
IPR2024-00242

the subject matter. I gave disclosure to the attorneys to actually file the patent.

Q. Okay. And then you said that things started from -- I think you said working more with a team happened a little later.

What started happening then when you picked it back up, I think you said?

A. Oh, in 2019 we put a complete team behind this technology. We hired mechanical engineers, electronic engineers, and software. So we actually started making the sensor and trying to optimize its performance.

Q. And when did Masimo have its own wrist pulse oximeter devices with sensing on the wrist?

A. This would be late 2019.

Q. And could you please on the -- it's on the stand that's behind you -- or someone might have put it next to you, please find Complainants' physical exhibit 22. It's either there or it's on the cart.

A. Oh, it's on the cart.

Q. Number 22.

A. I found it.

Q. Okay. Do you recognize Complainants' Exhibit 22?

A. Yes. It's one of our early sensors.

Q. Can you show us just on your camera there, not on the ELMO, but just on the camera what you're holding?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. (Complying.)
Q. And do you recognize that sensor?
A. Yes, I do.
Q. And when was it made?
A. This sensor was made in October 2019.
Q. How can you tell when it was made?
A. I do remember that, but also it has the labels on it.
Q. And maybe you could put it on the ELMO so that we can see that, what you're looking at. There we go.
So you were looking -- you were mentioning some labels. Are those the labels down there?
A. Yes, these are the labels, and 10-23-19, this is when it was actually used for a Desat study.
Q. When you say "Desat study," what do you mean by that?
A. This is a study that we do to evaluate the accuracy of the product. We bring in volunteers and we attach the sensor to their wrist and make them breathe a different mixture of oxygen and nitrogen to change the SpO2 in their blood. So typically that study we take a person from about 100 percent, which is normal, down to about 70 percent.
Q. On the back of the sensor head of that watch, is there a label?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

MR. JENSEN: Actually, Your Honor, I should have said earlier we were on the confidential record as soon as I started pulling up these samples. I would like to be on the confidential CBI for Masimo at this point.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

C O N T E N T S

INDEX OF WITNESSES

WITNESS	DIRECT	CROSS	RE-DIRECT	RE-CROSS
JOSEPH KIANI	79	131	181	186
MOHAMED DIAB	190	228	245	
AMMAR AL-ALI	248			

AFTERNOON SESSION		136
CONFIDENTIAL SESSIONS	17-27	194-204
	35-36	216-227
	62-68	233-244
	72-76	253-end
	106-113	
	120-139	
	169-182	

MASIMO 2029
Apple v. Masimo
IPR2024-00242

C E R T I F I C A T E

TITLE: CERTAIN LIGHT-BASED PHYSIOLOGICAL MEASUREMENT DEVICES AND COMPONENTS THEREOF

INVESTIGATION NO.: 337-TA-1276

HEARING DATE: June 6, 2022

LOCATION: Washington, D.C. - Remote

NATURE OF HEARING: Evidentiary Hearing

I hereby certify that the foregoing/attached transcript is a true, correct and complete record of the above-referenced proceedings of the U.S. International Trade Commission.

Date: June 29, 2022

Signed:

ss// LaShonne Robayo

Signature of the Contractor or the Authorized Contractor's Representative

I hereby certify that I am not the court reporter and that I have proofread the above-referenced transcript of the proceedings of the U.S. International Trade Commission against the aforementioned court reporter's notes and recordings for accuracy in transcription in the spelling, hyphenation, punctuation and speaker identification and did not make any changes of a substantive nature. The foregoing/attached transcript is a true, correct and complete transcription of the proceedings.

Signed:

ss// Raymond G. Bynteson

I hereby certify that I reported the above-referenced proceedings of the U.S. International Trade Commission and caused to be prepared from my record media and notes of the proceedings a true, correct and complete verbatim recording of the proceedings.

Signed:

ss// Linda Kinkade

MASIMO 2029
Apple v. Masimo
IPR2024-00242

UNITED STATES
INTERNATIONAL TRADE COMMISSION

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In the Matter of Investigation No.

CERTAIN LIGHT-BASED PHYSIOLOGICAL 337-TA-1276

MEASUREMENT DEVICES AND COMPONENTS

THEREOF

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OPEN SESSIONS

Pages: 283 through 596 (with excerpts)

Place: Washington, D.C.

Date: June 7, 2022

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MASIMO 2029
Apple v. Masimo
IPR2024-00242

UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

Before the Honorable Monica Bhattacharyya

Administrative Law Judge

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In the Matter of Investigation No.

CERTAIN LIGHT-BASED PHYSIOLOGICAL MEASUREMENT DEVICES AND COMPONENTS THEREOF 337-TA-1276

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EVIDENTIARY HEARING

Tuesday, June 7, 2022

Volume II

The parties met via remote videoconferencing pursuant to notice of the Administrative Law Judge at 9:30 a.m. Eastern.

Reported by: Linda S. Kinkade RDR CRR RMR RPR CSR

MASIMO 2029
Apple v. Masimo
IPR2024-00242

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Apple v. Masimo
IPR2024-00242

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MASIMO 2029
Apple v. Masimo
IPR2024-00242

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MASIMO 2029
Apple v. Masimo
IPR2024-00242

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MASIMO 2029
Apple v. Masimo
IPR2024-00242

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*** Index appears at end of transcript ***

MASIMO 2029
Apple v. Masimo
IPR2024-00242

P R O C E E D I N G S

(In session at 9:30 a.m.)

JUDGE BHATTACHARYYA: Let's begin. We're on the record. Let's start on the public record.

For today's activities, who is going to be the designated attorney regarding CBI for each side?

MS. SWAROOP: I will be for Complainants, Your Honor.

JUDGE BHATTACHARYYA: Thank you.

MR. MUELLER: Ms. Frazier has kindly agreed, Your Honor, to do the same for us.

JUDGE BHATTACHARYYA: Okay. Wonderful. We have some exhibits that I understand are ready or almost ready for admission. I have a list entitled Table of Exhibits Entered Into Evidence Without Sponsoring Witness. The PDF is entitled -- is dated 6-6-2022.

Are there any objections to admission of any of these exhibits?

MR. MUELLER: No, Your Honor. With respect to the two tables of exhibits that the Complainants submitted, one for the evidentiary hearing yesterday and one for the evidence without a sponsoring witness, we have no objection to the table for the evidence without a sponsoring witness.

For the admitted exhibits that were used yesterday, we have no further objections and nothing to

MASIMO 2029
Apple v. Masimo
IPR2024-00242

raise at this time. I would just note, Your Honor, there were a couple points where we made some standing objections, for example, to post-complaint evidence, which Your Honor has already ruled on, and I just wanted to make clear that we're not abandoning our legal position on that issue. We have no further objections for Your Honor to resolve at this time.

JUDGE BHATTACHARYYA: All right. So starting with the Table of Exhibits Entered Into Evidence Without a Sponsoring Witness, I understand no objections, those exhibits are admitted into evidence. Please send a copy of that list to the court reporter.

(Whereupon, the exhibits as recited by counsel and reflected in the attached index were submitted and received in evidence.)

JUDGE BHATTACHARYYA: The second list I have is Table of Admitted Exhibits With the Evidentiary Hearing on June 6, 2022. And I understand there are no objections to that list either; is that right, Mr. Mueller?

MR. MUELLER: No further objections, Your Honor, nothing that we need to raise beyond what you've heard in the past.

We have taken positions, again, the example I'd use is on post-complaint evidence, but we understand Your Honor's guidance and there's nothing further we would

MASIMO 2029
Apple v. Masimo
IPR2024-00242

ask Your Honor to do at this time.

JUDGE BHATTACHARYYA: Understood. Those exhibits are admitted into evidence.

(Whereupon, the exhibits as recited by counsel and reflected in the attached index were submitted and received in evidence.)

JUDGE BHATTACHARYYA: Please send a copy to the court reporter.

MS. SWAROOP: Your Honor, just so it's clear, this table contains exhibits that are now part of the evidentiary record. I just want to make sure there's no ambiguity with regard to that. Mr. Mueller indicated some standing objections, but I just want to make the record very clear that there are no objections to these exhibits coming in.

JUDGE BHATTACHARYYA: My understanding is they are admitted. If Mr. Mueller wants to preserve his right to potentially petition for review of that ruling, but under the current rulings, those exhibits are admitted.

MR. MUELLER: That's correct, Your Honor. Thank you.

JUDGE BHATTACHARYYA: Okay. I also have a list 6-7-2022, Complainants' Deposition Designations and Exhibits to Move Into Evidence. Are those ready to be moved in at this time?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

MS. SWAROOP: Yes, Your Honor. We had prepared a list. I believe Apple had raised one objection. I don't know if Apple is maintaining that objection, but we have prepared a list with the designations and the exhibits accompanying those to move into evidence.

JUDGE BHATTACHARYYA: All right. Mr. Mueller, are there objections to these designations and associated exhibits?

MR. MUELLER: Your Honor, there's been 13 sets of designations. For 12 of them we have no objections. We do have objections to David Amor. If Your Honor would like to hear those objections now, the bases for them, I'm happy to do so. Ms. Frazier can provide the details.

JUDGE BHATTACHARYYA: Yes, let's do that now.

MS. SWAROOP: Your Honor, just so it's clear, we had submitted written communications to Your Honor setting forth our positions. We believe Apple provided an email to Your Honor yesterday with regard to its position on Mr. Amor, and we had provided our response this morning in writing.

So that is in writing, if Your Honor would prefer to review that, or if you'd like to have argument now, we can do that.

JUDGE BHATTACHARYYA: I appreciate the parties giving me a heads-up on their positions. I would like to

MASIMO 2029
Apple v. Masimo
IPR2024-00242

have the argument on the record.

MS. SWAROOP: I understand. Mr. Bachand will be making that argument for Complainants.

MS. FRAZIER: Good morning, Your Honor.

JUDGE BHATTACHARYYA: Good morning.

MS. FRAZIER: As Mr. Mueller noted, we have significantly narrowed. We do have objections outstanding with respect to the designations and three exhibits Complainants seek to introduce through David Amor.

Mr. Amor was the designee with respect to -- actually, Your Honor, if we could please go on the Apple confidential record for this portion.

JUDGE BHATTACHARYYA: All right.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: And now we're moving on to the Masimo confidential record.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Moving back to the public record.

CROSS-EXAMINATION

BY MS. FRAZIER:

Q. Now, Mr. Al-Ali, you've testified for about 60 minutes between yesterday and today, correct?

A. Yes.

Q. And Mr. Jensen didn't ask you any questions about the '127 patent, correct?

A. I don't remember, no.

Q. You are an inventor on the '127 patent, sir?

A. I believe so.

Q. And the '127 patent was designed to measure carboxyhemoglobin and methemoglobin, correct?

A. I believe so.

Q. The '127 patent does not have anything to do with SpO2, right?

A. The patent itself, no.

Q. And you are unaware of Masimo ever using the techniques described in the '127 patent for measuring SpO2, right?

A. No, some of those techniques actually applied for SpO2.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. But you don't have any product that uses the techniques described and claimed in the '127 patent for measuring SpO2, right?

A. Not on the market, yes, but we are working.

Q. Let's turn, sir, please, to your deposition. Do you recall being deposed in this investigation?

A. Yes.

MR. JENSEN: Ammar, there should be an envelope that has been unopened somewhere in the room with you there.

THE WITNESS: Yeah, I see it.

MR. JENSEN: And our deposition should be in there.

THE WITNESS: Okay.

Q. Mr. Al-Ali, it will be at tab 1 of the binder, and we will also put it up on the screen for you.

A. Yes, I see that.

Q. Okay. And, again, sir, you yourself don't have a product, Masimo does not have a product out with the techniques described and claimed in the '127 patent for measuring SpO2, correct?

A. We don't have a product that we sell.

Q. Now you don't remember how the solution for the '745 patent came to mind, correct?

A. When you say how it came to mind, like the moment that I remember how I would go do that?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Well, you don't remember how you came up with the idea described in the '745 patent.

A. Of course, I mean, I remember thinking about the problem and trying to find a solution.

Q. But you don't remember how the solution came to your mind, right?

A. I'm not sure I understand that. I'm thinking about a solution for a problem. So are you saying like my thoughts, how I got there?

Q. So let's see what you said at your deposition, sir. It's at tab 1 of your binder.

A. Mm-hmm.

Q. If we could put it up on the screen. Page 44, beginning at line 16.

A. Yep.

Q. Do you see there:

Question. How did you come up with the idea described in the '745 patent?

Answer. I don't remember how the idea came to my mind, but it's a problem that we were facing and we tried to find a solution. And this is like many years ago, so it's not -- I don't remember how the solution came to my mind.

Were you asked that question and did you give that answer?

A. Yeah. And this is what I just gave you seconds

MASIMO 2029
Apple v. Masimo
IPR2024-00242

ago.

Q. And, sir, you don't remember because it was many years ago, correct?

A. Yeah, I don't remember how it came to my mind, but I remember it's a problem we were going after.

Q. And fair to say you don't know one way or the other why the '745 patent was not filed until March of 2020, correct?

A. The '745 patent?

Q. Correct.

A. That -- I think that was filed in 2015.

Q. You think you had the original idea in 2015; is that right?

A. I think it was filed in 2015.

Q. Well, let's bring it up. I believe it's Exhibit 4. This is the '745 patent, sir, correct?

A. Yes.

Q. And do you see on the left-hand column where it says, filed, March 31st, 2020?

A. Yeah, I see that, but that's the continuation. The original file, the disclosure, was done in 2015, I believe.

Q. Correct. And you, sir, don't know one way or another why the application for the '745 patent was not filed until March of 2020, correct?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. No, the application was filed in 2015. I know that very well because right after that actually I had major heart surgery, so I know exactly when it was filed because it's in my mind.

Q. And that's the original provisional you're talking about, correct?

A. That's the original, but it's in the same disclosure.

Q. Now, sir, you consider shaping the light to be the thing that was new about the '745 patent, correct?

A. Yes.

Q. And it changes from a first shape to a second shape, correct?

A. Correct.

Q. And as the sole inventor of the '745 patent, you do not know what the first shape of light emitted by the LEDs is, correct?

A. So it's not important to know what the first shape is. What's important is the final shape that we need. So LEDs, as their nature, they come out with different shapes, and usually the emission out of the LEDs comes out almost like a cone with a hollow inside. So it is not appropriate to what we're trying to do. So it doesn't matter how it is shaped as it comes out of the emitter, because we had a diffuser on top that actually uniforms the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

light, and then it allows us to shape it any way we want when it comes out. So what's important --

Q. Sir, if you could just stay with my question.

As the sole inventor of the '745 patent, you don't know what the shape of light emitted by the LEDs is, correct?

A. Yeah, but I'm trying to explain.

Q. Well, let's see what you said at your deposition, sir. It's in tab 1 of your binder. We'll put it up on the screen. Page 72, lines 5-14.

Question. In the '745 patent, what shape is the first shape of light emitted by the LEDs?

And what shape is that?

Answer. I don't know what shape.

Were you asked that question and did you give that answer?

A. That's correct. I don't care what the shape -- the first shape is. I care what comes out is important.

Q. And the '745 patent describes what comes out as the second shape as a ring or a doughnut. That's what you were showing Mr. Jensen?

A. That's one configuration of it, yes.

Q. And that's what you invented, right?

A. Reshaping the light, yes.

Q. Now I heard you mention prior art in your

MASIMO 2029
Apple v. Masimo
IPR2024-00242

discussion with Mr. Jensen. You personally did not investigate whether any prior art to the '745 patent describes shaping of light, correct?

A. I did not myself.

Q. And you have never compared the claims of the '745 patent to any prior art, correct?

A. I'm not qualified to do that.

Q. Now, sir --

MS. FRAZIER: Your Honor, at this point we should go on the Masimo confidential record, please.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

MS. SWAROOP: Your Honor, for our next witness, Complainants call Bilal Muhsin. We're just getting him set up in the witness room.

JUDGE BHATTACHARYYA: Okay.

MR. MUELLER: Your Honor, I'll be conducting this cross-examination.

JUDGE BHATTACHARYYA: Thank you.

MR. MUELLER: Are we back on the public record, Your Honor?

JUDGE BHATTACHARYYA: Yes, we are.

MR. MUELLER: Okay. Thank you, Your Honor.

MS. SWAROOP: Our witness is ready.

Good morning, Mr. Muhsin.

JUDGE BHATTACHARYYA: Good morning. Could you help me pronounce your name again?

THE WITNESS: Bilal.

JUDGE BHATTACHARYYA: And the last name?

THE WITNESS: Muhsin.

JUDGE BHATTACHARYYA: Okay. Mr. Muhsin, thank you for coming here today. Do you understand you're under an obligation to tell the truth in your testimony?

THE WITNESS: I do.

BILAL MUHSIN,

having been first duly sworn and/or affirmed

MASIMO 2029
Apple v. Masimo
IPR2024-00242

on his oath, was thereafter examined and testified as follows:

DIRECT EXAMINATION

BY MS. SWAROOP:

Q. Good morning, Mr. Muhsin.

A. Good morning.

Q. Could you please describe your current employment?

A. I'm the Chief Operating Officer at Masimo.

Q. How long have you held that position?

A. Since 2019.

Q. What are your responsibilities as the Chief Operating Officer at Masimo?

A. I oversee R&D, regulatory, quality, operations, and commercial for Masimo, and clinical affairs as well.

Q. Mr. Muhsin, what is the Masimo Watch project?

A. It is a project that formally started in 2019. It's about a design of a wrist sensor that's able to calculate pulse oximetry, the SpO2 reading, and has other functionalities that a watch would have.

Q. What is your role in the Masimo Watch project?

A. I'm no longer a hands-on engineer, but I do oversee the entire R&D development, the operation side, and the commercialization side of the product.

Q. You mentioned that the Masimo Watch project

MASIMO 2029
Apple v. Masimo
IPR2024-00242

formally started in 2019. What did you mean by that?

A. It started in 2019 because, formally I said, which is a W1 project, we had many iterations of wrist sensors that we worked on prior, between us and our sister company Cercacor. So, technically, we had a lot of work done prior to 2019 on the project, but that's when it formally started for the W1.

MS. SWAROOP: And I'm going to be going into some confidential material, so I would like to go on the CBI record for Masimo.

JUDGE BHATTACHARYYA: Moving on to the Masimo confidential record.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: All right. Let's move on to the public record.

BY MS. SWAROOP:

Q. Mr. Muhsin -- do we need to --

Can I continue, Your Honor?

JUDGE BHATTACHARYYA: Yes, you may.

MS. SWAROOP: Okay.

BY MS. SWAROOP:

Q. So, Mr. Muhsin, we were discussing CX-789, page 39. Can you tell us what this is showing here?

A. This is the model that would sit in the bed at Arab Health. We had kind of a mockup of a home setting, so the model would sit in the bed. This is the watch on the model's hand reading the SpO2 or the O2 calculation, the oxygenation. That's the 99 percent up there, and the heart rate, which is at 89 beats per minute, and then the step counter and the time. So this is being demonstrated at Arab Health on the model.

Q. Okay. Thank you, Mr. Muhsin.

I would like to ask you about Masimo's manufacturing activities in the United States in connection with the W1.

Does Masimo have a video made that illustrates

MASIMO 2029
Apple v. Masimo
IPR2024-00242

and shows the production of the Masimo W1 at its Irvine, California facility?

A. Yes.

Q. Did you have any involvement in coordinating that video?

A. I did walk the manufacturing floor and asked them to focus on certain parts of the line in terms of that video, yes.

Q. Okay. Do you know when that video was made?

A. Last year, end of last year.

MS. SWAROOP: I'm going to show the video and I would like to go on the Masimo CBI record for that.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

MR. MUELLER: Thank you, Your Honor. May I proceed?

JUDGE BHATTACHARYYA: Yes.

CROSS-EXAMINATION

BY MR. MUELLER:

Q. Good afternoon, or good morning I should say, Mr. Muhsin. Nice to see you.

A. Good morning.

Q. If we could please pull up CPX-0146.

A. I have a box here. Am I supposed to open it?

Q. If you could, that would be great actually. I'm not going to refer to it quite yet, but if you could open it up to have it handy, that would be terrific.

MS. SWAROOP: Are we on the public record right now?

JUDGE BHATTACHARYYA: Yes, we're on the public record.

MS. SWAROOP: Your Honor, our position is that the image of the W1 is fine for the public record, but any details with regard to its features and its operation we do consider to be Masimo CBI.

MR. MUELLER: Well, Your Honor, I think it would depend on the question of what's CBI and what's not. I

MASIMO 2029
Apple v. Masimo
IPR2024-00242

think some of the basic features and functionality should not be CBI, if that's what they are relying on is the domestic industry product and they are taking the position it's been released.

MS. SWAROOP: That's fine. I would just note, with regard to the release, again, as we've heard, individuals who access the watch do have to agree to certain contractual restrictions, including a restriction that they do not copy any features of the watch, and so that is our concern here.

JUDGE BHATTACHARYYA: Ms. Swaroop, let's take this on a case-by-case basis. If Mr. Mueller asks a question that you believe is seeking confidential information, then please speak up and we'll move onto the Masimo record at that time.

MS. SWAROOP: Thank you, Your Honor. I'll do that.

BY MR. MUELLER:

Q. Mr. Muhsin, let me ask you a few questions about what we're looking at here.

This is an image of a physical device that you say is the Masimo W1 watch, correct?

A. Yes.

Q. And if we pull up CPX-0155AC, this is another image of the Masimo W1 device, correct, sir?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Yes.

Q. And if we pull up CPX-156AC, this is another image of the Masimo W1 watch, correct?

A. Yes.

Q. And this is the watch that you've stated on the public record is being manufactured in Irvine, California, correct?

A. Yes, in our Laguna Canyon Road facility.

Q. Now, you have testified that this watch is currently in a phase called the limited market release, correct?

A. Yes.

Q. And that phase began after the premarket release phase or PMR, correct?

A. Well, they sometimes overlap, but, yes.

Q. Now just to be clear, before you answer the question I'm about to ask you, I'm not asking you for any detail in terms of pricing or contract materials or any confidential information in my next question.

The PMR phase only involved one customer, correct?

A. Correct.

Q. The Prince Sultan Cardiac Center, correct?

A. Yes.

Q. And the sale for that premarket release phase was

MASIMO 2029
Apple v. Masimo
IPR2024-00242

made at the end of 2021, correct?

A. Yes.

Q. You showed Her Honor a Purchase and Sales Agreement dated December 16th, 2021. Again, I don't want you to get into any details. It was dated December 16th, 2021, right?

A. Yes.

Q. Now the devices were not actually shipped on that date, right?

A. They were shipped soon after.

Q. They were shipped at some point in 2022, correct?

A. No, I believe we shipped in December.

Q. You did not ship them to the Cardiac Center in December, did you, sir?

A. We shipped them to the distributor. It went to Saudi Arabia. I don't know when it got to the Cardiac Center. If it got there in December or early January, I'm not sure.

Q. Well, sir, the Cardiac Center did not have use of those devices even as of your deposition in February; isn't that true?

A. Use is a little bit different. It doesn't mean they did not receive them.

Q. Well, they didn't have them in their hands to be able to use until some point after your deposition in

MASIMO 2029
Apple v. Masimo
IPR2024-00242

February, correct?

A. No. No, they had them in their hands, not necessarily using them, I believe, at that time. That's what I recall.

Q. Well, let me take you to your deposition.

A. Yes.

Q. If you look in your binder, sir, the Cross-Examination Binder, it should be tab 1.

A. I'm sorry?

Q. It should be tab 1 in your binder. Let me know when you have tab 1.

A. Yes.

Q. Sir, if you could please turn to page 70 --

A. May I grab my glasses real quick, do you mind?

Q. Take your time.

A. I have them.

MR. MUELLER: Ms. Swaroop, it might be you. We're hearing echoes from that room.

MS. SWAROOP: Well, Mr. Mueller, I was hearing some echoes from you as well so...

MR. MUELLER: I'll try to go slowly here and see if we can get it sorted out.

Q. Mr. Muhsin, do you have your glasses?

A. I do. Thank you.

Q. If you can please turn to your deposition at page

MASIMO 2029
Apple v. Masimo
IPR2024-00242

70, lines 9-11. In context, your deposition was taken in February, correct, sir?

A. Yes, the second one was in February. I had an earlier one as well.

Q. And if we look at lines 9-11.

Question. Has the Prince Sultan Cardiac Center used the Masimo Watch with any patients yet?

Answer. No.

Were you asked that question and did you give that answer?

A. That's correct.

MS. SWAROOP: I apologize, Mr. Muhsin. I'd like to object, because there is a further follow-up question that Mr. Mueller is not showing the witness.

JUDGE BHATTACHARYYA: Okay.

MR. MUELLER: If Ms. Swaroop wants to take it up on redirect --

JUDGE BHATTACHARYYA: Ms. Swaroop, you can provide any additional context during redirect.

MS. SWAROOP: Thank you, Your Honor.

JUDGE BHATTACHARYYA: I am hearing a considerable amount of echo.

MR. MUELLER: Your Honor, perhaps we can take the morning break and we can try to sort it out. Would that make sense?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

JUDGE BHATTACHARYYA: Yes, that sounds like a great idea. Let's take the morning break. We're on recess for 15 minutes.

(Whereupon, the proceedings recessed at 11:10 a.m.)

(In session at 11:25 a.m.)

JUDGE BHATTACHARYYA: We're back on the record. We're on the public record.

MR. MUELLER: May I proceed, Your Honor?

JUDGE BHATTACHARYYA: Yes, please.

BY MR. MUELLER:

Q. Mr. Muhsin, let me put on the screen the three images we looked at. Those are CPX-146, CPX-155, CPX-156. And they each have the suffix AC.

Now these are the three images of the Masimo W1 watch, correct?

A. Yes.

Q. Now you would agree, sir, from an industrial design perspective, this device looks a lot like the Apple Watch, right?

A. No, I wouldn't agree.

Q. You wouldn't agree.

A. No.

Q. Is that right?

A. I mean, from my perspective, maybe I know it a

MASIMO 2029
Apple v. Masimo
IPR2024-00242

little bit too intimately, but I would not agree.

Q. You would not agree. Now you understand, sir, that the Masimo engineering team actually gave consideration to the Apple Watch while designing what we're looking at right here, correct?

A. I don't know.

Q. You don't know one way or the other?

A. No. I wasn't part of the process.

Q. Well, you testified on direct that you are the head of the operations team, correct?

A. The head of the operations, yes, head of operations team, correct.

Q. Research and development reports to you, right?

A. Yes, they do.

Q. And, in fact, you testified on direct that they reported to you regularly about progress on the Masimo W1 watch, correct?

A. That is correct.

Q. A project that, according to you, began in 2019, right?

A. Yes.

Q. Continues through today, correct?

A. Correct.

Q. And you don't know one way or the other if the engineering team gave consideration to the Apple Watch while

MASIMO 2029
Apple v. Masimo
IPR2024-00242

designing the Masimo Watch; is that right?

A. That is correct.

Q. Now you will agree with me that the Apple Watch was released, the original model, was released years before the work even began in 2019 on the W1, credit?

A. So I explained this, I think, in the beginning. Our work also began a lot earlier, but, yes, there was a version of the Apple Watch that was released before the release of the W1.

Q. In fact, multiple versions. The original version was 2015, that's the Apple Watch, correct?

A. Yes.

Q. And there were a series of models released each year thereafter, correct?

A. Yes.

Q. Now, the Masimo W1 watch has followed a research and development schedule at a high level that is similar to other Masimo projects, correct?

A. In some ways, yes, in some ways, no, but, yes.

Q. Your normal process involves premarket release, correct?

A. Yes.

Q. Limited market release, right?

A. Yes.

Q. And then, finally, release to the open commercial

MASIMO 2029
Apple v. Masimo
IPR2024-00242

marketplace, correct?

A. Final market release.

Q. And that's called final market release, right, sir?

A. Yes.

Q. And you followed that normal process with respect to the W1 watch project, correct?

A. Yes.

Q. And you followed that normal process in the years 2019 to today, correct?

A. For the W1 again specifically?

Q. That's right, the W1.

A. Yes, we did.

Q. Is that right, sir?

A. Yes.

Q. Now the PMR or premarket release phase you testified is now complete, correct?

A. Yes.

Q. It consisted of sales to one customer, right?

A. Correct.

Q. And that's the Cardiac Center in Saudi Arabia, correct?

A. Yes. That wasn't the only use. That was the only sale.

Q. And they provided some feedback; is that right,

MASIMO 2029
Apple v. Masimo
IPR2024-00242

sir?

A. Yes.

Q. And you've now moved, you've testified, to the limited market release, correct?

A. Yes.

Q. This involves the use of non-disclosure agreements and certain terms that folks who want to acquire these devices have to agree to before they are given them, right?

A. Correct.

Q. And one of the things that you're seeking is further feedback, correct?

A. If there is feedback, yes, but really the stability of the manufacturing process, meaning when we go to high volume, can we make -- can we keep it consistent throughout. That's the main purpose right now of the limited market release.

Q. Well, sir, you would agree with me that research and development continues on the W1 even as of today, correct?

A. It's on the operational side now, so it's no longer with the engineers on the development side. It has now moved on to the manufacturing side, and we're in the manufacturing stability process of the product.

Q. Sir, are you testifying that no engineering work

MASIMO 2029
Apple v. Masimo
IPR2024-00242

is occurring on the software or hardware of the W1?

A. Software continues to always be improved, correct.

Q. Right. So the truth is, there is software development ongoing even as of today, correct?

A. Software will always be ongoing, so it never stops. Whether it's through these phases or after release, just like our phone or the Apple Watch, they continuously give upgrades and every year, every six months, you'll receive an upgrade, and that will improve the product.

Q. Well, sir, you don't yet have the final software for the final market release of the W1, correct?

A. At any point when manufacturing stability is complete, we have what we call our minimum set requirements for the software. So we can release with any -- or it can be pushed out with the current version of software.

Q. Right, but you're not at the point of market release stage, right?

A. That's because of the manufacturing stability, making sure the manufacturing stability is there, not because of anything else.

Q. And as of today, you are not in the manufacturing for the final market release phase, correct?

A. We are. We are in the manufacturing process of the -- for the limited market release, and we're producing

MASIMO 2029
Apple v. Masimo
IPR2024-00242

watches right now that at any point can be part of the final market.

So just because we have them on the shelf, once we say we're ready to go, those same watches that we built through those same manufacturing processes can be used for final market release.

Q. Let's put it this way. No customer anywhere in the world can walk into a store and buy a Masimo Watch today being correct?

A. So today you can buy it on -- through -- you can sign up for the limited market release and through the e-commerce we will send you one today, but it's not open to market.

Q. And if you could just stay with my question, please, sir.

There is no ability for a consumer to buy the Masimo Watch in any store anywhere in the world, correct?

A. So there's virtual stores. So today you can sign up for the limited market release and you can gain one through that, but it's not available in a store, no.

Q. It's not available in a store, correct, sir?

A. That is correct.

Q. Okay. Now you, Masimo, I should say, and Cercacor filed an amended complaint last July in 2021, correct?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Yes.

Q. And the physical devices that we looked at images of just a little while ago did not exist on the date that complaint was filed, correct?

A. I testified that the physical that was shown to me in the presentation was there, and I walked you through it, I think, in my deposition. It was on the table when I walked you through the version that was there.

Q. Well, sir, I want to be very careful here. I'm distinguishing between earlier prototypes, and we may come back to those, including on the confidential record.

On the public record for right now I'm focused on the Masimo W1 watch that is in this limited market release?

Do you have that device in mind, sir?

A. Yes.

Q. And we just looked at those three images. If we can pull them up again.

What we are looking at right here did not exist in July of 2021, correct?

A. Correct. These specific ones did not, but versions of the Masimo Watch did.

Q. Sir, you have to stay with my question. These particular watches did not exist in July of 2021, correct?

A. Correct.

Q. And, in fact, these particular watches in this

MASIMO 2029
Apple v. Masimo
IPR2024-00242

industrial design were not manufactured until December of 2021, correct?

A. November, December time frame.

Q. Now we can take those images down.

The complaint actually included a declaration from you; is that right, sir?

A. Yes, it did.

Q. And because we're on the public record I'm not going to pull up the actual content of the declaration, but that declaration included some computer-assisted design drawings, right, sir?

A. It included some drawings, yes, CAD drawings.

Q. And those are called CAD drawings, computer-assisted design, correct?

A. Yes.

Q. And you don't know when those were created, right?

A. Meaning?

Q. You don't know when the CAD drawings were created, correct?

A. Prior to me submitting that, yes, they were. I mean, they were created prior to my submission, yes.

Q. But you don't know exactly when.

A. No.

Q. And those CAD drawings did not correspond to an

MASIMO 2029
Apple v. Masimo
IPR2024-00242

actual physical device that existed at that time, correct?

A. A design did correspond to a physical.

Q. Sir, you did not put in in your complaint a photograph of an actual physical device in existence at that time, did you.

A. That is correct. I did not put in a photograph.

Q. Now if a device actually existed at that time that matched the CAD drawing, nothing would have stopped you from taking a photograph of it, right?

A. I testified to this in my deposition that I wore that same device on my wrist prior to me putting that declaration together with that same design.

Q. And, sir, if you wore it on your wrist, surely someone could have taken a photograph of it and attached it to the complaint, correct?

A. It wasn't -- it wasn't -- I didn't make the call whether it was a photograph or something else.

Q. Well, whoever made the call, what was attached to the complaint was not what you are testifying to now; it was a computer-assisted design drawing, correct?

A. In the complaint it was. And when we walked through the samples during my deposition, I walked you through --

Q. Sir, please, just stay with my question. Ms. Swaroop will have a chance to ask you questions later

MASIMO 2029
Apple v. Masimo
IPR2024-00242

and you can expand on whatever you like.

But my question was simply, you attached computer-assisted design drawings only to the complaint, correct, sir?

A. No, there were also photographs, but for that portion, yes.

Q. The photographs you're referring to were a photograph of a strap, an actual physical strap.

A. I believe so, yes.

Q. Okay. There was no photograph of an actual watch device, a full watch device, attached to the complaint, correct?

A. Correct.

Q. Now, in fact, you weren't aware as of your December deposition of a Masimo Watch that existed on the date of the complaint that matched the description of the Masimo Watch in your declaration attached to the complaint, correct?

A. No. I could tell you which vintage and which ones based on what was displayed at the table, but I couldn't pick if it was the exact same one or not.

Q. Well, let's pull up your deposition. This is your first deposition from December at page 127, line 22, to page 128, line 5.

Take your time, sir. I believe it's tab 1 in

MASIMO 2029
Apple v. Masimo
IPR2024-00242

that binder, the Cross-Examination Binder.

MS. SWAROOP: Apologize. Are we in the December deposition or the February deposition?

MR. MUELLER: December, which is tab 1 in the cross binder.

MS. SWAROOP: Thank you.

Q. Are you there, sir?

A. Yes.

Q. Okay. So we can put this up on the screen. This is page 127, line 22, to 128, line 5.

Question. Maybe you do, but do you have either on your person today sitting here right now or at your office or at your home, do you have in your possession somewhere a Masimo Watch that existed on the date of the complaint that matches the description on pages 1 through 7?

Answer. I do not.

Question. You do not?

Answer. Correct.

Were you asked those questions and did you give those answers, sir?

A. Yes, but I remember, if we go up and down throughout this question and answer, you were asking for the specific watch when we were doing that, and I was telling you I don't have a specific watch, and I did walk you through a series of watches on the table. There was

MASIMO 2029
Apple v. Masimo
IPR2024-00242

probably over 50 of them. And I did point out at which point I believed the complaint was filed and which watches were produced at that time.

Q. Sir, were you asked those questions and did you give those answers?

A. Yeah. Let me just look through here again.

Q. We're going to keep going, sir. You can come back to this with Ms. Swaroop, if you would like.

A. You asked me if I had it in my possession.

Q. Sir, you have to stay with my question.

A. I understand, but I had it in my possession, not whether it existed.

Q. I understand, but you have to stay with my questions, and Ms. Swaroop will have a chance to do redirect with you after I'm done.

You're also unaware of any documents that showed the exact state of the Masimo Watch project as of July 2021, correct?

A. Any what? I'm sorry.

Q. You are unaware of any documents, you're not sure whether they exist, documents that showed the exact state of the Masimo Watch project as of July 2021, correct?

A. Yeah. When you say "the exact state," that's, I think, what I answered to.

Q. Let's take a look at your deposition. This is

MASIMO 2029
Apple v. Masimo
IPR2024-00242

page 37, lines 12-15.

A. 37?

Q. Page 37, sir.

Question. Are there any documents that show the exact state of the Masimo Watch project as of July 2021?

Answer. I'm not sure.

Were you asked that question and did you give that answer?

A. I'm sorry. That's not -- I don't have that in front of me. I see on line 12 of the first deposition, it says this is the first time --

Q. I apologize, sir. It was my mistake there. This is tab 2. This is actually your February deposition. I apologize for the confusion. If you go to tab 2 in your binder --

MS. SWAROOP: Your Honor, I'll note that the clip was cut off here. His complete answer is not being shown.

Q. We can scroll down. That's fine.

A. Page 37; is that correct?

Q. That's right, page 37, lines 12-15.

A. Okay.

Q. Question. Are there any documents that show the exact state of the Masimo Watch project as of July 2021?

Answer. I'm not sure. I'm sure there's engineering documents.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Were you asked that question and did you give those answers -- that answer?

A. That is correct.

Q. And you did not identify any specific documents at that time, correct?

A. Not my job to have the specific documents for my engineering team, but there are specific documents that are generated by the engineering team.

Q. Now, sir, you didn't go back and check the inventory that existed on the date the complaint was filed, correct?

A. Inventory of what?

Q. Inventory of the Masimo W1 watch. Correct?

A. I'm sorry. I wasn't asked to check the inventory.

Q. Sir, you did not check the inventory that existed on the date the complaint was filed, correct?

A. Yeah, I don't think I checked the inventory at that date, no.

Q. You did not attempt to investigate the date for any particular physical product like the ones on the table at your deposition, you did not investigate the date for any particular product, correct?

A. So there was 50 samples of products that you were showing me, and I recall which one happened on which date.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

In my role that's too specific for what I do.

Q. In fact, sir, you didn't attempt to investigate the date for any of them, correct?

A. Correct, for those samples, you're right.

Q. Now you're aware that Masimo first provided a Masimo Watch to Apple during your December deposition, correct?

A. Correct.

Q. But that particular device could not turn on, right?

A. I don't know.

Q. Well, we tried to turn it on at the deposition and it didn't turn on; isn't that right?

A. That is correct. We were going through whether it was charged or not, and then later my lawyer said that maybe it didn't have software on it at that time. I'm not sure.

Q. Now the limited market release phase that the Masimo Watch is now in, you provided no details during your direct testimony about customers who have purchased during the limited market release phase, correct?

A. I'm sorry. Can you repeat the question?

Q. Sure. With Ms. Swaroop you did not provide any information about the customers that have purchased in that phase, correct?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Yeah, she didn't ask me about it.

Q. And no information about the number of sales, correct?

A. She did not ask me.

MR. MUELLER: At this point, Your Honor, I am going to go on the Masimo confidential business record, if I could.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

MS. SWAROOP: Are we on the public record now?

JUDGE BHATTACHARYYA: Yes, we are.

MS. SWAROOP: Thank you, Your Honor.

Mr. Scruggs, do you have a binder with you there in the room?

THE WITNESS: Yes, I have a binder.

MS. SWAROOP: We are ready to proceed. Before we begin, you're a little soft-spoken, so I would just ask that you try and speak as close to the mic as you can.

THE WITNESS: Sounds good.

JUDGE BHATTACHARYYA: Welcome, Mr. Scruggs. Do you understand that you are under an obligation to tell the truth here today?

THE WITNESS: Yes, I do.

STEPHEN SCRUGGS,

having been first duly sworn and/or affirmed on his oath, was thereafter examined and testified as follows:

JUDGE BHATTACHARYYA: You may proceed, counsel.

DIRECT EXAMINATION

BY MS. SWAROOP:

Q. Good morning, Mr. Scruggs. Could you please state and spell your last name for the record?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. My name is Stephen Scruggs, and my last name is spelled S-C-R-U-G-G-S.

Q. Where do you work?

A. I work at Masimo Corporation.

Q. How long have you worked there?

A. I've worked there for almost ten years now. My ten-year anniversary will be in July.

Q. What is your current position at Masimo?

A. I'm the Director of Sensor Design.

Q. How long have you had that position?

A. I have had that position for a little over a year now.

MS. SWAROOP: I am going to go on the Masimo CBI record for essentially all of Mr. Scruggs' testimony, so I would like to designate the record accordingly.

JUDGE BHATTACHARYYA: Moving to the Masimo confidential record.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Moving back to the public record.

CROSS-EXAMINATION

BY MR. MUELLER:

Q. Good afternoon, Mr. Scruggs. Nice to meet you. My name is Joe Mueller. I'd like to ask you a few questions, if I could.

A. Yes, please.

MS. SWAROOP: Mr. Mueller, before we begin, we do have the sealed box. Would you like Mr. Scruggs to open that?

Q. Yes, please, if you could, sir.

MS. SWAROOP: We'll do the same here.

A. All right. I have two binders.

Q. Thank you. Mr. Scruggs, you said you first started working on the Masimo Watch project in 2019, correct?

A. Yes, that's correct.

Q. And by that point there were several years worth of Apple watch models on the market, right, sir?

A. I'm not familiar with when the Apple Watches were put on the market.

Q. Well, you know they were put on the market before

MASIMO 2029
Apple v. Masimo
IPR2024-00242

2019, correct?

A. I -- yes, I knew that.

Q. And, in fact, sir, you and the engineering team that worked on the Masimo Watch considered the Apple Watch inspect designing the Masimo Watch, correct?

A. Yes, that's correct.

Q. Now at your deposition you were unable to answer questions because of instructions from your lawyers, and I want to just confirm that you were not able to answer certain questions for those reasons.

You were not able to answer the question about whether Masimo's counsel in this investigation contributed to any of the ideas in the design of the Masimo Watch, correct?

A. Are you reading from my transcript?

Q. I actually am. You are not able to answer any question -- you were not able to answer the question whether Masimo's counsel in this investigation contributed ideas to the design of the Apple Watch, correct?

MS. SWAROOP: Mr. Mueller, in view of the judge's ruling, we're not maintaining that instruction, and Mr. Scruggs can answer.

MR. MUELLER: Your Honor, I certainly object to disclosure of what -- if they are now going to permit him to answer a question they instructed him not to answer in fact

MASIMO 2029
Apple v. Masimo
IPR2024-00242

discovery, I object. I was just trying to make clear that he was not able to answer that question because of a privilege instruction at his deposition. He certainly shouldn't be now offering an answer he didn't offer then.

JUDGE BHATTACHARYYA: Are you objecting to the question? I'm not quite sure what you're asking.

MS. SWAROOP: Yes, Your Honor.

JUDGE BHATTACHARYYA: It was an improper question?

MS. SWAROOP: Well, there was an instruction not to answer on grounds of privilege with regard to the evidence that came out at Mr. Scruggs' deposition. Your Honor made a ruling on that.

I had instructed Mr. Scruggs not to answer at his deposition on the basis of that privilege issue with regard to that particular testing.

Your Honor has ruled that there's no privilege with respect to that. So if they are going to ask him that question, in view of Your Honor's ruling, we're not maintaining that instruction on privilege.

MR. MUELLER: Well, Your Honor, if I might respond.

MS. SWAROOP: I'm not objecting to the question. I'm just pointing out that he can answer the question.

MR. MUELLER: If I might respond.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

JUDGE BHATTACHARYYA: Mr. Mueller, I don't think there's a problem with your question, if you want to ask it. The objection is overruled to the extent the objection is to the question Mr. Mueller asked.

MR. MUELLER: To be clear, Your Honor, I'm not going to ask the question if he is now going to offer answers that he didn't offer at his deposition.

The motion before Your Honor was to claw back testimony, lots and lots and lots of testimony, that he gave at his deposition, much of which he offered answers to questions that we put to him at his deposition. That is not -- not what I'm asking him about now.

I am asking him a question that he was unable to answer because of a privilege instruction. And it's too late to waive the privilege now to provide us with information that was not provided during discovery.

JUDGE BHATTACHARYYA: Okay. You are free to ask him if he was unable at his deposition to answer a question because of a privilege instruction.

MR. MUELLER: That's all I want to do, Your Honor.

JUDGE BHATTACHARYYA: Okay.

Q. Mr. Scruggs, at your deposition you were unable to answer the following question because of an instruction from counsel, and the question was:

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Did Masimo's counsel in this investigation contribute to any of the ideas in the design of the Masimo Watch?

You were unable to answer that question at your deposition, correct, sir?

A. If you're referencing my transcript, could I follow along in my binder?

Q. You certainly can, sir. It's tab 1 in your binder.

A. Okay.

Q. It's page 148, sir, starting at line 4, continuing to line 9.

MS. SWAROOP: Your Honor, the basis for my comment was that --

MR. MUELLER: I apologize. It's tab 2.

THE WITNESS: Tab 2?

MS. SWAROOP: Mr. Mueller is attempting to draw an adverse inference from the instruction. I want to make it clear that no counsel in this investigation was involved in the design and development. So I just would like the record to be clear on that.

A. I'm on tab 2, page 148. Could you please repeat the line number?

Q. Yes, I can. Lines 4-9. And we can put it up on the screen.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Question. Did Masimo's counsel in this investigation contribute to any of the ideas in the design of the Masimo Watch?

Ms. Swaroop: I'm going to instruct the witness not to answer.

The Witness: I'm not able to answer.

Were you asked that question and did you give that answer?

A. Yes, I asked that question and I gave that answer.

Q. And the same was true with respect to the question: Did Masimo take any steps to ensure its litigation counsel in this investigation would not contribute ideas or influence the design of the Masimo Watch?

At your deposition you were not able to answer for the very same reason, correct?

A. Yes, that's correct.

Q. Thank you, sir. You can put that aside.

A. Okay.

Q. Now you spent, by my count, over an hour of direct testimony going through various materials and images of products, correct, sir?

A. Yes, that's correct.

Q. And you understand, Mr. Scruggs, none of those

MASIMO 2029
Apple v. Masimo
IPR2024-00242

materials, none of those images, were attached to the amended complaint in this case last July, right?

A. I'm not aware of what was attached.

Q. To the best of your knowledge, sir, none of the devices referred to in your testimony today were referred to in the amended complaint last July, correct?

A. I don't know what was attached to the amended complaint. I know that those devices have been around. I know the devices. I don't know what was attached to the complaint.

Q. In fact, sir, according to your own testimony today, not all of them were around. Some of them were created after last July, correct?

A. Yes.

Q. Okay. Now you said that you demonstrated these devices to the technical experts in this case, including Apple's experts and also Dr. Madisetti. Do I have that right, sir?

A. Yes, that's correct.

Q. Let me show you a demonstrative, RDX-11.2.

Before I show it to you, before I put it up, for my next couple of questions, I'm not going to show you any images of these products. I'm not asking you about the internal workings of them. In fact, I'm not asking about anything in terms of how they measure blood oxygen readings

MASIMO 2029
Apple v. Masimo
IPR2024-00242

or measure heart rate. Okay? Do you have that in mind? I want to stay on the public record here, so I want you to be careful not to reveal any confidential information. Okay, sir?

MS. SWAROOP: Mr. Mueller, did you provide a copy of those demonstratives to Complainants or to Mr. Scruggs? I don't believe I see them in the cross binder that was given to counsel.

MR. MUELLER: There's no requirement for cross binders to be given to counsel, sir -- Ms. Swaroop.

MS. SWAROOP: I have a binder with cross exhibits because we actually do have an agreement that two copies would be provided to our team. I have my cross binder. Mr. Scruggs has his cross binder.

My point is, the demonstratives exhibits that you're referring to now do not appear to be in the cross binder. So I'd like to know if I could have a copy.

MR. MUELLER: We can certainly get you a copy. It was our understanding that demonstratives were not part of the cross binders, the exhibits were, but not the demonstratives, Ms. Swaroop. We're happy to get you a copy of it too. It's a single page, and I can put it up right now. It's RDX-11.2.

Q. Now, again, as I said, Mr. Scruggs, if you could, please, sir, be careful not to talk about any confidential

MASIMO 2029
Apple v. Masimo
IPR2024-00242

information, because we're on the public record.

These are readings taken of the Masimo Watch articles or physicals that you showed to our technical experts, Professors Warren and Sarrafzadeh, during the March 14th, 2022 demonstrations.

Do you recall that demonstration that day, sir?

A. Yes, I do.

Q. Okay. And various physicals, as Masimo refers to them, were presented that day by you, right?

A. Yes, that's correct.

Q. Now you handled them yourself, correct?

A. Yes.

Q. You did not permit Apple's experts to themselves operate the devices, take readings on their own bodies, correct?

A. Yes, that's correct.

Q. That is to say, you took the readings and you only let the experts watch once you were satisfied that a reading had been taken, correct?

A. The experts were in the room the whole time during the demonstration, so they could see the entire demonstration.

Q. But, sir, stay with my question. You only let the experts read the numbers on the devices when you were satisfied with the readings, correct?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. They were able to see the readings the entire time that I was doing the demonstration.

Q. Now they asked you for permission to also use a finger clip sensor as a reference device; isn't that true?

A. I don't recall that.

Q. You didn't permit them to, did you.

A. We did not use a reference device.

Q. By the way, using reference devices, you know what that means, right?

A. Yes, I do.

Q. Using reference devices is using a device to compare the accuracy of one device against another, correct?

A. Yes, that's correct.

Q. It's a very common thing in the industry in which you work, right, sir?

A. I don't know that it's common, but I know that that's done.

Q. And you've done it yourself.

A. I don't know that I've used a reference device on myself. I know that during clinical studies we'll sometimes use reference devices.

Q. And by "we" you mean Masimo?

A. Yes, that's correct.

Q. Okay. Now if we look at the data here, we have blood oxygen on the left and pulse rate on the right. Do

MASIMO 2029
Apple v. Masimo
IPR2024-00242

you see that, sir?

A. Yes.

Q. And there are various numbers, which I will represent to you were recorded by our experts. You have no reason to quarrel with those numbers, do you?

A. I would think that, if your experts recorded them, that it is likely they were displayed.

Q. And do you see there's lists, CPX numbers, that correspond to various devices, including the ones you testified about earlier?

A. Yes, I see those.

Q. Now these demonstrations were taken where you were sitting at a table, correct?

A. Yes, I was sitting.

Q. And you were there for about 75 minutes. Do I have that right, sir?

A. I don't remember the specific time, but that sounds about right.

Q. And you were sitting the entire time, correct?

A. Yes, I was sitting during the demonstrations.

Q. And I really don't mean to be flip in my next question. You didn't go out for a jog midway through, did you.

A. No, I did not go for a jog.

Q. All right. You remained sitting, correct?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Yes.
Q. So let's look at these readings. On the left we have blood oxygen, and do you see in the top row, the variation was between 95 percent and 99 percent? Do you see that?
A. Yes, I see those three numbers reported.
Q. Now on the next row down we have a variation of 97 to 81. Do you see that?
A. Mm-hmm.
Q. Now a reading of 81 percent can be cause for concern, correct?
A. I'm not a medical professional, so I don't know what would be cause for concern.
Q. Well, sir, you're one of the leaders of the sensor group at Masimo, aren't you?
A. Yes, of the mechanical design group.
Q. And you understand, sir, that a reading at 81 is a cause for concern of a user of these types of devices, correct?
A. I think I'd want to talk to one of our clinicians or a doctor.
Q. So you don't know one way or the other?
A. I don't know what value would be cause for concern.
Q. Well, you'd agree with me that the difference

MASIMO 2029
Apple v. Masimo
IPR2024-00242

between an 81 reading and a 97 reading on the same subject sitting at the same table is a very significant variation, isn't it?

A. I definitely see that that's a variation of 16 percent SpO2.

Q. That's a poorly functioning blood oxygen sensor, isn't it.

A. I don't know that variation of 16 personnel means that it was poorly performing, but I do see variation.

Q. Do you consider that good performance?

A. I don't think there's enough data here to quantify whether or not it's good or bad performance.

Q. Let's go to the next row. The next device measured your blood oxygen level at 100 percent, correct?

A. Yes, I see that.

Q. With no variation at all, right?

A. I see that.

Q. Now, in fact, these devices had a cap at 100 percent, didn't they.

A. I don't believe the devices display values over 100.

Q. So if there was some sort of reading that hit the top of the charts, it's going to be listed as 100 no matter what the particulars, correct?

A. Yes, that's how all pulse oximeters report

MASIMO 2029
Apple v. Masimo
IPR2024-00242

values.

Q. And the next row down has 100, 100, 100, 100, 100, right?

A. I see that, yes.

Q. Same with the one below that, correct?

A. Mm-hmm.

Q. And then below that we have 99.4, 100, 100. Do you see that?

A. Yes, I do.

Q. And then three 98s, right?

A. Yes.

Q. So we have a variation from device to device from 81 to 100, correct?

A. Yes. The reported values here, I see 81 and I CDX-100.

Q. Same person, sitting at the same table, in the same session, there is variation from 81 to 100, correct?

A. Yes, I see that.

Q. Pulse rate, right-hand side of the screen, let's take a look at the readings.

First device, 125, 113, 94, correct?

A. Yes.

Q. Now 125 is a pretty high pulse rate, isn't it?

A. Yes.

Q. It would indicate that you might be, in fact,

MASIMO 2029
Apple v. Masimo
IPR2024-00242

running, at least at a very, very brisk walk, correct?

A. Or stressed, yes.

Q. Or very stressed. That could be another reason why the heart rate is extremely high, correct?

A. Yes.

Q. Now the next row down we have in the 90s and then as low as 82, correct?

A. Yes, I see that.

Q. And, again, this is you being measured, right?

A. Mm-hmm.

Q. Same person, right, sir?

A. Yes.

Q. Same table, same session.

A. Correct.

Q. The next row down, the device measured your pulse rate at 140 and then 52. Do you see that?

A. Mm-hmm. I see that.

Q. 140 is a very high pulse rate, correct?

A. Yes.

Q. 52 is extremely low. That's indicative of somebody who might be sleeping or very not stressed, correct?

A. Yes, 52 is lower than 140.

Q. And the device, same device, CPX-052C, measured the same person's pulse rate as 140 and then 52, correct?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Yes, at different points in time.
Q. Now there's other numbers listed below for the other devices, correct?
A. I see that.
Q. But, again, if we look at the sum total of these we have variation of 52 to 140 as well as numbers in the 90's, 80's, and 100's, correct?
A. I see that variation, yes.
Q. And this variation, again, was the same subject, same session, right?
A. Yes, these values were taken on me during the same session.
Q. And you never once got up, correct?
A. I did not get up.
MR. MUELLER: At this point, Your Honor, we need to go on the Masimo confidential record.
(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

MR. LAQUER: Good afternoon.

JUDGE BHATTACHARYYA: Good afternoon. I see Mr. Young is before us here.

THE WITNESS: Good afternoon, Your Honor.

JUDGE BHATTACHARYYA: Good afternoon. Do you understand that the testimony -- that you are under an obligation to tell the truth in your testimony today?

THE WITNESS: Yes, I do.

MICAH YOUNG,

having been first duly sworn and/or affirmed on his oath, was thereafter examined and testified as follows:

DIRECT EXAMINATION

BY MR. LAQUER:

Q. Can you please state your name?

A. Micah Young.

Q. What is your job title?

A. I'm Masimo's CFO and Executive Vice President.

Q. When did you join Masimo?

A. In October of 2017.

Q. What's your educational background?

A. I have a Bachelor of Science in accounting as well as Criminal Justice, and that's from Indiana Wesleyan

MASIMO 2029
Apple v. Masimo
IPR2024-00242

University, and I earned my CPA shortly thereafter, although I'm currently inactive.

Q. What are your responsibilities as Masimo's CFO and Executive VP?

A. I'm responsible for all aspects of financing, including accounting, financial planning and analysis, tax and investor relations.

Q. How many people does Masimo employ in its financial department?

A. We have just over a hundred employees in the finance department.

Q. And who do you report to?

A. I report directly to Joe Kiani.

Q. Let's look at Complainants' Exhibit 1637, if you could tell me whether you recognize this.

A. Yes, that's our latest Earnings Report for fiscal year 2021.

Q. Let's turn to page 17 of the exhibit. Could you tell me why did Masimo include the Masimo W1 watch in its 2021 Earnings Report here?

A. Well, the Masimo W1 watch is a top priority for the company, and we've invested significant dollars over the years to develop the watch and other wrist-worn devices, and we wanted to also show investors that this is going to become a larger part of our revenue earnings going forward.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Please turn to page 19 of the exhibit. Can you describe what is shown here?

A. Yes. This slide shows our Sound United acquisition. We paid just over a billion dollars for Sound United. That acquisition closed in April of this year.

Sound United is a premium consumer technology leader with premium audio brands like Denon, Marantz, Bowers & Wilkins, as well as Polk Audio, and they have over 20,000 points of retail distribution.

Q. And why did Masimo pay over one billion dollars for Sound United?

A. If you look at the next slide, you'll see it's a strategic priority for the company, and if you look underneath cross-leveraging our core competencies and capabilities, you'll see where this acquisition is strategic for us and it helps us bring Masimo W1 watch to consumers and bring it from our technologies from the hospital into the home.

Q. Let's take a look next at Complainants' Exhibit CX-1630. Let me know whether you recognize this.

A. Yes. That's our form 10-K for fiscal year 2020, which is ending January 2nd, 2021.

Q. Please turn to page 40 of the exhibit. The last paragraph there begins with:

Continuing technological advances and new product

MASIMO 2029
Apple v. Masimo
IPR2024-00242

introductions within the medical device industry place our products at risk of obsolescence. For example, in September 2020 Apple Inc. announced that its Apple Watch Series 6 includes a pulse oximetry monitoring feature, which may compete with certain of our existing products and products in development, including the consumer versions of our iSpO2 and MightySat pulse oximeters.

Why did Masimo include that statement in its 10-K?

A. Well, at that time Apple just launched the Watch 6 Series, and we were concerned that the public would rely on it for pulse oximetry rather than our other pulse oximetry devices we have launched over the years, in addition to the W1 watch that we were -- that we -- had been in development during that time. So we disclosed it in the 10-K as a risk factor at that time.

MR. LAQUER: Your Honor, at this point I'd like to go on Masimo's confidential record in order to discuss CBI.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

CROSS-EXAMINATION

BY MR. MUELLER:

Q. Good afternoon, sir. It's nice to meet you. My name is Joe Mueller, and I'd like to ask you a few questions, if I could.

A. Yes. Thank you.

Q. Let's pull up CX-1630, which was an exhibit that you were asked about during your direct testimony.

This is a form 10-K, right, sir?

A. Yes, that's correct.

Q. And let's take a look at page 40, which I think was the same page you were asked about. And I want to focus in on the same section that you were asked about, about potential competition with MightySat --

A. Okay.

Q. -- and iSpO2. Do you recall that, sir?

A. Yes.

Q. In particular, there's a reference to the Apple Watch Series 6 potentially competing with those products. Do you see that?

A. Yes, I see that.

Q. Now you understand neither iSpO2 nor the MightySat is a domestic industry product in this case?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Okay. Yes.
Q. And there's no reference here to the rainbow« sensors, correct?
A. Not in that line.
Q. Right. There's no reference to the rainbow« sensors competing with the Apple Watch, correct?
A. There's no reference in that document, no.
Q. And, in fact, there is no competition between the rainbow« sensors and the Apple Watch, correct?
A. I can't answer that.
Q. Now the Masimo Watch right now is in something called the limited market release phase, correct?
A. Yes, correct.
Q. It's not on the open commercial marketplace yet, correct?
A. Yes.
Q. There's no competition between Apple and Masimo with respect to the Apple Watch and the Masimo Watch in the open commercial marketplace today, correct?
A. We've limited released it in the Middle East.
Q. Right. Not to the open commercial marketplace in the U.S. or anywhere else in the world, correct?
A. Correct.
Q. Now today, as of today, in this limited market release phase, what are the total revenues to Masimo for the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Masimo Watch?

A. I don't have that number. You'd have to get that from Bilal Muhsin or his team.

Q. Well, sir, you're the Chief Financial Officer, correct?

A. Correct.

Q. You just spent over a half hour giving us various numbers, correct?

A. Correct.

Q. And you don't know the revenues of the Masimo Watch as of today; is that right?

A. We're in a limited release, and at this point it's not material to overall numbers.

Q. Less than a thousand dollars?

A. I can't give you a number on that.

Q. You don't know one way or the other if the total revenues for the Masimo Watch as of today are less than a thousand dollars, correct?

A. I don't know that at this time.

MR. MUELLER: At this point, Your Honor, we'll go on the confidential Masimo record, if we could.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Good afternoon, Mr. Hammarth.

THE WITNESS: Good afternoon.

JUDGE BHATTACHARYYA: Do you understand that you're under an obligation to tell the truth in your testimony here today?

THE WITNESS: Yes, I do.

JEROEN HAMMARTH,

having been first duly sworn and/or affirmed on his oath, was thereafter examined and testified as follows:

JUDGE BHATTACHARYYA: Thank you.

DIRECT EXAMINATION

BY MR. LAQUER:

Q. Could you please state your name?

A. My name is Jeroen Hammarth.

Q. What is your job title?

A. I'm the CFO of Cercacor Labs.

Q. How long have you been Cercacor's CFO?

A. Since January of 2013.

MR. LAQUER: Your Honor, I'd like to go on to Complainants' confidential record in order to discuss CBI.

(Whereupon, the hearing proceeded in confidential

MASIMO 2029
Apple v. Masimo
IPR2024-00242

session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Moving back to the public record.

MR. COX: I'm sorry. Let's take down the exhibit. Thank you.

BY MR. COX:

Q. You'll agree with me, Mr. Hammarth, that Cercacor's R&D includes R&D for clinical products, like rainbow« sensors, correct?

A. Yes.

Q. And you'll agree that rainbow« sensors are kinds of sensors used with external monitoring devices, right?

A. Sure. Yes.

Q. And those clinical products are used in places like hospitals and doctors' offices, correct?

A. Masimo products do, yes.

Q. That's right. And those clinical products, like rainbow«, are not the same as consumer wearable products, correct?

A. Well, that's really not for me to make a determination, right. Quite a lot in the market, we're seeing a convergence between consumer products and medical products, so I'm not sure that I can really answer that question.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Okay. So it's your understanding that a rainbow« sensor used in an external monitoring device would be considered a consumer wearable product; is that your testimony?

A. No. What I'm saying is that I don't know if I'm qualified to say what the difference is between a wearable clinical product and a consumer wearable product.

Q. Okay. But you wouldn't go jogging while wearing a rainbow« sensor with an external monitor, right?

A. Well, if I was wearing a continuous glucose monitor, I could go jogging with that on, and that is a clinical product that's wearable.

Q. You wouldn't go for a swim while wearing a rainbow« sensor with an external monitor; is that right?

A. Well, if it was waterproof -- I don't know. See, you're asking me for an opinion on the difference between a clinical product and a consumer product, and, like I said, I'm not sure that the market is going in that direction where there's going to be such a clear delineation. I'm probably not the right person to ask that question to.

Q. Very well. Thank you very much, Mr. Hammarth.

MR. COX: No further questions.

MR. LAQUER: Very briefly.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

REDIRECT EXAMINATION

BY MR. LAQUER:

Q. Apple's counsel just asked you about product categories and uses.

Are you familiar with the Ember« product?

A. Yes.

Q. Can you explain very briefly what that is?

A. Yeah. Ember is our product, which incorporates our technologies for hemoglobin measurement, carbon monoxide measurement, and some others, that's marketed to individuals, consumers, who are mainly elite athletes to measure their physiological parameters to help them with their training.

MR. LAQUER: I have no further questions.

MR. COX: Just a brief recross, Your Honor, on the questions that were just asked.

RECROSS-EXAMINATION

BY MR. COX:

Q. You just mentioned Cercacor's Ember« products; is that right?

A. Yes.

Q. Those are -- those Ember« products are Cercacor's one and only product, correct?

A. That is our current one and only product that we sell today, yes.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. You'll agree that the Ember« is a small, niche product, right?

A. It is. It is marketed to elite athletes, who do things like marathons, Tour de France type of stuff, Ironman Triathlons, those kinds of things, yes.

Q. Approximately how many Ember« units does Cercacor sell every year?

A. Oh, in a given year, between 30 and 50.

Q. That's 30 and 50, not 30 and 50,000, right?

A. I'm talking about units, yes.

Q. Okay, 30 and 50 units.

MR. COX: No further questions. Thank you.

MR. LAQUER: I have no further questions.

JUDGE BHATTACHARYYA: Thank you, Mr. Hammarth.

THE WITNESS: Thank you.

MR. LAQUER: Complainants next call Daniel McGavock.

JUDGE BHATTACHARYYA: Good afternoon, Mr. McGavock.

THE WITNESS: Good afternoon.

JUDGE BHATTACHARYYA: Do you understand you're under an obligation to tell the truth in your testimony here today?

THE WITNESS: Yes, I am.

DANIEL M. MCGAVOCK,

MASIMO 2029
Apple v. Masimo
IPR2024-00242

having been first duly sworn and/or affirmed on his oath, was thereafter examined and testified as follows:

JUDGE BHATTACHARYYA: Thank you.

DIRECT EXAMINATION

BY MR. LAQUER:

Q. Could you state your name?

A. Daniel M. McGavock.

Q. What do you do professionally?

A. I'm a vice president at Charles River Associates, and I'm the practice leader of the intellectual property practice, and I specialize in financial and economic consulting, primarily focused on intellectual property matters, both in litigation context as well as outside of litigation for strategy and transactional purposes.

Q. Could you briefly describe your educational background?

A. Yes. I earned a Bachelor of Science degree in accounting from Indiana University in 1984, and I'm also a certified public accountant. I've been a CPA since 1985.

Q. Do you have prior experience in ITC investigations?

A. Yes, I do. I've worked on several investigations on behalf of both Complainants and Respondents.

MR. LAQUER: Your Honor, Complainants proffer

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Mr. McGavock as an expert on financial matters, including economic, domestic industry, bond, and commercial success.

MR. MUELLER: No objection, Your Honor.

JUDGE BHATTACHARYYA: At this time Mr. McGavock is admitted as an expert in financial matters, including economic, domestic industry, bond, and commercial success.

Q. Mr. McGavock, do you have an opinion regarding the economic prong of domestic industry requirement in this investigation?

A. Yes. It's my opinion that Masimo's domestic investments in plant and equipment as well as labor or capital are both quantitatively and qualitatively significant in accordance with the requirements of section 337.

Q. What work did you do in preparing your opinion?

A. Well, I first -- I gained an understanding of the patents and the products at issue, and then I also gained a thorough understanding of the appendices that Mr. Young went through in detail, and the sources of the information, how the information was compiled, and I also did some independent research.

Q. Did you consider Mr. Hammarth's appendix also?

A. Yes, I did.

Q. All right. And can you describe your independent research?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Yes. Well, one of the, I think, most important elements of my work was to actually visit the domestic facilities where the research and development activities are taking place in Irvine, not only research and development, but manufacturing activities as well.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

C O N T E N T S

INDEX OF WITNESSES

WITNESS	DIRECT	CROSS	RE-DIRECT	RE-CROSS
AMMAR AL-ALI,.....	313, 313	330		
BILAL MUHSIN,.....	342	362		
STEPHEN SCRUGGS,.....	390	437	472	478
MICAH YOUNG,.....	481	512		
JEROEN HAMMARTH,.....	521	526	532	532
DANIEL M. MCGAVOCK,.....	534	552	573	576

AFTERNOON SESSION 428

CONFIDENTIAL SESSIONS 294-300, 302-329, 337-340, 344-355, 358-361, 385-389, 392-436, 453-480, 485-511, 515-520, 523-529, 537-582

MASIMO 2029
Apple v. Masimo
IPR2024-00242

COMPLAINANTS' TABLE OF ADMITTED EXHIBITS FOR THE EVIDENTIARY HEARING ON JUNE 6, 2022

JOE KIANI

CX-0364C

CX-0612C

CX-0691

CX-0777

CX-0783C

CX-1370

CX-1371

CX-1378

CX-1482C

CX-1483C

CX-1493C

CX-1511C

CX-1512C

CX-1520C

CX-1539C

CX-1586

CX-1612C

CX-1615C

CPX-0139aC

CPX-0139C

CPX-0140aC

CPX-0140C

MASIMO 2029
Apple v. Masimo
IPR2024-00242

CPX-0161
CPX-0161a
JX-001
JX-002
JX-003
RX-1467
RX-0333
MOHAMED DIAB
JX-007
CPX-0152C
CX-0342C
CX-0388C
CX-0397C
CX-0426C
CX-0427C
CX-0430C
CX-0440C
CX-0454C
CX-0584C
CX-0588C
CX-0589C
CX-0590C
CX-0596C
CX-0678
CX-0782C

MASIMO 2029
Apple v. Masimo
IPR2024-00242

CX-0797C
CX-0816C
CX-0818C
CX-1635C
AMMAR AL-ALI
CX-0004
CX-0352C
CX-0355C
CX-0356C
CX-0357C
CX-0370C
CX-0375C
CX-0378C
CX-0433C
CPX-0022C
CPX-0022aC
CPX-0052aC
CPX-0052C
CPX-0054aC
CPX-0054C
CPX-0056C
CPX-0056aC
COMPLAINANTS' DEPOSITION DESIGNATIONS AND EXHIBITS
David Amor - CX-0273C

MASIMO 2029
Apple v. Masimo
IPR2024-00242

CX-0266C

CX-0267C

CX-0269C

Ueyn Block - CX-0281C

CX-0057C

CX-0058C

CX-0059C

CX-0060C

CX-0007C

CX-0067

CX-0061C

CX-0103

CX-0062C

CX-0063C

CX-0064C

CX-0068C

CX-0069C

CX-0070C

CX-0071C

CX-0072C

CX-0073C

CX-0104C

CX-0106C

CX-0011C

CX-0109C

MASIMO 2029
Apple v. Masimo
IPR2024-00242

CX-0110C
CX-0111C
CX-0112C
CX-0114C
CX-0103
CX-0118
Diedre Caldbeck - CX-0275C
CX-0240C
CX-0241C
CX-0242
CX-0244
CX-0245C
Mathieu Charbonneua-Lefort - CX-0283C
CX-0100C
CX-0022C
CX-0023C
CX-0024C
CX-0025C
CX-0026C
CX-0011C
CX-0027C
CX-0028C
CX-0031C
CX-0032C
CX-0033C

MASIMO 2029
Apple v. Masimo
IPR2024-00242

CX-0035C

CX-0037C

CX-0038C

CX-0039C

Aditya Dua - CX-0285C

CX-0092C

CX-0094C

CX-0096C

CX-0098C

CX-0100C

Brian Land - CX-0287C

CX-0175C

CX-0006C

Paul Mannheimer - CX-0289C

CX-0007C

CX-0010

CX-0011C

CX-0012C

Saahil Mehra - CX-0291C

CX-0189C

CX-0190C

CX-0191C

CX-0192C

CX-0068C

CX-0069C

MASIMO 2029
Apple v. Masimo
IPR2024-00242

CX-0070C
CX-0071C
CX-0072C
CX-0073C
CX-0105C
CX-0193C
CX-0106C
CX-0194C
CX-0107C
CX-0195C
CX-0100C
CX-0196C
CX-0197C
CX-0011C
CX-0111C
CX-0198C
RX-0294C (Dep. Ex. 108)
CX-0199C
CX-0201C
CX-0202C
CX-0203C
CX-0110C
CX-0205C
CX-0206C
CX-0207C

MASIMO 2029
Apple v. Masimo
IPR2024-00242

CX-0208C
CX-0209C
CX-0210C
CX-0211C
CX-0212C
CX-0213C
CX-0214C
CX-0215C
Mark Rollins - CX-0293C
CX-0051C
CX-0128C
CX-0129C
CX-130C
RX-0928C (Depo. Ex. 131)
CX-0132C
CX-0133C
CX-0134C
CX-0135C
CX-1216C (Depo. Ex. 136C)
CX-0137
Robert Rowe - CX-0279C
Tao Shui - CX-0295C
CX-0013C
CX-0014C
CX-0015C

MASIMO 2029
Apple v. Masimo
IPR2024-00242

CX-0016C

CX-0017C

Vivek Venugopal - CX-0297C

CX-0051C

CX-0052C

CX-0053C

CX-0054C

CX-0055C

CX-0056C

CX-0057C

CX-0059C

CX-0061C

CX-0062C

CX-0063C

CX-0067C

CX-0068C

CX-0069C

CX-0074C

Stephen Waydo - CX-0299C

CX-0100C

RX-0678C (Depo. Ex. 120)

CX-0123C

CX-0051C

CX-0125C

CX-0126C

MASIMO 2029
Apple v. Masimo
IPR2024-00242

CX-0127C

Asserted Patents, File Histories, and Assignments

(Category A)

JX-001

JX-002

JX-003

JX-004

JX-005

JX-006

JX-007

JX-008

JX-009

JX-010

CX-1266

CX-1267

CX-1268

CX-1269

CX-1270

Related Patent File Histories (Category B)

CX-1422

CX-1425

CX-1429

CX-1456

CX-1459

CX-1621

MASIMO 2029
Apple v. Masimo
IPR2024-00242

CX-1622
CX-1623
CX-1760
Stipulations (Category C)
CX-0128C
CX-1259C
EDIS Dkt. No. 770692
Apple's Interrogatories and Admissions (Category D)
CX-1254C
CX-1228C
CX-1216C
CX-1248C
CX-1221C
CX-1200C
CX-1231C
CX-1226C
CX-1230C
CX-1204C
CX-1225C
CX-1250C
CX-1229C
CX-1217C
CX-1228C
CX-1227C

MASIMO 2029
Apple v. Masimo
IPR2024-00242

CX-1257C

CX-1256C

Physicals of the Apple Watch Series 6 and Series 7 and Components Thereof (Category G)

CPX-0160

CPX-0160a

CPX-0161

CPX-0161a

CPX-0162

CPX-0162a

CPX-0163

CPX-0163a

CPX-0166

CPX-0166a

CPX-0167

CPX-0167a

CPX-0168C

CPX-0168aC

CPX-0169C

CPX-0169aC

CPX-0170C

CPX-0170aC

CPX-0171C

CPX-0171aC

CPX-0172C

MASIMO 2029
Apple v. Masimo
IPR2024-00242

CPX-0172aC
CPX-0173C
CPX-0173aC
CPX-0174C
CPX-0174aC
CPX-0175C
CPX-0175aC
CPX-0176C
CPX-0176aC
CPX-0177C
CPX-0177aC
CPX-0178C
CPX-0178aC
CPX-0179C
CPX-0179aC
CPX-0180C
CPX-0180aC
CPX-0181C
CPX-0181aC

MASIMO 2029
Apple v. Masimo
IPR2024-00242

C E R T I F I C A T E

TITLE: CERTAIN LIGHT-BASED PHYSIOLOGICAL MEASUREMENT DEVICES AND COMPONENTS THEREOF

INVESTIGATION NO.: 337-TA-1276

HEARING DATE: June 7, 2022

LOCATION: Washington, D.C. - Remote

NATURE OF HEARING: Evidentiary Hearing

I hereby certify that the foregoing/attached transcript is a true, correct and complete record of the above-referenced proceedings of the U.S. International Trade Commission.

Date: June 7, 2022

Signed:

ss// LaShonne Robayo

Signature of the Contractor or the Authorized Contractor's Representative

I hereby certify that I am not the court reporter and that I have proofread the above-referenced transcript of the proceedings of the U.S. International Trade Commission against the aforementioned court reporter's notes and recordings for accuracy in transcription in the spelling, hyphenation, punctuation and speaker identification and did not make any changes of a substantive nature. The foregoing/attached transcript is a true, correct and complete transcription of the proceedings.

Signed:

ss// Raymond G. Bynteson

I hereby certify that I reported the above-referenced proceedings of the U.S. International Trade Commission and caused to be prepared from my record media and notes of the proceedings a true, correct and complete verbatim recording of the proceedings.

Signed:

ss// Linda Kenkade

MASIMO 2029
Apple v. Masimo
IPR2024-00242

UNITED STATES
INTERNATIONAL TRADE COMMISSION

----------x

In the Matter of Investigation No.

CERTAIN LIGHT-BASED PHYSIOLOGICAL 337-TA-1276

MEASUREMENT DEVICES AND COMPONENTS

THEREOF

----------x

REVISED AND CORRECTED TRANSCRIPT

OPEN SESSIONS

Pages: 597 through 861 (with excerpts)y

Place: Washington, D.C.

Date: June 8, 2022

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MASIMO 2029
Apple v. Masimo
IPR2024-00242

UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

Before the Honorable Monica Bhattacharyya

Administrative Law Judge

In the Matter of | Investigation No.

CERTAIN LIGHT-BASED PHYSIOLOGICAL MEASUREMENT DEVICES AND COMPONENTS THEREOF | 337-TA-1276

EVIDENTIARY HEARING

Wednesday, June 8, 2022

Volume III

The parties met via remote videoconferencing pursuant to notice of the Administrative Law Judge at 9:30 a.m. Eastern.

Reported by: Linda S. Kinkade RDR CRR RMR RPR CSR

MASIMO 2029
Apple v. Masimo
IPR2024-00242

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MASIMO 2029
Apple v. Masimo
IPR2024-00242

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MASIMO 2029
Apple v. Masimo
IPR2024-00242

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MASIMO 2029
Apple v. Masimo
IPR2024-00242

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MASIMO 2029
Apple v. Masimo
IPR2024-00242

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*** Index appears at end of transcript ***

MASIMO 2029
Apple v. Masimo
IPR2024-00242

P R O C E E D I N G S

(In session at 9:30 a.m.)

JUDGE BHATTACHARYYA: Good morning. We're back on the record. Let's start on the public record. Is there any housekeeping to take care of before we begin?

MS. SWAROOP: Your Honor, we do have a table of admitted exhibits. I think we're just waiting on Apple to confirm some of the final descriptions and then that should be ready to go. Apart from that Complainants have no further housekeeping and we're ready to begin with the examination of Mr. Goldberg, which will be conducted by Mr. Lateef.

MR. MUELLER: Good morning, Your Honor. Joe Mueller on behalf of Apple. Just a couple of quick things.

We have two objections to some Goldberg testimony and exhibits. Mr. Selwyn could address those briefly now, Your Honor, if Your Honor pleases, or we can wait until the testimony, whatever your preference is.

JUDGE BHATTACHARYYA: Why don't we do that argument now. It could be that I would defer ruling until the testimony, but I would like to hear argument.

MR. MUELLER: Thank you, Your Honor. Mr. Selwyn will do this.

MR. SELWYN: Good morning, Your Honor.

JUDGE BHATTACHARYYA: Good morning.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

MR. SELWYN: We have two objections with respect to Mr. Goldberg's anticipated testimony, which I'll briefly state.

First, it appears that Masimo intends to admit Mr. Diab's deposition testimony through Mr. Goldberg. We object to that. Mr. Diab was present for the hearing and Masimo could have elicited any relevant testimony during his examination. The rules don't permit a party to use a deposition of its own witness in support of itself where the witness was available.

And, second, it appears that Masimo intends to offer more than 20 exhibits through Mr. Goldberg for which he was never identified as a sponsoring witness. If it were just a couple of exhibits, we could overlook that, but it's more than 20. We didn't have the notice that the ground rules require and we object.

JUDGE BHATTACHARYYA: Mr. Lateef, is it?

MR. LATEEF: Yes, that's correct.

JUDGE BHATTACHARYYA: Okay.

MR. LATEEF: Thank you, Your Honor. Last night we had emailed Mr. Selwyn's team and said that Masimo does not seek to admit the Diab deposition into testimony, so I'm not sure why he is maintaining that objection.

MR. SELWYN: I'm making that objection because the note indicated that Masimo intended to rely upon his

MASIMO 2029
Apple v. Masimo
IPR2024-00242

deposition testimony. So it was not at all evident how that was going to be used.

If Mr. Goldberg will just say I considered it as part of all the deposition testimony in the case, we have no problem with that, but if the intent is to use Mr. Goldberg in order to offer deposition designations from Mr. Diab, then we object.

MR. LATEEF: I think our position was clear that we're not admitting it into evidence, so I think this objection should be overruled.

JUDGE BHATTACHARYYA: Mr. Lateef, could you describe how you intend to -- what the witness is going to say in terms of Mr. Diab's testimony?

MR. LATEEF: I considered --

JUDGE BHATTACHARYYA: Deposition testimony.

MR. LATEEF: I considered Mr. Diab's deposition testimony.

JUDGE BHATTACHARYYA: Is he going to describe Mr. Diab's deposition testimony?

MR. LATEEF: No.

JUDGE BHATTACHARYYA: Based on that representation, the objection is overruled at this time.

With respect to the exhibits?

MR. LATEEF: I don't know what exhibits he is talking about. They were not -- there was no objection when

MASIMO 2029
Apple v. Masimo
IPR2024-00242

we gave him the list of exhibits two days ago.

MR. SELWYN: I don't think that's right, Your Honor. We did object to exhibits for which Mr. Goldberg is apparently going to be the sponsor for which there was never an indication that he would be the sponsoring witness. As I say, there are more than 20 in that category.

JUDGE BHATTACHARYYA: Can you tell me the timeline of what happened? When were the --

Mr. Lateef, do you agree that Mr. Goldberg wasn't listed as a sponsoring witness for these exhibits?

MR. LATEEF: I don't know what exhibits he is talking about.

JUDGE BHATTACHARYYA: The parties need to meet and confer about this. The parties were supposed to meet and confer on these kinds of issues --

MR. LATEEF: We've had about three exchanges of emails about Goldberg's slides, and I don't recall there being mention of any exhibits being objected to. There was a meet-and-confer on Monday evening about exhibits, and I did not see further correspondence about that.

MR. SELWYN: Your Honor, we did object at that time, and it was not cured. They were not removed from the list. I can lead the list, if Your Honor pleases.

JUDGE BHATTACHARYYA: When did you tell

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Mr. Lateef's team that you were objecting to those exhibits?

MR. SELWYN: It would have been Monday evening.

MR. LATEEF: All of the documents have already been admitted as far as I can tell through the depositions of Apple's witnesses that were admitted yesterday.

MR. SELWYN: We checked that, Your Honor, and that's true as to some, but there's still more than 20 that were not.

MR. LATEEF: I'd like to see that list of 20 that he is maintaining are objected to.

MR. SELWYN: I'll read it Your Honor. CX-11C, CX-12C, 15C, 25C, 57C, 59C, 100C, 105C, 111C, 193C, 195C, 198C, 199C, 206C, 211C, 215C, 280C, 282C, 290C and 298C.

JUDGE BHATTACHARYYA: Mr. Selwyn, do you have a copy of the email where you provided notice of your objections to these exhibits?

MR. SELWYN: We're locating it, Your Honor.

JUDGE BHATTACHARYYA: Thank you.

MR. SELWYN: I thing we're going to try to display it on the screen, Your Honor.

JUDGE BHATTACHARYYA: Okay. I guess a further question I have for the parties is, to the extent -- are these major documents such that we need to rule on this right now, or could this be addressed later?

MR. SELWYN: Your Honor, we don't know how

MASIMO 2029
Apple v. Masimo
IPR2024-00242

they're going to be used in the examination.

So here was the email that we sent. If we scroll up, I believe we will see the first objection.

At the time, Your Honor, nearly all of his exhibits were not admitted and he was not listed as a sponsoring witness. As Mr. Lateef points out, some have since been admitted but more than 20 have not and he was not listed as a sponsor.

MR. LATEEF: I don't see a list of 20 here. I don't see a list of any exhibits here. I've gone through at least the first three exhibits that Mr. Selwyn mentioned. They are all in the record as of yesterday morning.

For example, Exhibit 11 came in through the deposition testimony of Dr. Mehra yesterday. Exhibit 57 came in through the deposition testimony of Dr. Venugopal Gopal. 100 came in through the deposition testimony of Dr. Mehra. Exhibit 111 came in through the deposition testimony of Dr. Mehra. Exhibits 12, 15, and 25 have also come in through the deposition testimony of various Apple witnesses. Exhibit 59 came in through the deposition testimony of Ueyn Block. Exhibit 59 came in through the deposition testimony of Ueyn Block. Exhibit 3 -- Exhibit 211 came in through the deposition testimony of Dr. Mehra.

MR. SELWYN: Your Honor, just to short-circuit it, we obviously have a discrepancy. If we could go offline

MASIMO 2029
Apple v. Masimo
IPR2024-00242

to resolve it.

MR. LATEEF: No, you brought this up, and I clearly indicated that they are in the record.

JUDGE BHATTACHARYYA: Do you want to continue with your -- complete your list, Mr. Lateef, and then I think we should take a break and the parties can discuss what they want to do.

Mr. Lateef, did you have further --

MR. LATEEF: I haven't seen this list of 20 exhibits, and I would -- I'd like to proceed with the witness at this time.

JUDGE BHATTACHARYYA: All right. But I have not ruled on the objections. Mr. Lateef, if I don't rule on them now, if we defer this to a later point, it could be that some of the testimony will be subject to motion to strike. Is that okay with you?

MR. LATEEF: Okay. Let's take the break.

Are those all your objections, Mr. Selwyn?

MR. SELWYN: Yes, that would complete our objections to anticipated testimony.

MR. LATEEF: And are you removing your objections to 11, 57, 100, 111?

MR. SELWYN: As I say, that's or objections to the anticipated testimony.

MR. LATEEF: No, are you removing your objections

MASIMO 2029
Apple v. Masimo
IPR2024-00242

to 11, 57, 100, and 111 that I just identified that came in through the deposition testimony?

JUDGE BHATTACHARYYA: Counsel, let's take a break for five minutes.

MR. LATEEF: I deserve a response to that question.

MR. SELWYN: Your Honor, I'll respond if you would like me to.

JUDGE BHATTACHARYYA: No, I would like you to meet and confer offline and come back and let me know your respective positions.

MR. SELWYN: Certainly. Thank you.

MR. LATEEF: Thank you, Your Honor.

(Whereupon, the proceedings recessed at 9:44 a.m.)

(In session at 9:49 a.m.)

JUDGE BHATTACHARYYA: We're back on the record. Did counsel have a chance to address this issue?

MR. SELWYN: Yes, Your Honor. We've looked at the list. It does appear that some of the exhibits were admitted yesterday. We haven't had time to confirm that all. But in the interest of time we'll withdraw the objection so we can move forward.

JUDGE BHATTACHARYYA: Very well.

MR. LATEEF: Your Honor, I'd like the record to

MASIMO 2029
Apple v. Masimo
IPR2024-00242

reflect that this time goes to Apple.

JUDGE BHATTACHARYYA: Are you asking me for a ruling on that?

MR. LATEEF: Yes, I am.

JUDGE BHATTACHARYYA: According to what I understand about the parties' agreement, that seems appropriate.

MR. LATEEF: Thank you, Your Honor.

MR. MUELLER: Your Honor, we have no further --

MR. LATEEF: We would like to call Dr. Goldberg to the stand please. Thank you.

JUDGE BHATTACHARYYA: I'm sorry. Mr. Mueller, did you --

MR. MUELLER: I was just saying, Your Honor, we have no further issues this morning, and Mr. Selwyn will do the cross-examination of Dr. Goldberg. Thank you, Your Honor.

JUDGE BHATTACHARYYA: Okay. Thank you. Welcome, Dr. Goldberg.

THE WITNESS: Good morning, Your Honor.

JUDGE BHATTACHARYYA: Do you understand that you're under an obligation to tell the truth in your testimony today?

THE WITNESS: Yes, I understand that.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

//

JACK GOLDBERG,

having been first duly sworn and/or affirmed on his oath, was thereafter examined and testified as follows:

JUDGE BHATTACHARYYA: Thank you.

DIRECT EXAMINATION

BY MR. LATEEF:

Q. Good morning, Mr. Goldberg. Could you please state your name for the record?

A. My name is Jack Goldberg.

Q. Did you provide or prepare demonstrative slides to assist you in today's testimony?

A. Yes, I did.

Q. Okay. Let's pull up the cover to the demonstratives.

Does this look like your demonstratives that you prepared for today's testimony?

A. Yes.

Q. Let's go to the next slide. Could you please tell us the scope of your analysis in this case?

A. Yes. My analysis was limited to issues involving the '127 patent, specifically infringement of claim 9 by the Apple Watch Series 6 and 7 products and the Next Generation Apple Watch, the domestic industry technical prong of claim

MASIMO 2029
Apple v. Masimo
IPR2024-00242

9, which includes Masimo's current and early rainbow« sensors, and the validity of the '127 patent, which will be covered in my rebuttal testimony.

Q. What are your opinions that you're going to state today?

A. That the Apple products infringe claim 9 of the '127, that the domestic industry products practice the claims of the '127 patent, and that the '127 patent -- well, I'm not going to address that today, that's for later, regarding validity.

Q. Great. Let's go to the next slide. Could you please tell us about your qualifications in this case?

A. Yes. I have a bachelor's, master's degree, both from MIT, in electrical engineering and computer science. During the years '73 to '84 I had varied industry experience, but in '84 through '95 I worked for IVAC Corporation, a medical device company that offered products, including infusion pumps, blood pressure machines, and clinical thermometers.

My experience at IVAC involved lots of work with sensors, heat flow, thermal management, fluid flow management, and projects including the noninvasive measurement of cardiac output, the processing of optical and radio frequency signals and other.

From 1995 until the present I've been working at

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Metrionix, which is my own company, as a consultant and expert in various fields, including medical sensors.

MR. LATEEF: Your Honor, at this time Masimo moves to have Mr. Goldberg moved as a technical expert in the field of physiological monitoring technologies.

JUDGE BHATTACHARYYA: Any objection?

MR. SELWYN: We have no objection. We do intend to cross him on the extent of his expertise, however.

JUDGE BHATTACHARYYA: At this time Dr. Goldberg is admitted as an expert in the field of physiological technologies.

Q. Okay. Let's go to the next slide. Could you please explain what you're providing here on this slide is this?

A. Yes. This slide was shown earlier during others' testimony. This is Fig. 12 from the '127 patent. It shows light emitters and the temperature sensors, both coupled to the thermal mass.

Quoting from the patent, the substrate shown here, substrate 1200, quote, is also configured with a relatively significant thermal mass, which stabilizes and normalizes the bulk temperature so that the thermistor measurement of bulk temperature is meaningful.

The patent also -- and that occurs at column 10, lines 67, through column 11, line 4.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

The patent also expresses the fact that the thermistor measures a bulk temperature of the thermal mass, which is used to estimate the operating wavelengths of all the LEDs, and that occurs at column 10, 22-48.

Q. Okay. Let's go to the next slide, and can you explain the identifiers you're going to use for your analysis?

A. Yes. This slide documents all of the elements and the shorthand reference to those elements ranging from the preamble to 7A through 7H of claim 7, and the verbiage of claim 9.

Q. Okay. Let's go to the next slide.

Did you review any stipulations relevant to your analysis?

A. I did. I reviewed document 770692, there are three stipulations there which basically explain that, regarding the hardware components of the blood oxygen feature, it's stipulated that there are no differences between the various models of the Apple Watch Series 6, no differences between the various models of the Apple Watch 7, and that for the purposes here those hardware components of the Apple Watch 6 are representative of the hardware components of the Apple Watch 7 and vice versa.

I also saw the stipulation, Complainants' Exhibit 1259, which in paragraph 7 states that a determination

MASIMO 2029
Apple v. Masimo
IPR2024-00242

regarding the Apple Watch Series 7 regarding infringement of any claim would apply equally to the currently planned design of Apple's Next Generation watches.

Q. Great. Let's go to the next slide.

Could you please explain your analysis for the preamble?

A. Yes. The accused products satisfy the preamble. This is undisputed. The preamble requires a sensor capable of emitting light into the tissue, and this evidence from an Apple Watch consumer support page points out that the blood oxygen application includes photodiodes, light emitting -- photodiodes-type detectors for detecting the amount of light reflected back from the light emitters, which include red and green, and infrared light emitters, and that advanced algorithms are used to evaluate the color of the blood and, thereby, determine the oxygen level.

MR. LATEEF: I think for the next part of the testimony we need to go on the Apple CBI transcript, Your Honor.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

CROSS-EXAMINATION

BY MR. SELWYN:

Q. Good morning, Mr. Goldberg.

A. Good morning.

Q. You were engaged by Masimo's law firm, Knobbe Martens, to serve as an expert to testify on behalf of Masimo in this matter, correct?

A. That is correct.

Q. And much of your consulting practice is tied to the Knobbe firm, correct?

A. Currently, yes.

Q. This is not your only ongoing case for which you are engaged by the Knobbe firm, correct?

A. Yes.

Q. And, in fact, there are currently five different ongoing matters for which you have been hired by Knobbe, correct?

A. I don't think there's five.

Q. Well, let's see what you said in your deposition.

Can we have, please, page 14, lines 8-11? We'll put it on the screen.

MR. LATEEF: Should the witness now open the cross box?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

MR. SELWYN: That would be fine.

A. I have it.

Q. Do you remember being asked this question and giving this answer:

Question. Five of the matters for which you are currently engaged by Knobbe Martens are listed on your CV as ongoing, correct?

Answer. That's correct.

Were you asked that question and did you give that answer?

A. At that time I gave that answer, yes.

Q. And you've been retained by Knobbe for 10 or 11 different matters in recent years, correct?

A. I would say so.

Q. Now, sir, you don't hold yourself as an expert in the design of medical sensors broadly or generally, correct?

A. I have -- I'm not sure I can answer that.

Q. Let's see what you said at your deposition.

Can we have page 43, lines 1-6.

Do you remember being asked this question and giving this answer:

Do you hold yourself out to be an expert in the design of medical sensors?

Answer. Again, medical sensors cover a very broad range of technologies. I've never held myself out to

MASIMO 2029
Apple v. Masimo
IPR2024-00242

be an expert in the design of medical sensors broadly or generally.

Were you asked that question and did you give that answer?

A. I did.

Q. You've never designed a pulse oximeter, have you, sir?

A. That is correct.

Q. You've never done any research and development for a pulse oximeter, correct?

A. I was engaged in investigation of the current state of the art involving pulse oximeters while I was working for IVAC Corporation. I'm not sure that --

Q. Sir, you've never done any research and development in the laboratory for a pulse oximeter, correct?

A. That is correct.

Q. And you've never published any books, papers or articles regarding pulse oximetry or pulse oximeters, correct?

A. Correct.

MR. SELWYN: Your Honor, I think we now have to go on to the Apple confidential record.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Let's move to the public record.

MR. LATEEF: Are we ready to proceed?

JUDGE BHATTACHARYYA: Yes.

BY MR. LATEEF:

Q. Mr. Goldberg, could you please explain your experience with temperature measurement or sensing?

A. Yes. While at IVAC I did a lot of work involving temperature measurement. I worked on an infrared thermometer. I worked on various aspects of other clinical thermometers that involved thermistors. I have done a lot of projects that involved the measurement of heat. I worked on the equipment used in manufacturing thermometers, that involved temperature measurement.

Q. Great. Does the '127 patent anywhere describe testing the average temperature of the LEDs?

A. No, it does not.

Q. Does the thermistor in the '127 patent measure temperature in the same manner as the Apple Watch?

A. They both employ thermistors, and thermistors are located on the circuit board.

Q. That's a sufficient answer.

Can we now move to the Apple CBI confidential

MASIMO 2029
Apple v. Masimo
IPR2024-00242

record?

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

MR. CLAASSEN: Good morning, Your Honor. This is Brian Claassen on behalf of Masimo. For the next witness Masimo calls Dr. Vijay Madisetti.

THE WITNESS: Good morning, Your Honor.

JUDGE BHATTACHARYYA: Good morning, Dr. Madisetti. Do you understand you're under an obligation to testify truthfully today?

THE WITNESS: I do.

VIJAY MADISETTI,

having been first duly sworn and/or affirmed on his oath, was thereafter examined and testified as follows:

DIRECT EXAMINATION

BY MR. CLAASSEN:

Q. Good morning, Dr. Madisetti.

A. Good morning, sir.

Q. Please introduce yourself and spell your last name for the court reporter.

A. My name is Vijay Madisetti. My last name is spelled M-A-D-I-S-E-T-T-I.

Q. Did you prepare demonstrative slides regarding your analysis in this case?

A. Yes, I did.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Let's pull up CDX-11, please.

Turning to the next slide, slide 2, Dr. Madisetti, will you explain your background?

A. Yes. I'm a full professor at Georgia Tech in the Colleges of Engineering and Computer Science. I have a Ph.D. from the University of California at Berkeley in electrical engineering and computer science, and my CV is shown attached as Exhibit 329.

Q. Dr. Madisetti, is your CV Exhibit 329 current?

A. Yes.

Q. Turning to the next slide, Dr. Madisetti, could you tell me your assignment in this case? Excuse me. Let's go to slide 4, please.

Dr. Madisetti, can you explain your background with respect to -- with respect to publications and books that you've written?

A. Yes. In the area of this investigation I've been working, teaching, researching, and consulting in the area of signal processing, chip design, software design, for over 30 years.

These are some of the books that I've written, starting back in the '90s until last year, I've been focused on the areas of signal crossing, chip design, and software, and along the way I've also taught many courses and done research in these areas.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Turning to the next slide, Dr. Madisetti, can you describe for the ALJ what technical articles you've written relating to biological signal processing?

A. Yes. Over the past 30 years I've authored many papers in technologies such as filters, cancellers, noise-reduction techniques, adaptive digital filters, and also, for example, on the right, pulse signals, pulse oximetry is a special case of this particular general problem. I've also designed a pulse oximeter.

MR. CLAASSEN: Your Honor, at this time Masimo moves to admit Dr. Madisetti as a technical expert in the field of physiological monitoring technologies.

JUDGE BHATTACHARYYA: Any objection?

MS. FRAZIER: There is, Your Honor. No objection to Dr. Madisetti being admitted as an expert, but we would request that it be in the areas of expertise he recited -- signal processing, chip design, and software.

MR. CLAASSEN: Your Honor --

JUDGE BHATTACHARYYA: Mr. Claassen, is that acceptable to you?

MR. CLAASSEN: Your Honor, Dr. Madisetti has rendered opinions regarding physiological monitoring technologies. He has explained his technical articles related to this area and his design of pulse oximeters.

Masimo would like to have him admitted in the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

field of physiological monitoring technologies.

JUDGE BHATTACHARYYA: I understand that, but you're objecting to that designation.

MS. FRAZIER: We are, Your Honor, but happy to take it up on cross-examination.

MR. CLAASSEN: Your Honor, I'd ask if he is admitted, they either raise their objection now or -- so that I know how to address it.

JUDGE BHATTACHARYYA: Ms. Frazier, are you --

MR. CLAASSEN: I'm requesting that they voir dire the witness now if they have a question as to his qualifications.

MS. FRAZIER: Again, Your Honor, no objection to Dr. Madisetti being admitted as an expert consistent with description of his background related to signal processing.

We do object as to his expertise regarding physiological monitoring devices.

JUDGE BHATTACHARYYA: In that case, I believe we have to resolve that. Should we resolve that at this time?

MS. FRAZIER: May I voir dire the witness, Your Honor?

JUDGE BHATTACHARYYA: Yes, you may.

VOIR DIRE EXAMINATION

BY MS. FRAZIER:

Q. Dr. Madisetti, good morning.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Good morning.

Q. You said that you designed one pulse oximeter, correct?

A. Yes, I designed a pulse oximeter.

Q. And that work was led by Professor John Scharf and his colleagues at Emory University, correct?

A. I collaborated with Professor John Scharf.

Q. And you have never written any books about that research, correct?

A. It was entered in a prototype, and I did not write -- I don't believe I wrote a book on that topic.

Q. And you have never written any papers about that research, correct?

A. There were some reports, I believe, but no published papers.

Q. And let's see what you said at your deposition, Dr. Madisetti.

Mr. Lee, if we could bring up Dr. Madisetti's deposition transcript at page 185, line 11.

Question. Did you ever write any books, papers, or articles about that research?

Answer. I did not.

Dr. Madisetti, were you asked those questions and did you give that answer?

A. Yes, that is what I said today. There was a

MASIMO 2029
Apple v. Masimo
IPR2024-00242

prototype and there were some internal reports.

Q. And you have never spoken publicly on that research, correct?

A. I made presentations to reviewers.

Q. And --

MR. CLAASSEN: Your Honor, I'm going to ask if this voir dire is going to contain any sort of reference to his deposition transcript that he be given the entire transcript to review.

JUDGE BHATTACHARYYA: He can look at his whole transcript, and you'll also have the opportunity to respond.

MR. CLAASSEN: I understand. I'm asking that counsel give him his entire transcript, which they have not done yet.

MS. FRAZIER: Your Honor, the transcript is in possession of Masimo's counsel at their offices. We sent them over this morning. I'm happy for the binder to be given to Dr. Madisetti now, if it's in the room.

MR. CLAASSEN: Go ahead and open your cross-examination binder, Dr. Madisetti.

THE WITNESS: I will.

MS. FRAZIER: Your Honor, just a point of clarification. We are on the public record, correct?

(Clarification by reporter.)

THE WITNESS: I have the binder, counsel.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Dr. Madisetti, we'll put up on the screen. It's also at tab 1 of volume 1 of your binders, page 185 of your transcript, lines 14 through 19.

Question. Did you speak about that research publicly?

Answer. I am not.

Were you asked that question, did you give that answer?

A. Yes, I did, and I confirmed that today. It was an internal review.

Q. And, Dr. Madisetti, the slide you showed a few moments ago of four papers you had written with respect to biological signal monitoring, do you recall those?

A. Yes.

Q. And if I search those papers, I will not find a reference to pulse oximetry in those, correct?

A. I don't know. I would have to look through them, but they deal with biological signals. They deal with different types of signal extraction techniques, noise cancellation, and associated formulation technologies that are applicable to pulse oximetry.

Q. And they deal with biological signal extraction, correct?

A. Yes. They deal with various kinds of biological signals as well as physical signals.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Thank you.

MS. FRAZIER: Your Honor, no further questions for Dr. Madisetti. We do maintain our objection. We believe his expertise should be consistent with what he has described, which is expertise in the biological signal monitoring, not physiological monitoring devices.

MR. CLAASSEN: Your Honor, I'd like to respond, moving back to slide 4 of Exhibit CDX-11C.

By MR. CLAASSEN:

Q. Dr. Madisetti, the books that you mentioned on the left side of Exhibit 11 -- CDX-11C, are those all related to signal processing?

A. Yes.

Q. Are there any books on hardware design?

A. Yes, the ones on the bottom left.

Q. Can you explain your experience in hardware design to us?

A. Yes. I was one of the authors of the Standard Language for Hardware Design, which is called VHDL. This is a IEEE standard. I authored books in the area of chip design, software design, system-on-chip design.

I designed several products. The software that I've designed on cell phones is present in millions of phones worldwide. And I have extensive experience in the design of -- and design, research, and teaching of software

MASIMO 2029
Apple v. Masimo
IPR2024-00242

and hardware --

Q. Do you have experience --

A. -- signal processing, monitoring, and sensor design.

Q. To be clear, you also have experience designing hardware for pulse oximeters; is that correct?

A. Yes. I designed using PVDs and in collaboration with Professor Jim Scharf.

MR. CLAASSEN: Your Honor, Masimo proffers Dr. Madisetti as an expert in the field of physiological monitoring technologies.

JUDGE BHATTACHARYYA: Mr. Claassen, could you just summarize for me your position regarding his experience in physiological monitoring versus biological signal monitoring?

MR. CLAASSEN: Yes, Your Honor. If you'd like to focus on pulse oximetry in particular with respect to physiological signal monitoring, we would accept that as an acceptable field for Dr. Madisetti.

JUDGE BHATTACHARYYA: Okay. Could you just summarize for me what we've just heard about his experience in pulse oximetry?

MR. CLAASSEN: Yes, Your Honor. He has years of experience developing a pulse oximeter and both the hardware and software for that pulse oximeter. Dr. Madisetti is also

MASIMO 2029
Apple v. Masimo
IPR2024-00242

a well-regarded author with respect to the design of ASIC, which are hardware, so it's hardware and software. He is a signal processing expert. Without question, Apple is not questioning that.

So the issue here really is the definition of the field, and I believe it's fair to say that Dr. Madisetti is an expert with respect to physiological monitoring technologies in pulse oximetry in particular.

JUDGE BHATTACHARYYA: Ms. Frazier, did you want to respond to Mr. Claassen's argument?

MS. FRAZIER: Yes, Your Honor. Again, no objection to admission in the areas that Dr. Madisetti offered himself, including chip design and signal processing, but we do maintain his only pulse oximetry experience that he testified to was that one effort in collaboration with another professor that he never wrote about, never talked about, never published on.

So, Your Honor, he has no publications specific to the field of pulse oximetry, so I actually think that the narrower definition here would be even more objectionable to Apple.

JUDGE BHATTACHARYYA: Okay. What is your position regarding the proper field? You said chip design and signal processing?

MS. FRAZIER: Signal processing, Your Honor, no

MASIMO 2029
Apple v. Masimo
IPR2024-00242

objection to that.

JUDGE BHATTACHARYYA: All right. Thank you. Let's take a quick break.

(Whereupon, the proceedings recessed at 11:36 a.m.)

(In session at 11:38 a.m.)

JUDGE BHATTACHARYYA: We're back on the public record.

Based on the testimony and arguments I've just heard, the objection is overruled. Dr. Madisetti will be admitted as an expert in the field of physiological monitoring technologies.

Counsel for Apple can explore the extent of his expertise on cross-examination.

MS. FRAZIER: Thank you, Your Honor.

MR. CLAASSEN: Your Honor, I'd like to clarify that the time was charged to Apple with respect to the voir dire and the objection.

JUDGE BHATTACHARYYA: I understand the parties have an agreement regarding how to charge time. I ask that the parties discuss it, and, if there's a dispute, you can raise it before me.

MR. CLAASSEN: Thank you, Your Honor. We'll do that.

BY MR. CLAASSEN:

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Turning back to CDX-11C, let's turn to slide 3.

Dr. Madisetti, what was your assignment in this case?

A. Yes. I was asked to study Masimo's '501, '502, '648, and the '745 patents, specifically the asserted claims determining whether Apple's accused products, the watches, infringe the asserted claims, and also determine whether Masimo's DI products practice the asserted DI claims.

Q. Turning to the next slide -- turning to slide 6, Dr. Madisetti, how did you arrive at your opinions?

A. I reviewed a lot of evidence that was provided to me, and these included the patents themselves, their file histories, which I discuss there. I also reviewed the products themselves. I reviewed the documentation. I reviewed Masimo's DI products as well as the accused Apple products, technical documents that were provided to me, testimony, both deposition as well as in this hearing, and source code that I reviewed, physicals that I examined, and testing that I also performed.

Q. Turning to slide 8, Dr. Madisetti, based upon your independent analysis, what is the summary of your opinions in this case regarding infringement and domestic industry technical prong?

A. With respect to my opinions, as a summary, it is my opinion that the accused Apple Watch products infringe

MASIMO 2029
Apple v. Masimo
IPR2024-00242

claim 12 of the '501, claims 22 and 28 of the '502, claims 12, 24, and 30 of the '648. And the accused Apple products, the watches, infringe claims 9 and 27 of the '745.

It is also my opinion that the Masimo DI products satisfy the Rev. A article, satisfies claim 12 of the '501 patent, claims 12, 24, and 30 of the '648 patent. And, further, that Revision D, E, and W1 articles satisfy claim 12 of the '501, claim 28 of the '502, claims 12, 24, and 30 of the '648.

And, further, that Masimo's DI products Circle, Wings, Rev. A, D, E, W1 articles satisfy claim 18 of the '745 patent.

Q. Turning back to -- do you expect to render opinions later in this case, if necessary, regarding the validity of Masimo's Asserted Patents?

A. Yes, sir.

Q. Turning back to slide 7, did you review any stipulations between the parties that are relevant to your opinions in this case?

A. Yes. I understand that the parties have stipulated that Series 6, 7, and the Next Generation watches all behave in the same manner, with respect to the relevant features at issue.

So, therefore, my opinions with respect to any of these products would apply to all of these products.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

MR. CLAASSEN: Your Honor, we're going to be moving into some information that is Apple CBI. I'd like to move onto the Apple confidential CBI record.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

CROSS-EXAMINATION

BY MS. FRAZIER:

Q. Dr. Madisetti, during your testimony for Mr. Claassen, you've been reviewing the slides on the screen in front of you; is that correct?

A. Yes.

Q. And we will continue to put information up on the screen. There is also some information that we've provided hard copies of also.

Do you have those binders available to you?

A. Yes, I see one binder. I see two binders.

Q. Two binders, that's correct.

Now, Dr. Madisetti, the parties are on a time clock here, so I'd ask you to answer my questions yes, no, or I don't know. Do you understand?

A. Yes.

Q. You have worked as an expert litigation witness over 50 times, correct?

A. Yes, over the past 15, 20 years.

Q. You have had your deposition taken at least 80 times, correct?

A. Yes.

Q. You have testified at trial roughly 30 times?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. I don't remember the number, but I've testified probably that many times.

Q. Probably roughly 30 times?

A. Yes.

Q. You have served as a technical expert in cases involving 4G LTE protocols; is that right?

A. Yes.

Q. You have served as a technical expert in cases where the technology at issue was power over Ethernet, correct?

A. Yes.

Q. You've served as a technical expert in cases regarding networked storage devices?

A. I'm not sure what you mean but probably.

Q. Well, let's take a look at your CV, Dr. Madisetti. We'll put it up on the screen. It is CX-329, Exhibit A, page 2. And if we could zoom in on the IOEngine v. IMC/Imation.

A. Yes.

Q. Do you see you've served as a technical expert regarding networked storage devices, correct?

A. Yes.

Q. You've served as a technical expert regarding digital videos, correct?

A. Yes.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. You've served as a technical expert regarding interactive graphical user interface technology, right?

A. Yes.

Q. You are currently serving as an expert in a case regarding virtualization, correct?

A. Cloud computing, yes.

Q. Virtualization, correct?

A. Yes.

Q. Now I'd like to turn to your opinions regarding Apple's alleged infringement of the --

A. One second. Excuse me. One second, counsel.

MR. CLAASSEN: I'm sorry. I have to go into the witness room for counsel. Masimo has lost internet connection. We need to break until we're able to rejoin.

MS. FRAZIER: I'd ask that we go off the record during this technical break.

JUDGE BHATTACHARYYA: That's fine. Off the record.

(At which time, the proceedings were off the record.)

JUDGE BHATTACHARYYA: Let's take a five-minute break.

(Whereupon, the proceedings recessed at 3:04 p.m.)

(In session at 3:10 p.m.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

MS. FRAZIER: May I proceed, Your Honor?

JUDGE BHATTACHARYYA: Yes, let's go back on the record. We are on the public record.

You may proceed.

BY MS. FRAZIER:

Q. Dr. Madisetti, I'd like to turn now to your opinions regarding Apple's alleged infringement of the '745 patent. Do you have that in mind?

A. Yes.

Q. You heard yesterday the testimony of Mr. Al-Ali, correct?

A. Yes.

Q. And you heard Mr. Al-Ali testify that shaping the light was what was new about his patent, correct?

A. Could you please repeat the question, counsel?

Q. Sure. Yes, no, or you don't remember, you heard Mr. Al-Ali testify yesterday that shaping the light was what was new about the '745 patent, correct?

A. I heard Mr. Al-Ali say that.

Q. And you've reviewed Mr. Al-Ali's deposition in this case, correct?

A. I reviewed his deposition, yes.

Q. And Mr. Al-Ali has also acknowledged that physiological measurement systems with diffuser that are configured to spread light existed before the '745 patent,

MASIMO 2029
Apple v. Masimo
IPR2024-00242

correct?

A. I don't recall that testimony.

Q. Sure. Let me see if I can refresh your recollection.

If we could bring up Mr. Al-Ali's February 16th deposition on page 56.

Dr. Madisetti, this one is not in your binder.

Line 13 through 18. Mr. Al-Ali was asked:

Would you agree that physiological measurement systems with --

MR. CLAASSEN: Your Honor, I think Masimo counsel might have lost connection again.

I can hear, Your Honor.

JUDGE BHATTACHARYYA: Please go ahead. We have Masimo counsel here.

MR. CLAASSEN: Yes, Your Honor.

BY MS. FRAZIER:

Q. Mr. Al-Ali was asked:

Question. Would you agree that physiological measurement systems with diffusers configured to receive emitted light spread received light and emit the spread light over a larger tissue area existed before the '745 patent?

Answer. Yes.

Does that refresh your recollection that

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Dr. Al-Ali testified that physiological measurement systems with diffusers configured to receive emit light and spread light over larger tissue areas existed before the '745 patent?

MR. CLAASSEN: Your Honor, I ask that the witness be shown the entirety of at least this page of the transcript. This is not his own testimony. It's not impeachment. So I'd like him to be able to review the content.

MS. FRAZIER: We're happy to zoom out.

MR. CLAASSEN: Please.

Q. Dr. Madisetti, does that refresh your recollection that Mr. Al-Ali said that?

A. As I said, Mr. Al-Ali speaks for Mr. Al-Ali speaks for himself. These are not my opinions.

Q. And do you agree or disagree that physiological measurement systems with diffusers configured to spread light over a larger tissue area existed before the '745 patent?

A. As I described in my deposition, they don't -- in my opinion they did not exist in the claimed manner.

Q. Sir, stick with my question, if you could. I'm not asking about the claimed manner. I'm just asking whether you agree or disagree that physiological measurement systems with emitters -- excuse me -- with diffusers

MASIMO 2029
Apple v. Masimo
IPR2024-00242

configured to receive light and spread that light over a larger tissue area existed before the '745 patent, do you agree or disagree?

MR. CLAASSEN: Your Honor, I'm going to object. This is outside the scope of the direct.

A. I can't answer it without knowing the context.

JUDGE BHATTACHARYYA: Let's pause for a minute. I'd like Ms. Frazier to respond to the objection.

MS. FRAZIER: Your Honor, this goes to Dr. Madisetti's opinions regarding infringement of the '745 patent. It's squarely within the scope of his direct.

MR. CLAASSEN: Your Honor, these questions are directed to validity issues.

JUDGE BHATTACHARYYA: It does sound like you're asking a validity question. Can you link it to something --

MS. FRAZIER: Sure, Your Honor, I'll move on.

JUDGE BHATTACHARYYA: In that case the objection is sustained.

BY MS. FRAZIER:

Q. Dr. Madisetti, we're going to put up on the screen claims 1 and 20. These are the claims from which claims 9 and 27 depend.

Those are the claims that you've alleged Apple Watch Series 6 and 7 infringe, correct?

A. Counsel, could you please tell me which patent

MASIMO 2029
Apple v. Masimo
IPR2024-00242

claim is this from?

Q. Yes. This is the '745 patent. On the left side of the screen we've put independent claim 1 and on the right side of the screen we've put independent claim 20.

You recognize those claims, sir, correct?

A. Yes.

Q. And they are the independent claims from which claims 9 and 27 depend, correct?

A. Yes.

Q. Okay. Now both claim 9 and claim 27 of the '745 patent require a plurality of light-emitting diodes configured to emit light in a first shape. Do you see that?

And if we could highlight it on the screen.

A. Yes, I agree, that that's a limitation of claim 1 and claim 20 with respect to that limitation.

Q. And claims 1 and 20 also require a material configured to be positioned between the plurality of light-emitting diodes and tissue on a wrist of a user, the material configured to change the first shape into a second shape, correct?

A. Again, I don't -- I mean, I will agree with you that you are reading from the claim limitation.

Q. And the '745 patent uses the term shape to refer to geometric shape, such as a rectangular, circle, or square, correct?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. I disagree. It just calls it a shape.

Q. Dr. Madisetti, let's see what you said in your claim construction report in this case.

If we could bring up Dr. Madisetti's claim construction report at paragraph 60.

MR. CLAASSEN: Is this in his binders so he can follow along?

MS. FRAZIER: It's at tab 7 of his binder.

Q. Dr. Madisetti, do you see there in the second sentence you wrote:

The specification uses the term shape to refer to patterns and geometry (such as rectangular, circle, or square).

Do you see that?

A. I see that. These are non-limiting embodiments.

Q. Now the '745 patent provides examples of shapes, including shapes that are substantially rectangular, correct?

A. You would have to point me to the sections, counsel.

Q. You don't recall if the patent refers to shapes that are substantially rectangular?

A. Again, please show me the relevant section because I would like to be very precise.

Q. Dr. Madisetti, is it your position that the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

shapes described by the '745 patent must be perfect geometric shapes?

A. I don't have an opinion on that issue beyond what's in the claim itself.

Q. Now the term second shape, as used in the claims of the '745 patent, means a shape that is different than the first shape, correct?

A. Again, we have to refer to the claim constructions of both parties and the claim language itself, so I'm unsure. You're referring to the claim or to the claim construction positions, counsel?

Q. Dr. Madisetti, you've offered an opinion that Apple infringes the '745 patent, correct?

A. Yes.

Q. And you've offered the opinion that the MLA in the Apple Watch changes the light from a first shape to a second shape, correct?

A. Again, that's one of the reasons, and I've provided analysis and testing support for that limitation.

Q. And you can agree that second shape as you applied it for purposes of your infringement analysis means a shape that is different from a first shape, correct?

A. I've applied both constructions.

Q. And we can agree that both constructions define a second shape as a shape different than the first shape,

MASIMO 2029
Apple v. Masimo
IPR2024-00242

correct?

A. Can I look at the constructions for both parties just to make sure that I'm precise?

Q. Do you know sitting here today if this definition of second shape that you applied means a shape that is different than the first shape?

A. I understand that -- I understand how I applied it, counsel. I understand that I've also used the term's plain and ordinary meaning and used a parentheses, so I want to be very precise.

Q. If you could just stick with my questions.

Second shape, as used in the claims of the '745 patent, your understanding is that encompasses a shape that is different from the first shape, correct? Yes or no?

A. All I can say is that it is as required in the claim.

Q. Okay. Now, Dr. Madisetti, a second shape in the '745 patent is not different from the first shape if it differs only in size, correct?

A. I understand that's the construction that -- or similar language has been proposed by Masimo, and it's part of the file history.

Q. Sir, for purposes of your analysis, you understood that second shape is not different from a first shape if it is different only in size, correct?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Counsel, I applied both parties' constructions.
Q. Can you answer my question yes or no, sir?
A. Would you repeat your question, counsel? I applied both parties' construction, counsel, so --
Q. And so in your application you understood that a second shape is not different from a first shape, if it is different only in size, correct?
A. I applied the construction of both parties.
Q. Can you answer my question yes or no?
A. As I said, this question can't have a yes or no answer.
Q. Okay. Dr. Madisetti, that's all you have to say.
Now you testified that in the Apple Watch the microlens array is the thing that is configured to change the first shape into a second shape, correct?
A. Would you point me to something specific as to what you're referring to?
Q. So, sir, you do not know sitting here today if it is your opinion that the microlens array is the material configured to change the first shape into a second shape in your analysis?
A. That is the opinion that I -- that is part of my opinion, yes.
Q. Okay. So you have testified to that, correct?
A. Yes.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. And in your opinion, in your analysis of the Apple Watch, the first shape is like a square and the second shape is circular, correct?

A. At a high level, yes, but the focus was on the shapes are different.

Q. Well, let's see what you said at your deposition. It's in tab 1 of your binder. We'll bring it up on the screen.

This is page 288, beginning at line 13 going on to page 289, line 3.

Question. You performed various tests that attempted to take pictures of light as it exited the MLA. Correct?

Answer. I did not attempt. These were actual pictures.

Question. And did those pictures show the shape of light?

Answer. Referring to my appendix, as I describe in my appendix, Appendix H, how -- what the first shape and the second shape are, and how they are different.

The first shape is like a square, and the second shape is circular.

Were you asked those questions and did you give those answers?

A. Yes, that's what I said right now.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

MS. FRAZIER: Your Honor, I'd like to go on the Apple confidential record, please.

JUDGE BHATTACHARYYA: We're moving to the Apple confidential record.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Good afternoon, Dr. Venugopal.

THE WITNESS: Good afternoon.

JUDGE BHATTACHARYYA: I'm sorry. I hopefully will get your name correct next time.

THE WITNESS: No worries. No worries.

JUDGE BHATTACHARYYA: Do you understand that you are under an obligation to tell the truth here today?

THE WITNESS: Yes, I am.

VIVEK VENUGOPAL,

having been first duly sworn and/or affirmed on his oath, was thereafter examined and testified as follows:

DIRECT EXAMINATION

BY MS. FRAZIER:

Q. Good afternoon. Could you please introduce yourself to Her Honor?

A. Good afternoon. My name is Vivek Venugopal. I live in Sunnyvale, California, and I'm an optical engineer with Apple.

Q. Could you please describe your educational background?

A. Yes, of course. I have a master's in electrical

MASIMO 2029
Apple v. Masimo
IPR2024-00242

engineering from Rensselaer Polytechnic Institute and a Ph.D. in biomedical engineering from the same.

Q. When did you receive your Ph.D.?

A. That was in December of 2011.

Q. What did you do after that?

A. I was working as a postdoctoral researcher for a couple of years with Harvard Medical School at the medical center in Boston.

Q. And when did you join Apple?

A. That would be in January of 2014.

Q. Since joining Apple, what products have you worked on?

A. I have worked on all of the Apple Watches exclusively, Series 0 through Series 7.

Q. And what is your particular focus with respect to the Apple Watch?

A. I work on the optical architecture of the heart rate monitors, the optical sensors which are used for heart rate monitoring.

Q. How many different optical sensors are there across the Apple Watch Series 0 through 7?

A. The resting heart rate on the health sensor, in addition to that we also have ambient light sensors and others, which I'm not involved with.

Q. Now has the design of the optical sensor in the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Apple Watch changed over time?

A. Yes, it has. There have been three distinct generations of optical designs in the Apple Watch. The first one -- we call them Generation 1 through 3.

Q. And could you explain for Her Honor which generations map to which series watch?

A. Of course. Gen 1 was for Series 0 through Series 3, Generation 2 was Series 4 and 5, and Gen 3 is Series 6 and 7.

Q. Starting, Dr. Venugopal, with the Series 6, when did Apple first sell Apple Watch Series 0, excuse me, starting with Series 0, when did Apple first sell Apple Watch Series 0?

A. The first customer ship for Series 0 was in April of 2015.

Q. What was your role with respect to the optical sensor in the Series 0 watch?

A. When I started, I was brought in to work on the Fresnel lens, specifically writing documentation and specifications that can be used by vendors to design and develop the lens. Subsequently I was also involved in testing.

Q. And is the Fresnel lens part of the optical sensor?

A. Yes, it is.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. What are the other parts of the optical sensor in Apple Watch Series 0?

A. Series 0 comprises of LEDs, green and infrared LED, and two photodiodes, and there is also, as I said, the Fresnel lenses, and we have the back crystal, which is essentially the back housing of the watch, which is an optical component as well.

Q. I'd like to put up on the screen what's been marked as RX-0392.

Do you recognize RX-0392?

A. Yes, I do.

Q. What is it?

A. This is an Engineering Requirement Specification or an ERS for one of the features using the optical sensor.

MS. FRAZIER: Your Honor, if we could at this time go on the Apple confidential record.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Good afternoon, Dr. Mehra.

THE WITNESS: Good afternoon.

JUDGE BHATTACHARYYA: Could you please pronounce your name?

THE WITNESS: Saahil Mehra, Saahil, yes.

JUDGE BHATTACHARYYA: Welcome. Do you understand that you're under an obligation to tell the truth in your testimony today?

THE WITNESS: Yes, I do.

SAAHIL MEHRA,

having been first duly sworn and/or affirmed on his oath, was thereafter examined and testified as follows:

MR. SELWYN: May I proceed, Your Honor?

JUDGE BHATTACHARYYA: Yes, please, go ahead.

DIRECT EXAMINATION

BY MR. SELWYN:

Q. Good afternoon. Could you please introduce yourself, tell us where you work and a little bit about yourself, please?

A. Sure. My name is Saahil Mehra, and I work at Apple. I live in Boston with my wife and my two-year-old.

Q. What is your current position at Apple?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Currently I lead and I manage the mechanical engineering or product design team that's responsible for design, development, and validation of the health sensors for Apple's products.

Q. What is your educational background, sir?

A. I have a Bachelor's in material science and engineering from MIT in 2008, a Master's and a Ph.D. in material science and engineering from Stanford in 2010 and 2014, and a certificate in biomedical engineering from Stanford in 2019.

Q. When did you join Apple?

A. I joined Apple directly after my Ph.D. in late 2014.

Q. At a high level, what work have you done on Apple Watch?

A. At a high level, I've been deeply involved in all aspects of the product development for R&D life cycle for health sensor features for the Apple Watch, including the electrocardiogram and all of the optical health sensors, which are the heart rate sensor, the pulse oximetry feature, and also the optical proximity sensors.

Q. Which versions of Apple Watch has your work related to?

A. I have been deeply involved with Apple Watch design and development since the Series 4 onwards.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. When did you begin working on the blood oxygen feature of Apple Watch Series 6?

A. I joined the team around mid 2018 after the early prototyping feasibility had been established, and they were looking for my expertise to help integrate this feature into a system in the Apple Watch.

Q. Did your work on the blood oxygen feature for Apple Watch have anything to do with the work that you had done on the heart sensor?

A. Yes, very much so. So pulse oximetry as a feature is essentially heart rate sensing, but comparing the amplitude of the signal at two different colors of light or wavelengths of light.

And so all of the work that we did to design, develop, and validate heart rate sensors over multiple generations of the watch was a great engineering base for us to build off of.

MR. SELWYN: Your Honor, could we go on the Apple confidential record.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

C O N T E N T S

INDEX OF WITNESSES

WITNESS	DIRECT	CROSS	RE-DIRECT	RE-CROSS
JACK GOLDBERG,.....	612	636	657, 663	662
VIJAY MADISETTI,.....	664	763	808	
VIVEK VENUGOPAL,.....	816	833	845	848
SAAHIL MEHRA,.....	850			

AFTERNOON SESSION 718

CONFIDENTIAL SESSIONS 617-635
639-657
660-663
678-762
777-815
820-849
853-end

MASIMO 2029
Apple v. Masimo
IPR2024-00242

C E R T I F I C A T E

TITLE: CERTAIN LIGHT-BASED PHYSIOLOGICAL MEASUREMENT DEVICES AND COMPONENTS THEREOF

INVESTIGATION NO.: 337-TA-1276

HEARING DATE: June 8, 2022

LOCATION: Washington, D.C. - Remote

NATURE OF HEARING: Evidentiary Hearing

I hereby certify that the foregoing/attached transcript is a true, correct and complete record of the above-referenced proceedings of the U.S. International Trade Commission.

Date: June 29, 2022

Signed:

ss// LaShonne Robayo

Signature of the Contractor or the Authorized Contractor's Representative

I hereby certify that I am not the court reporter and that I have proofread the above-referenced transcript of the proceedings of the U.S. International Trade Commission against the aforementioned court reporter's notes and recordings for accuracy in transcription in the spelling, hyphenation, punctuation and speaker identification and did not make any changes of a substantive nature. The foregoing/attached transcript is a true, correct and complete transcription of the proceedings.

Signed:

ss// Raymond G. Bynteson

I hereby certify that I reported the above-referenced proceedings of the U.S. International Trade Commission and caused to be prepared from my record media and notes of the proceedings a true, correct and complete verbatim recording of the proceedings.

Signed:

ss// Linda Kenkade

MASIMO 2029
Apple v. Masimo
IPR2024-00242

UNITED STATES
INTERNATIONAL TRADE COMMISSION

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In the Matter of Investigation No.

CERTAIN LIGHT-BASED PHYSIOLOGICAL 337-TA-1276

MEASUREMENT DEVICES AND COMPONENTS

THEREOF

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OPEN SESSIONS

Pages: 862 through 1167 (with excerpts)

Place: Washington, D.C.

Date: June 9, 2022

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MASIMO 2029
Apple v. Masimo
IPR2024-00242

UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

Before the Honorable Monica Bhattacharyya

Administrative Law Judge

In the Matter of | Investigation No.

CERTAIN LIGHT-BASED PHYSIOLOGICAL MEASUREMENT DEVICES AND COMPONENTS THEREOF | 337-TA-1276

EVIDENTIARY HEARING

Thursday, June 9, 2022

Volume IV

The parties met via remote videoconferencing pursuant to notice of the Administrative Law Judge at 9:30 a.m. Eastern.

Reported by: Linda S. Kinkade RDR CRR RMR RPR CSR

MASIMO 2029
Apple v. Masimo
IPR2024-00242

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CONTINUED ON FOLLOWING PAGE

MASIMO 2029
Apple v. Masimo
IPR2024-00242

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MASIMO 2029
Apple v. Masimo
IPR2024-00242

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MASIMO 2029
Apple v. Masimo
IPR2024-00242

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MASIMO 2029
Apple v. Masimo
IPR2024-00242

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*** Index appears at end of transcript ***

MASIMO 2029
Apple v. Masimo
IPR2024-00242

P R O C E E D I N G S

(In session at 9:30 a.m.)

JUDGE BHATTACHARYYA: We'll start on the public record. I believe there's some housekeeping matters to take care of. Shall we begin with the admission of exhibits?

MS. SWAROOP: Yes. Good morning, Your Honor, Sheila Swaroop for Complainants.

I believe we have two lists from two days ago, and then I believe we have agreement on the list from today as well for the admitted exhibits.

JUDGE BHATTACHARYYA: All right. So I have one entitled Complainants' Corrected Table of Admitted Exhibits for the Evidentiary Hearing on June 7th, 2022.

Beyond the objections that have already been ruled upon, are there any further objections from Apple?

MR. MUELLER: The one thing, Your Honor, and this may be addressed in the version that you're looking at, and, if it is, it's a moot point, but I think in one version of the table there had been some demonstratives listed.

We have no objection to the demonstratives being lodged with Your Honor, but we believe, as a formal matter, they are not exhibits.

MS. SWAROOP: Mr. Mueller, we addressed that. We prepared two separate lists of exhibits, so there's a list of admitted exhibits and there's a separate list of

MASIMO 2029
Apple v. Masimo
IPR2024-00242

demonstrative exhibits, which we sent to you and your team yesterday. We're in agreement on that.

MR. MUELLER: Then it's a moot point. Thank you.

MS. SWAROOP: Thank you.

JUDGE BHATTACHARYYA: All right. There's one item on this corrected table that we discussed yesterday, I believe with Mr. Claassen. It has to do with whether the physical sent to the ALJ, CPX-156C, will be listed as an exhibit.

My understanding was that would not be a physical exhibit; the photo would stay in --

MS. SWAROOP: My apologies. You're correct, Your Honor. If that was included, we'll resubmit again and remove CPX-156 and make sure CPX-156A is on instead.

JUDGE BHATTACHARYYA: There is no need to do that. I'll admit this list of exhibits that's entitled Complainants' Corrected Table of Admitted Exhibits for the Evidentiary Hearing on June 7th, 2022, with the exception of CPX-156C, physical A, sent to ALJ.

Could you please send the list to the court reporter and cross out that particular entry.

(Whereupon, the exhibits as recited by counsel and reflected in the attached index were submitted and received in evidence.)

MS. SWAROOP: We will do that, Your Honor. Thank

MASIMO 2029
Apple v. Masimo
IPR2024-00242

you.

JUDGE BHATTACHARYYA: Then I have Complainants' Table of Demonstratives for Evidentiary Hearing on June 6th and June 7th, 2022.

Are there any objections to receiving those demonstratives as demonstrative exhibits, not as substantive evidence?

MR. MUELLER: No objection, Your Honor.

JUDGE BHATTACHARYYA: So those demonstratives will be received.

(Whereupon, the exhibits as recited by counsel and reflected in the attached index were submitted and received in evidence.)

JUDGE BHATTACHARYYA: Then I have a list entitled Table of Admitted Exhibits for the Evidentiary Hearing on June 8th, 2022.

Are there any objections to that table of exhibits other than objections that have already been ruled upon?

MR. MUELLER: No further objections, Your Honor.

JUDGE BHATTACHARYYA: Then the list of exhibits in that table are admitted. Please send a copy to the court reporter.

(Whereupon, the exhibits as recited by counsel and reflected in the attached index were submitted and

MASIMO 2029
Apple v. Masimo
IPR2024-00242

received in evidence.)

MS. SWAROOP: We will do that, Your Honor. Thank you.

JUDGE BHATTACHARYYA: Okay. Thank you.

Anything further before we begin with the witness?

MR. MUELLER: Briefly, Your Honor. The other issue, which we emailed chambers about shortly before the hearing, we continue to have concerns about the time allocation. We're not asking for a ruling right now. We don't want to --

MS. SWAROOP: Your Honor, we would like to get started because --

MR. MUELLER: If I could please finish my sentence.

At the end of the day yesterday Ms. Swaroop said that I had wildly or significantly overstated the time in balance when I said it was three and a half hours more consumed by Masimo.

We checked. It was actually three hours and 30 minutes, which is precisely what I said.

There's two problems that have emerged. Number one, apparently Masimo did not track time on Monday in a granular fashion, objection by objection, witness by witness. We did. We provided those numbers each day to

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Masimo. They haven't accepted our numbers for Monday despite apparently not doing what we did.

The second thing, on meet and confers, they have raised arguments about allocation that we think are incorrect. We're not going to raise them with Your Honor right now. We're going to continue to try to meet and confer about this.

I raise it now, Your Honor, because, as I said at the end of the day yesterday, we will not be able to achieve a 50-50 split of the time for the week unless Masimo confines its cross-examinations to make them quite short. And it's hard for us to see how a rebuttal case on invalidity is possible. It's, of course, up to them how they choose to allocate their time, and I won't -- I won't do their job for them.

But I do think the concerns are significant enough that at the end of the day we may need to raise it again with Your Honor, and perhaps at that time request some rulings.

Right now I'm not requesting anything specific, but I am previewing that we continue to have very significant concerns about the consumption of time. Even without tracking, Your Honor, you have been here, of course, every day to observe the hearing, it's pretty clear Masimo has taken far more time than we have, and at some point that

MASIMO 2029
Apple v. Masimo
IPR2024-00242

needs to change to achieve a 50-50 split.

MS. SWAROOP: Your Honor, the grandstanding that we hear every day from Mr. Mueller is one of the reasons why some of these proceedings are taking so long.

We are ready to begin. Mr. Mueller has no requests for you, yet we're continuing to hear from him. So we're prepared to begin with our witnesses and conduct the hearing.

JUDGE BHATTACHARYYA: One question right now. What are the parties' estimates as to how much time each party has left?

MR. MUELLER: Your Honor, our best estimate is that they have three and three quarters hours. We have seven and one quarter hour, which is three and a half hours more than they have, because they have used three and a half hours more than we have.

I'll let my statements for the week stand for themselves. They're not grandstanding.

JUDGE BHATTACHARYYA: Ms. Swaroop, do you have an estimate of how much time Masimo has left?

MS. SWAROOP: Masimo has left, I think we -- we have calculated that I think we have spent two hours and 45 minutes more than Apple at this point in time. Our original estimate, I think, was at the end of our Masimo witnesses we would be at two hours and 30 minutes more than Apple, which

MASIMO 2029
Apple v. Masimo
IPR2024-00242

makes sense, since we are presenting our direct case on a number of issues that Apple refused to stipulate to.

The balance, which we informed Apple yesterday, is that during today's presentation, when their witnesses are going, they are going to spend way more time than we do.

So we think to it makes sense to revisit this at the end of the day, see where we're at, and we can have a discussion at this point.

JUDGE BHATTACHARYYA: You don't have an estimate right now as to how much time Masimo has left? I understand -- if you don't know, that's fine.

MS. SWAROOP: Thank you, Your Honor. We'll work on getting that number. We've been working on how much time we have and the spread -- as to what the spread we had originally projected, and we are in line with that.

JUDGE BHATTACHARYYA: Okay. Let's go ahead with the witness.

MR. MUELLER: Thank you, Your Honor. We'll resume with Dr. Mehra, please.

SAAHIL MEHRA,

having been previously duly sworn and/or affirmed on his oath, was thereafter examined and testified further as follows:

MR. SELWYN: Your Honor, may we begin on the Apple confidential record, please.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

JUDGE BHATTACHARYYA: Yes.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

MR. MUELLER: Your Honor, as our next witness we call Dr. Ueyn Block, and Ms. Frazier will do the examination.

MS. FRAZIER: Dr. Mehra, assuming it's okay with Her Honor, you are free to go.

JUDGE BHATTACHARYYA: Yes. Thank you for your time.

THE WITNESS: Thanks. Sounds good.

JUDGE BHATTACHARYYA: Good morning, Dr. Block.

THE WITNESS: Good morning.

JUDGE BHATTACHARYYA: Do you understand that you have an obligation to tell the truth here today?

THE WITNESS: Yes.

UEYN BLOCK,

having been first duly sworn and/or affirmed on his oath, was thereafter examined and testified as follows:

JUDGE BHATTACHARYYA: Thank you.

You may proceed.

DIRECT EXAMINATION

BY MS. FRAZIER:

Q. Good morning, Dr. Block.

A. Good morning.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Could you please introduce yourself to Her Honor?
A. Absolutely. My name is Ueyn Block, and I work at Apple.
Q. What is your educational background?
A. I have a Bachelor's degree in physics and mathematics and then got a Master's and a Ph.D. degree in applied physics at Stanford University.
Q. What did you do after you defended your dissertation at Stanford?
A. I went from Stanford to a startup company working on noninvasive biomedical optics devices and stayed there for about six years.
Q. And after that what did you do?
A. I pursued a job at Apple and went directly from that company to Apple.
Q. When did you join Apple?
A. I joined Apple in March of 2013.
Q. Why were you interested in working at Apple?
A. Basically I've been a longtime appreciator of the company since using products dating back all the way to the '80s, and for me it was some kind of a dream job. I had actually tried to get a job there straight out of graduate school but didn't have the right qualifications at that time, so I eventually got there.
Q. Dr. Block, what products have you worked on

MASIMO 2029
Apple v. Masimo
IPR2024-00242

during your time at Apple?

A. Primarily the Apple Watch since I first joined.

Q. Which versions of Apple Watch have you worked on?

A. All of them.

Q. Starting with the first Apple Watch, if I refer to that as the Series 0, will you understand what I'm talking about?

A. Yes.

Q. What were your responsibilities with respect to the Series 0 Apple Watch?

A. When I started, we were at very early stages of doing R&D and prototyping, and I was primarily working on the overall optical architecture of the health sensors for the Series 0 Apple Watch.

Q. And at a high level, what are the components that are part of the optical sensors in Apple Watch Series 0?

A. Components such as the LEDs and photodiodes, the windows and apertures in the back crystal, how they are all arranged and how we create the overall optical architecture.

Q. Now, Dr. Block, next to you in the room is what has been marked as RPX-5.

Do you see that?

A. Yes.

Q. Could you tell us what RPX-5 is? And if you don't mind just holding it up.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. So it's an enclosed Series 0 Apple Watch.

Q. And what -- excuse me. Strike that.

You referred to the back crystal a moment ago. Using RPX-5, could you show Her Honor what the back crystal on the Series 0 is?

A. Sure. So on the back of the watch, the watch has this metal housing, the front has a display, on the rear side there's a circular protruding dome, I'm going to try to hold it close, that sticks out of the metal housing. This circular dome is what we refer to as the back crystal on the Series 0.

MS. FRAZIER: Your Honor, at this point I'd like to go on the Apple confidential record.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

MR. MUELLER: Your Honor, for our next witness we call Dr. Steve Waydo, and Ms. Garcia will do the examination, Nina Garcia.

MS. GARCIA: Good morning, Your Honor. Nina Garcia for Respondent Apple.

JUDGE BHATTACHARYYA: Good morning, Dr. Waydo. I believe you're on mute.

THE WITNESS: Good morning.

JUDGE BHATTACHARYYA: Welcome. Do you understand that you are under an obligation to tell the truth here today?

THE WITNESS: I do.

STEPHEN WAYDO,

having been first duly sworn and/or affirmed on his oath, was thereafter examined and testified as follows:

JUDGE BHATTACHARYYA: You may proceed, counsel.

DIRECT EXAMINATION

BY MS. GARCIA:

Q. Good morning, sir. Would you please introduce yourself? Where do you live? Where do you work?

A. My name is Stephen Waydo. I live in Saratoga, California, and I work for Apple.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. What is your current role at Apple?
A. I'm director of a group called HID Health.
Q. What is HID Health?
A. HID stands for human interface devices. The larger organization builds algorithms for sensors on a variety of Apple products. My team, in particular, is responsible for health algorithms primarily on the Apple Watch.
Q. Dr. Waydo, could you briefly describe your educational history?
A. Yes. I have a Bachelor's degree in aeronautics and astronautics from the University of Washington that I obtained in 2001, and a Ph.D. in control and dynamical systems from Caltech that I obtained in 2007.
Q. What did you do after you received your Ph.D. from Caltech?
A. Before and during graduate school I worked at NASA Jet Propulsion Laboratory in Pasadena, and I continued on there as a full-time employee for about six or eight months after I finished my Ph.D.
Q. Can you give an example of a project that you worked on at NASA Jet Propulsion Lab?
A. Yes. I worked on a variety of robotic heat space exploration missions. The biggest one was a mission called Deep Impact that flew out and took pictures of a comet in

MASIMO 2029
Apple v. Masimo
IPR2024-00242

2005.

(Clarification by reporter.)

Q. Did you work anywhere else before joining Apple?

A. Yes. After JPL I worked at a startup called C8 Medisensors for about four and a half years. At C8 we were trying to build a noninvasive glucose measuring device.

Q. When did you join Apple?

A. I joined Apple in March of 2013.

Q. What motivated you to join Apple, Dr. Waydo?

A. Well, the startup I worked at was ultimately unsuccessful, but I got very excited about the prospect of the building consumer products, and I thought Apple offered a tremendous learning opportunity to learn from the best about how to build products, and to have the opportunity to ship something at very large scale.

Q. And when you joined Apple in 2013, were you hired for a specific product?

A. I was, although I didn't know it at the time. So the interview process is very secretive. But I knew I would be working on products, and I was informed on my first day that the -- that I would be working on the first generation Apple Watch.

Q. What features did you work on for the first generation Apple Watch?

A. I worked on the algorithm supporting heart rate

MASIMO 2029
Apple v. Masimo
IPR2024-00242

sensing as well as wrist detection on the first Apple Watch.

Q. And what specifically was your role in developing the heart rate sensor for that first watch?

A. The biggest part of my role was working together with the hardware team to make sure that the hardware sensors they were building were a good fit for the algorithms we were building for particular end user applications. And by the time we shipped that first watch, I was responsible overall for the heart rate algorithm development.

Q. Can you tell us briefly about the hardware and software used for the heart rate sensing?

MS. GARCIA: Your Honor, at this point we would like to move onto the Apple confidential record.

JUDGE BHATTACHARYYA: We're moving onto the Apple confidential record.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: We're moving to the public record.

THE WITNESS: Okay.

BY MS. SWAROOP:

Q. Dr. Waydo, I believe in your direct testimony you said that you wanted to join Apple because you wanted to learn from the best, correct?

A. Yes.

Q. Okay. And, Dr. Waydo, are you aware that Apple has hired individuals from Masimo?

A. Yes.

Q. You know Mike O'Reilly, correct?

A. I do.

Q. You worked with Mike O'Reilly, correct?

A. Yes.

Q. And you filed a patent application with Mike O'Reilly; isn't that correct?

A. It's possible. I don't know for sure.

Q. Okay. Let's bring up CX-1684. It's in your binder. And we'll put it up on the screen.

Dr. Waydo, this is a published patent application filed by Apple naming you and Michael O'Reilly among the inventors; isn't that right?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Yes.

Q. Dr. Waydo, in your direct testimony you discussed the heart rate sensing feature of the Series 0 watch; isn't that right?

A. Yes.

Q. Okay. And that watch involved a heart rate measurement, correct?

A. Yes.

Q. Okay. And the measurement of oxygen saturation is a more difficult measurement than the heart rate measurement, correct?

A. It's different for sure.

Q. It's more difficult, isn't it, Dr. Waydo?

A. It's very different. It solves a different set of problems. I don't know that I would characterize it as more difficult.

Q. Okay. Let's go to your deposition, which is in your binder, and we'll take a look at pages -- page 163, line 15, to 164, line 3.

A. Can you tell me where in my binder I can find that?

Q. It should be in your binder, if there's a tab there, I believe it's CX-298C.

A. Okay. And then what pages?

Q. Page 164 -- sorry -- page 163, line 15, to 164,

MASIMO 2029
Apple v. Masimo
IPR2024-00242

line 3, and I have it up on the screen as well.

A. Okay.

Q. And the question was from your own counsel:

What was your reaction to receiving the assignment of helping develop the blood oxygen feature for the Apple Watch?

And your answer:

I was both excited and, I'd say, intimidated. It's a more difficult measurement than the heart rate measurement, and, however, embarking on a new sensing development project is always exciting and quite a ride. So I was looking forward to it.

Were you asked that question and did you give that answer at your deposition, Dr. Waydo?

A. Yes.

Q. Okay. So you would agree, then, that oxygen saturation is a more difficult measurement than heart rate measurement, correct?

A. It depends very much on the context, but in some contexts, yes.

Q. Okay. And, in fact, it was extremely challenging to develop the blood oxygen feature in the Apple Watch, correct?

A. Yes.

Q. Now you've been involved in assessing the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

accuracy of the blood oxygen feature of the Apple Watch, correct?

A. Not in a hands-on way, but I reviewed the data.

Q. You understand when talking about accuracy that there's a difference between sensitivity on the one hand and specificity on the other hand, correct?

A. Yes.

Q. And let's talk first about sensitivity.

An Apple Watch that detects everyone who has a particular medical condition would be an example of a highly sensitive device, correct?

A. Yes.

Q. Okay. And that's different from specificity, correct?

A. That's correct.

Q. Okay. An Apple Watch that detects medical conditions in people who do not actually have that medical condition would be an example of a device with low specificity, correct?

A. Yes.

Q. Okay. And in your direct today you didn't present any information on false alarms, that is, people who went to seek out medical care or thought something was wrong with them based on something from the Apple Watch but had no reason to do so, correct?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Presented nothing to that effect, that's correct.
Q. Okay. Did you ever work with Chin San Han in 2013?
A. Yes.
Q. Are you aware that Mr. Han tore apart a Masimo reflectance sensor during that time period?
MS. GARCIA: Objection, Your Honor. This lacks foundation.
JUDGE BHATTACHARYYA: Ms. Swaroop?
MS. SWAROOP: I'm simply asking if he is aware, Your Honor.
JUDGE BHATTACHARYYA: The objection is overruled.
A. Not that I can recall.
Q. Dr. Waydo, there has been feedback in the press about the unreliability of the blood oxygen feature of the Apple Watch Series 6, correct?
A. There's been a wide variety of feedback in the press about the product, both positive and negative.
Q. Okay. Well, let's talk about some of that feedback. Let's go to CX-1606 in your book, and I'm also going to put it on the screen. It's an article from Input Mag titled, quote, The Apple Watch's blood oxygen sensor is less accurate than you think.
Do you see that?
A. I see that.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Okay. And let's turn to page 2. Let's go to the "Check with your doctor" paragraph. In this article it says, quote, some day Apple's blood oxygen monitoring could be accurate enough to actually detect medical conditions, but right now it's more of a gimmick than anything else.

Is that correct, Dr. Waydo?

A. That's what this article says.

Q. Right. Let's go to CX-1608 in your book. This is an article from the Verge entitled Apple Watch Series 6 review, minute improvements.

Do you see that?

A. What page are we looking at here?

Q. Sure. We're at CX-1608, page 1.

A. Okay.

Q. Okay. And if we go to page 2, there's a heading, "bad stuff."

Do you see that?

A. I see that.

Q. And the third bullet point, "blood oxygen monitoring is unreliable."

Do you see that?

A. I see that. I think here they are referring to difficulties getting successful measurements, because we tried very hard not to produce inaccurate measurements.

MS. SWAROOP: Okay. We need to go to the Apple

MASIMO 2029
Apple v. Masimo
IPR2024-00242

CBI record at this point.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

BY MS. SWAROOP:

Q. Dr. Waydo, you've been aware of Masimo since 2010, correct?

A. I think so.

Q. Okay. And you're aware of Masimo's products, correct?

A. Not by model number, but generally speaking, yes.

Q. Okay. And in the specific area of clinical and in-hospital monitoring, you consider Masimo to be an important player and a leader; isn't that right, Dr. Waydo?

A. I believe they are an important player.

Q. And a leader, correct?

A. I don't know. I'm not deeply familiar with the clinical market.

Q. Okay. Well, let's go to your deposition. It's in your binder, CX-298C, page 127, line 25, to 128, line 6.

A. Can you repeat the page number again, please?

Q. Sure. Page 127, line 25 to 128, line 6.

A. Okay.

Q. And you were asked:

And do you consider Masimo to be a leader in that field as well?

And you answered:

MASIMO 2029
Apple v. Masimo
IPR2024-00242

I consider Masimo to be an important player and a leader just specifically in the area of clinical and in-hospital monitoring.

Do you see that?

A. Yes. Masimo is certainly a market leader. I don't know the extent to which they are a technology leader.

Q. So you were asked that question and you gave that answer at your deposition, right, Dr. Waydo?

A. Yes.

Q. Thank you.

MS. SWAROOP: I have no further questions.

MS. GARCIA: Brief redirect, Your Honor.

REDIRECT EXAMINATION

JUDGE BHATTACHARYYA: Yes, go ahead. We're on the public record. Do you want to stay on the public record?

MS. GARCIA: No, Your Honor. We'll briefly go on the confidential record please.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: We're moving to the public record.

BY MS. GARCIA:

Q. Dr. Waydo, you were also shown some articles that purported to describe the accuracy of Apple Watch.

Do you recall that?

A. Yes.

Q. Now as a factual matter, based on your work developing the blood oxygen feature, how accurate are the measurements that are presented to users?

A. We've tested the watch to the same standards that are used to assess clinical grade devices, and we meet the general accepted standards for accuracy of blood oxygen devices.

Q. Dr. Waydo, you were asked some questions about Dr. O'Reilly.

Do you recall that?

A. Yes.

Q. Did Dr. O'Reilly contribute any ideas to the software or hardware of the Apple Watch blood oxygen sensors?

MS. SWAROOP: Objection, foundation.

MS. GARCIA: I can restate it.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Dr. Waydo, what role, if any, did Dr. O'Reilly have on your health sensing algorithm team with respect to the development of the blood oxygen feature?

A. Dr. O'Reilly is an anesthesiologist. He has extensive knowledge around the physiological, that's in general, and physiological of PPG signals in particular, but he has no engineering expertise and had no contributions to the hardware or software.

Q. Who did come up with the ideas for the software and hardware of Apple Watch and the blood oxygen feature?

A. The majority of the work happened between the health sensing hardware team, I believe we have heard from a few of them in this hearing, as well as my team.

Q. Did any of those ideas come from Masimo?

A. No.

Q. Thank you, Dr. Waydo.

MS. GARCIA: I have no further questions at this time.

RECROSS-EXAMINATION

BY MS. SWAROOP:

Q. Ms. Garcia asked you about your familiarity of accuracy with the Apple Watch health sensing features.

Do you recall that?

A. Yes.

Q. Okay. Are you aware of a published study from

MASIMO 2029
Apple v. Masimo
IPR2024-00242

the Mayo Clinic indicating that the Apple Watch triggers a number of false alarms causing people to go to the hospital and resulting in unnecessary utilization of hospital resources?

A. We have a number of problems with that particular study and the methodology there in general, but I'm aware of the paper you're talking about.

Q. Thank you.

MS. SWAROOP: No further questions.

MS. GARCIA: Nothing further, Your Honor.

Thank you, Dr. Waydo.

JUDGE BHATTACHARYYA: Thank you for your time, Dr. Waydo.

THE WITNESS: Thank you.

MR. MUELLER: We certainly defer to Your Honor, but this might be a good time for the morning break before our next witness.

JUDGE BHATTACHARYYA: It sounds like a good idea. Let's take a morning break now. We're in recess for 15 minutes.

(Whereupon the proceedings recessed at 11:07 a.m.)s.

(In session at 11:23 a.m.)

JUDGE BHATTACHARYYA: We're back on the record.

MR. MUELLER: Thank you, Your Honor. Apple calls

MASIMO 2029
Apple v. Masimo
IPR2024-00242

as its next witness Brian Land.

JUDGE BHATTACHARYYA: Good morning, Mr. Land. Do you understand you're under an obligation to tell the truth in your testimony today?

THE WITNESS: Yes.

BRIAN LAND,

having been first duly sworn and/or affirmed on his oath, was thereafter examined and testified as follows:

JUDGE BHATTACHARYYA: Thank you.

MR. MUELLER: May I proceed, Your Honor?

JUDGE BHATTACHARYYA: Yes, please.

DIRECT EXAMINATION

BY MR. MUELLER:

Q. Good morning, Mr. Land. Could you please introduce yourself to Her Honor?

A. Yes. My name is Brian Land. I live in Woodside, California, and I work at Apple.

Q. Sir, could you please describe your educational background starting with college?

A. Yes. I have a Bachelor's of Science in Material Science and Engineering from Cornell University, and I have a Master of Science in Material Science and Engineering from Stanford University.

Q. Mr. Land, what year did you earn your Master's

MASIMO 2029
Apple v. Masimo
IPR2024-00242

from Stanford?

A. 1992.

Q. And what did you do next?

A. I went for work -- to work at a startup company that designed sensors, specifically gyroscopes and applications that integrated sensors and gyroscopes.

Q. What was the name of that company?

A. It was called Gyration.

Q. For how long did you work at Gyration?

A. I worked there 12 years.

Q. What type of work did you do in that time?

A. It was a small company. It was a startup, so I had to wear a lot of hats. But the main tasks were designing gyroscopes, designing test equipment, and manufacturing equipment to build and test gyroscopes, and then designing applications that integrated the gyroscopes into bigger systems that we could try to sell to customers.

Q. Sir, what did you find interesting about working on these types of sensors?

A. Well, I really like sensors because they require engineering knowledge across multiple domains, examples being electrical, mechanical, physics. And the best design requires really an understanding of all of them, and so I got to apply many engineering skills. And I also particularly like sensors because they interface with the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

world at large, they tell us something about the outside world, and the world is complex, and, because it's complex, it's a challenging engineering problem.

Q. Now, sir, when did you leave Gyration to go to work at Apple?

A. It was spring of 2005.

Q. And why did you make the decision to join Apple?

A. Gyration was -- I really enjoyed working there, but it was a small company and the products that we sold were sold in modest numbers, and we did excellent engineering work, we made great products, but I felt like I had an opportunity to make a bigger impact at a company like Apple, which is, you know, has been a premier company in the electronics and computer space for many years.

Q. What is your current position at Apple?

A. It's -- my title is distinguished engineer.

Q. Sir, what does it mean to be a distinguished engineer at Apple?

A. It's a title and a job level that is granted upon engineers and technical people at Apple who have achieved technical excellence during their time at Apple in developing Apple products.

Q. And, Mr. Land, in your responsibilities as a distinguished engineer today, which group do you work with at Apple?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. I lead a hardware development team called Health Sensing Hardware.

Q. How many engineers work under your supervision?

A. It's about 55 or 56.

Q. Which Apple products does the Health Sensing Hardware Group that you head up contribute to, which Apple product in the market today?

A. It's primarily the Apple Watch, the health sensors for the Apple Watch.

Q. Now I want to just briefly rewind to when you joined the company and the period between when you joined Apple and when you began working on Apple Watch.

Do you have that time period in mind?

A. Yes.

Q. In that time period, sir, what were some of the other products that you worked on?

A. I've worked on many types of Apple products. I worked on the first iPhone. I've worked -- I developed -- I was part of the team that developed the touchscreen for the first iPhone. I was part of the team that developed the touchscreen for the first iPad.

I've also worked on optical sensors, such as an optical proximity sensor, which would be used in a phone to turn the screen off when you bring it near your head so your cheek doesn't push a button by mistake.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

I've also worked on ambient light sensors, which look out into the room to determine how bright the room is, or if you're outdoors and can adjust the screen brightness to a level that's appropriate for the room brightness.

Q. Fair to say, you and your colleagues at Apple had worked on many different types of sensors before the Apple Watch?

A. Yes.

Q. Let me take you to the Apple Watch. The very first Apple Watch was called the Series 0; is that right, sir?

A. Yes, that's correct.

Q. And that was released to the general public in April of 2015. Do I have that right?

MR. RE: Leading, Your Honor.

A. Yes, I think that's approximately correct. It was in the spring of 2015.

JUDGE BHATTACHARYYA: I didn't rule on the objection.

Mr. Mueller, can you rephrase so it's not leading.

MR. MUELLER: Sure.

Q. When was the first Apple Watch, the Series 0, released to the general public?

A. It was the spring of 2015. I don't remember the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

exact date.

Q. And when did you personally start work on what became the Series 0?

A. It would have been fall of 2012.

Q. What were your responsibilities with respect to the Series 0?

A. I was in charge of the team that was tasked with developing multiple optical sensors for the Apple Watch. There were three.

One was the optical heart rate monitor, the second was a optical, what we called wrist detection sensor, which could determine when you removed the watch from your wrist for purposes of data security, it would lock the watch up if you removed it from your wrist, and I also worked on the ambient light sensor for the Apple Watch.

Q. Let's focus, if we could, on the heart rate sensor.

What were some of the engineering challenges that you and your colleagues confronted in designing the heart rate sensor for the Series 0?

A. Well, first of all, making a heart rate measurement at the wrist was particularly challenging because the wrist doesn't have a lot of blood volume there to measure optically. But even on top of that, which was already a daunting problem, we had to fit into a very small

MASIMO 2029
Apple v. Masimo
IPR2024-00242

product. As I mentioned, I've worked on many products, and the watch was the smallest of all of them. So we did not have much space to fit the sensor itself.

The battery was small, so we had to make sure that the heart rate worked with as low power as possible. And we also had to work, because it was a mobile device, we had to work in all these use cases throughout the day for people, people are different size, different shapes, they choose different bands, they choose different tightness of bands, and we needed to make sure that the heart rate monitor worked well in all the use cases that our customers would expect.

Q. Mr. Land, what was the engineering impact, if any, of the industrial design of the Apple Watch?

A. Yeah. Industrial design is an important part of the Apple product. It defines, not only the outside shape of the product, but the look and the feel, and the design language, the aesthetics.

So we not only had to make a product that checked all the boxes of low power, fit in this tiny form factor, worked well across all the use cases, but we also had to make sure that it was beautiful and compatible with the look and feel of what the ID studio was going for for the product vision.

Q. Now you succeeded in meeting these challenges.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Do I have that right?

A. Yes.

Q. And what were some of the components in the heart rate sensor for the Series 0 watch?

A. We had an LED package, which had a couple of different LED wavelengths in it, and we had packaged photodiodes so LEDs emitted light, the photodiodes collected the light.

We also had the apertures that the LEDs and photodiodes were lined up to shine light through, and we also had optical barriers to provide isolation internally. And we built a custom electrical chipset that drove the LEDs and processed signals from the photodiodes.

Q. Mr. Land, what was the shape of the back crystal in the Series 0 watch?

A. It was dome-shaped.

Q. Why was it dome-shaped?

A. My understanding is the primary reason that it was dome-shaped was to provide a little extra space to fit the coils that were part of the wireless charging system. The Apple Watch charges wirelessly through a dock that has a complementary shape, and the dome-shape, when in combination with the charging cradle, in addition to providing additional space for the charging coils, it also provides a self-centering mechanism so that, when you place it on the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

cradle, it aligns itself well to the other -- the charger for efficient wireless charging.

MR. MUELLER: Your Honor, if we could go on the Apple confidential record.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Moving to the public record.

BY MR. MUELLER:

Q. Now, sir, the health sensing hardware developed by your team, there are, of course, other components beyond that hardware in the Apple Watch; is that fair?

A. Yes.

Q. Let's take a look at RX-0319. And this is a public technical specification for the Apple Watch Series 6.

Can you give Her Honor just a few examples of other features and functions in the Series 6 beyond the features developed by your team?

A. Yes. There's audio, which can be used to listen to music or make a phone call, speaker microphone. There are motion sensors that can be used to track your motion, steps, your calories burnt through the day. There is a near-field communication sensor that you can use for a point-of-sale display.

There's all sorts of wireless connectivity, Bluetooth, Wi-Fi, including cellular networks for network connectivity, and that's one of the particularly challenging module that's in the Apple Watch, because there's a powerful transmitter that needs to talk with cell phone towers that

MASIMO 2029
Apple v. Masimo
IPR2024-00242

are perhaps miles away, and that's a potential source of interference for all the sensors.

There's also other health sensors. There's an ECG sensor. There's a touchscreen. There's -- and it's really kind of a miniature computer in addition to all the sensors.

Q. If we go to RX-0306, a Watch Series 7 Technical Specification, is there a similarly broad array of features, sir?

A. Yes. The list between Series 6 and Series 7 is quite similar. There's a few I didn't mention, like GPS, to tell you where you are on a map, there's a compass to give you a heading if you're walking through a map, et cetera.

Q. Now I think you touched on some of the challenges posed by all of these different components.

Can you tell us a bit more about the challenges of developing a blood oxygen sensor in light of all of the other components that we see on the specifications that we've gone through?

A. Yes. The Apple Watch is very compact. Everything is co-located in a very tight space. And every single one of these sensors and modules is run by electricity. It can be a source of interference, interference into the blood oxygen sensor.

And we had to, in addition to making an excellent

MASIMO 2029
Apple v. Masimo
IPR2024-00242

blood oxygen sensor, we also had to consider all of these interference sources and design the integration of the blood oxygen sensor into the watch in a way that avoided these interference sources and worked under the use cases that we care about.

Q. And were you able to develop a reliable, accurate sensor, notwithstanding those challenges?

A. Yes, we were.

Q. Now last few questions. You understand there's five patents that are being asserted by the Complainants in this case?

A. Yes.

Q. Before this investigation, Mr. Land, had you heard or seen anything about these five patents?

A. No.

Q. You are the head of the Health Sensing Hardware team at Apple for the Apple Watch; is that correct?

A. Yes.

Q. To the best of your knowledge, sir, did any of the software or hardware developed by your team come from ideas that originated at Masimo?

A. No.

Q. Did Marcelo Lamego contribute any ideas to the software or hardware of the Apple Watch?

A. No.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Did Dr. Michael O'Reilly contribute to the ideas to the software or hardware of the Apple Watch?

A. No.

Q. Who did come up with the ideas for the software and hardware for the blood oxygen sensor in the Apple Watch?

A. My team in conjunction with Steve Waydo's team did all of the work to develop the blood oxygen sensor of the Apple Watch.

Q. My final question. Are you proud of the work of you and your team?

A. Yes, absolutely.

MR. MUELLER: Thank you, sir.

I pass the witness, Your Honor.

CROSS-EXAMINATION

BY MR. RE:

Q. Good morning, Mr. Land. My name is Joseph Re. Nice to meet you.

A. Nice to meet you.

Q. Are you at least generally aware of how Apple markets the Series 6 and Series 7 watches?

A. Somewhat, yes, a little bit.

Q. And are you aware of the fact that Apple has made a conscious effort to move from the consumer space into the health care space?

A. No.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Have you ever looked at Apple's websites, particularly Apple Health Care?

A. Apple Health Care? I'm not aware of that website.

Q. Are you aware of how Apple markets the watch to clinicians and doctors and hospitals on their website?

A. No.

Q. Are you aware of any company directive or announcement that Apple is making an effort to move from consumer electronics into the health care sector?

A. I'm sorry. Can you repeat the question? I didn't follow.

Q. Are you aware of any company directive, announcement, speech where Apple has made it very clear to the world that they are moving from the consumer space into health care and hospitals?

A. No.

Q. Okay. Let me take a look and show you --

We're going to go on the Apple confidential portion.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Welcome, Dr. Mannheimer.

Do you understand that you are under an obligation to tell the truth in your testimony today?

THE WITNESS: I do.

PAUL MANNHEIMER,

having been first duly sworn and/or affirmed on their oath, was thereafter examined and testified as follows:

JUDGE BHATTACHARYYA: Go ahead, Mr. Mueller.

MR. MUELLER: It looks like we may have lost the witness. There we go. We're ready to proceed.

JUDGE BHATTACHARYYA: Sounds good.

DIRECT EXAMINATION

BY MR. MUELLER:

Q. Good afternoon, Dr. Mannheimer. Can you please introduce yourself to Her Honor?

A. Yes. Your Honor, my name is Paul Mannheimer. I live in Los Altos and I work at Apple.

Q. Sir, what is your role at Apple?

A. I'm a sensor architect and scientist.

Q. What is your educational background starting with college?

A. I have my undergraduate degree in physics from

MASIMO 2029
Apple v. Masimo
IPR2024-00242

the University of California at Berkeley.

Q. Did you earn any graduate degrees over the years?

A. Yes. I obtained My master's degree in applied physics from Stanford University, and my Ph.D. from the University of Lubeck in Germany in biomedical engineering.

Q. Now when did you start to work for Apple?

A. At the very end of 2014.

Q. Before you worked at Apple what were you doing?

A. Just prior to joining Apple I was an independent consultant with my own consulting practice.

Q. And before serving as an independent consultant, did you work at another company?

A. Yes, I did. I worked at Nellcor. Although at the time they were Covidien, when I left, but it was Nellcor and then a variety of flavors of Nellcor.

Q. Dr. Mannheimer, for how long did you work at Nellcor?

A. I believe it was around 21 years.

Q. And would that be from around 1987 to 2008?

A. Yes, that's correct.

Q. What did you do in those 20-plus years at Nellcor?

A. I developed pulse oximetry sensors, some monitoring techniques, alarm handling techniques, I did clinical studies, a variety of roles.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Let me put up on the screen RDX-3.02, and, Dr. Mannheimer, what are we looking at on the left-hand side of the of the screen?

A. Those are Nellcor products, patient bedside monitors, and a portable monitor at the bottom that uses pulse oximetry technology.

Q. And, sir, what setting were these Nellcor products designed for?

A. These were prescription-use pulse oximeters intended for use in the hospital or a home care or other critical and home-use settings.

Q. Now, in your time at Nellcor, did you become familiar with Masimo?

A. Yes.

Q. And how are Nellcor and Masimo situated in the industry as compared to each other?

A. They were competitors to one another.

Q. Did you become familiar, at a high level, with the Masimo product offerings in your years at Nellcor?

A. Of that era, yes, I was.

Q. If we could go to RDX-3.02.

What are we looking at here on the right-hand side of the screen?

A. Those are Masimo bedside monitors and portable akin to what we see on the left.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Now what are some of the key considerations that you had to deal with personally in working on clinical products at Nellcor?

A. Well, they need to be reliable, accurate, they monitor continuously as a bedside safety monitor, relied upon by clinicians. The readings that were provided were generally interpreted by clinicians, and -- that's the bulk of it that I would call out.

Q. Now you joined Apple in 2014; is that right, sir?

A. Yes.

Q. Why did you decide to join Apple?

A. I had received a recruiting email from the Apple recruiter that said they were interested. I was intrigued, because I didn't exactly know why. Shortly after, the company had their launch, early September of 2014, announcing the watch, and so I got introduced to this concept of heart rate monitoring and consumer wearables. I knew there were people at Apple from -- with medical backgrounds but did not know other than what the blog sphere suggested that they might have been working on.

After meeting a few of the people during my interview process, it seemed like it would be a very interesting place to be and an interesting time to work in a consumer environment, consumer product environment.

Q. When you joined Apple in 2014, what assignment

MASIMO 2029
Apple v. Masimo
IPR2024-00242

were you given?

A. I didn't know what it was at the time of the interview, but after joining, and several days later, Brian Land told me that I would be asked to look into doing pulse oximetry at the wrist for the Apple Watch.

Q. And you joined, to be clear, Mr. Land's health sensing hardware team?

A. Yes, that's correct.

Q. Now let's pull up RDX-03.03.

MR. MUELLER: And let me go on the Apple confidential record at this point to be safe.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Moving back to the public record.

BY MR. MUELLER:

Q. Dr. Mannheimer, just a few more questions.

There's been some suggestions in this hearing that the blood oxygen sensor in the Apple Watch is inaccurate.

Based on your own personal experience, as a factual matter, is it accurate?

A. Absolutely, it is. Relative to the ISO standard, which says the accuracy is calculated as a root means square when tested in the manner precisely like we did from a study protocol perspective, as we did at UC San Francisco, against blood draws measured in a cooximeter, as well as the FDA guidance, which is a similar document more specific to U.S. use, recognizes the international standard plus some additional requirements, and additional set of accuracy requirements, the Apple Watch that we characterized meets both the FDA and the ISO standard guidance for accuracy.

Q. Dr. Mannheimer, this case involves five patents asserted by the Complainants.

Before this investigation had you ever heard of any of them?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. No, I had not.

Q. Dr. Mannheimer, you were part of the research and development project that resulted in the blood oxygen sensor in the Series 6 and Series 7 watch, right?

A. Yes.

Q. In fact, fair to say you were at the heart of that R&D process?

A. Yes.

Q. Dr. Mannheimer, did any, any, of the sensors, hardware and software, come from Masimo?

A. No.

MR. JENSEN: Object, Your Honor, lacks foundation.

JUDGE BHATTACHARYYA: Would you explain a little further?

MR. JENSEN: How would he know whether the other people did or did not rely upon Masimo information? He can only know what he relied upon, not what was in their heads.

MR. MUELLER: I can rephrase, Your Honor.

JUDGE BHATTACHARYYA: Okay. Please do.

BY MR. MUELLER:

Q. From your position at the heart of the research and development of the blood oxygen sensor for the Apple Watch, have you, Dr. Mannheimer, personally seen any evidence that any of the software or hardware came from

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Masimo ideas?

A. No, I have not.

Q. Who actually developed the software and the hardware in the blood oxygen sensor in the Apple Watch Series 6 and Series 7?

A. The folks from my team in Brian's organization and the HID team under Steve's organization.

Q. Thank you, sir.

MR. MUELLER: I have no further questions at this time, and I pass the witness, Your Honor.

MR. JENSEN: May I proceed, Your Honor?

JUDGE BHATTACHARYYA: Yes, please go ahead.

CROSS-EXAMINATION

BY MR. JENSEN:

Q. Good morning for me, Dr. Mannheimer. I think it's your afternoon or getting close.

A. Yes.

Q. My name is Steven Jensen, one of Masimo's lawyers. Good to meet you. I think we met in the '90s. I will be asking you some questions today.

Before we begin, you should have a sealed package or an envelope there that you are welcome to open now. We will be looking at some of the documents in there.

Is it in the room with you?

A. Yes.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. If you could open that.

If I heard your testimony correctly, you've been designing pulse oximetry sensors and pulse oximetry systems for decades, correct?

A. Yes.

Q. If I heard you right, you worked on pulse oximetry at Nellcor from 1987 to 2008; is that correct?

A. Yes.

Q. And so if I calculated in my head right, you were part of the pulse oximetry team at Nellcor during the development and introduction of at least the M3000, the O4, the O5, the O5CI, and the N600 pulse oximeters; is that correct?

A. Yes, that's correct.

Q. Did I miss any?

A. I don't recall if there were additional form factors that were created.

Q. But at least those technologies you were involved with the development, correct?

A. Yes.

Q. And you were at Nellcor in 2004 and testified for Nellcor in a patent trial between Masimo and Nellcor, did you not?

A. Yes.

MR. MUELLER: Your Honor -- I'm sorry,

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Dr. Mannheimer. Just give me a moment here.

I'm going to object on relevance grounds to discussion of another litigation involving unrelated patents asserted against products of another company developed in another time period. I don't think it's relevant to this case what the infringement allegations were made in another case involving different patents against a different company.

MR. JENSEN: Your Honor, I didn't ask any questions about the content of that case, and it just simply goes to bias and the high priority objection on this issue was overruled on the Phillips decision, but I do not plan to ask any questions about the content of that case, one question only, the one I just asked.

JUDGE BHATTACHARYYA: The objection is overruled.

Q. So did you answer my question? You testified in that trial, correct?

A. Yes.

Q. Over the years you have designed many sensors for different body locations, correct?

A. Yes.

Q. And I mean pulse oximetry sensors in that, correct?

A. That's how I interpreted it, yes.

Q. And you have filed and been granted many patents

MASIMO 2029
Apple v. Masimo
IPR2024-00242

on your pulse oximetry ideas, correct?

A. Correct.

MR. JENSEN: At this time, Your Honor, I'm going to need to the move to the Apple confidential record.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

AFTERNOON SESSION

(In session at 2:00 p.m.)

JUDGE BHATTACHARYYA: We're on the public record.

MR. MUELLER: Thank you, Your Honor. We would like to call as our next witness Scott Cromar.

Hello, Mr. Cromar.

THE WITNESS: Good morning or good afternoon. Can you hear me and see me okay?

JUDGE BHATTACHARYYA: I can.

THE WITNESS: Okay. Great.

JUDGE BHATTACHARYYA: Do you understand that you're under an obligation to tell the truth here today?

THE WITNESS: Yes.

SCOTT CROMAR,

having been first duly sworn and/or affirmed on his oath, was thereafter examined and testified as follows:

JUDGE BHATTACHARYYA: Proceed, counsel.

DIRECT EXAMINATION

BY MR. MUELLER:

Q. Good afternoon, Mr. Cromar. My name is Joe Mueller, and I'd like to ask you a few questions, if I could.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Okay.
Q. Mr. Cromar, you are an attorney, correct?
A. Yes, that's correct.
Q. And you prosecute patents, right, sir?
A. Yes.
Q. You've prosecuted in the range of a hundred or so patents for Masimo or Cercacor, correct?
A. I don't know what the specific number is. That might be right. Something like that, quite a few.
Q. Now, sir, you're a partner at Knobbe Martens, right?
A. Yes, that's right.
Q. That's the same firm as Mr. Re and Ms. Swaroop and their colleagues, correct?
A. Yes.
Q. Now you, sir, were the prosecutor and helped primary responsibility for the prosecution of three of the patents in this investigation; is that fair?
A. Yes, that's right.
Q. The '501, '502, and '648, correct?
A. Correct.
Q. Now the original priority application for those patents was filed in 2008, right?
A. Are you referring to the provisionals that the patents-in-suit claim priority to?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. That's correct, sir.
A. I believe there were multiple provisionals, so they were -- I think they were filed in 2008 in different times in 2008.
Q. Now the '501, '502, and '648 were filed on September 24th of the year 2000, right? I'm sorry. 2020. I misspoke. 2020. Is that right, sir?
A. That's consistent with my recollection at the moment. I would have to look at the files just to confirm that that date is correct, but I believe that's correct.
Q. Just to make this a little easier, if we could go to tab 1 in the binder that you should have in front of you. This is your deposition from this case. You were deposed, right, sir?
A. Yes, I was deposed. I don't know for sure which binder you're referring to. I have a binder that says Cromar direct on it and there's also a sealed envelope.
Q. You can open the sealed envelope right now, sir.
A. Okay. Let me grab that. I was told that I should open this on camera; is that correct?
Q. Go right ahead.
A. All right. So I think, is this the binder that you're referring to?
Q. Yes, tab 1, please, sir. Page 108, lines 14-17. We can put these up on the screen too.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Question. Okay. So you filed the applications for the '501, '502, and '648 patents on the same day, that was September 24th, 2020, correct?

Answer. I believe that's correct.

Does that refresh your memory, sir?

A. Sorry. You got a little ahead of me. I was trying to open to the correct page. So you said it's page 108?

Q. No -- that's right -- 108, lines 14-17, please, sir.

A. Okay. I'm there now.

Q. And you see here, you were asked whether you filed these three patents on the same day, September 24th, 2020, correct?

A. Correct. I believe that's the correct date, but I would have to go verify that by looking at the file histories.

Q. Now that's 12 years after 2008, right?

A. Yes. You're asking for the difference between the year 2008 and the year 2020, correct?

Q. Twelve years, right?

A. That would be 12 years, that's right.

Q. Now you couldn't identify at your deposition any reason why, for example, the application for the '501 patent could not have been filed earlier than September of 2020,

MASIMO 2029
Apple v. Masimo
IPR2024-00242

correct?

A. I don't know that that's correct. Can I refresh my recollection, or do you have something that can remind me?

Q. Absolutely. Let's go to page 90 in your deposition, lines 2-11.

Question. Sitting here today, you cannot identify any reason why the application for the '501 patent could not have been filed earlier than September 2020, correct?

Yeah. Again, I -- I haven't formed an opinion on that, and I don't feel comfortable doing so as we sit here.

Were you asked that question and did you give that answer?

A. Yes, that's correct. I believe my answer to the question was that I haven't formed an opinion on it, and, you know, at the time I hadn't formed an opinion on it.

Q. Let's pull up CX-1287. This is a press release for the release of the Apple Watch Series 6. Let me just focus you on the date.

Do you see September 15th, 2020?

A. Yeah, I see that on the screen.

Q. That's nine days before you filed the applications that led to the '501, '502, and '648 patents, correct?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Just to confirm, I understand the question correctly, you're asking for the difference between September 15th, 2020, and September 24th, 2020?

Q. Nine days, right?

A. Yes, there's -- that would be nine days, that's right.

Q. Now over the course of the prosecution of these three patents, the '501, '502, and '648, you had access to confidential teardowns of the Apple Series 6 watch, correct?

A. I am not sure -- the question sounds kind of like it's potentially getting into privileged information, and I'm not sure if I can answer.

Q. Let me take you to your deposition, at page 245, lines 12-18.

Question. Did you see those nonpublic teardowns of the Apple Watch Series 6 during prosecution of the '501, '502, and '648 patents?

The Witness: Yes, I think so.

Were you asked that question and did you give that answer?

A. I'm getting to that page. I see that, yes, I believe that's correct.

Q. Now at your deposition you did not answer because you said you could not answer without revealing privileged information the following question:

MASIMO 2029
Apple v. Masimo
IPR2024-00242

You drafted the claims of the '501 patent application to cover Apple Watch products.

At your deposition you were unable to answer that question without revealing privileged information, true?

MR. RE: Objection, Your Honor, again, seeing an adverse inference from the assertion of the privilege which is wholly improper and unethical.

MR. MUELLER: It's neither improper nor unethical, Your Honor. Right now I'm not asking for any adverse inference; I'm asking for the facts.

MR. RE: No, the privilege has been asserted. I don't see why you're asking questions where you know the privilege has been asserted.

MR. MUELLER: Your Honor, what I asked was, you couldn't answer the question on the grounds that it would reveal privileged information. This is precisely the same question we asked an earlier witness in the hearing, Your Honor.

MR. RE: Sounds like we're in agreement.

MR. MUELLER: That was not a sustained objection. The question was permitted. I'm asking the exact same form of the question now.

JUDGE BHATTACHARYYA: I'll allow the question.

Mr. Re, to the extent you want to argue, there shouldn't be any adverse inference.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

MR. RE: I'm sorry. I didn't hear Your Honor. There was some noise from another room.

JUDGE BHATTACHARYYA: To the extent you want to argue that there should not be any inference, adverse inference from that testimony, you're free to make that argument, but I'm not going to sustain the objection.

BY MR. MUELLER:

Q. Mr. Cromar, I want to repeat the question just to make sure you have it fresh in mind.

At your deposition you didn't think you could answer without revealing privileged information following question: You drafted the claims of the '501 patent application to cover Apple Watch products.

You were asked that question and you said you couldn't answer it without revealing privileged information, true?

A. Did you want to point me to part of the deposition transcript so I can confirm that that's accurate?

Q. Certainly. Let's go to page 179, lines 13-20.

Question. You drafted the claims of the '501 patent application to cover Apple Watch products, correct?

I don't think I can answer that without revealing privileged information.

Were you asked that question and did you give that answer?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. That seems correct. Like I said earlier, it seems like the question is asking for potentially, you know, protected information, privileged information, so I'm not sure that I can answer it.

Q. Thank you, sir.

MR. MUELLER: I pass the witness.

CROSS-EXAMINATION

BY MR. RE:

Q. Good afternoon or good morning for you, Mr. Cromar.

You were asked about your awareness of the Apple Watch during prosecution. I wonder if you can tell me if there's anything else you can recall with regard to Apple during the prosecution of these applications that Mr. Mueller raised with you.

MR. MUELLER: Your Honor, I'm just going to object to the question to the extent that it elicits information that we were shielded from receiving on the basis of a privilege assertion both at his deposition and just now.

If it's going to be something different, I have no objection, but I do object if we're now going to hear facts that were not given at his deposition and were not given when I just asked him questions a few minutes ago.

MR. RE: Of course.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Only stuff that you know is public and doesn't involve an attorney-client communication.

MR. MUELLER: I'm not sure what that question is referring to, Your Honor, so I object to the form of the question.

JUDGE BHATTACHARYYA: I'm not going to sustain the objection at this time. Why don't we go ahead and see what the testimony is.

A. Just to confirm that I understand the question, you're talking about around the time of the prosecution of the patents-in-suit?

Q. Yes. Yes, and what was happening.

A. Sure. I recall that around that time Apple was producing quite a bit of prior art through IPRs and District Court litigation, and that that was information that we wanted to make sure we took into consideration and filed an IDS, for example, Masimo was developing their watch around that time. Prosecution of other patent applications was going on. Those are what I can think of at the moment.

Q. Are you suggesting you used -- you sent to the Patent Office IPR materials generated by Apple?

A. Yeah, that's right. I'd have to go look at the file just to confirm exactly which materials or which IPRs had, you know, started at that point, but that was definitely information that was being filed in IDSes to the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Patent Office during that time and that we were receiving.

Q. One other area I want to get to. Mr. Mueller suggested or made some comment about a 12-year period. Did you remember that?

A. Yes.

Q. And he is talking about the 12-year period between the filing of some provisional applications in 2008 and the filing of some patents in 2020. Do you remember that? That's the 12-year period we're talking about?

A. Yes, I remember.

Q. And can you, very briefly, just describe for Your Honor what was happening with regard to the patent prosecution activity in this family of patents in that 12-year time frame?

A. In this family there was active prosecution through that time period. I believe there were over 30 applications or continuations filed and actively prosecuted during that time period.

Q. Was there any sort of delay on your part in prosecuting those patents in that period?

A. No.

MR. RE: I have no further questions.

Thank you, Mr. Cromar.

MR. MUELLER: Very briefly, Your Honor.

JUDGE BHATTACHARYYA: Yes, please proceed.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

REDIRECT EXAMINATION

BY MR. MUELLER:

Q. I'm going to pull up a slide from my opening statement for just a moment, and this shows some of the prosecution activities for this family of patents.

This is RDX-1.16. Here we have the timeline for the '501, '502, and '648 patents. Do you see that, sir?

A. Yes. Excuse me. Yes, I see that.

Q. And do you see in the top we have various, in blue, Apple Watch releases, Apple Watch Series 0, Series 4, Series 5, Series 6, do you see that?

A. Yes, I see that.

Q. Do you see that in each instance, in each instance, you and other folks prosecuting applications in this family on behalf of Masimo -- I'm not sure if it was just you or others as well -- filed applications after the Apple Watch models were released? Do you see that, sir?

A. I see the timeline and the notes on it. I don't think I could come to the conclusion that -- it seems like you're implying.

Q. Sir, you have no reason as you sit here right now to contest the timeline shown on this slide, correct?

A. No. I think I do.

Q. What specifically are you contesting in terms of the chronology?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Well, there's at least a couple of things. The first one, I would say, is I see a five-year gap arrow from 2008 to 2015. I'm not sure what that represents. I know that during that time period in the family there were many applications filed and being actively prosecuted. So that's, you know, that's just one example.

The slide also represents a 12-year delay, which I just answered a question a moment ago, I do not believe there was a delay.

Q. Sir, I guess -- let me put it this way. I'm not asking you about the labeling. I'm asking you about the chronology.

You do not contest, do you, sir, that the dates shown for Masimo filing applications in this family on this slide are correct.

A. Well, I don't know if this represents all the filings in family. It appears to me it's missing some of the filings. So to that extent I think it would be a misrepresentation.

MR. MUELLER: I have nothing further for this witness, Your Honor. I pass the witness.

RECROSS-EXAMINATION

BY MR. RE:

Q. Please explain what you mean why it is a misrepresentation.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

If we can keep that slide up. Where did it go?

MR. MUELLER: We can pull it back up.

MR. RE: We'll do it from here.

Q. Before we begin, Mr. Cromar, have you ever seen this slide before?

A. No, I have not.

Q. Okay. You didn't like the label "gap." Can you please explain why you didn't like the five-year gap label?

A. Yes. Like I said, I think during that time period there were a dozen applications being actively prosecuted in this family, including continuation filings during that time period.

Q. With regard to the 12-year delay, you said there was no delay, but what did you mean why there's no delay?

A. Well, I don't know what delay means in this context, and if it's referring to a delay that I may have done, I don't recall any delays so -- and, you know, like I mentioned earlier, I believe through that 12-year time period there were more than 30 applications being prosecuted, and I only see a small fraction of those represented on the slide. It only mentions one, two -- let's see -- plus four plus two, so that's, you know, seven applications. I know that there were more than 30. So I don't know -- the delay seems like a misrepresentation and this slide doesn't represent the family very well.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. And in the misrepresentation, is there some sort of correlation, we'll call it, between when you file applications in those 30 cases or so you mentioned and the releases of various Apple Watches?

A. I don't think so, especially because a huge portion of the prosecution happened before any Apple Watch was released. Like I said, in that early period there were many applications, so I'm not sure how there could be a correlation.

Q. Okay.

MR. RE: I have no further questions, Your Honor.

MR. MUELLER: May I ask just one, Your Honor?

JUDGE BHATTACHARYYA: Yes.

REDIRECT EXAMINATION

BY MR. MUELLER:

Q. You referred to or Mr. Re referred to misrepresentations. Sir, the application filing dates are a public record, correct?

A. I believe that's correct. All of the applications in the family were publicly -- they were published and prosecuted in public.

MR. MUELLER: Nothing further, Your Honor.

MR. RE: If I can have one follow-up.

BY MR. RE:

Q. Your suggestion of misleading, just so I

MASIMO 2029
Apple v. Masimo
IPR2024-00242

understand, it's not that information concerning the filing dates, you're suggesting it's misleading to the extent that it's missing additional information, is that what your point is?

MR. MUELLER: Your Honor, I'm going to object to the leading. It's a highly leading question, I object.

MR. RE: I have no further questions.

THE WITNESS: I'm happy to clarify my answer, because I kind of recognize --

JUDGE BHATTACHARYYA: If there's nothing further, I will need to rule on the objection.

Mr. Re, are you withdrawing your question?

MR. RE: I'm withdrawing the question, Your Honor.

JUDGE BHATTACHARYYA: Thank you for your time, Mr. Cromar.

MR. MUELLER: As our next witness we call Mr. Majid Sarrafzadeh, and Mr. Selwyn will do the examination.

JUDGE BHATTACHARYYA: Welcome, Dr. Sarrafzadeh. Did I pronounce your name correctly?

THE WITNESS: You sure did.

JUDGE BHATTACHARYYA: Okay. Good. Do you understand that you are under an obligation to tell the truth here today?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

THE WITNESS: I do.

MAJID SARRAFZADEH,

having been first duly sworn and/or affirmed on his oath, was thereafter examined and testified as follows:

JUDGE BHATTACHARYYA: Thank you. You may go ahead. I think you're on mute, though.

MR. SELWYN: Can you hear me now?

JUDGE BHATTACHARYYA: Yes, perfectly.

MR. SELWYN: Thank you. May I proceed, Your Honor?

JUDGE BHATTACHARYYA: Yes.

DIRECT EXAMINATION

BY MR. SELWYN:

Q. Good afternoon, sir. Could you please introduce yourself?

A. I'm Majid Sarrafzadeh. I work and live in Southern California.

Q. Have you prepared a set of slides to present with your testimony today?

A. Yes, I have.

Q. Can we have RDX-7-2?

Would you please describe your educational background?

A. Certainly. I have received my Bachelor of

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Science, Master of Science, and Ph.D., all in electrical and computer engineering, from University of Illinois at Urbana-Champaign.

Q. While working towards your various degrees, did you study electrical and thermal technologies?

A. Yes, those are the two topics among others that I have focused on.

Q. Can we turn to RDX-7-3?

Where do you work today?

A. I work at University of California at Los Angeles, also known as UCLA. I'm a distinguished professor in both computer science and electrical and computer engineering.

Q. Have you had any positions or roles at UCLA in addition to being a professor?

A. Yes. I have been co-director, cofounder, and director of various national and local institutes, mostly in the area of wireless, held, and handheld monitoring.

Q. What is the UCLA Wireless Health Institute?

A. It's an institute that tries to address health care problems using technology. They investigate problems in collaboration with health care providers and go from inception to hardware and software design to clinical trial, patent filing at times, and eventually commercialization of our ideas.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Have you taught any classes at UCLA related to sensors or medical devices?

A. Yes, both at undergrad and graduate levels. For the past 20 some years I've been doing that continuously.

Q. Have you conducted any research related to sensors or medical devices?

A. My research in the past 20 plus years has been on sensors and medical technology devices.

Q. Could we have RDX-7-4?

Would you please describe your experience in the medical device industry?

A. There has been numerous of them, but by way of example, I'm a cofounder of three companies in this area among a few other companies. These three companies are Bruin Biometrics, MediSense Wireless, and Wanda Health.

Q. Do you have any experience with thermal management technologies?

A. Yes. A number of my publications is related to thermal management, a company that I cofounded in 1999 called Higher Design deals hardware and thermal management of circuits.

Q. Could we have RDX-7-5?

Do you have any publications, sir?

A. I have a few. I have about 600. I think 550 or so of them are peer-reviewed. And a good number of them are

MASIMO 2029
Apple v. Masimo
IPR2024-00242

in various medical devices. I've coauthored three books, and I have a few patents, 25 plus of them, and one of them -- sorry.

Q. Please. Finish.

A. One of them is some of my publication and one of the patents is entitled Apparatus Systems and Methods for Tissue Oximetry and Perfusion Imaging.

Q. Can we have RDX-7-6?

Let me ask you, sir, to be a little bit immodest for a moment. Have you received any awards for your work?

A. I'm honored to have received a few awards. One is I'm a fellow of IEEE, Institute of Electrical and Electronics Engineers, the number one electrical engineering institution in the world.

I'm a fellow of National Academy of Inventors. I'm truly humbled that Time Magazine named one of our inventions and products for change -- for making a change in health care standards as the best invention in medical technology in 2020.

I also received the Best Innovation Award in 2018. And also been blessed with a number of teaching awards, both in my previous institution at Northwestern and currently at UCLA.

Q. Could we display CX-322-A?

Is this your CV?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. This seems to be a copy of my CV, correct.
Q. Is it accurate?
A. It seems to be fairly accurate, although I'm sure there a few additional publications.
MR. SELWYN: Your Honor, Apple offers Professor Majid Sarrafzadeh as an expert in physiological monitoring technologies including the design of pulse oximetry sensors.
MR. RE: No objection.
JUDGE BHATTACHARYYA: At this time Dr. Sarrafzadeh is admitted as an expert in physiological monitoring technologies including the design of pulse oximetry sensors.
BY MR. SELWYN:
Q. RDX-7-7, please.
What was your assignment, sir, for this case?
A. My assignment was to analyze the validity of patents '745 and '127 and domestic industry claims. I was asked to analyze infringement of the asserted claims. And, finally, analyze the technical prong of domestic industry requirement.
Q. Slide RDX-7-8.
In brief, what materials did you consider for your assignment?
A. The materials included but not limited to '745 and '127 patents and their prosecution histories, claim

MASIMO 2029
Apple v. Masimo
IPR2024-00242

construction briefing, statements and hearing transcripts, Complainants' expert reports, including documents that were cited there, prior art references, deposition transcripts, conversations with a number of Apple engineers and other experts, and the hearing testimony that has been going on this week.

Q. Can we begin, Professor, with the '127 patent?

A. Surely.

Q. Can we display, please, RDX-7-9?

What does the '127 patent discuss generally?

A. This is related to a physiological monitoring device, and, as you see, in Fig. 12 of the patent, light emitters are shown that is in contact with the thermal mass that is on a substrate, and there are temperature sensors connected to them, to the thermal mass.

Q. Slide 7-10.

What is the level of ordinary skill in the art of the '127 patent?

A. In my opinion, it's working knowledge of physiological monitoring and thermal management technology, one would have a Bachelor of Science in an academic discipline emphasizing design of electrical and thermal technologies in combination with training or at least one or two years of related work experience with processing of data information, including but not limited to physiological

MASIMO 2029
Apple v. Masimo
IPR2024-00242

monitoring technology.

Obviously, if somebody had a Master of Science in relevant academic discipline with less than a year of related work experience, that would qualify.

Q. Slide 7-12.

What combinations of prior art references have you compared to claim 9?

A. Fundamentally two. I have looked at combination of Mendelson and Webster and Yamada and Noguchi.

Q. On the screen our next slide is RDX-458.

What is that reference?

A. This is an article by Mendelson that was published in 1991, and it talks about gas monitoring in the body.

Q. When did you first become aware of that article?

A. Roughly 20 years ago.

Q. Can we put on the screen RX-35, which is slide 7-14.

What is this reference sir?

A. This is a textbook called "Design of Pulse Oximeters" by Webster. This was published roughly in 1997.

Q. When did you become aware of Webster?

A. Give or take 20 years ago.

Q. How well-known is the Webster textbook?

A. It is one of the standard textbooks in the field.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Could we have slide 7-15?

When were pulse oximeters first commercially introduced?

A. Webster says that they were introduced in 1983, but actually truly some of the earlier history goes back to World War II, and first commercialization in 1973.

Q. So let's turn now to the claim. Can we have slide 7-16?

Does Mendelson disclose the preamble of claim 7?

A. Yes, that's undisputed. If we look at Fig. 1016 at 24 of Mendelson, it talks about the noninvasive reflective SAO2 sensor, and the corresponding figures show some part of that.

Q. Using Fig. 10.16 on the screen, can you briefly explain how pulse oximeters work?

A. I sure can. We see the top figure in 1016, we see a collection of red and infrared LEDs pointed in the center. They emit light to the tissue. There are separators between them called optical shields, and there are a collection of photodiodes that collect the light after it has been through the tissue, and they make a determination of physiological parameters based on the optical light received by the photodiodes.

Q. Slide 7-17.

Let's look at limitation 7A. In Mendelson, what

MASIMO 2029
Apple v. Masimo
IPR2024-00242

are the LEDs and photodiodes mounted on?

A. As shown in Fig. 1016B of Mendelson, they are on a ceramic substrate.

Q. Is that another name for a circuit board?

A. Also a circuit board or a printed circuit board. Thank you.

Q. Were circuit boards with thermal cores known before the '127 patent?

A. Yes, they have been known for many years, before this patent.

Q. Can we see RDX-7-18?

Professor, what is this document?

A. This is a handbook called the "Multilayer Printed Circuit Board" by Scarlett.

Q. And if we could turn to RDX-7-19.

Turning to Fig. 24.30 of Scarlett, what does this show?

A. In Fig. 24.30 at 122 it shows the cross-section of a metal core. We see there is a reference to an aluminum core that, as Scarlett describes, provides thermal management to the core.

Q. Is Scarlett RX-397, if you look at the lower right-hand corner of the slide?

A. Exactly right, RX-397 at 122.

Q. Can we have slide RDX-7-17?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Does Mendelson render obvious the, quote, thermal mass?

A. Yes. So we see that the LEDs and photodiodes are mounted on a printed circuit board. We know that there are electrical connections. That's really the main -- main way of bringing electricity to LEDs and photodiodes. And these connections would provide thermal connectivity.

One of ordinary skill in the art would know that you could implement this in a multilayer fashion and would also know that, for example, using the concepts in Scarlett as was very well-known, one could add metal core or thermal core for better management.

Q. What do you understand Mr. Goldberg alleges as a thermal mass in Apple Watch?

A. He alleges the metal layers of printed circuit boards of the Apple Watches as the thermal mass.

Q. Does Mendelson disclose such metal layers?

A. Yes, we see that in Fig. 1016 that there are metal layers in Mendelson.

Q. What does Mr. Goldberg say is a thermal mass in the Masimo current rainbow« sensors?

A. He refers to the metal layers and the ceramic in the current sensor.

Q. Does Mendelson disclose such ceramic layers with metal areas?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Yes. We see that in Fig. 1016, and the corresponding description.

Q. Now can we have RDX-7-20?

Does Mendelson disclose limitation 7B?

A. Yes. At RX-458, Mendelson in Fig. 1016, if we look at that figure, on top we see there is a red and infrared LEDs, and obviously through electrical connection they are materially coupled to the thermal mass.

Q. Can you explain how Mendelson renders obvious LEDs thermally coupled to the thermal mass?

A. Surely. Because of electrical connection, we know that the LEDs are connected by wires to the printed circuit board, and that's the thermal connection.

Q. Is there any dispute between you and Mr. Goldberg on this limitation regarding Mendelson's disclosure of a plurality of LEDs in a substrate?

A. No.

Q. Can we have 7-21?

Does Mendelson disclose limitation 7C?

A. Yes, it does. Again, at RX-458, Mendelson in Fig. 1016 discloses red and infrared LEDs, and we know that these are a plurality of operating wavelength -- multiple.

Q. Is there any dispute between you and Mr. Goldberg on this limitation?

A. None.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Can we have slide 7-22?

Does Mendelson render obvious limitation 7D?

A. Looking at RX-458 at 24, that's Fig. 1016, in the same manner that I described earlier, in previous limitation, LEDs and photodiodes are mounted on a printed circuit board, and one would know that you could readily implement these in multilayer and add thermal core to it.

Q. Next slide, 7-23.

Does Mendelson in combination with Webster disclose limitation 7E?

A. Yes. If we look at the textbook we looked at earlier, Webster at RX-35, at 85, it says, one way to compensate for LED temperature changes is to have a temperature sensor built into the probe along with the LEDs and photodiodes.

Q. Why do you conclude from that that Webster renders obvious the temperature sensor being thermally coupled to the alleged thermal mass?

A. Because it says that the temperature sensor is going to be built into the probe along with the LEDs, and we know there are going to be electrical connection for a temperature sensor to work.

Q. Slide 7-24.

Looking at limitation 7F, does Webster render obvious a temperature sensor capable of determining a bulk

MASIMO 2029
Apple v. Masimo
IPR2024-00242

temperature for the thermal mass?

A. Yes. If we look at RX-35 at 85, Webster discusses that there is a shift in LED peak wavelength due to change in temperature, and that can cause error in SpO2 reading, and it says one way to compensate for that is for LEDs temperature changes to have a temperature sensor built into the probe.

Of course, one of ordinary skill would know that, to take temperature measurement, in order to get the bulk temperature in multiple locations, you would just add multiple temperature sensors of Webster.

Q. What --

A. And obvious to do that.

Q. What does Mr. Goldberg say measures a bulk temperature in Apple Watch?

A. He points to the thermistor in the Apple Watches.

Q. Does Webster teach such a temperature sensor?

A. We see that in section 553 at 85 of Webster, that does exactly that.

Q. Slide 7-25, please.

Does Webster disclose the operating wavelengths of the LEDs dependent on the bulk temperature of the alleged thermal mass?

A. That's a fact of physics that has been known for many years, but at RX-35, both at 74 and 83, Webster states

MASIMO 2029
Apple v. Masimo
IPR2024-00242

that a wavelength depends on the so-called forbidden energy gap, and energy gap is dependent on temperature. So wavelength is dependent on temperature via the energy gap.

Q. Slide 7-26.

Does Mendelson disclose limitation 7G?

A. Looking at RX-458 at 24, that's, again, Fig. 1016 of Mendelson, we see there are a collection of photodiodes shown, and that's exactly what the limitation requires.

Q. Does Mr. Goldberg dispute that?

A. No.

Q. Next slide, please.

Does Mendelson disclose limitation 7H?

A. Yes, that is also undisputed. Mendelson at RX-458 at 21 shows an ear oximeter from Hewlett-Packard. It shows that the optics is collected at the ear location. It goes through a number of processing, such as A to D on a central processor, and, finally, the digital display shows the SpO2, the oxygen saturation.

Q. Slide 7-28.

Does Mendelson in combination with Webster teach claim 9?

A. They do. First of all, our macro here, RX-419 at 3, talks about what thermistors are. They have been known for many years as a resistive circuit, and Yamada and other references, RX-381, specifically talks about a thermistor

MASIMO 2029
Apple v. Masimo
IPR2024-00242

that is a metal-resistant temperature detector.

Q. Slide 7-29.

What fields are Mendelson and Webster related to?

A. They are in the same field as the '127 patent, physiological monitoring systems and devices.

Q. Would a POSITA have been motivated to combine Mendelson with Webster?

A. Very much so. If we look at RX-35, Webster, and RX-458 at 24 Mendelson, one would be motivated to combine the two.

Q. Why is that?

A. Because would know that you can improve the functionality of what Mendelson talks about by bringing a temperature sensor to improve the wavelength values of Mendelson.

Q. Relatedly, would a POSITA have had a reasonable expectation of success in incorporating a temperature sensor of Webster into Mendelson?

A. Very much so. These temperature sensors have been known for several hundred years. Very simple devices and relatively low-tech. So including them in Mendelson would have been straightforward, and there would have been a reasonable chance of success.

Q. So does Mendelson in combination with Webster disclose claim 9 of the '127 patent?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Yes, it would.
Q. Can we switch now to your opinion about Yamada and Noguchi?
A. Absolutely.
Q. May we have slide 7-30?
Actually slide 7-31, please.
On the screen is RX-381. What is that document?
A. This is the Yamada reference, Japanese patent application.
Q. When was it published?
A. This was published, the priority date it says is 2003. I can't find the publication right now. Because it's not zoomed in, I have a hard time seeing it.
Q. That's okay, Professor.
A. Patent application is from 2004, as I see under 21.
Q. What does the Yamada patent application discuss?
A. It discusses a physiological monitoring system. It's a wrist-worn device with a sensor placed on the fingertip of a user.
Q. Can we put on the screen 7-32 and RX-353?
What is RX-353?
A. This is also a patent application by Noguchi. It was filed in 1992 and granted in '94. It relates the wavelength of an LED to temperature variation, among other

MASIMO 2029
Apple v. Masimo
IPR2024-00242

things.

Q. Next slide, please.

Does Yamada disclose the preamble of claim 7?

A. Yes, that's undisputed. If we look at RX-41 and Figs. 1 and 5, we see that both in the figure and the corresponding text the notion of pulse oximeter is disclosed.

Q. Slide 7-34.

Does Yamada render obvious limitation 7A?

A. Yes. We'll see that from Fig. 5 RX-381, there are LEDs and photodetectors mounted on the printed circuit board. We know that there is electrical connection among them and to the power supply to make them work. The electrical connection, the wires provide thermal connectivity.

Furthermore, a POSITA would know that you can readily implement this in a multilayer fashion, also add thermal cores in order to provide better thermal management in the circuit.

Q. Next slide, please.

Does Yamada disclose limitation 7B?

A. Yes. Looking at, again, RX-381, Fig. 5 at 43, both Fig. 5 and the corresponding text talks about the first light-emitting component, an LED, and a second light-emitting component, another LED.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Does Yamada disclose LEDs thermally coupled to the thermal mass?

A. Yes. For the same reason mentioned before, there is an electrical connection between the LEDs and the rest of the circuit and the metal of the circuit board, and that's what provides thermal coupling.

Q. Does Mr. Goldberg dispute that Yamada teaches the light-emitting sources in a substrate?

A. No.

Q. Slide 7-36, please.

Does Yamada disclose limitation 7C?

A. This is also undisputed. If we look at RX-381 at 43, we'll see that Yamada specifies the light of a first wavelength, maybe, for example, red light, the light of a second wavelength, maybe, for example, near infrared, and we know red and infrared operate at different wavelengths.

Q. Slide 7-37.

How about limitation 7D, is that disclosed by Yamada?

A. Very similar to the discussion I had before, yes, LEDs and photodiodes are implemented in a printed circuit board, and the electrical connection provides the thermal mass. A POSITA would know that you can do this in a multilayer fashion, and could add a thermal core of, for example, Scarlett, to provide better thermal management.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Slide 7-38.

Does Yamada disclose limitation 7E?

A. Very much so. Looking at RX-381 at Fig. 5, 109, paragraph 109, Yamada says that a temperature sensor may be attached to the light probe 1, and attachment we know, among other things, requires an electrical attachment, and that's what provides thermal coupling to the thermal mass.

Q. Slide 7-39.

Does Yamada disclose a temperature sensor capable of determining a bulk temperature for the thermal mass?

A. Yes. Yamada RX-381 at, again, 109, says that a temperature sensor may be attached to the light probe, and a temperature sensor, for example, could be attached to the surface. And one of ordinary skill in the art would know that you could easily use multiple temperature sensors in order to do some sort of a bulk temperature of the thermal mass.

Q. What does Masimo accuse of meeting limitation 7F in Apple Watch?

A. Also the thermistor in Apple Watches is what Masimo accuses.

Q. Does Yamada teach that?

A. As we saw in 109, it talks about the temperature sensor here, so yes.

Q. Slide 7-40.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Does Noguchi teach a temperature sensor?

A. Yes. Noguchi at RX-353 and RX-353, both in column 1 and 2, talks about the fact that there is a comprising temperature measurement means for measuring the temperature of an LED.

Later, Noguchi says that a plurality of LEDs and a plurality, multiple temperature measurement can be utilized in this invention, and it goes talking about the relation between the two. So, yes, absolutely.

Q. How would a skilled artisan have used Noguchi's teaching in a pulse oximeter like Yamada?

A. It would have taken the notion of the fact that LED wavelength is a function of temperature and included that in Yamada to provide better values for wavelength estimation.

Q. Slide 7-41.

Would a POSITA have found it obvious at the time of the '127 application to combine Yamada with Noguchi?

A. Very much so. They are both -- Yamada is related to pulse oximeter and physiological measurement. Noguchi talks about the impact of heat on temperature variation. So one would be very motivated to combine the two.

Q. Why would one be motivated to combine Yamada with Noguchi?

A. Basically because of the notion of temperature

MASIMO 2029
Apple v. Masimo
IPR2024-00242

variation on wavelength would improve the functionality of Yamada.

Q. Relatedly, would a POSITA have had a reasonable expectation of success combining in a Yamada with Noguchi?

A. Very much so. Again, this is a notion of a temperature sensor that has been known for several hundred years, very low-tech device, and would have been easily added to Yamada's system.

Q. 7-42, please.

Does Yamada disclose limitation 7G?

A. Yes. Looking at RX-318 at Fig. 562, Yamada states, and also in Fig. 5 it states, that a portion of the light that traverses body tissue is received by the light-receiving component, and that's undisputed.

Q. Slide 7-43.

Does Yamada disclose limitation 7H?

A. Yes, that's also undisputed. RX-381, both at 62 and 65, talks about the strength signal for the light that is sent to the analysis component, and it talks about the CPU that performs the corresponding analysis.

Q. Slide 7-44, please.

Does Yamada teach claim 9?

A. That's undisputed. RX-381 at 111 talks about a thermistor that performs the temperature measurement.

Q. Next slide, please.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Did you also conduct an analysis of secondary considerations of nonobviousness for the '127 patent?

A. Yes, I have.

Q. And what factors did you consider?

A. Long-felt but unmet need, commercial success, industry praise, copying, failure of others, unexpected results, and industry skepticism.

Q. Slide 7-46.

Did you find the existence of a long-felt but unmet need that was satisfied by the '127 patent?

A. No, because, first of all, Webster says that these things were known as far back as '80s and even before that, so the notion of various components of the physiological parameters, such as LEDs, et cetera, was disclosed by Webster. The notion of thermal mass for improving thermal connectivity was disclosed, for example, at RX-397 at 122, Fig. 24.3.

Q. Slide --

A. Also, sorry, Webster was disclosed at RX-35, as we discussed earlier.

Q. Slide 7-45.

Did you find any evidence of commercial success indicative of nonobviousness?

A. I have not seen any commercial success related to this patent by Masimo.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. How about industry praise, did you find any evidence of that?

A. I have not, not for Masimo, no.

Q. Any evidence that you saw of copying, failure of others, unexpected results, or industry skepticism?

A. I haven't seen any of that, especially going through the hearing this week.

Q. Let's change subjects. Let me turn to your noninfringement opinion with respect to claim 9 of the '127 patent.

Can we have slide 7-48?

At a high level, can you tell us the reasons for your opinion?

A. Yes. At a high level, that accused products do not have a thermal mass, also they do not determine bulk temperature for the thermal mass.

MR. SELWYN: Your Honor, I think at this point we can turn to the Apple and Masimo confidential record.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

MR. SELWYN: May I proceed?

JUDGE BHATTACHARYYA: Yes.

BY MR. SELWYN:

Q. Could we have please RDX-7-79?

Professor, can we turn now to the '745 patent?

A. Absolutely.

Q. With reference to Fig. 7A, can you briefly describe the '745 patent?

A. Yes. '745 patent talks about a physiological monitoring system, and Fig. 7A shows a combination of LEDs and photodetectors. If you go to the next slide, I have more details on that, I believe.

Q. Slide 7-80.

A. Exactly. Thanks very much.

Fig. 7A and companion Fig. 7B shows that there is a light emitter highlighted with label 702. It emits light. That light goes through a diffuser, diffuser 704. And the light goes through the tissue as shown with red arrows. And that comes back to a photodetector, a light detector 710.

And we see that the shape of the light as it leaves the diffuser is an annular shape, and we can perhaps better see that in Fig. 7B in the highlighted blue part.

Q. Slide 7-81, please.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Who was a person of ordinary skill in the art of the '745 patent?

A. In my opinion, one of ordinary skill in the art would be somebody with working knowledge of physiological monitoring technologies, would have a Bachelor of Science in an academic discipline emphasizing the design of electrical, computer, or software technologies, in combination with training or at least one or two years of related work experience with capture and processing of data or information, including but not limited to the physiological monitoring technologies.

And, obviously, if somebody had a Master of Science in a relevant academic discipline could have maybe less than a year of related work experience in the same discipline.

Q. Next slide.

What reference or combinations of references are you relying upon for your opinion regarding invalidity for the '745?

A. I have three. The first one is the Apple Watch Series 0; second one is Iwamiya in combination with Sarantos; and, finally, Iwamiya in combination with Sarantos and then Venkatraman.

Q. Beginning with Apple Watch Series --

JUDGE BHATTACHARYYA: Mr. Selwyn, could we take

MASIMO 2029
Apple v. Masimo
IPR2024-00242

our afternoon break now?

MR. SELWYN: Of course.

JUDGE BHATTACHARYYA: We're in recess for 15 minutes.

(Whereupon, the proceedings recessed at 3:33 p.m.)

(In session at 3:48 p.m.)

MR. SELWYN: Good afternoon.

JUDGE BHATTACHARYYA: We are back on the record.

MR. SELWYN: I believe we're on the public record at the moment, Your Honor. May I proceed?

JUDGE BHATTACHARYYA: Yes, please go ahead.

BY MR. SELWYN:

Q. Could we have RDX-7-83?

Professor Sarrafzadeh, on the screen is RX-23. Do you recognize that document?

A. I do. It's a press release from Apple dated April 9, 2015, and it says it's available for purchase online by April 24, 2015.

Q. What does that document say about the date that Apple released the Series 0?

A. It says that the date is for sale is April 24, 2015.

Q. How did you conduct your analysis of Apple Watch Series 0?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. I looked at various documents available, I also talked to and heard a number of Apple engineers in that regard.

Q. Did you speak with Dr. Venugopal?

A. I did, yes.

MR. SELWYN: Your Honor, we have to move, I think, to the Apple confidential record now.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

MR. RE: Thank you.

BY MR. SELWYN:

Q. What conclusions did you reach with respect to Iwamiya in combination with Sarantos?

A. That they make the claims obvious.

Q. Can we have slide 7-99?

Does Iwamiya disclose the preamble?

A. It does. That's undisputed, in RX-130, the abstract, Iwamiya says an optical biological information detecting apparatus, and that discloses it.

Q. Slide 7100.

Does Iwamiya disclose limitation 1A of the '745 patent?

A. That is also undisputed, in RX-130, and Fig. 4, talks about the light-emitting unit, and in Fig. 4, I have highlighted it as number 6 and colored red.

Q. Slide 7-101.

Does Iwamiya disclose limitation 1B?

A. It does. Again, looking at RX-130, column 6 of the patent, it talks about these annular light guide 7, and they annularly diffuse and irradiate the observation light, and I have annotated that with the annular shape under the figure.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Does Mr. Goldberg dispute is that?

A. No.

Q. Next slide, please.

Is limitation 1C disclosed by Iwamiya?

A. 133 and column 4 -- column 8 and 14 of the patent do talk about a silicon photodetector, yes.

Q. Slide 7-103.

Does Iwamiya in combination with Sarantos disclose limitation 1D?

A. Sure. Surface comprising a dark-colored coating, Iwamiya talks about light shielding, that shields the light. One option for that is, indeed, a dark-colored coating. In addition, Sarantos, specifically in RX-366 and Fig. 22, talks about the dark-colored coating, black or otherwise, rendered opaque, and the Iwamiya part is from RX-1130.

Q. Does Iwamiya disclose limitation 1E? If we go to slide 7-104.

A. It does. RX-130, Fig. 3, columns 6 and 7 talks about the first and second reflection layer, 13 and 15, and we see that they provide the shielding that's required in the claim, and that's undisputed.

Q. Next slide.

Does Iwamiya disclose limitation 1F?

A. Yes, at RX-130 and Fig. 10 in column 9, it is undisputed that a CPU is shown and the CPU performs

MASIMO 2029
Apple v. Masimo
IPR2024-00242

biological information calculation.

Q. Slide 7-106, please.

Does Iwamiya render obvious claim 9 of the '745 patent?

A. Yes. RX-130 talks about display unit of Iwamiya, also at column 9, that displays a measurement result of the biological information. Oxygen saturation is a biological information.

Q. Slide 7-107.

Alternatively, does Iwamiya in combination with Sarantos disclose claim 9?

A. Yes. As shown in RX-366, Sarantos talks about a heart rate monitor, and it says it can do other physiological parameters such as blood oxygenation level.

Q. Would a POSITA have found it obvious to combine Iwamiya and Sarantos?

A. Yes. They are both physiological monitoring devices, as shown in RX-130 and RX-366, and they are in the same area '745 patent. Furthermore, they are actually both wrist-worn devices.

Q. Slide 7-109.

Would a POSITA have been motivated to combine the dark-colored coating of Sarantos into Iwamiya at the time of the application for the '745 patent?

A. Yes. Looking at RX-366, RX-130, and RX-35, we

MASIMO 2029
Apple v. Masimo
IPR2024-00242

see that the shielding that Iwamiya talks about can be enhanced with the dark-colored coating of Sarantos, and Webster further talks about black materials that are used to prevent transmission of light.

Q. Would a POSITA have reasonably expected success in combining the dark-colored coating of Sarantos with Iwamiya at the time of the application for the '745 patent?

A. Absolutely. These are low-tech additions. This dark-colored coating and also low cost, so one would have a reasonable success of adding it and motivation.

Q. Slide 7-110.

Would a POSITA have been motivated to combine Sarantos teaching of a blood oxygen measurement with Iwamiya's sensor at the time of the application for the '745 patent?

A. Very much so. If you look at RX-130 and RX-366, Sarantos adds the fact that a PPG, such as blood oxygenation level can be added, and that would enhance, by way of example, what the biological information of Iwamiya is.

Q. Would a POSITA have reasonably expected success in combining Sarantos' teaching of making a blood oxygen measurement with the Iwamiya sensor at the time of the application for the '745?

A. Yes. As described in Sarantos and as we saw in the literature way before that, one would have success of

MASIMO 2029
Apple v. Masimo
IPR2024-00242

combining Sarantos with Iwamiya.

Q. Can we turn to slide 7-111?

And do you see on the screen RX-368?

A. Yes.

Q. What is that document?

A. RX-368 is a patent with the first inventor Venkatraman.

Q. What's that patent about generally?

A. Generally about the wearable heart rate sensor or monitor.

Q. Is it a wrist-worn wearable?

A. Yes, it is.

Q. Can we turn to the next slide, 7-112?

What conclusion did you reach with respect to Iwamiya in with Sarantos and Venkatraman in the validity of claims 18 and 27?

A. I believe their combination make 18 and 27 obvious.

Q. Can we have slide 7-113?

Does claim 15 differ from claim 1?

A. There are actually a lot of similarities, but, as shown in RDX-7113, there are some differences that I've highlighted in blue.

Q. Slide 7-114, please.

Does Iwamiya disclose the preamble of claim 15?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. That's undisputed. I discussed this before. Iwamiya in RX-130 talks about a biological information apparatus.

Q. Next slide.

Does Iwamiya disclose limitation 15A?

A. That's undisputed. Same discussion as 1A. So in RX-130, and also Fig. 4 and column 5, a wrist-worn device is shown and discussed.

Q. Slide 7116, please.

Does Iwamiya disclose limitation 15B?

A. Again, this is undisputed. I discussed that in relation to 1B. In RX-130 and Fig. 4, column 6, we see that about material that changes the shape of light into an annular light guide using a light, annular light guide, unit 7.

Q. Slide 7-117.

Is limitation 15C disclosed by Iwamiya?

A. Yes. RX-133 shows that Figs. 2, 3, columns 6 and 7, Fig. 3 shows the reflection layer, and a top view of that is shown in Fig. 2, where we see the circular shape. This is undisputed.

Q. Slide 7-118.

Does Iwamiya disclose limitation 15D?

A. Yes. If we look at RX-130 and the corresponding figure and columns, although I believe this limitation is

MASIMO 2029
Apple v. Masimo
IPR2024-00242

indefinite, but using Masimo's interpretation, there are a number of photodiodes shown, and they would have, according to Masimo's interpretation, they would be arranged in a shape that corresponds to the shape of the portion of tissue measurement that is encircled by the light block.

Q. Slide 7-119.

Does Iwamiya disclose limitation 15E?

A. Yes. RX-130 shows that this is undisputed, I discussed this before, a photodiode is shown.

Q. Next slide.

Does Iwamiya disclose limitation 15F?

A. Yes, that is also undisputed. Looking at 130, we see the photodiode and the LEDs are on the same side of the tissue. So that's the reflectance measurement configuration.

Q. What figure are you referring to?

A. Fig. 4 of it.

Q. Can we have slide 7-121?

Does Iwamiya disclose limitation 15G?

A. Yeah, that's undisputed. I went through this in 1E. So RX-133 in Fig. 3 and column 6 and 7 show that. We see the reflection layer 13 and 15 are what provides the optical isolation.

Q. Next slide, please.

Is limitation 15H shown by Iwamiya?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Sure. That's also undisputed, same as 1F, we see that in RX-133, Fig. 10 shows a processor and column 9 discusses what the CPU does to do biological information calculation.

Q. Can we have slide 7-123?

Does Venkatraman disclose limitation 15I?

A. Yes, that is shown in RX-368 column 31. Venkatraman shows a secondary device that can be a generic device, and it talks about the monitoring device that may transmit data to and from a secondary electronic device, such as a cell phone, such as an iPhone.

Q. Could we go back tor for one second to RDX-7-119?

Does Iwamiya teach multiple photodiodes?

A. It does. As I mentioned, in column 8 and 14, it talks a plurality of light receiving units 9. That's multiple photodiodes.

Q. And rolling forward to slide 7-124, would a POSITA have found it obvious to combine Iwamiya with Venkatraman at the time of the '745 application?

A. Yes. It was as shown in RX-368, Fig. 7, RX-130 at 25, and 9, the wristwatch of Venkatraman is also -- there is also a wristwatch in Iwamiya, so one would be able to combine the two.

Q. Slide 7-125.

Would a POSITA have been motivated to combine

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Iwamiya with Venkatraman at the time of the '745 application?

A. Very much so. As shown in RX-368 and RX-130, column 57 and Fig. 4 respectively, the fact that a device can be connected to an external smartphone and other devices was known, and, therefore, taking Venkatraman and enhanced the external connection of Iwamiya would have been obvious.

Q. Would a POSITA had a reasonable expectation of success in combining Iwamiya with Venkatraman?

A. Very much so, because adding these external devices was known for quite a bit of time.

Q. Slide 7-126.

Does Iwamiya render obvious claim 18?

A. Yes. That's same as claim 9. In RX-130, column 9, we see there is a display unit that displays a measurement of the biological information, and oxygen saturation is a biological information.

Q. Slide 7-127.

Does Iwamiya together with Sarantos disclose claim 18?

A. Yeah. I discussed that in relation to claim 9. So RX-366 at 13, Sarantos talks about a heart rate and other parameters such as a blood oxygenation level.

Q. Would a POSITA have found it obvious to combine Sarantos' teaching of a blood oxygen measurement with

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Iwamiya sensor at the time of the '745 patent?

A. Very much so, yes.

Q. Why?

A. Because they are both related to monitoring, and adding the sensor will add extra functionality there.

Q. What would have motivated a POSITA to combine Sarantos' teaching of a blood oxygen measurement with the Iwamiya sensor at the time of the '745 patent?

A. By way of example, because Sarantos talks about blood oxygenation level, and that would be one additional parameter that Iwamiya can use.

Q. And would a POSITA have had a reasonable expectation of success in that combination?

A. Yes, because as I discussed earlier, the notion of doing blood oxygenation has been known according to Webster for -- since early '80s or so.

Q. Slide 7-128, please.

Can we look together at claim 27? When you discussed Iwamiya, was your analysis for limitation 1 Preamble through 1F the same as your analysis for limitations 20 Preamble through 20F?

A. Yes.

Q. And is that true for Iwamiya in combination with Sarantos as well?

A. That's correct.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. So let's go to limitation 20G, and can I have slide 7-129?

Does Iwamiya in combination with Venkatraman disclose limitation 20G?

A. Yes. RX-368 in various columns shows that Venkatraman talks about a smartphone that has a capacity of touch sensing. We know smartphones have storage devices, network interfaces, and all other requirements of 20G.

Q. Would a POSITA have found it obvious to combine Iwamiya with Venkatraman?

A. Yes. As I said, adding these external devices, such as a cell phone, was done for quite a bit and was obvious to do so.

Q. What would have motivated a POSITA to combine Iwamiya with Venkatraman?

A. The fact that you can add these external devices for better display and extra information gathering as discussed in the combination.

Q. Would a POSITA have reasonably expected success in combining Iwamiya with Venkatraman?

A. Yes. This notion of adding external devices was tested and done a number of times and a number of years before this.

Q. Slide 7-130, please.

Does Iwamiya in combination with Sarantos

MASIMO 2029
Apple v. Masimo
IPR2024-00242

disclose claim 27?

A. Yes, it does. In RX-366, that's Sarantos, column 13 talks about that it might be desirable to include a separate light-emitting device that are each able to emit different wavelengths. That's the number of wavelengths that's claim 27 discusses.

Q. Would a POSITA have been motivated to combine Sarantos' teaching of emitting multiple wavelengths with Iwamiya's sensor at the time of the '745 patent?

A. Yes. In fact, because it allows these multiple wavelengths, they are both in the same area of biological monitoring, one would be motivated to combine them.

Q. Would a POSITA have reasonably expected success in combining Iwamiya with Sarantos?

A. Yes, because, again, adding these multiple wavelengths in a biological monitoring device was known, as Webster said, for many years.

Q. Turning to secondary considerations and slide 7-131, what conclusion did you reach with respect to long-felt but unmet need?

A. My conclusion is that there has not been a long-felt but unmet need. As we saw today by Webster, conventional pulse oximeters were known, photodiodes were known, LEDs were known, materials that change the shape of light were known.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

As we discussed, for example, in Iwamiya, processor for computations were known, light blocks have been discussed and known for many years, and optical shielding using dark-colored coating was also disclosed and known.

Q. Slide 7-132.

What conclusion did you reach with respect to alleged commercial success?

A. I believe there has been no success between the accused Apple Watches and the claimed invention shown.

Q. What was your conclusion with respect to the remaining secondary considerations?

A. I have not shown any evidence of the other secondary considerations.

Q. Can we have slide 7-133?

What conclusion did you reach regarding the validity of claims 1 and 20 of the '745 patent under section 112?

A. I think there is a lack of written description. What we see in 1B and 20B are disclosed in 7A, a physiological monitoring device. The notion of dark-colored coating is in a different embodiment, Fig. 3, as we can see in '745 patent, respectively, Fig. 7A and Fig. 3.

Q. Why did you find a lack of written support?

A. Because each of them, 1B and 1D, corresponds to a

MASIMO 2029
Apple v. Masimo
IPR2024-00242

different embodiment, and there is no description on how to combine these embodiments in the description of the patent.

Q. May we have slide 7-134?

What conclusion did you reach regarding the validity of claim 15 from the perspective of the definiteness requirement?

A. I believe, because of -- because of 15D limitation, the claims are indefinite, especially the part talking about the plurality of photodiodes that are arranged in an array, having a special configuration corresponding to a shape of the portion of tissue measurement site encircled by the light block.

So here I've shown four photodiodes in purple color in RX-7134, and obviously there are a number of shapes that could correspond to these four photodiodes. It can be an X shape, it could be a triangle, it could be a square, it could be many other shapes. So it's not obvious what the shape is.

Q. Let's switch gears just a little bit to your noninfringement opinion for the '745 patent.

Can we have slide 7-136?

A. Yes.

Q. Why is claim 9 of the '745 patent in your opinion not infringed?

A. Basically for two reasons. And I believe there

MASIMO 2029
Apple v. Masimo
IPR2024-00242

are no materials that receive the lights having the same shape as light emitted by LEDs, i.e., the first shape. Also, there is no material that are configured to change the first shape into a second shape.

Q. In the claim language, why does the material need to receive light in the same shape that was emitted by the emitter?

A. If we look at by way of example claim 1 -- limitation 1A, it says the LED light-emitting diodes emit light in a first shape. Then if we look at limitation 1B, it says the material configured to change different shape into a second shape. So it refers back to the shape that it was emitted. These are the same first shape obviously. The same analysis for 20A and 20B.

Q. Does claim 27 also require the material to receive light in the same shape that was emitted by the emitters?

A. Yes.

Q. Does claim 27 also require the material to change the first shape into a second shape?

A. Similarly, yes.

Q. Turning now to slide 7-137, can you explain the claimed material in the context of Fig. 7A and B?

A. Yes. Looking at '745, Fig. 7, A and B, we see there is a light emitter labeled 702 that emits light in a

MASIMO 2029
Apple v. Masimo
IPR2024-00242

local shape. That goes through a diffuser 704, and the diffuser has an annular shape, and that's better seen in Fig. 7B, the annular shape.

So it takes the light that is emitted from LED and changes that to an annular shape. So that's the change of shape.

And we see the shape that is received that is emitted from LED, that exact same shape is received by the diffuser, because they abut each other, they touch each other.

MR. SELWYN: Your Honor, may we go onto the Apple confidential record now, please.

JUDGE BHATTACHARYYA: Moving onto the Apple confidential record.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

BY MR. RE:

Q. Okay. So you did consider the listing of Masimo's awards and they were cited to as a document reviewed in your expert report, right?

A. I have looked at some awards of Masimo, yes.

Q. And you decided to dismiss those because, in your view, none of the awards could be attributed in any way to Masimo's claimed inventions, right?

A. Because Masimo did not show that, correct.

Q. I want to show you what the document is, CX-1375. This is the document you dismissed because Masimo didn't show something. Did I understand your testimony?

A. Repeat your question, please.

Q. Does this look familiar to you, this document?

A. Yes, I've seen this before.

Q. Right. And you decided to dismiss them for the reasons you gave on the record, right?

A. No. When I was at Motorola, they had 20,000 patents. It doesn't mean each product is related to each of those patents. There is no proof from Masimo that these awards are related to the claimed invention. That's what I'm saying.

Q. I understand. Okay.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Thank you.
Q. I want to show you what is also one of your slides. You showed some data from sitting with Mr. Scruggs and the other experts, and that's slide RDX-157C. Do you remember this?
A. Yes.
Q. And you did not pull up the actual statistics of your calculations, correct?
A. I don't understand your question.
Q. If we go -- do you remember doing an analysis of these numbers for purposes in your -- in your expert report?
A. I have discussed them in the joint report, yes.
Q. Right. And isn't it true that across the 15 groups of reportable comparison values the MightySat and CPX-46C, the SpO2 and pulse rate numbers differed, on average, by 3.5 percent and 2.1 beats per minute, correct?
A. That's irrelevant. The absolute difference matters. If I am, during COVID, if my pulse value is 97 --
Q. Sir, I didn't ask you if you thought it was relevant. I didn't ask you. I just want to know if my data is correct --
A. Say that again.
Q. -- what I read to you. If I can direct you to paragraph 25 of your expert report.
A. Sure.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. I just want to know if I can read this into the record because I didn't hear this in your presentation.

At the last sentence of your report it says:

Across the 15 groups of reportable comparison values, the MightySat and MASITC_P_146 SpO2 and pulse rate numbers differed, on average (in terms of absolute values or their respective differences), by 3.53 percent and 2.1 bpm respectively.

Did you write that and that's in your report?

A. I did.

Q. And that's talking about the data that's on RDX-157, right?

A. That's one aspect of the data. There are more important aspects that I just discussed, for example, the absolute difference.

Q. If we can pull up your slide.

I just want to make sure I have it correct in the record. I think we have -- hold on. There might be a typographical error.

I think you have -- I'm being alerted that there might be a typographical error on your slide; isn't that correct?

A. I'm not aware of any.

Q. Yeah. It says CPX-146 bpm, or is that SpO2? I can't tell.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. That's bpm. On the lower side? That's bpm, beats per minute.

Q. Right. But SpO2, right above it --

A. Oh, I think those are -- I'll double-check on that, but I think they are bpm's too.

Q. Okay.

A. Doesn't make sense for SpO2 to be 65. That's a typo. Please correct that, make that bpm. Those are the heart rate numbers.

Q. So which one is incorrect? Can you tell?

A. Yes. If you look at --

Q. The ones --

A. The one you have highlighted in yellow, at the bottom, CPX-146 SpO2, that should be bpm. And MightySat SpO2 should be bpm, I believe. I'll double-check that.

Q. Right. Those numbers obviously are beats per minute and not SpO2, correct?

A. You are correct.

Q. Okay.

MR. RE: I have no further questions.

Thank you, doctor.

THE WITNESS: It's a pleasure, sir.

MR. SELWYN: Your Honor, I have no redirect.

MR. RE: Thank you, doctor.

THE WITNESS: Thank you, Your Honor.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

JUDGE BHATTACHARYYA: Thank you.

MR. MUELLER: Your Honor, we call as our next witness Robert Rowe. I believe Your Honor said we would be going a little bit later today because of the NEXT Advocates Program.

We call as our next witness Robert Rowe, and Ms. Vreeland will do the examination.

MS. VREELAND: Good afternoon. Dr. Rowe, I believe, should be joining us.

MS. SWAROOP: Perhaps while we're waiting, we had shipped a binder to Dr. Rowe, and I know we have an agreement that it has to be opened on camera, but I think for purposes of speeding this up, we're happy to have him open our cross binder now so that we can begin the cross as soon as you're done with his direct examination.

MS. VREELAND: Absolutely.

MS. SWAROOP: Your Honor, I assume we're on the public record now?

JUDGE BHATTACHARYYA: Yes, we are.

MS. SWAROOP: Thank you.

MS. VREELAND: I apologize for the delay. We were in coordination with his counsel, and I believe he will be here momentarily.

Your Honor, we had told him that we would call him when his time -- it was hard for us to predict when the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

cross-examination would be over.

JUDGE BHATTACHARYYA: What's the name of Mr. Rowe's counsel?

MS. VREELAND: Tim Rawson is Dr. Rowe's counsel.

MR. RAWSON: Good morning, Your Honor. This is Tim Rawson on behalf of Dr. Rowe. He is going to be joining us in just a moment.

MS. SWAROOP: Mr. Rawson, I don't know if you heard -- this is Sheila Swaroop -- if Dr. Rowe wants to open his cross binder, and if you want to as well, we're happy to have you do that now so that we don't waste time on the record with that.

MS. VREELAND: I believe Dr. Rowe has joined us. I'm hoping everybody can see him on screen.

MR. RAWSON: One thing I did want to raise, Dr. Rowe had requested to have access to an electronic copy of the '212 patent during his testimony, and I wondered if Your Honor would entertain that notion. I could send him the exhibit that I just received from Masimo's counsel.

JUDGE BHATTACHARYYA: If counsel has no objections, that's fine with me.

MS. SWAROOP: No objection from Masimo. I believe Apple's counsel also sent him the same exhibit.

MS. VREELAND: Certainly no objection from us either.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

JUDGE BHATTACHARYYA: That's fine.

MR. RAWSON: Dr. Rowe, I just sent you an email with that exhibit.

JUDGE BHATTACHARYYA: Dr. Rowe, you might be on mute.

Welcome, Dr. Rowe. Do you understand that you are under an obligation to testify truthfully here today?

THE WITNESS: I do.

ROBERT ROWE,

having been first duly sworn and/or affirmed on his oath, was thereafter examined and testified as follows:

JUDGE BHATTACHARYYA: Thank you. You may proceed.

MS. VREELAND: Thank you.

DIRECT EXAMINATION

BY MS. VREELAND:

Q. Dr. Rowe, if you could begin by introducing yourself to Her Honor.

A. Yes, Your Honor. I'm Robert Rowe.

Q. Dr. Rowe, I'd like to focus my questions today on the Lumidigm patent, but before I do, could you briefly describe your personal background beginning with your educational history?

A. Sure. I have a undergraduate degree in

MASIMO 2029
Apple v. Masimo
IPR2024-00242

mechanical engineering from Kettering University, used to be called General Motors Institute.

After receiving the mechanical engineering degree, I went on to University of Arizona, where I attained a Ph.D. in optics with a primary focus on medical imaging, but certainly covering a whole range of optics and physics.

From that point, after getting the degree, I took an industrial postdoctoral appointment with Leica, the precision optics company in Switzerland.

After that I returned to the United States and had another postdoctoral appointment with Sandia National Laboratories. From there I became familiar with a very, very recent startup that was developing medical measurement technology for measuring glucose and other analytes, noninvasively, optically. So I joined that company. It was called Rio Grande Medical Technology, and later became InLight Solutions.

After working there for a number of years, I and some colleagues saw an opportunity to take that technology and use it as a basis for a spinout company developing a novel type of biometrics. That company was called Lumidigm.

Lumidigm was successful for a number of years as a startup, transitioning to a product-focused company. In 2014 it was acquired by HID Global, which is a business unit of Assa Abloy, a public company in Sweden. And that is who

MASIMO 2029
Apple v. Masimo
IPR2024-00242

I'm with currently, HID Global.

Q. I'd like to take you backwards with a couple more questions before we turn to your Lumidigm patent.

Can you tell us what you were focused on at Sandia Labs when you did the postdoc there?

A. At Sandia there were a range of projects. The one -- one of them that wasn't classified and occupied a fair bit of my time was a spectroscopic measurement of semiconductor gases and trying to detect small amounts of water vapor and other impurities in the gas using spectroscopic techniques.

Q. How did you decide to join Rio Grande Medical when you completed that postdoc?

A. They, Rio Grande, had a very close working relationship with Sandia Laboratories. Some of the technology -- the original technology was shared with Sandia Laboratories, so I became familiar with Rio Grande through their collaboration, and just -- it just seemed like a fabulous opportunity to join them.

Q. Can you tell us about a few of the products you worked on when you were at Rio Grande Medical?

A. Sure. The primary focus of the company was noninvasive glucose measurement, something that a diabetic could use to measure their blood sugar without drawing blood, without poking themselves. So we designed and built

MASIMO 2029
Apple v. Masimo
IPR2024-00242

a variety of different spectrometers to do that.

Secondarily, we would measure alcohol, which both had a commercial potential, but then had some technical advantages to be able to test equipment, the spectroscopic equipment measuring alcohol.

And then a variety of analytes in the system that are medically important, blood gases and a variety of different analytes.

Q. Did Rio Grande Medical make any products that measured hemoglobin?

A. You know, I don't remember that. I was trying to think about that, but it wasn't primary. As I say, we measured a variety, a wide variety of analytes, but I don't recall exactly.

Q. If I can take you back, then, to Lumidigm. How did you -- how did you decide to found Lumidigm?

A. Well, technologically, what we found at Rio Grande or InLights Solutions, as it became known, is that the spectroscopic measurements that we were taking on people had a bias. From person to person they would look different, and we would have to correct for each person in order to get the medical measurements out.

Those lemons, if you will, became lemonade when we realized that bias from person to person, that difference from person to person, could be made into a biometric, a way

MASIMO 2029
Apple v. Masimo
IPR2024-00242

to identify a person and distinguish between people. So that was the technology or technological thought behind Lumidigm.

Q. And what was your personal role at Lumidigm?

A. Well, I was one of the founders of Lumidigm, and I was the Chief Technology Officer.

Q. Now your patent that we'll talk about in a moment mentioned something called "liveness detection." Did Lumidigm ultimately incorporate any liveness detection features into its products?

A. It was a very important part of what we developed all through the product family and the technology family that we developed. It was critical to be able to distinguish between real living biometric samples, fingers, for example, on humans, and those that were artificial of some kind, or even those that were dead or otherwise not living human fingers.

Q. And were Lumidigm's products ultimately successful?

A. Yes. Yeah. Yeah.

Q. And is Lumidigm still a standalone company?

A. No. It was acquired by HID in 2014.

Q. And what did you do after HID acquired Lumidigm?

A. For a couple of years I continued to be associated and developing and working within HID on the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Lumidigm biometrics, making further improvements there with the rest of the team, but then I transitioned into developing other biometrics, such as facial recognition, and most recently transitioned into heading up a team of data scientists working in the area of artificial intelligence, broadly, across a variety of different application spaces.

Q. I'd like to pull up now your '212 patent, RX-411. Can you describe -- we'll pull it on the screen and it should also be in your notebook.

Can you describe the work that you were doing at Lumidigm that led to the ideas described in the '212 patent?

A. Yeah. So the electro-optic sensors that we were designing and building for doing biometric measurements, doing spectroscopic determinations of identity and also liveness, we felt could be used for other purposes. So the '212 patent as well as other patents pertain to the extended functionality of these electro-optic sensors.

Q. And I see you at the very end of a very long list of inventors. What was your role in the work described in the patent?

A. Throughout the course of Lumidigm, including in developing this patent, I was really the key inventor, the person responsible for coming up with ideas and maturing those ideas so they could be patented.

In this particular case many of the concepts came

MASIMO 2029
Apple v. Masimo
IPR2024-00242

out of a brainstorming session that involved all the different coinventors listed on this patent, but I was -- I was the primary inventor.

Q. And how did you end up at the end of the list?

A. Yeah. Rather than the tricky process of trying to distinguish just how much each of these people contributed and ordering it according to the value of their contribution, my patent lawyers and I decided let's just alphabetize by last name.

Q. I'd like to ask you about some of the functions you describe in your patent, starting with column 19, lines 16 to 28, which we'll put on the screen.

A. Okay.

Q. You describe here functionality that you call a hemoglobin monitor and say that it can detect spectroscopic changes that are correlated with oxygenation and hemoglobin levels in the blood.

How would your sensor accomplish that function?

A. So in the spectral range that we use, the visible and the very near infrared, hemoglobin has a very, very strong spectral signature, and we would see that spectral signature in our data.

Furthermore, hemoglobin has -- has two different aspects, an oxygenated hemoglobin and deoxygenated hemoglobin, both of which are strong and both of which are

MASIMO 2029
Apple v. Masimo
IPR2024-00242

spectrally distinct from each other.

So seeing the hemoglobin in the spectral data and seeing the two different forms of the hemoglobin was something that our sense was very sensitive to.

Q. I'd like to put up on the screen some of the figures in your patent showing your potential sensor designs, Figs. 3 through 7D. We're going to put them all up on the screen at the same time.

What were you illustrating in these figures?

A. So this is a range of embodiments of the inventions disclosed where we are showing in these figures multiple LEDs. They can be of the same wavelength. They can be of different wavelengths.

And we're also showing a detector or multiple detectors that can be single element. They can be multi-element. They can be one-dimensional arrays. They can be two-dimensional arrays. And then all of the different arrangement or some example arrangements of how those components can be assembled.

Q. I'd like to ask you just about a few of those figures, starting with we're going to put on the screen Fig. 3 and the accompanying text at 833 to 37.

What does your patent say about the example in Fig. 3?

MS. SWAROOP: Your Honor, I'd like to make an

MASIMO 2029
Apple v. Masimo
IPR2024-00242

objection with regard to Order No. 42.

Masimo filed a motion in limine with regard to Dr. Rowe's testimony, and Your Honor ruled that any questions regarding the disclosure of the Lumidigm reference must be limited to Dr. Rowe's personal and factual knowledge regarding the reference and may not seek opinion testimony regarding how one of ordinary skill in the art would interpret any particular disclosures.

So to the extent there's going to be testimony beyond the four corners of this patent, we object as a violation of Order No. 42.

MS. VREELAND: Your Honor, if I may respond. I've simply asked him what his patent discloses about Fig. 3. We've put on the screen the relevant disclosure, and I've asked him what the patent says about Fig. 3. I believe that is squarely within what Your Honor said we could do.

MS. SWAROOP: Your Honor, if he deviates beyond the text of what his patent says about Fig. 3, that is a violation of Order 42.

JUDGE BHATTACHARYYA: Let's continue with the questioning. To the extent you believe there are portions of his testimony that are improper, we'll deal with it when we get to that point.

MS. SWAROOP: Thank you, Your Honor.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

THE WITNESS: Can you repeat your question, then, please?

Q. Yes. The question was: What does your patent say about the example in Fig. 3?

A. Would you like a verbatim reading or paraphrased?

Q. Just a paraphrase for what the patent -- what the patent is showing in Fig. 3.

A. Yeah. So Fig. 3 is showing an arrangement of LEDs numbered 34 and a detector 36 which, again, can be a single element, multi-element, 1D array or 2D array, and all of that within a sensor head 32.

Q. And --

MS. SWAROOP: Object, move to strike everything describing the characters of the detector that's not stated here in this passage that counsel is showing Dr. Rowe.

MS. VREELAND: I think the response, Your Honor, would be that the patent in an earlier place says that that single detector can be multiple detectors.

MS. SWAROOP: Your Honor, now we have counsel arguing about the disclosure.

MS. VREELAND: Well, I think he --

MS. SWAROOP: Your Honor, he also used words like "it can be." It does appear that he is now interpreting the disclosure in direct violation of Order No. 42.

JUDGE BHATTACHARYYA: Can we take a break for a

MASIMO 2029
Apple v. Masimo
IPR2024-00242

minute?

MS. VREELAND: Absolutely.

MS. SWAROOP: Yes, Your Honor. It's page 3 of order 42.

(Brief recess.)

JUDGE BHATTACHARYYA: We're back on the record.

Dr. Rowe can testify regarding his personal knowledge about what the invention is. He can testify regarding his personal knowledge about what he wrote in the patent.

To the extent that that's what he is testifying about, it is going to be let in and given the appropriate weight, and counsel can argue about the appropriate weight it should be given in the post-hearing briefs, but he is not limited precisely to reading the patent.

MS. SWAROOP: Your Honor, can he be permitted to testify -- he is using words like "can" and "may be able to do this." That seems to be exceeding the disclosure of the patent in violation of Order 42 -- could be, it could be doing this.

JUDGE BHATTACHARYYA: I agree. I think he should avoid testimony like that. To the extent there can be some foundation laid for various options that he wrote about in the patent, that's permissible, but general discussion about what could theoretically happen is too much without a

MASIMO 2029
Apple v. Masimo
IPR2024-00242

foundation.

MS. SWAROOP: Thank you, Your Honor.

MS. VREELAND: Thank you.

Q. Why don't we just speed ahead and look at the embodiment that you illustrate in Fig. 8B and describe in the accompanying text at 1160 to 122.

What were you illustrating in Fig. 8B?

A. So in 8B we're showing the electro-optic sensor or one example of the electro-optic sensor on the back of a wristwatch.

Q. And in the accompanying text you say that any of the sensor geometries previously disclosed can be used for this application.

What sensor geometries had you previously disclosed in the patent?

A. The figures we were just -- we were just looking at, the Figs. 3 through 7, I believe they were.

Q. Okay. So it would have been included the illustrations that we previously discussed in Figs. 3 through 7B?

A. Mm-hmm, correct.

Q. And was there any previously disclosed discussion of the sensor head?

A. Yes. Yes, quite a bit, yes.

Q. Okay. Great.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

MS. VREELAND: Well, we'll stop there, Your Honor, since it's past Your Honor's stopping point. No further questions.

JUDGE BHATTACHARYYA: All right. Sounds good.

There will be further questions tomorrow, I assume, Ms. Vreeland? Will you continue with the witness tomorrow?

MS. VREELAND: We'll pass the witness.

JUDGE BHATTACHARYYA: All right. So let's break for today.

Is there anything that counsel needed to bring up before we adjourn?

MS. SWAROOP: Yes, Your Honor.

JUDGE BHATTACHARYYA: Dr. Rowe, I'll see you tomorrow for Ms. Swaroop's questioning.

THE WITNESS: Okay. May I leave now, Your Honor?

JUDGE BHATTACHARYYA: Yes, you may leave. Thank you.

THE WITNESS: All right. Thank you.

MS. SWAROOP: Your Honor, on the issue of the clock, I did want to address one point.

I believe yesterday Mr. Mueller and this morning had indicated to you that Masimo was several hours -- had used several hours more of time than Masimo.

Based on our calculations, on the end of today,

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Apple had, I believe, seven or eight witnesses, they exceeded their time estimates for five of those, and, based on our calculation, Apple is now at a point where they have used more time than Masimo has in terms of hearing time. And we are very concerned that we are not going to have adequate time tomorrow to fully present our rebuttal case.

So we believe -- there is a slight dispute in terms of the calculation of time, but we believe that, by our calculation, they have used about 37 more minutes than we have in total. I think, under their calculation, they will think that we have used 15 minutes more than them. So that's the spread we're looking at.

We think the dispute is based upon the fact that there were lengthy objections that were argued, including Mr. Scruggs and Mr. Goldberg, that Apple is counting -- is charging us for, and we don't think that's correct. So that's the basis of the difference.

But we do think we have -- we're entitled to more than three hours of the hearing day tomorrow in view of where the time -- where we have ended up today after four days of testimony.

MR. MUELLER: Your Honor, if I could respond?

JUDGE BHATTACHARYYA: Yes.

MR. MUELLER: I disagree with the last point. I do think the parties are much closer now than they were at

MASIMO 2029
Apple v. Masimo
IPR2024-00242

the beginning of the day, that's certainly true.

I think at this point, Your Honor, the parties should try to hash out the differences that Ms. Swaroop referred to tonight and we can report back to Your Honor first thing tomorrow morning.

It is definitely closer than it was at the beginning of the day. Again, I'm not going to agree with that last estimate, but I think we can -- I hope we can -- hash out the remaining agreements tonight and we can report on any outstanding issues to Your Honor first thing tomorrow morning.

MS. SWAROOP: Your Honor, we're happy to meet and confer with Mr. Mueller and report to you first thing. Thank you.

JUDGE BHATTACHARYYA: One thing that would be helpful, in order to save hearing time tomorrow is, to the extent you come to a position, come to positions tonight, or early tomorrow morning, if you can send me an email previewing any disputes that you're going to want me to resolve, then that will be helpful. We can just summarize what everybody's positions are on the record and I can hopefully rule more quickly with that preview.

MR. MUELLER: Thank you, Your Honor. We will do that. I had just one more issue, but I'll wait to see if Ms. Swaroop has any others first.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

MS. SWAROOP: I'm sure I'll have a response to yours, Mr. Mueller, but please go ahead.

MR. MUELLER: Maybe not.

Your Honor, for this one, it's actually just a request to Your Honor. Tomorrow morning my daughter is graduating eighth grade, and so, with Your Honor's permission, I would step out for about an hour and a half or so, maybe two hours, to attend the graduation.

MS. SWAROOP: We're pleased to have Mr. Mueller attend his daughter's graduation. I'm glad that he is able to fit that in.

JUDGE BHATTACHARYYA: I'm happy that you will attend as well. I assume there will be somebody on your team who will be here.

MR. MUELLER: Yes, Your Honor, absolutely. Just a preview, I should be here for the beginning of the day, so I should be on camera from a different location at the beginning of the day.

Ms. Vreeland will complete the examination of Dr. Rowe, and then Ms. Vreeland will also do the examination of our next witness, Dr. Warren. I will be back before Dr. Warren completes his testimony.

JUDGE BHATTACHARYYA: Thank you very much everyone.

MR. MUELLER: Thank you, Your Honor.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

MS. SWAROOP: Thank you. See you tomorrow.

(Whereupon, at 5:31 p.m., the proceedings adjourned, to reconvene the following day, June 10, 2022, at 9:30 a.m.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

C O N T E N T S

INDEX OF WITNESSES

WITNESS	DIRECT	CROSS	RE-DIRECT	RE-CROSS
SAAHIL MEHRA,	876, 876			
UEYN BLOCK,	895	903	910	914
STEPHEN WAYDO,	918	934	946, 947	950
BRIAN LAND,	952	973	985	
PAUL MANNHEIMER,	993	1008	1023	1025
SCOTT CROMAR,	1026	1034	1037, 1040	1038
MAJID SARRAFZADEH,	1042	1128		
ROBERT ROWE,	1141			

AFTERNOON SESSION 1026

CONFIDENTIAL SESSIONS 876-894, 899-917, 922-935, 943-944, 947-948, 961-969, 975-992, 998-1005, 1012-1025, 1065-1087, 1092-1097, 1114-1134

MASIMO 2029
Apple v. Masimo
IPR2024-00242

COMPLAINANTS' CORRECTED TABLE OF ADMITTED EXHIBITS FOR THE EVIDENTIARY HEARING ON JUNE 7, 2022

AMMAR AL-ALI

CX-0494C

CX-1634C

CX-1638C

JX-009 (CX-0004)

CPX-0020C

CPX-0020aC

BILAL MUHSIN

CX-0680C

CX-0682C

CX-0778C

CX-0789C

CPX-0019aC

CPX-0019C

CPX-0146aC

CPX-0146C

CPX-0155aC

CPX-0155C

CPX-0156aC

CPX-0157aC

CPX-0157C

STEPHEN SCRUGGS

MASIMO 2029
Apple v. Masimo
IPR2024-00242

CX-0389C
CX-0390C
CX-0392C
CX-0395C
CX-0473C
CX-0474C
CX-0536C
CX-0550C
CX-0551C
CX-0591C
CX-0593C
CX-0594C
CX-0595C
CX-0600C
CX-0605C
CX-0652C
CX-0653C
CX-0654C
CX-0655C
CX-0656C
CX-0658C
CX-0661C
CX-0665C
CX-0666C
CX-0675C

MASIMO 2029
Apple v. Masimo
IPR2024-00242

CX-0676C
CX-0679
CX-0685C
CX-0701C
CX-0704C
CX-0705C
CX-0709C
CX-0710C
CX-0772C
CX-0784C
CX-0790C
CX-0801C
CX-0805C
CX-0806C
CX-0812C
CX-0813C
CX-0814C
CX-0815C
CX-0835C
CX-0836C
CX-1111C
CX-1124C
CX-1125C
CX-1128C
CX-1129C

MASIMO 2029
Apple v. Masimo
IPR2024-00242

CX-1132C
CX-1137C
CX-1185C
CX-1415C
RX-0263
RX-0264
RX-1183C
RX-1444
CPX-0012C
CPX-0012aC
CPX-0013C
CPX-0013aC
CPX-0014
CPX-0014a
CPX-0021aC
CPX-0021C
CPX-0029aC
CPX-0029C
CPX-0058aC
CPX-0058C
CPX-0065aC
CPX-0065C
CPX-0141aC
CPX-0141C

MICAH YOUNG

MASIMO 2029
Apple v. Masimo
IPR2024-00242

CX-0611C
CX-0617C
CX-0618C
CX-0620C
CX-0623C
CX-0624C
CX-0625C
CX-0626C
CX-0627C
CX-0628C
CX-0629C
CX-0630C
CX-0631C
CX-0632C
CX-0634C
CX-0635C
CX-0636C
CX-0637C
CX-0638C
CX-0639C
CX-0640C
CX-0641C
CX-0642C
CX-0643C
CX-0644C

MASIMO 2029
Apple v. Masimo
IPR2024-00242

CX-0645C
CX-0646C
CX-0647C
CX-0648C
CX-0649C
CX-1630
CX-1637
GERRY HAMMARTH
CX-0633C
DANIEL McGAVOCK
CX-1293
CX-1409
CX-1616
JOSEPH KIANI (JUNE 6, 2022)
RX-1186
TABLE OF ADMITTED EXHIBITS FOR THE EVIDENTIARY HEARING ON JUNE 8, 2022
JACK GOLDBERG
CX-0330
CX-0419C
CX-0597C
CX-0839C
CX-0840C
CX-0845
CX-0846

MASIMO 2029
Apple v. Masimo
IPR2024-00242

CX-0847
CX-0849
CX-0850
CX-0853
CX-1724
CPX-0154C
VIJAY MADISETTI
CX-0307iC
CX-0329
CX-1038C
CX-1058C
CX-1062C
CX-1068C
CX-1069C
CX-1072C
CX-1074C
CX-1251C
CX-1406
CX-1407
CX-1447
CX-1449
CX-1451
CX-1492
CX-1532
CX-1546C

MASIMO 2029
Apple v. Masimo
IPR2024-00242

CX-1548C
CX-1646C
CX-1647C
CX-1705
CX-1726
CX-1727
CPX-0159
CPX-0159a
VIVEK VENUGOPAL
RDX-4
RPX-0040C
RPX-0041C
RX-0392C
RX-0895C
CX-1683
SAAHIL MEHRA
RX-0677C
COMPLAINANT'S TABLE OF DEMONSTRATIVES FOR EVIDENTIARY HEARING ON JUNE 6 and 7, 2022
CDX-0001C
CDX-0005C
CDX-0006C
CDX-0008C
CDX-0016C

MASIMO 2029
Apple v. Masimo
IPR2024-00242

C E R T I F I C A T E

TITLE: CERTAIN LIGHT-BASED PHYSIOLOGICAL MEASUREMENT DEVICES AND COMPONENTS THEREOF

INVESTIGATION NO.: 337-TA-1276

HEARING DATE: June 9, 2022

LOCATION: Washington, D.C. - Remote

NATURE OF HEARING: Evidentiary Hearing

I hereby certify that the foregoing/attached transcript is a true, correct and complete record of the above-referenced proceedings of the U.S. International Trade Commission.

Date: June 9, 2022

Signed:

ss// LaShonne Robayo

Signature of the Contractor or the Authorized Contractor's Representative

I hereby certify that I am not the court reporter and that I have proofread the above-referenced transcript of the proceedings of the U.S. International Trade Commission against the aforementioned court reporter's notes and recordings for accuracy in transcription in the spelling, hyphenation, punctuation and speaker identification and did not make any changes of a substantive nature. The foregoing/attached transcript is a true, correct and complete transcription of the proceedings.

Signed:

ss// Raymond G. Bynteson

I hereby certify that I reported the above-referenced proceedings of the U.S. International Trade Commission and caused to be prepared from my record media and notes of the proceedings a true, correct and complete verbatim recording of the proceedings.

Signed:

ss// Linda Kenkade

MASIMO 2029
Apple v. Masimo
IPR2024-00242

UNITED STATES
INTERNATIONAL TRADE COMMISSION

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In the Matter of Investigation No.

CERTAIN LIGHT-BASED PHYSIOLOGICAL 337-TA-1276

MEASUREMENT DEVICES AND COMPONENTS

THEREOF

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REVISED AND CORRECTED TRANSCRIPT

OPEN SESSIONS

Pages: 1168 through 1459

Place: Washington, D.C.

Date: June 10, 2022

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MASIMO 2029
Apple v. Masimo
IPR2024-00242

UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

Before the Honorable Monica Bhattacharyya

Administrative Law Judge

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In the Matter of Investigation No.

CERTAIN LIGHT-BASED PHYSIOLOGICAL MEASUREMENT DEVICES AND COMPONENTS THEREOF 337-TA-1276

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EVIDENTIARY HEARING

Friday, June 10, 2022

Volume V

The parties met via remote videoconferencing pursuant to notice of the Administrative Law Judge at 9:30 a.m. Eastern.

Reported by: Linda S. Kinkade RDR CRR RMR RPR CSR

MASIMO 2029
Apple v. Masimo
IPR2024-00242

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MASIMO 2029
Apple v. Masimo
IPR2024-00242

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MASIMO 2029
Apple v. Masimo
IPR2024-00242

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MASIMO 2029
Apple v. Masimo
IPR2024-00242

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MASIMO 2029
Apple v. Masimo
IPR2024-00242

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*** Index appears at end of transcript ***

MASIMO 2029
Apple v. Masimo
IPR2024-00242

P R O C E E D I N G S

(In session at 9:30 a.m.)

JUDGE BHATTACHARYYA: It looks like there's no cross for Dr. Rowe; is that correct?

MS. SWAROOP: That's correct, Your Honor, but there is one issue that has arisen with regard to his deposition designations that we did want to raise with Your Honor this morning.

JUDGE BHATTACHARYYA: Okay. Go ahead.

MS. SWAROOP: Sure. So we understood from the motion in limine that we filed on Dr. Rowe, Apple made representations that it was not intending to call Dr. Rowe by deposition but rather call him live at the hearing, and that was in their opposition to our motion in limine. And in Order 42 at page 2, Your Honor also reflected that, indicating that Apple was not intending to present him by deposition.

After Dr. Rowe completed his direct examination yesterday, Apple asked us to withdraw our cross-examination of Dr. Rowe, but at the same time we received a set of designations from Apple for Dr. Rowe.

And so we understood that Apple would not be presenting any designations from Dr. Rowe based upon the representations that they made in opposing our motion in limine and that Your Honor relied on in Order No. 42. We

MASIMO 2029
Apple v. Masimo
IPR2024-00242

would like to object to that, Your Honor.

MS. VREELAND: Just to be clear, we do not ask that any designations be entered. The trial testimony is what we'll rely on. So I don't think there's a dispute here.

MS. SWAROOP: Thank you. I appreciate that clarification.

So the chart that we got of the designations, you'll be taking Dr. Rowe's designations off of that; is that correct?

MS. VREELAND: I think they've already been taken off, yeah.

MS. SWAROOP: Thank you.

We also have a couple of issues with regards to exhibits for today. So there is two specific I wanted to raise. One was an exhibit that came up in -- was referenced in the presentation of Dr. Sarrafzadeh yesterday, and that was CX-322bC, lower case b capital C, and the issue there is that Apple had presented a version of that exhibit, and it's an excerpt from Dr. Sarrafzadeh's report relating to some testing.

And we are in agreement that certain images and factual information relating to the tests can come in, but we felt that the excerpt presented also included opinions that we didn't think were appropriate, so we presented an

MASIMO 2029
Apple v. Masimo
IPR2024-00242

alternative version.

I think the parties would suggest that we submit both exhibits to Your Honor, both parties' versions of that exhibit, and Your Honor can make a decision as to which one should be admitted. So that, I think, is reflected on the table of exhibits for yesterday.

MR. SELWYN: Your Honor, we don't want to spend time debating this. We want to get moving this morning. We agree. We'll submit both of them. Your Honor will have emails from the parties summarizing their arguments and Your Honor can rule.

JUDGE BHATTACHARYYA: All right. If everyone agrees on that procedure, we'll move in that fashion.

MS. SWAROOP: Thank you, Your Honor. And then the last issue I wanted to raise is with an anticipated exhibit coming up in the examination of Apple's expert, Dr. Warren, and that is RX-1470C.

So what this exhibit appears to be is an excerpt from a report that Dr. Warren submitted in this investigation on the issue of domestic industry technical prong. And, again, this appears to be not simply test results, but it's his -- things that he observed with regard to the DI products. It's not actually a test setup at all.

And so Dr. Sarrafzadeh testified about this in his direct, and we think, if Apple would like to rely on

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Dr. Warren's objections or whatever it is, they should do that through his direct testimony rather than excerpting portions of his report and submitting that as part of the record. So we do object to that as well.

JUDGE BHATTACHARYYA: Ms. Swaroop, this is a portion of Dr. Warren's report that you're concerned about?

MS. SWAROOP: Yes. Dr. Warren is attempting to introduce portions of Dr. Warren's own report in his direct.

JUDGE BHATTACHARYYA: And you also mentioned Dr. Sarrafzadeh.

MS. SWAROOP: Yes, Your Honor. They submitted a joint report that they both signed on the issue of technical prong domestic industry. So the official title of it is a rebuttal expert report from both of them. So that's what they're now seeking to introduce through Dr. Warren, excerpts from his -- of his opinions.

JUDGE BHATTACHARYYA: Thank you.

MS. VREELAND: Your Honor, two responses. First, just a clarification on what it is. It is a short excerpt from Dr. Warren's report with the measurements he recorded during the demonstration of the Masimo devices and also his own work with them.

We think it is admissible for two reasons. First, it is a summary of his work under Rule 106. And, secondly, and uniquely important, we have agreed twice

MASIMO 2029
Apple v. Masimo
IPR2024-00242

during this trial to Masimo introducing similar summaries of their experts' work. And I would point Your Honor specifically to CX-307IC, and we can put it on the screen if it would help Your Honor. This is a 32-page excerpt from Dr. Madisetti's report relating to the testing he did. It was not on their exhibit list. They provided it as a new exhibit during the trial, and we agreed to its admission.

Dr. Warren's Exhibit 1470C is much shorter. It's only nine pages. It's a very short excerpt from his expert report with the testing data. So we think it's admissible for two reasons.

First, under Rule 106, and, secondly, we agreed to allow Masimo to provide exactly the same type of excerpt from Dr. Madisetti's report.

MS. SWAROOP: Your Honor, if I could be heard. Length has nothing to do with admissibility here. The Appendix I that counsel showed on the screen was an appendix that was describing a test setup.

What we have here in RX-1470C is Dr. Warren's observations about what he saw. We did agree to the excerpt from Dr. Sarrafzadeh because that was a test setup and we do have a dispute over which version. But really the issue is over the content here, they're excerpting portions of his opinions, and seeking to admit that into evidence.

If they want to submit his observations into

MASIMO 2029
Apple v. Masimo
IPR2024-00242

evidence, he should provide testimony about that.

MS. VREELAND: Your Honor, if I may just respond. He will proceed the testimony. The specific thing we're interested in are those measurement tables that Dr. Sarrafzadeh testified about and that Dr. Warren will as well, and we offered to redact anything else they wanted us to redact from the exhibit. They made no suggestions.

We're certainly happy to do further redactions. We offered to do further redactions. What we're really interested in having in evidence are his tables of the measurements he recorded during his work with the W1 and during the demonstration. Again, it's a much smaller thing to add than what we agreed to add for Dr. Madisetti.

JUDGE BHATTACHARYYA: It sounds like the measurements themselves fall into this general category of test data and test protocols that you believe are admissible.

MS. SWAROOP: That's correct, Your Honor. The measurement table itself would be fine with us. I think the issue is the text and the explanations there.

MS. VREELAND: Your Honor, we offered to make further redactions. So I think this is something that the parties can work through following this conversation as we've offered to do from the start.

MS. SWAROOP: I'm sure we can work that out,

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Your Honor.

JUDGE BHATTACHARYYA: All right. Sounds good.

Can we go ahead with the witness or do we need to take a break to --

MR. MUELLER: Yes, Your Honor. Our next witness is Dr. Warren. Ms. Vreeland will do the examination. As I said yesterday, I'm going to step out for a bit, but I will be back.

JUDGE BHATTACHARYYA: All right. Thank you.

MR. MUELLER: Thanks very much.

MS. SWAROOP: Your Honor, I don't know if we need to put it formally on the record, but we are not calling Dr. Rowe for cross-examination. We did inform Apple of that yesterday, but I wanted to make that clear on the record as well. Dr. Rowe, not Dr. Warren.

JUDGE BHATTACHARYYA: You're calling Dr. Rowe for cross-examination?

MS. SWAROOP: No, no. I just wanted to make clear that we are not seeking cross-examination of Dr. Rowe. We're completed with that witness and we can begin with Dr. Warren.

JUDGE BHATTACHARYYA: Understood. Thank you very much.

Good morning, Dr. Warren. I think you're on mute still.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

THE WITNESS: Good morning, Your Honor. Good morning everyone.

JUDGE BHATTACHARYYA: Do you understand that you're under an obligation to tell the truth in your testimony today?

THE WITNESS: Yes.

STEVE WARREN,

having been first duly sworn and/or affirmed on his oath, was thereafter examined and testified as follows:

JUDGE BHATTACHARYYA: Thank you. You may proceed counsel.

DIRECT EXAMINATION

BY MS. VREELAND:

Q. Dr. Warren, could you begin by introducing yourself to Her Honor?

A. Yes. My name is Steve Warren. I'm a professor at Kansas State University.

Q. You got your K-State purple on today?

A. I do, yes, I have to represent.

Q. How long have you been a professor at K-State?

A. I started in '99, so about 23 years.

Q. And can you briefly describe your educational background?

A. Yes. I have three degrees in electrical

MASIMO 2029
Apple v. Masimo
IPR2024-00242

engineering: a Bachelor's and a Master's degree from Kansas State, and then a doctorate from the University of Texas at Austin, and then I've also done a postdoctoral appointment at Sandia National Labs.

Q. What was the focus of your research, your Ph.D. research, at the University of Texas?

A. That research was biomedical research. It was light tissue interaction or laser tissue interaction, where we were using argon ion laser light to diagnose coronary artery and aorta disease progression.

Q. And what did you do after receiving your Ph.D.?

A. I finished my doctorate, and then I went to Sandia National Labs as a postdoctoral appointment, and I worked for a group there that was working on a personal status monitor project.

Q. Was that a light-based sensor?

A. It incorporated a light-based sensor, among other things, yes.

Q. What did you do after completing your work at Sandia?

A. After I finished at Sandia, I went to Kansas State University to begin a professor appointment and I've been there since.

Q. How did you choose to go back to K-State?

A. Well, I'm from Kansas originally, so it was nice

MASIMO 2029
Apple v. Masimo
IPR2024-00242

to bring kids back to grandparents.

Q. What are your current responsibilities at Kansas State?

A. It is a three-prong appointment. It's a research, teaching, and service appointment.

Q. Okay. What technologies have you focused on at Kansas State?

A. We've worked on a lot of things, but for research it's been primarily physiological monitoring tools, wearable sensors, pulse oximeters specifically, signal analysis, and engineering education, to name a few.

Q. Can you provide some -- have you built or developed any physiological sensors over the time that you've worked at K-State?

A. We've built dozens of different varieties of sensors, accelerometers, pulse oximeters, motion units, conductive plethysmographs, all kinds of different things.

Q. Can you provide a few examples?

A. Yeah. A lot of our work deals with what I would call vulnerable populations. So the elderly, for example, we've looked at various portable or ambulatory monitors for use with aging.

Some of those units, if you turn them a quarter turn, you get a different sensor every time you turn it a quarter turn. We've looked at portable pulse oximeters in

MASIMO 2029
Apple v. Masimo
IPR2024-00242

that environment, both wired and wireless.

And we've spent a fair amount of time doing designs for kids with disabilities, specifically recently a bed that monitors the child's heart rate and breathing rate in-and-out bed activity and movement all night while they sleep.

Q. Have you published any papers in the field?

A. We've published quite a lot. It's about 175 papers total that are peer-reviewed. I think about 80 or 85 percent of those are physiologic monitoring related.

Q. How many of those would relate to pulse oximetry then?

A. I would bet more than half of the physiologic ones.

Q. And have you received any grants or funding for your research?

A. Yeah. Last count we were at 62 funded grants since I started at Kansas State for about $14 million total. Most of that was --

Q. Go ahead.

A. Most of that was through the National Science Foundation, and we had a fair amount of funding through NASA to look at wearable sensors.

Q. Have you taught any classes?

A. I teach every semester, usually two classes a

MASIMO 2029
Apple v. Masimo
IPR2024-00242

semester. This was my 33rd time on linear systems last semester.

Q. Have you included in those classes any teachings on pulse oximetry?

A. We address pulse oximetry directly in my introduction to biomedical engineering class and in my biomedical instrumentation course, but we also use those signals in -- there's a graduate scientific computing class that I've taught and that class I just mentioned, I use those signals as test cases for the students.

Q. What about laboratories, have you -- do you have any laboratories that involve pulse oximetry?

A. We've had a number of them, usually as part of the biomedical instrumentation sequence. It's a lecture lab pair.

Q. And when did you begin building pulse oximeters with your students?

A. Well, I started myself in the mid-'90s, but with my students I started in about spring 2000 was when we had our first units.

Q. So that would have been about eight years before the Poeze patents were filed?

A. That's correct.

Q. We're going to put on the screen RX-632.

Do you recognize RX-632?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Yeah, these are some of my favorite students from a fall 2002 biomedical instrumentation course.

Q. Who are we seeing?

A. Ryan Schmitz in the front currently works for Garmin; Zanatil Furtis is behind him; and then behind her is Jianchu Yao, who is an associate dean at East Carolina at the moment.

Q. For Mr. Schmitz, where is the sensor in the photo?

A. Ryan is acquiring a measurement from his wrist in this photo.

Q. Okay. So were your students able to use these pulse oximeters, then to, make measurements on their wrists?

A. Yeah. That was part of the fun part was having them make measurements all over their bodies, in fact, with these sensors.

Q. Have you personally received any awards or recognitions for your work at K-State?

A. Well, I have, I mean, a number of them. The one that's my favorite, honestly, is an award I received about two years ago. It's a public service award that I received from the college, and that was for our work, not only with a disaster response team for tornado cleanup that I manage, but also some work that we did for 15 years with Heartspring to build tools with kids for special needs.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. And would those, when you say "tools for kids with special needs," what kinds of tools would those be?

We can take the photograph down.

A. Yeah, these would be the beds that I mentioned or wearable senses. We worked on toothbrush design to track how they brush their teeth as a training exercise. Just a variety of things that you might not imagine unless you spend time with these children.

Q. We're going to put on the screen CX-335.

Do you recognize this?

A. I do.

Q. What are we seeing?

A. This is the front page from my academic CV.

Q. And does CX-335 accurately summarize your work in the field of light-based sensors and pulse oximetry?

A. It does, yes.

Q. Dr. Warren, have you ever testified at trial before?

A. No, this is the first time.

Q. Well, I'll be the first, then, to move to admit you as an expert witness.

Your Honor, we would move to admit Professor Warren as an expert in biomedical engineering, medical monitoring systems, biomedical instrumentation, biomedical optics, light issue interaction, diagnostic systems,

MASIMO 2029
Apple v. Masimo
IPR2024-00242

wearable sensors, and biomedical signal processing.

JUDGE BHATTACHARYYA: Any objection?

MR. CLAASSEN: Just making sure I can read the transcript of that impressive list.

No objection.

JUDGE BHATTACHARYYA: Let me formally admit him.

Dr. Warren is hereby admitted as an expert in biomedical engineering, medical monitoring systems, biomedical instrumentation, biomedical optics, light issue interaction, diagnostic systems, wearable sensors, and biomedical signal processing.

MS. VREELAND: Thank you, Your Honor.

Q. Professor Warren, at a high level, what issues have you been asked to consider in this case?

A. I've been asked to look specifically at whether the Apple products infringe a set of three patents we call them the Poeze patents.

Q. Any other issues?

A. Yeah. I've also been asked to address the validity of the claim limitations that are specified in those asserted patents.

Q. And at a high level, have you reached any opinions?

A. Yeah, at a high level, I guess my opinions are twofold. The first is that the Apple Watch Series 6 and 7

MASIMO 2029
Apple v. Masimo
IPR2024-00242

do not infringe these patents, and my other opinion, at a high level, is that these patents in terms of their claim limitations are invalid based on prior art.

Q. And have you put together -- have you helped put together some demonstrative exhibits to explain the basis for your opinion?

A. Yes.

Q. We're going to put on the -- and do you recognize what we have on the screen, RDX-8.1?

A. I do. Yes, I do. Thank you.

Q. If we could turn to the next slide.

Professor Warren, how long have researchers been using light-based sensors to take physiological measurements?

A. We have well-documented evidence that goes back at least eighty years, although there's some work in the late 1800's that applies as well.

Q. When was RX-654, the Mathis article, published?

A. This is a 1938 article that looked at light-based transmission through the finger and the toe in a subject.

Q. I'd like to ask you some questions about the state of the art in July 2008, the priority date for the Poeze patents. Do you have that date in mind?

A. I do.

Q. If we could turn to the next slide.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

In July 2008 what was known about the number of LEDs that could be included in an optical sensor?

I'm sorry. I'm going to skip that one and go one more to RDX-8.5.

In July of 2008, what was known about the number of LEDs that could be included in a light-based sensor?

A. Well, I could say generally that the answer would be a plurality and a plurality in sets. I noted some examples on this slide or this viewgraph.

For example, Smart is an interesting one, 1971. It has 13 LEDs and this was 50 years ago.

McCarthy in the upper right, 1991, incorporated eight LEDs, each of which could be included in sets or co-located we would say.

If you look in the lower left, there's Haar -- oh, by the way, Smart, RX-473 is its number. McCarthy RX-489.

Haar in the lower left, RX-667, is an example of a plurality of LEDs, which are also in sets; Scharf 137, RX-335, is a good example of a pulse oximeter that uses green light.

And then Lumidigm in the lower right, RX-411, is a little more recent, but it has all kinds of configurations.

Q. On the next slide, what is a set of LEDs?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. A set of LEDs would be a grouping, and they could be either in different locations but assigned to one another as a group, or it could be what we would call a co-located set, which might be, for example, three LED dies about the size of a pepper speck, as we saw the other day in the same physical package.

Q. And in July of 2008, what was known about the number of sets of LEDs that could be included in an optical sensor?

A. Well, as of that time it had already been known for quite some time that you could work with LEDs in sets. I included some examples here on the slide.

For example, McCarthy in the upper middle, RX-489, in 1991 demonstrated this principle; Haar, which I've already mentioned in the upper right, RX-667, did the same.

There's a really an interesting, in the lower left, an application from Walowit, RX-502, that used various sets of sets of LEDs.

And then we have an additional set of examples, I'll pull out Gratton, for example, on the lower right, RX-456, that did LEDs in sets at different distances.

Q. If we could turn to the next slide.

In July of 2008, what was known about the number of photodiodes that could be included in an optical sensor?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Yeah. A person of ordinary skill would have known at that time that you could include a plurality of photodiodes. I have examples here that note four or more where they could be arranged radially, meaning in a circular arrangement, or in what we would say is a rectilinear grid or a Cartesian coordinate system.

So some of the examples of note here are from 1978. I've noted two. There's Orr, RX-495, and Cramer, RX-670, and then, again, we see McCarthy on the upper row, RX-489. Mendelson in the top is really popular, RX-458. And then if you look at the bottom, the Konig reference, RX-487, has made an impact in this arena.

Q. If we were to turn to the next slide, would you be able to name even more? And I won't stop you.

A. This slide has some really good ones. A good example, I include, Lumidigm RX-411, in the upper left, which we'll talk about much more later.

The Avni article in the upper right, second from the right, is an interesting one, because that's a swallowable GI pill that uses light as a sensing mechanism. I listed our own sensor in the upper right, K-State 6D, RPX-6.

Q. I'm going to stop you there. I think we got a full list.

I'm going to ask you on the next slide, in July

MASIMO 2029
Apple v. Masimo
IPR2024-00242

of 2008, what was known about the use of openings with opaque surfaces over photodiodes?

A. Well, I would say in 2008 and many decades prior, openings are a way for light or to allow light to get to a detector. A detector can't detect light without some sort of opening above it.

Q. And if we were to turn to the next slide, can you provide some examples before 2008 -- July of 2008 -- of devices that combine these concepts that you've been talking about -- multiple LEDs, four or more photodiodes, and openings over those photodiodes?

A. Yes. None of these tools existed in isolation. A designer would have used a collection of a grouping or permutation of many of them in their work.

One I really like a lot is Smart, RX-473, because it incorporates the LEDs, the photodiodes, the opaque material, the interior surfaces, the opaque surfaces, and the openings all in one bundle, 50 years ago.

Q. What are the others that you've identified on this slide? And just by name and exhibit number.

A. Okay. Haar, RX-667, and then McCarthy, RX-489, Lumidigm, RX-411, and then finally Imai, RX-1220.

Q. If we can turn to the next slide.

In July of 2008, what was known about the use of transmissive coverings or windows over photodiodes?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. I noted earlier that you need an opening to allow light to reach a detector. A window is another way to allow that to happen where a window is a physical piece of material, or we call it a transmissive covering, where the covering would allow light through, but it would also physically protect the detector from dust and debris and dirt, liquid, things of that nature.

Q. What are your favorite examples here?

A. I'll pick a few. I really like Cramer RX-670 in the upper left, because it's more than 40 years old. Nippon, or what I call Jaib, RX-665, next to it. Seiko, we'll hear about in a moment, RX-666, and then also Haar, RX-667. And I might point out we also did this with Kansas State, RX-648.

Q. If we could turn to the last slide in this series.

In July of 2008, what was known about the use of structures protruding into the tissue in optical sensors?

A. So a person of ordinary skill would have already known that you could take a structure, we'll call it a protrusion or a sensor head, and push that into tissue, and what that would enable is that would push residual blood out of the way and increase your AC-to-DC signal ratio, meaning that you would see the tissue perfusion in a better way.

And there were a number of designs that did this.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Again, I like Smart, because it's so old, RX-473, but Cramer, next to it, RX-670, also implemented this mechanism.

And Seiko in the bottom left, Seiko 131, which is RX-666, not only implemented it, but explained well why the technique was important and why it worked.

Q. If we could go to the next slide.

Professor Warren, we're going to come back to the Apple Watch later, but until then just a few preliminary questions.

How long have optical sensors included four or more sets of LEDs?

A. At least since 1990, so 30 years.

Q. How long have optical sensors included four or more photodiodes arranged in quadrants?

A. Cramer 1978 would be a good example, so 40 years.

Q. How long have optical sensors included openings with opaque surfaces over photodiodes?

A. That goes all the way back to Herczfeld and Smart in the late '60s.

Q. And how long have optical sensors included convex protrusions to conform to a measurement site?

A. I would offer Smart for that one, early '70s.

Q. We're going to turn now to RDX-8.88.

You mentioned earlier that you have built pulse oximeters with your students in laboratory classes. Do you

MASIMO 2029
Apple v. Masimo
IPR2024-00242

recognize -- let me just ask you to remind us the timing of these laboratory courses.

A. I took these pictures in fall 2002.

Q. Okay. What are we seeing on the top row?

A. So the top row is just some example pictures from a Tuesday evening session that we managed with the students where I attempted to archive the pulse oximetry procedure.

Q. Is that Mr. Schmitz again on the left taking a measurement on his wrist?

A. It is, yes.

Q. And what are we seeing in the bottom row?

A. So the bottom row is a collection of sensors that were built by students. On the left row we have some built by Ryan, excuse me, by Austin Wareing. And in the center there were some other built by students as well as the right.

Q. I'd like to ask you about one in particular. We're going to turn to RDX-889.

Do you recognize the student-made sensor in the photo on the left here, RX-515?

A. Yes. This is a sensor that Austin Wareing built.

Q. Okay. And who was Austin Wareing?

A. Oh, yes, Austin Wareing was an undergraduate student in my laboratory working on an Honors Research project.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Okay. And at the time he created this sensor, would he have met the agreed definition of a person of ordinary skill in the art?

A. No, he did not yet have his undergraduate degree.

Q. When did he create this sensor?

A. This was a summer 2004 project.

Q. Can you describe at a high level the primary components he included in his sensor?

A. Yeah. The sensor incorporated six photodiode detectors. These are large area detectors. And they were embedded on an interior foam surface, and that was sandwiched then with another piece of foam on top.

And to provide openings, Austin cut holes in the foam with an X-Acto knife, and then he cut the border around the entire unit with a pair of scissors.

Q. Do you recognize the photo on the top left, RX-517?

A. Yes. On the top right, it's Austin's sensor along with a data acquisition board to which it interfaced.

Q. What components would that data acquisition board have had?

A. That was a board driven by a PIC microcontroller, and it also had the sample on hold circuitry and some other circuitry on it.

Q. Including processors?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Yes, the PIC microcontroller was a processor with memory.

Q. What are we seeing in the bottom right, RX-652?

A. The image in the bottom right is a depiction of one of the Bluetooth boards that we used with RX-0517. This was a Bluetooth board that we had just a small number of.

Q. And we're going to quickly put on the ELMO three physical exhibits, RPX-6, RPX-7, and RPX-33.

Do you recognize these?

A. Yes, I do.

Q. And how would you compare these to what we just saw in the photos?

A. They're the same units that were in the photos, although I believe the one on the right is upside down.

Q. Sorry about that.

We're going to turn, then, to RDX-890.

Did any of your students ever use more than two LEDs in RDX-890?

A. Yeah. We looked at a previous viewgraph with some students' sensors in it, and it incorporated four sets of two LEDs around a central photodiode detector. And there is an image on the screen at the moment that depicts another student's work that incorporates three LEDs.

Q. Did any of your students ever include windows over the photodiodes in their sensors?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Yeah. One of the nice products available at the time is what we would call a can photodiode, which means a photodiode in a can with a window over the top to provide a lens and a protective function.

Q. And are we looking at RX-510 and RX-648?

A. Yes.

Q. If we could turn to the next slide.

MR. CLAUSSEN: Your Honor, I'd like to raise an objection before we move on. My objection is that RPX -- want to make clear for the record that RPX-18 is not part of the grounds for this case. And so we object to any implication that RPX-16 and RPX-18 are part of the grounds for this case.

MS. VREELAND: Your Honor, we're only introducing the photos so we're not going --

MR. CLAASSEN: With that representation, we can move on.

Q. If we could turn, then, to the next slide.

What is RX-508?

A. This is a publication from 2005 that we presented at the American Society for an Engineering Education Conference.

Q. And do you recognize the acquisition board and the sensor in the bottom left excerpt from this article?

A. Yes. Those are the same two pieces of hardware

MASIMO 2029
Apple v. Masimo
IPR2024-00242

that we just saw on the ELMO unit.

Q. Okay. And if we could turn, then, to the next exhibit.

What is RX-504?

A. This is a poster that Austin used for a public presentation in our college Honors Colloquium, the atrium exercise, and it speaks to the design of his sensor head in addition to the other hardware and software that was used.

Q. And what did he highlight about his design?

A. The highlighted element is -- speaks to the foam. So the optical foam that we use or the black foam was intended to be pliable so that the sensor head could conform to tissue. And there was a clear reason for using the foam itself, and that was to essentially block light or prevent light piping via the use of opaque material.

Q. Let's turn, then, to the Poeze patents. We're going to go to RDX-814.

Do you recognize the three patents on the screen, JX-1, JX-2, and JX-3?

A. I do.

Q. Can we call these the Poeze patents?

A. Yes.

Q. What types of pulse oximeters do the Poeze patents show in their figures and embodiments?

A. These would address what we would call clothespin

MASIMO 2029
Apple v. Masimo
IPR2024-00242

style transmissive finger clips.

Q. If we could go to the next figure.

So in the examples in the Poeze figures, are the LEDs and the photodiodes on the same side of the sensor?

A. The LEDs and photodiodes are on different sides of tissue, if that was the question you intended.

Q. And do the Poeze patents say anything about reflective pulse oximeters?

A. That mode is mentioned briefly in the spec but not in the pictures themselves.

Q. And in the examples in the Poeze figures, what part of the body is being used as the measurement site?

A. These are all fingertip sensors.

Q. Okay. Have you read each of the -- the patent specifications from front to back?

A. I've read them front to back twice, but I've studied a number of the other areas, many hours, countless hours it seems at this point.

Q. And have you seen anything anywhere in those Poeze specifications about taking a measurement on a wrist?

A. No.

Q. Nothing?

A. No. There is only a mention to finger, toe, hand, foot, ear, and forehead, as I recall, no wrist.

Q. If we could turn to the next slide, RDX-816.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Masimo has focused in particular on the fact that the Poeze patents disclose pulse oximeters with a protrusion.

What do the patents say about the shape of the protrusion that you can use with the -- in the purported invention?

A. The specification states that it can be convex, but then it also says it can be sized and shaped to conform the tissue to a flat or relatively flat surface. It also states that it can be cylindrical or partially cylindrical.

And then it says here at the bottom of the highlighted portion it could be sized and shaped differently for different measurement sites. So a variety of descriptions of shapes and sizes.

Q. Do the patents ever at any point suggest using a convex protrusion for taking a measurement at a wrist?

A. No.

Q. We're going to turn to the next slide.

Masimo has focused in its testimony on the reduction of light piping. What do the Poeze patents say about how to reduce light piping, if at all?

A. The only thing the spec says about reducing light piping, at least with regard to opaque material, is with regard to the protrusion in the upper example, black or other colored plastic. And then with regard to the noise

MASIMO 2029
Apple v. Masimo
IPR2024-00242

shield in the bottom exhibit, opaque color such as black or dark blue.

Q. So are there any teachings in these specifications, then, beyond using opaque materials?

A. Not for light piping.

Q. And how long have people in the industry been using openings with opaque materials to reduce light piping?

A. The Herczfeld reference shows it explicitly in 1969 so 50 years, decades.

Q. Professor Warren, have you studied the asserted claims of the Poeze patents?

A. Yes.

Q. And do you have an opinion on whether or not the Poeze claims describe anything new or novel?

A. My opinion is that they do not. In fact, the ideas or teachings are quite old.

Q. We're going to turn next, then, to RDX-818, the next slide, RDX-819.

Professor Warren, have you studied the Lumidigm patent, RX-411?

A. Yes.

Q. How did you first become aware of the company Lumidigm?

A. I learned of Lumidigm as a spinoff from Rio Grande Medical Technology, and I knew about them when I

MASIMO 2029
Apple v. Masimo
IPR2024-00242

worked at Sandia in Albuquerque in the mid-'90s.

Q. How did you first become aware of the Lumidigm '212 patent?

A. I found this patent when I was doing a recessed detector search online.

Q. Can we call it Lumidigm for short?

A. Yes, that's fine.

Q. How would you characterize Lumidigm's disclosures?

A. The spec -- I think the real novelty is in the idea of a personal identification system that uses liveness as an additional indicator.

But one of the other benefits of the specification is that it includes a collation of what was known about the time of optical sensor heads that were used in reflectance mode for spectroscopy purposes in terms of their various LED and photodiode detector layouts.

Q. We're going to pull on to the screen RX-411, Figures 3 through 7B.

What does Lumidigm describe in connection with these figures?

A. These figures are various examples or exemplary ideas of ways to lay out a variety of sources and detectors in reflectance mode on a sensor such as this, including in radial and rectilinear and Cartesian layout.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Does Lumidigm say anything about when you might want to use various of these iterations of LEDs and photodiodes?

A. Well, Lumidigm states that any one of the given sources, for example, can be sets of LEDs, and any one of the given detectors can be a single detector or a plurality or an array of detectors.

And, generally, with regard to how they might be used, there's a section in the spec called extended functionality that speaks to many different application areas.

Q. We're going to put on the screen Figs. 8A, 8B, and 8C from the Lumidigm patent.

What was Lumidigm illustrating in these figures?

A. These three figures illustrate portable embodiments of this particular sensing approach. Key fob on the left, Figure 8A, Figure 8B would be a watch embodiment, and Figure 8C would be an embodiment on the surface of a phone.

Q. And what does Lumidigm say about the types of LEDs and photodiodes you can use in any of these embodiments?

A. Lumidigm states, with regard to any of these portable embodiments, that any of the sensor geometries that are presented in the specification can be applied.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

And what I mean by that specifically is Figs. 1 through 7, for example, all show different layouts of sensor heads, but additionally the specification itself describes different geometrical layouts, different signal management techniques, including what it calls a compound curvature that would essentially relate to the shape of the sensor head itself.

Q. We're going to turn to the next slide, then.

Were you here for Ms. Swaroop's opening statement?

A. I was, yes.

Q. Did you hear her describe Lumidigm's functions as a wish list?

A. Yes, I did.

Q. Have you studied the functions referenced in the Lumidigm patent that these devices can perform?

A. I have, yes.

Q. And how would you characterize these functions?

A. I would characterize these functions as known applications in reflectance spectroscopy where one might want to employ then a reflectance mode sensor.

A fruit ripeness example is a good one. While that sounds esoteric in this context, this has been used with Japanese fruit markets forever as a means to assess fruit quality.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. And Professor Warren, have you compared Lumidigm's disclosures to the asserted Poeze claims?

A. Yes.

Q. And what have you concluded?

A. My conclusion is that Lumidigm invalidates every one of those independent claim limitations for those asserted patents.

Q. And have you reached an alternative opinion on whether Lumidigm alone would, at a minimum, render them obvious?

A. Yes. My alternative opinion would be that these claim limitations would be obvious in view of Lumidigm.

Q. If we could turn to the next slide.

In reaching your opinions, what level of skill did you assume a person of skill in the art would have had in July of 2008?

A. I've accepted this definition, which is a person with a bachelor's degree in a discipline related to either electrical, computer, or software technologies, plus one to two years of work experience including with physiological monitoring tools, or, alternatively, a master's degree in less than a year of related experience.

Q. We're going to show on the next slide your claim chart for 501, claim 12, and we're going to turn to the preamble of that claim.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

How does Lumidigm teach the preamble of claim 1 from which claim 12 depends?

A. So the preamble is a well-known idea. The thought here is that you have a user-worn device that measures a physiological parameter of a user, and Lumidigm teaches this explicitly through, we'll say Figure 8B as an example, which is a wristwatch embodiment.

This is also addressed in column 11 in the spec, which speaks to the wristwatch and says that any of the sensor geometries that were disclosed can apply to this particular application, meaning all of the other embodiments in Figures 1 through 7 as well as the information that's in the text itself.

Q. We're going to turn, then, to the next slide.

How does Lumidigm teach element 1A?

A. So this element speaks to three light-emitting diodes, which, as I noted, have been known for many decades.

Lumidigm provides a specific example in Fig. 6, for instance, where there are three LEDs on the same side of a reflectance sensor head, but, in addition, Lumidigm states in column 6 that these light-emitting diodes which can be either at the same wavelength or at different wavelengths can also consist of light sources that include sets of LEDs.

Q. We're going to turn to the next slide.

How does Lumidigm teach element 1B?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. So element 1B is, again, quite well-known. It speaks to three photodiodes. I'll use the same example as in the prior claim limitation, which is Fig. 6 in Lumidigm, which describes a sensor head in reflectance mode with three photodiodes and three LEDs.

As a means of explanation, in column 6, Lumidigm notes that this detector can comprise a single element, a plurality of elements, or one or two-dimensional array, meaning any one of these detectors, and that they can be photodiodes.

And I underlined in red the indium gallium arsenide material as well as silicon, which are typical photodiodes for this wavelength range.

Q. Is there any doubt in your mind that that reference to indium gallium arsenide and silicon would connote a photodiode to a person of skill in the art?

A. No. That's obvious.

Q. If we could turn to the next slide.

How does Lumidigm teach the second part of element 1B?

A. So this is another well-known principle where you arrange your, in this case photodiodes and LEDs, on an interior surface, and your photodiodes are then configured to receive light attenuated by the tissue of the user. This is illustrated well in Lumidigm Fig. 2.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

So in Fig. 2 the red items are LED sources, each of which sends light or photons into the tissue, and tissue is normally forward-scattering, but you can get it to reflect light back. And in this case the light does reflect back to a center photodiode, which is located in, we'll say, a recessed well or cavity in the reflectance sensor head.

In this case the light does represent light that has been attenuated or has propagated through tissue consistent with Lumidigm column 3, and column 7, which also addresses the tissue optical properties that would change what you see at the detector.

Q. We're going to turn to the next slide.

How does Lumidigm teach element 1C?

A. So element 1C, again, it's a well-known idea of a protrusion that's over the interior surface, which is the surface that holds the sources and detectors, the protrusion comprises or includes a convex surface.

Lumidigm addresses this directly in column 7, where the spec states that the sensor head can have a compound curvature on the optical surface, and the spec teaches that this has several benefits. One is to match the profile of the device itself on the exterior, but also to incorporate ergonomic features, meaning comfort and usability for the user, features that allow for good optical and mechanical coupling, or for other technical or stylistic

MASIMO 2029
Apple v. Masimo
IPR2024-00242

reasons.

Q. What would a person of skill in the art have understood in July of 2008 from this teaching?

A. Well, it was already well-known that a convex curvature itself could be a useful element in increasing signal quality. So a person of ordinary skill would see the words "compound curvature" and realize that a practical implementation of this would be a convex surface.

Q. If we could turn to the next element.

How does Lumidigm teach element 1D?

A. So element 1D, again, is quite well-known. This is a plurality of openings where an opening allows light to reach a detector. And these openings are positioned over the three photodiodes individually.

Lumidigm addresses this generally and specifically. Lumidigm addresses it specifically in Fig. 6, knowing that, when you read the spec, the cross-section in Fig. 6 would be similar to Fig. 2, where each of the photodiodes would be recessed and there would be an opening over each photodiode.

And in terms of explanation, there is a very nice but terse explanation in column 8, where the spec states to the idea that, if you recess the photodiodes or detectors from the sensor surface in an optically opaque material, you can reduce the amount of light that's detected without going

MASIMO 2029
Apple v. Masimo
IPR2024-00242

through tissue, meaning, you don't want the light that goes straight from the emitter to the photodiode and has not passed through tissue first.

Q. So what would a person of skill in the art in July of 2008, then, have understood about how many openings you should have in the sensor head?

A. Well, they would have understood that the number of openings wasn't really constrained. In this case it's mapped to the number of photodiodes, for example, that exist.

Q. Why don't we turn to the next element, 1E.

How does Lumidigm teach this?

A. So element 1E is a little bit longer, but it essentially speaks to the well-known idea of opaque lateral surfaces, which comprise each of the openings, and this is because the detector head or the protrusion would be made out of opaque material.

These openings would allow light to reach the photodiodes and the opaque lateral surfaces would have a role of helping to avoid light piping through the protrusion.

This idea is, again, illustrated in Fig. 2 where the gray area in the sensor head is meant to represent the opaque material in the viewgraph, and, as a result, when there is an opening, then put in that material, the opaque

MASIMO 2029
Apple v. Masimo
IPR2024-00242

lateral surfaces would exist, and their purpose would be as noted in column 8, to perform optical blocking for light shunts or what is called light piping in this matter.

Q. If we could turn then to element 1F. How does Lumidigm teach this?

A. So this is, again, a well-known idea where a processor is needed to manage the overall set of events. In this case the processor will receive one or more signals from the photodiodes and then calculate a measurement of the physiological parameter of the user based on those signals.

Lumidigm incorporates Fig. 9, which itself includes a functional block diagram that has two blocks that speak directly to processors, one is in the upper left, and the other is called processing acceleration, which is kind of a digital signal processor or a special feature arrangement in the device.

And there are several excerpts in the spec, I will note, columns 3 and 9 and 12, which describe the idea that the processor performs the standard function, which is to operate the device or operate the biometric sensor. One of those roles is also to digitize and record those data.

And then in column 12 the spec speaks to the idea that any of the elements in Fig. 9 can either be arranged on the same device, meaning in an integrated manner, or separated out geographically or in a distributed way

MASIMO 2029
Apple v. Masimo
IPR2024-00242

depending on the needs of the system.

Q. If we could turn to the next slide.

Before we -- actually, how does Lumidigm teach the dependent claim 12, the limitations of dependent claim 12?

A. So claim 12 is -- it's honestly a little bit of an obvious statement, but the idea here is that, if you have a convex surface and you position it next to tissue, any pressure at all will conform the tissue into a convex shape or, excuse me, a concave shape just because it would then match the shape of the convex surface of the protrusion.

Q. If we could turn to the next slide, and before we turn to the next claim, I do want to go back to the preamble slide just one more time and Lumidigm's description of its watch embodiment.

What does Lumidigm say about the geometries that can be included in its watch?

A. Lumidigm states, and this is with regard to Fig. 8B, by the way, the watch embodiment, Lumidigm states in column 11 that any of the sensor geometries previously disclosed or other equivalent configurations can be used for this application.

And what the spec is saying is that the geometries presented in Figs. 1 through 7 or the textual descriptions, which, again, would include the compound

MASIMO 2029
Apple v. Masimo
IPR2024-00242

curvature or the convex surface, any of those light management features could be incorporated into an embodiment, for example, such as 8B, which would be, we'll call it, the watch embodiment.

Q. If we could turn to the next slide, then.

What was your conclusion about how Lumidigm compares to '501 claim, 12?

A. My opinion is that Lumidigm as a singular reference anticipates or discloses every one of the claim limitations present in '501, claim 12.

Q. We're going to turn, then, to the next claim, '502, claim 22.

And am I correct that you have already explained the basis for your opinion that Lumidigm meets '502 elements 19C and 19E in connection with your opinions on the similar elements of '501, claim 12?

A. Yes.

Q. Let's turn, then, to the preamble of '502, claim 22, or the preamble of independent claim 19.

How does Lumidigm teach this?

A. This preamble is similar to the prior preamble, but it also adds the well-known idea of oxygen saturation -- excuse me -- oxygen saturation as a result.

Lumidigm, again, addresses this through the wristwatch embodiment, so we'll go back to Fig. 8B, where

MASIMO 2029
Apple v. Masimo
IPR2024-00242

the wristwatch performs the functionality of, not only the biometric sensor or reader, but also extended functionality as a portable device that's mentioned later in the specification where I will go to, not only columns 11 for the wristwatch description, but also column 19, where there are two descriptions to a hemoglobin monitor, or two references to a hemoglobin monitor, but also to a system that can measure oxygenation and/or hemoglobin levels in the blood, or otherwise stated, to quantify oxygenation levels.

Q. Professor Warren, would a person of skill in the art in July of 2008 have needed any further details than these to know how to implement pulse oximetry functionality in Lumidigm's watch embodiment in 8B?

A. No, because it was a standard reflectance mode sensor application. We had already seen a number of publications in that area, and we got it to work ourselves in the laboratory several years prior. So a person of ordinary skill would not have needed any additional information to make that work in this kind of an embodiment.

Q. When you said we did it ourselves in the laboratory, were you referring to the measurements taken at the wrist?

A. Yes. I did it myself in the mid-'90s, and then when I started at Kansas State my own students built these sensors and worked with them on their wrists.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. You were here for the testimony of the Apple witnesses; is that correct?

A. Yes.

Q. So you're aware that it took Apple many years to implement blood oxygen measurements in the Apple Watch?

A. Yes, I am.

Q. And why did it take Apple so long, in your opinion and from the evidence you've seen, why did it take Apple so long to implement blood oxygen measurements in the Apple Watch?

A. Apple had a set of significant challenges to overcome. Not only were they severely limited on real estate, but they were also limited on processor capabilities given the amount of other applications that need to run also on the watch.

And even though these -- the simple light management problems such as addressed in the Poeze patents had already been essentially solved in many cases, there were still nuances of those light management features in addition to the algorithms that needed to be developed to make that entire package come together.

Q. Great. Let's turn to the next element, then, 22A -- 19A.

MR. CLAASSEN: Your Honor, I want to object to that last question. That opinion testimony was not

MASIMO 2029
Apple v. Masimo
IPR2024-00242

disclosed in Dr. Warren's report.

MS. VREELAND: Your Honor, we can put on the screen the exact paragraph that discloses that. It's paragraph 244 of his opening report.

JUDGE BHATTACHARYYA: Please go ahead.

MS. VREELAND: I'm actually going to display 243 and 244 for the context, and it's paragraphs 243 and 244.

Just for context, Your Honor, the discussion of the claim 22 Preamble refers to the earlier reference to measuring blood oxygen, one of the '501 dependent claims that is no longer in the case, but I'll show you the text there that's incorporated by reference.

So in paragraph 243 Dr. Warren provided the opinion that he just gave about how a person of skill in the art would understand how to implement Lumidigm's device in a pulse oximeter, and in paragraph 244 he explained how the Apple Watch -- the reasons why the Apple Watch took longer to develop and the challenges of the Apple Watch.

MR. CLAASSEN: Your Honor, slide -- the processor that was mentioned in slide 29 that Dr. Warren was discussing is not mentioned in this paragraph 244.

JUDGE BHATTACHARYYA: Could I see the remainder of 244, I just want to read the whole paragraph 244, and then slide 29.

MS. VREELAND: It was the preamble for claim 22.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Your Honor, for context, he was explaining why it took Apple longer to implement the blood oxygen measurement in the Apple Watch.

MR. CLAASSEN: Your Honor, if we could go back to the report.

JUDGE BHATTACHARYYA: Okay. Could you clarify, Mr. Claassen --

It's Mr. Claassen, correct?

MR. CLAASSEN: That's correct, Your Honor. Thank you.

JUDGE BHATTACHARYYA: Could you clarify exactly what you're objecting to in terms of his testimony?

MR. CLAASSEN: Your Honor, my understanding of what's stated in paragraph 244 is that Dr. Warren is discussing -- I'm trying to read it on the screen, Your Honor -- the attractiveness and accuracy and nothing about a processor or any specific use. He was just describing with respect to the slide that was presented.

MS. VREELAND: May I respond, Your Honor? He says in the paragraph that begins, "I understand," I understand it took years of work by the Apple engineers to develop a successful wrist-worn pulse oximeter for consumers that is also aesthetically pleasing and able to function in combination with the many other features of the Apple Watch.

I think that's what Professor Warren was just

MASIMO 2029
Apple v. Masimo
IPR2024-00242

explaining, that you had to put all that software together in a small watch.

MR. CLAASSEN: Your Honor, if the testimony is limited to what he states exactly in his report, we withdraw the objection, but we would like the testimony to be exactly what's in his report.

MS. VREELAND: Your Honor, I would certainly be happy to do that.

JUDGE BHATTACHARYYA: Okay. Why don't the parties -- if the parties can work it out, that's wonderful. We can revisit this later.

Q. We'll go on to the next element, then.

Can you explain how Lumidigm teaches -- if we could go to 19A and 22 --

A. Yes, this is a pair of claim limitations that are very similar in nature. They both speak to a plurality of emitters -- in the second case at least four emitters.

In the first case the plurality would comprise at least two light-emitting diodes, and in the second case each of the plurality of emitters would be a respective set of at least three LEDs.

So a plurality of sets of two or four emitters each of which had at least a set of three. This is a well-known idea in the literature, as I noted earlier, but with respect specifically to Lumidigm, Lumidigm includes

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Figures 3 and -- let's see, 5, 7A and 7B -- where Lumidigm states that each of the locations for the LEDs, which, again, are the red dots on these figures, each of those locations can be comprised of LEDs with the same or different wavelengths, but also the light sources themselves can include sets of LEDs --

Q. Why don't we go --

A. -- at each location.

Q. Let's go, then, to the next limitation.

How does Lumidigm teach element 19B?

A. So this is the well-known idea of four photodiodes arranged on the user-worn device. Lumidigm addresses this specifically in Fig. 7A and 7B, where 7A incorporates five photodiodes in a linear arrangement, and Fig. 7B incorporates an 8x8 grid of 64 photodiodes.

Q. Let's turn, then, to element 19C or 19D, excuse me.

How does Lumidigm teach this?

A. The notion of an optically transparent material is, again, quite well-known where the material is in each of the openings. Lumidigm states in column 8 that an optical relay, which is not shown in the diagram, between the sensor and sensor surface and the skin, and helped to transfer light by directionally either from the light source from the skin or from the skin back to the detector.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

And I've illustrated, for example, a well-known optical relay, which is a lens, in the opening of the photodiode that's depicted in Fig. 2, but Lumidigm also states that you can use fiber-optic faceplates for this purpose, where you could use a single faceplate for multiple openings or you could do an individual -- a person of skill would know that you could do an individual faceplate for each of the individual openings as a means to provide light but still optimize the process.

Q. And what about the example, the fiber bundle, what would a person of skill in the art understand about that?

A. Right. This is one that I mentioned in my report where you could use a fiber bundle to essentially direct the light from a portion of tissue straight to the detector as a means to optimize the detection process.

Q. And in July 2008, what materials would a person of skill in the art recognize a fiber-optic faceplate or a fiber bundle would be made of?

A. The individual fibers would have a glass core and then either a glass or a plastic cladding and then a protective layer. A fiber-optic faceplate, by the way, is like a bundle of spaghetti that you hold in your hand and you cut sideways so that you get all the little fibers lined up with one another.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Why don't we go to the next element then, 19E, excuse me, dependent claims 20 and 21.

How does Lumidigm teach these?

A. These claims are paired -- they essentially relate to the well-known notion that, if your processor can receive a temperature signal, in this case from a thermistor, it can then adjust the operation of the user-worn device.

The importance of this, by the way, is that LEDs change their behavior depending on temperature. They, for example, will change their center wavelength if the temperature increases or decreases.

So these two claims speak to that, as does Lumidigm. And we can look at Lumidigm, for example, in column 14, where Lumidigm states the goal to perform explicit corrections to account for sensor to sensor variations or environmental influences of temperature that would involve the processor depicted in Fig. 9, and a person of ordinary skill would realize that such a temperature measurement could easily be done with a thermistor.

Q. If we could turn to the next element. Let me actually ask you about your conclusion.

What did you conclude, then, about how Lumidigm compares to '502, claim 22?

A. My opinion is that, as a single reference,

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Lumidigm anticipates or discloses every one of these individual claim limitations.

Q. Let's turn then to '502, claim 28.

And am I correct that you have already explained the basis for your opinion that Lumidigm meets the preamble and elements 28D, E, F, G, and in connection with your opinions on the similar elements of the earlier claims?

A. Yes.

Q. Let's turn to element 28A, then.

How does Lumidigm teach elements 28A and 28B?

A. So these claims are similar to the earlier ones that -- but in this case we have a first set of LEDs and a second set of LEDs where, within the first set, there is the emission of light at a first wavelength and a second wavelength, and in the second set of LEDs there is the same, meaning an emission of light at the first wavelength and at the second wavelength.

And I'll go back in this case to this well-known idea as illustrated in Lumidigm Figs. 3 and 5 and 6 and 7A and 7B, which --

Q. Let's turn -- I'm sorry -- turn to the next slide before your further explanation.

How does Lumidigm teach the first wavelength and the second wavelength?

A. Right. I've illustrated here, and in this case

MASIMO 2029
Apple v. Masimo
IPR2024-00242

I've included an animation that I thought would help, where every source location that is depicted in any of these figures, meaning 3, 5, 6, 7A and 7B, is a location where then multiple wavelengths would be present, for example, in a multi-chip LED package.

And I've also included an excerpt from a publication that was incorporated by reference in the Lumidigm -- this is by the same author -- I included Fig. 6 from RX-0411 where Fig. 6 is RX-0460 -- as a means to illustrate that in static locations this specification teaches the idea of multiple wavelengths in sets that can be many, many LEDs.

Q. Okay. I'd like to quickly run through the rest of the elements of claim 28. We're going to turn to the next slide.

How does Lumidigm teach element 28C?

A. So the only new thing about 28C is that the four photodiodes should be arranged in a quadrant configuration, which, again, was quite well-known. Lumidigm illustrates this in Fig. 7B, which depicts an array or two-dimensional array of photodiodes.

And I've illustrated with a green cross four quadrants that you could use within this embodiments. One of ordinary skill could essentially choose any four of the photodiodes within this arrangement and make those into a

MASIMO 2029
Apple v. Masimo
IPR2024-00242

quadrant and then include an opening over each one.

Q. Let's turn to the next element, then, 28H.

How does Lumidigm teach this, if you could just briefly tell us?

A. Yeah. This is the idea of an opaque wall, which is well-known, where the opaque wall extends from the interior surface to the surface of the protrusion. That's illustrated by the gray material in Fig. 2.

Q. Okay. If we could go to the next element, 28J.

How does Lumidigm teach this?

A. A network surface configured to wirelessly communicate an oxygen saturation was also a well-known idea.

Lumidigm teaches this in the Fig. 8B embodiment through element 103, which is a wireless communication depiction, as well as in Fig. 9, which has a communication system block.

Additionally, in columns 13, 11 and 19, Lumidigm describes the teaching of a wireless link or an interfacing connection where the wireless link can also be embedded into the fob, for example, or the watch, and that it could communicate oxygenation levels as quantified by the device.

Q. Let's turn to the next slide.

How does Lumidigm teach element 28K? Again, you can go quickly at this point.

A. Yeah, element 28K is a touchscreen interface

MASIMO 2029
Apple v. Masimo
IPR2024-00242

which was well-known. That's embodied in the highlighted portion in the smartphone and PDA, which both would have had at the time.

Q. Would a person of skill in the art have recognized that that could also be incorporated in a watch?

A. Yes, it could be incorporated in any visual depiction for a portable device.

Q. Let's go to the next slide.

How does Lumidigm teach element 28L?

A. Element 28L is the well-known idea of storage. This is addressed in three separate boxes in Fig. 9, and in columns 12 and 13 Lumidigm addresses the idea that storage could be used to store the spectra that were obtained meaning the information obtained from the individual.

Q. If we could turn to the last slide.

How does Lumidigm teach 28M?

A. Lumidigm depicts a strap in Fig. 8B.

Q. And if we could turn to the next slide, what did you conclude, then, about '502, claim 28?

A. My opinion is that Lumidigm anticipates every one of these individual claim limitations as a single reference.

Q. Why don't we turn, then, to '648, claim 12, and am I correct that you've already explained the basis for your opinion that Lumidigm teaches the elements of independent claim 8 and dependent claim 12 so that we can

MASIMO 2029
Apple v. Masimo
IPR2024-00242

go -- except the housing, and we'll go to the housing?

A. Yes.

Q. How does Lumidigm teach the housing in element 8H?

A. Lumidigm states in column 11 that the wristwatch has a case.

Q. Great. And then what did you conclude, then, for '648, claim 12, if we were to go to the next slide?

A. My opinion is that Lumidigm anticipates or discloses every limitation of claim 12.

Q. Let's turn, then, to claims 24 and 30.

Am I correct that you've already explained the basis for your opinion that Lumidigm teaches the elements of independent claim 20?

A. Yes.

Q. Let's turn to dependent claim 24.

How does Lumidigm teach this?

A. The idea of a protrusion comprising an opaque material that prevents light piping is a restatement of what we've already addressed.

Lumidigm discusses this in Fig. 2 and in column 8, which states that optically opaque material can be used as an optical blocking mechanism.

Q. And, finally, if we were to turn to dependent claim 30, how does Lumidigm teach this?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. This claim addresses chamfered edges which were a well-known mechanical principle at the time. Those chamfered edges would have been included in the face where the edges of the face of the watch on Fig. 8B.

Additionally, those chamfered edges would be elements that addressed in column 7 where the compound curvature that we know represents a convex surface, would incorporate ergonomic features, and it's those chamfered edges that make for a comfort issue with regard to the usage of the watch.

Q. So if we could turn to the next slide, what did you conclude then about '648, claims 24 and 30?

A. My opinion is that Lumidigm anticipates all of the limitations of claims 24 and 30.

Q. Great. So I'd like to go to the next slide.

I'd like to ask you about a few of the limitations that, if we could turn one more slide, that Masimo contends are missing in Lumidigm?

Do you agree that Masimo -- do you agree that Lumidigm is missing any of these limitations?

A. No, I disagree.

Q. And if we -- do you have an opinion on whether or not other prior art discloses those same limitations that Masimo contends are missing?

A. Yes, there's much other prior art, but I've

MASIMO 2029
Apple v. Masimo
IPR2024-00242

looked at Seiko 131 and Cramer for examples of additional references as well as Webster and Apple 047.

Q. And which combinations are you relying on for which claims?

A. Well, for all claims, Lumidigm in combination with Seiko 131 and Cramer, but, specifically, for '502, claim 22, Lumidigm in combination with Webster or Lumidigm, Seiko and Cramer in combination with Webster, and then specifically for '502, claim 28, Lumidigm and Webster in combination with Apple 047, or Lumidigm, Seiko, Cramer and Webster in combination with Apple 047.

Q. And do you have an opinion on whether or not a person of skill in the art would have been motivated to make these combinations in July of 2008?

A. Yes. In all cases Lumidigm states the need expressly for such combinations and a person of ordinary skill would have easily gone to the references to find them.

Q. Let's turn quickly, then, to the next slide, and Seiko, RX-666. When was Seiko filed?

A. Seiko was filed in July 1996.

Q. And at a high level, what does it disclose?

A. Seiko discloses an embodiment very similar to one that is in a Poeze figure, which is a pulse oximeter sensor on a finger connected via cable to a display unit that's worn on the wrist of the user.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. And if we were to turn to the next slide, what does Seiko describe in its Figure 28 and the text in column 19?

A. Seiko discloses what's called a light transmittance plate, which is stated to be a convex surface. And the purpose of this convex surface, as stated in Seiko, is to move residual blood out of the way and increase the quality of the measurement.

Q. And let's turn, then, to the next slide, Cramer, RX-670. When was Cramer filed?

A. Cramer was filed in 1978.

Q. At a high level, what does it disclose?

A. Cramer discloses a light-based wristwatch for pulse rate measurements.

Q. And if we were to turn to the next slide, what does Cramer show -- what does it say about the embodiment of its sensors shown in Figs. 2, 3, and 6?

A. Cramer describes what it calls a raised boss area, which is essentially a convex protrusion. It consists of two concentric raised annular areas of opaque material, and those areas surround the four photodiodes, and they also separate four photodiodes from the central emitter or LED.

Q. And you said that -- you mentioned that Cramer has four photodiodes. What does Cramer say about those photodiodes?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Cramer notes that an example of a suitable detector is a Clairex CLT 2160 photodiode.

Q. If we were to turn to the next slide, do you recognize RX-1221?

A. Yes. This is a depiction from the Clairex data sheet, which depicts the can detector itself on the right where there's a window or a lens on the top, and then the photodiode sits down within that can at the focal point of the lens to receive the detected light.

Q. Okay. So why don't we turn, then, to the next slide, and I'd like to ask you about the limitations in all of the Poeze claims relating to a protrusion with a convex surface, and the limitation in claim 12 relating to conforming the tissue into a concave shape.

If we were to turn to the next slide, how does Seiko disclose these limitations?

A. Seiko discloses the protrusion explicitly as a means to increase the signal quality associated with the light-based measurement via a convex protrusion. It's called a light transmittance plate in that example.

Q. And how does Cramer teach these limitations?

A. Cramer teaches that, with regard to the raised boss area, that that boss area must be pressed into tissue in order to get a measurement, and that you can do that measurement with minimum discomfort to the user.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. And if we were to turn to the next slide, what is the basis for your opinion that a person of skill in the art would have been motivated to combine Lumidigm's watch with Seiko's and Cramer's teachings of protrusions with convex surfaces?

A. So Lumidigm already expressly states that the curvature on the optical surface could be a compound curvature, which in the case of a convex surface would natural mean a concave shape for the applied tissue. And a person of ordinary skill even independent of that expressed disclosure would know that they could go to a reference like Seiko or Cramer to teach different ways that you might incorporate a convex protrusion into one of these reflectance sensors.

Q. Let's turn, then, to the next set of limitations in all the claims relating to openings over photodiodes with opaque surfaces to avoid, reduce, or prevent light piping.

If we could turn to the next slide, how does Seiko -- how do Seiko and Cramer teach these limitations?

A. The openings and patent and trademark surfaces in Seiko are rendered in the opening above the photodiode in Fig. 28, for example. And Seiko also incorporates opaque material in its casing. Cramer teaches the similar notion of openings with opaque surfaces with regard to the opaque region that comprises, not only the sensor head, but the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

boss regions, all of which help to prevent light piping because of the fact that they are indeed opaque material.

Q. And what about Cramer's can?

A. Yeah, the can itself adds another layer of what we could say is opaque material. A person of ordinary skill would realize that the can would be made from aluminum or stainless steel or some material that was impervious to light as a means to prevent light piping.

Q. If we could turn to the next slide.

What, then, is the basis for your opinion that a person of skill in the art would have been motivated to combine Lumidigm's watch with Seiko's and Cramer's teachings of openings over photodiodes with opaque surfaces to avoid reduce or prevent light piping?

A. Well, again, it's a twofold response. The first note is that Lumidigm expressly states the need for openings over detectors that are themselves recessed in opaque material, but, regardless of that disclosure, which was well-known at the time, a person of ordinary skill could go to Seiko and Cramer and a number of other references that teach this particular concept.

Q. Let's turn to the next slide, then, and the limitations in '502 -- in the '502 and '648 claims relating to optically transparent materials or windows within or across the openings.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

If we could turn to the next slide.

How do Seiko and Cramer teach these limitations?

A. In Seiko, for example, these limitations are taught through the light transmittance plate that I already mentioned. It's a transparent material that allows light to reach the photodiode detector.

In Cramer, windows or transparent materials are taught two different ways. The first one, for example, is the lens that exists at the top of the can above the photodiode in this depiction, and the other is the windows that are between the raised boss regions as depicted in Fig. 6.

Q. If we could turn to the next slide.

What is the basis for your opinion that a person of skill in the art would have been motivated to combine Lumidigm's watch with Seiko's and Cramer's teachings on the use of optically transparent materials and windows over or within openings -- over or within the openings over photodiodes?

A. The basis for my opinion is, first, that Lumidigm expressly teaches this idea through the notion of an optical relay, which is a general way to say a transparent material for allowing light to pass.

And, in addition, independent of that idea, a person of ordinary skill would have known that windows could

MASIMO 2029
Apple v. Masimo
IPR2024-00242

be used and that Seiko 131 and Cramer would be suitable references to consult.

Q. Finally, then, let's turn to the limitation in the next slide -- limitation in claim 30 relating to a protrusion with chamfered edges.

How do Seiko and Cramer disclose this limitation?

A. Seiko discloses chamfered edges in several figures. I've noted Fig. 5 and Fig. 28 here where chamfered edges are illustrated in Fig. 5 at the edges of the protrusion, and in Fig. 28 on the opposite side of the sensor as a comfort mechanism.

And in Cramer, chamfered edges are incorporated in Fig. 3, as an example, where a chamfer allows the edge to transition from the main watch body to the raised boss area without a sharp, 90-degree orthogonal edge that would be uncomfortable for the user.

Q. And if we were to turn to the next slide, what is the basis for your opinion that a person of skill in the art would have been motivated to combine Lumidigm's watch with Seiko's and Cramer's teachings of protrusions with chamfered edges?

A. The basis for my opinion, again, is twofold. The first thought is that the compound curvature and the need for ergonomic features is expressly stated in Lumidigm. Additionally, a person of ordinary skill would understand

MASIMO 2029
Apple v. Masimo
IPR2024-00242

that chamfered edges have been around for many decades as a means to soften transitions between surfaces and make items such as watches more wearable.

Q. If we could turn to the next slide, I'd like to ask you about this combination of features that we've just discussed -- the convex surface, the openings, the windows, and the chamfered edges.

What is the basis for your opinion that a person of skill in the art would have been motivated to combine all these features in Lumidigm's watch?

A. Well, these features are well-known management features, and as a watch embodiment, for example, a person of ordinary skill would realize that there had been many other watch embodiments introduced into the literature, including Seiko and Cramer, and that they would then form a natural combination for teaching purposes.

Q. Now you mentioned that Seiko and Cramer focused on measuring pulse rate rather than blood oxygen. Does that impact your opinion in any way?

A. No, not at all, because the same light management features that you need to incorporate for a single excitation wavelength to allow a pulse rate determination are the same light management features that you need to incorporate with multiple wavelengths to employ pulse oximetry or any other kind of spectroscopy measurement.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Would a person of skill in the art have had a reasonable expectation of success in making this combination?

A. Yes, the combination had already been done in various forms as I illustrated with my combination slide earlier.

Q. If we could turn to the next slide.

What did you conclude, then, about the Lumidigm, Seiko, and Cramer combination?

A. Well, my conclusion is twofold. My first opinion is that the Lumidigm reference alone discloses and renders these ideas obvious. My second opinion is that Lumidigm combined with Seiko 131 and Cramer as an alternative additionally renders these claims obvious.

Q. Let's turn, then, to just two more claims. Claim 22 requires, in addition, a thermistor and processors to adjust operations based on a thermistor.

At a high level, what was known in the art about the use of thermistors at this time?

A. At a high level, a person of ordinary skill would know that a thermistor could be used to monitor temperature and that that knowledge could be used to adjust the calibration of a circuit or a system such as this.

Q. Are you aware of other prior art teaching a thermistor for pulse oximetry?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Yes, there's a lot of teaching out there, but the example I'll use is Webster from 1997.

Q. How long have you had a copy of Webster?

A. I got a photocopy of the book after it was published in the late 1990s because we couldn't -- the publisher ran out and I kept --

Q. I'm sorry.

A. And I've kept a copy for 20 years.

Q. Could we go to the next slide?

How does Webster teach the elements and dependent claims 20 and 21?

A. So Webster addresses the idea of compensation for LED temperature changes directly at page 85, where Webster notes that a temperature sensor can be built into the probe along with the LEDs and photodiodes. That idea is illustrated explicitly in Webster in Figure, I believe it's 3.4.

Q. And if we were to turn to the next slide, what is the basis of your opinion that a person of skill in the art would have been motivated to combine Lumidigm's watch with Webster's thermistor?

A. The basis for my opinion is that Lumidigm expressly states this need on its own, meaning, the performing explicit corrections to account for environmental influences of temperature, but, irrespective of what's

MASIMO 2029
Apple v. Masimo
IPR2024-00242

disclosed in Lumidigm, a person of ordinary skill would realize that a thermistor would be an obvious way to accomplish this mechanism.

Q. If we could turn to the next slide, I'd also like to ask you about claim 28.

We've discussed the thermistor, but we haven't yet discussed the user interface with a touchscreen.

Are you aware of any prior art that a person of skill in the art would have been aware of in July 2008 relating to a user interface with a touchscreen?

A. This is a well-known mechanism, but I decided to pull Apple 047 as an example of a reference for a touchscreen.

Q. And why did you look to Apple art?

A. I thought it appropriate given that Apple has such a history in this area and it fit well with the embodiments that we're talking about.

Q. If we could turn to the next slide.

How does the Apple '047 patent, RX-673, teach the touchscreen in '502 claim 28?

A. The central theme of this patent is that, if a device incorporates a touchscreen, and you would then rotate the device, the device would not only change from a portrait to landscape orientation in its display, but it would also display different kinds of information.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. And if we could turn, then, to the next slide, I'd like to start by asking you about the three pieces of prior art that you've identified for claims 22 and 28 -- Lumidigm, Webster, and Apple.

What is the basis for your opinion on whether a person of skill in the art would have been motivated to make this combination and would have had a reasonable expectation of success?

A. Yeah, a person of ordinary skill would realize that, to add the features of temperature sensing and touchscreen to Lumidigm, they could look to a number of references, but looking to Webster and Apple would be an obvious choice.

Q. And what would -- would they have had an expectation of success in implementing that combination?

A. They would have, because that combination had already been used in other devices at the time with success.

Q. Let me ask you, then, about the broader combination.

If we were to turn to the next slide, and if I were to ask you about the broader combination of Lumidigm, Seiko, Cramer, Webster, and Apple 047, what is the basis for your opinion that a person of skill in the art would have been motivated to make that combination?

A. This combination, to me, is a three plus one plus

MASIMO 2029
Apple v. Masimo
IPR2024-00242

plus one. The three elements for the watch all go together. It would be obvious, then, as a person of ordinary skill to add the thermal sensing and the touchscreen elements via Webster or Apple or any number of other references to accomplish this.

Q. Would a person of skill in the art have had a reasonable expectation of success?

A. Yes. Not only had this been done, but these are known elements. The result would have been known.

Q. So let's turn, then, to another issue. I'd like to ask you about the secondary considerations of nonobviousness.

Have you considered these in connection with your opinion?

A. Yes.

Q. And do you have an opinion on whether or not the commercial success of Apple's Series 6 and 7 watches has been due to the claimed inventions of the Poeze patents?

A. I do.

Q. And what is your opinion?

A. Well, my opinion, as a commercial device, at a high level, is that the Apple Watch incorporates a lot of features. The blood oxygen feature is only a small fraction of the percentage of those features. And it incorporates only a small portion of the hardware functionality.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Additionally, the limitations that are in the Poeze patent are quite old, and they would really not have been effective in terms of teaching the Apple Watch designers how to implement these light management features.

Q. Do you have an opinion on whether or not the fact that Apple spent years working on its watch indicates that Apple could not have achieved the alleged inventions without the Poeze claims?

A. No. As I noted, the light management features were known. The issues that Apple had to deal with were issues that related more to building complex functionality into a device that was already quite complex in an environment where there were a lot of other features while they were still under the same constraint to meet the aesthetic and functional needs of a product that would be consistent with their standards.

Q. And did you --

MR. CLAASSEN: Your Honor, I'm going to object that that's outside the scope of his report.

MS. VREELAND: Your Honor, it's in his report at paragraphs 1802 to 1807. I would be happy to display them.

JUDGE BHATTACHARYYA: Let's see.

MR. CLAASSEN: Your Honor, my response is that that paragraph is, again, about the aesthetics, not the complex functionality.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

MS. VREELAND: Your Honor, we would certainly be happy to limit the testimony to be consistent with what was in the report. We think it was fully consistent with the report, 1802 to 1806, and specifically 1806.

JUDGE BHATTACHARYYA: This is basically the same issue we had before or a similar issue. Can the parties work this out? Otherwise, I will --

MS. VREELAND: Yes.

MR. CLAASSEN: Yes, Your Honor.

JUDGE BHATTACHARYYA: Okay.

Q. Let me ask you about, then, about Dr. Kiani's suggestion in his testimony that there was skepticism in the field about the use of curved protrusions before July of 2008.

Do you agree that there was skepticism in the field on the use of curved protrusions?

A. No. It was actually quite the opposite.

Q. Let me pull up briefly -- let me turn to the next exhibit and ask you about RX-668, Mendelson's '799 patent.

Do you agree that Mendelson expressed skepticism about the use of convex protrusions in pulse oximetry?

A. No. The first thought is that Mendelson is not speaking of convex protrusions, but the second thought is that this example is in the context of situations like fetal monitoring or monitors over ribs or a forehead where there's

MASIMO 2029
Apple v. Masimo
IPR2024-00242

a bone backing right behind the sensor and the tissue, and that, if you press too hard, you move the residual blood out of the way and you don't have any blood left.

But that is a really special case with too much applied pressure. Some of the other literature does a much better job of explaining why, indeed, the convex protrusion itself is a feature to be desired.

Q. If we were to turn to the next slide, RPX-665, what did Nippon teach in 1987 about protrusions?

A. Nippon is one of many articles that conveys the idea that, if the detector protrudes slightly into tissue, not only can you get more repeatable coupling, but you can increase the sensitivity of the sensor in this case, meaning that the signal strength of the detected signal itself is improved, consistent with what we've all seen in our own laboratories.

Q. If we were to turn to the next slide, Seiko and Cramer, what did they teach even farther back in the 1970s about convex protrusions?

A. So I believe the date on Seiko might be mislabeled here. It should say 1996, I recall.

But Seiko 131 taught the notion that the convex surface, light transmittance plate, could be used to increase the quality of the signal, not only via positive contact with a body surface, but Seiko includes a long

MASIMO 2029
Apple v. Masimo
IPR2024-00242

section on the removal of residual blood out of the way as a result of added pressure so that the pulsatile signal would be more available to the field of view of the sensor.

Q. Okay.

A. Cramer, likewise --

Q. Go ahead.

A. Well, Cramer, likewise, taught the idea where the Cramer specification states that pressure needs to be applied in order to push the boss region into tissue to make an effective measurement, and that the boss arrangement with its convex curvatures is effective to minimize the discomfort to the wearer.

Q. And have you, finally, have you seen any evidence either over the course of this case or at this trial that Apple copied the alleged inventions in the Poeze patents?

A. I have not.

Q. Let's turn, then, briefly to the written descriptions in the Poeze patents. We're going to put on the screen RDX-8131.

Have you also considered whether the Poeze specification supports and enables the asserted Poeze claims?

A. Yes, I have considered that.

Q. And just briefly, have you identified any embodiments in the Poeze patents that include the claimed

MASIMO 2029
Apple v. Masimo
IPR2024-00242

limitations of features recited in '501, claim 12, '502 claim 22, '502 claim 28, and '648, claim 12?

A. No. As an example, the combination of three LEDs, three photodiodes, and a plurality of openings over the photodiodes with opaque lateral surfaces as in claim 12, I can't find a single embodiment. The same is true of these other descriptions that are on the same viewgraph.

Q. Okay. We're going to go to RDX-8.133.

Have you identified any -- any discussion or any embodiments in the Poeze specification that include four emitters each with three LEDs?

A. No.

Q. If we could turn to the next slide.

Have you identified any discussion in the Poeze specification of the use of multiple sets of LEDs each with LEDs emitting at a first wavelength and a second wavelength?

A. I have not found one, no.

Q. If we could turn to the next slide.

Have you identified anything in the Poeze specification that would tell a person of skill in the art how to implement a user interface with a touchscreen?

A. I have only found two brief references to touchscreens, so no.

Q. Finally, on the next slide, have you seen anything in the Poeze specification that provides guidance

MASIMO 2029
Apple v. Masimo
IPR2024-00242

on reducing or avoiding light piping other than a general reference to the use of opaque materials?

A. No. I've just seen a vague correlation between the two, that's it.

Q. Let's turn, then, to the issue of the basis for your opinion that the Apple products do not infringe.

And you were here for the testimony of Apple's engineers, correct?

A. That's correct.

Q. And have you also compared Apple's accused products to the asserted Poeze claims?

A. Yes.

Q. And what did you conclude?

A. I have concluded that they do not infringe those claims.

MS. VREELAND: Your Honor, we would like to go on the Apple confidential record with Apple CBI.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Let's move back to the public record.

BY MR. CLAASSEN:

Q. Are --

A. That's not completely correct, no.

Q. Hold on.

Are we okay to proceed, Your Honor?

JUDGE BHATTACHARYYA: Yes, you can proceed.

Q. Dr. Warren, you should have a series of three binders available to you for cross-examination. You can go ahead and open those now.

Dr. Warren, I want to make sure that you have the right set of binders in front of you. Could you open up the first binder? We'll verify that it's the right binder.

So the first binder has a label on its spine that's binder 1 of 3. Do you see that?

A. Yes.

Q. And there's an index, a table of contents. Do you see that?

A. I do, yes.

Q. Okay. Thank you. All right. So we'll now move on to the questions.

I had asked you before I asked you to open the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

binders that you testified earlier today that this was your first time testifying in court; is that right?

A. This is the first time I've testified at trial.

Q. At trial; is that correct?

A. Yes. I've testified in earlier depositions.

Q. So you did not mean to suggest to Her Honor that you have not been retained as an expert in litigation before, right?

A. Oh, no, certainly not. That was not my suggestion.

Q. And you have been retained on behalf of Phillips in a case against Masimo; is that right?

A. That's correct.

Q. And that case was -- your involvement in that case was from approximately August 2013 to November 2016; is that right?

A. That sounds correct.

Q. Dr. Warren, you talked earlier about a sensor head called a Kansas State 6D. Do you remember that?

A. Yes.

Q. You dug that Kansas State 6D head out of storage at the request of counsel in this case. Would you agree with that?

A. I would agree that I removed it from storage.

Q. You removed it out of storage at the request of

MASIMO 2029
Apple v. Masimo
IPR2024-00242

counsel, right?

A. Yes.

Q. Just to be clear, you are withdrawing any opinion that the Kansas State 6D invalidates any asserted claims; is that correct?

A. I never had the opinion that Kansas State 6D invalidates any asserted claims on its own. It was always an obviousness argument.

Q. So just to be clear, then, you are withdrawing any opinion that the Kansas State 6D in the combinations invalidates any asserted claims; is that correct?

A. Well, I don't know that I can say that I'm withdrawing an opinion because I don't know the legal ramifications of that, but I had planned to offer those opinions today, but I reduced my set of slides in order to save Her Honor some time.

Q. And you did not compare any Kansas State 6D references, documents to the claims asserted in this case; is that correct?

A. That's incorrect.

Q. Today.

A. Today I don't recall that I did.

Q. When you say you don't recall that you did, you did not compare any of the claims asserted in this case to the Kansas State 6D documents or sensor head, right?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. I did not formally present those in a slide, but I don't recall if I mentioned anything in passing that you would consider to meet that requirement.

Q. And you didn't offer an opinion on obviousness with respect to the Kansas State 6D and, for example, the Seiko 131 and Haar references; is that correct?

A. The intention of my opinions today was to note that those techniques are old and that it would be obvious for a person of ordinary skill to implement them.

Q. And I'd like to make clear for the record that counsel is withdrawing the opinions from you, Dr. Warren, on Kansas State regarding obviousness of claims 12 of the '501, 12, 24, and 30 of the '648, claim 22 of the '502, and claim 28 of the '502. Is that correct?

A. I don't know how to respond to that because that sounds like a legal matter.

Q. But you didn't present any analysis on a claim-by-claim basis with respect to Kansas State right?

A. That's correct.

Q. Let's talk a little bit about the Lumidigm reference. Do you have that in mind?

A. I do.

Q. Fig. 2 of Lumidigm depicts an example where the sensor head is flat, right?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. To my memory, yes.
Q. Do you remember what Fig. 2 looks like without having it in front of you?
A. I do.
Q. Okay. Let's pull up RDX-8.26.
This is one of the slides you presented this morning, isn't it, Dr. Warren?
A. Yes.
Q. You shaded the LEDs in red; is that correct?
A. That is correct.
Q. And this is the sensor head that is flat, right?
A. Yes, it is the sensor head and not depicted with a curvature, simply drawn.
Q. When you say "simply drawn," you mean that you annotated on this figure; is that correct?
A. No. What I mean by simply drawn is that Fig. 2 was drawn with simple constructs, straight lines and boxes and arcs.
Q. But it is, in fact, straight, isn't it?
A. In this depiction the top of the sensor head is indeed straight.
Q. When you say "the top of the sensor head," what are you referring to, Dr. Warren?
A. The part of the sensor head that meets the tissue is what I'm referring to.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Is there a reference designator associated with what you're talking about, and do you know what I mean by "reference designator"?

A. I don't know what you mean by reference designator, but the way the cross-section is drawn in the figure, if I consider down to be the bottom of the figure and up to be the top of the figure, then the top of the sensor head would be where the sensor head meets tissue.

Q. Is there a number 39 associated with that line?

A. 39 looks like the closest label to the line of which I speak.

Q. Dr. Madisetti, you offered an opinion that a person of ordinary skill in the art would know that a protrusion can help improve signal quality of light-based signals received by optical biosensing devices; is that correct?

A. You called me Dr. Madisetti.

Q. Oh, I apologize.

A. No, that's all right.

Q. Running on very little sleep, Dr. Warren. I apologize. I really -- I do apologize.

A. I get it. No worries. That's okay.

Q. So, Dr. Warren, you offered the opinion that a person of ordinary skill in 2008 would know that a protrusion can help improve signal quality of light-based

MASIMO 2029
Apple v. Masimo
IPR2024-00242

signals received by optical biosensing devices, right?

A. Yes.

Q. And, Dr. Warren, you analyzed the Mendelson '799 patent, right?

A. I did look at that patent, yes.

Q. You included that in your demonstratives today; is that correct?

A. The Mendelson '799? I don't recall how it was labeled -- as a document or an exhibit.

Q. Okay. Let's take a look at your demonstrative RDX-8.127.

A. Oh, I see. I thought you meant the state of the art section.

Q. This is the Mendelson '799 reference, right?

A. Yes.

Q. And you highlighted a little bit of the text here in Mendelson '799, right?

A. I did.

Q. But Mendelson '799 actually states that variations in contact pressure between the sensor and the skin can cause larger errors in reflection pulse oximetry (as compared to the transmission pulse oximetry) -- as compared to transmission pulse oximetry -- since some of the blood near the superficial layers of the skin may be normally displaced away from the sensor housing towards

MASIMO 2029
Apple v. Masimo
IPR2024-00242

deeper subcutaneous structures, right?

A. I see those words, yes.

Q. And you didn't highlight those words, did you.

A. No, I did not.

Q. But they are on this slide, aren't they?

A. They are on the slide, but the context as displayed in Fig. 4 is that you see the skin layer a little bit of tissue --

Q. Dr. Warren, you've answered my question. They're on the slide, right?

A. Those words are on the slide, yes.

Q. That's all I asked you.

MR. CLAASSEN: I'd like to go on the Apple confidential record for a moment.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

BY MR. CLAASSEN:

Q. Dr. Warren, you would agree that the Seiko reference, in the Seiko reference, the cover glass closes the through hole, right?

A. I would have to look at the document to see what the language is, whether it says a through hole or an opening, but I believe it says through hole, and, yes, the cover glass closes the through hole.

Q. So the cover glass closes the through hole in Seiko 131, right?

A. Such that the through hole no longer is -- no --

Q. Yes or no, Dr. Warren? Yes or no?

A. The cover glass closes --

Q. Dr. Warren, I would like you to stop.

Let's turn to your deposition, page 113. It's in your binder. That's exhibit, tab 1, Exhibit CX-300, and I'd like you to turn to page 113.

A. Which binder are we in?

Q. Binder 1, tab 1, and I'd like you to turn to page 113.

A. Okay. I'm with you.

Q. Take a look at line 4, lines 4-6. You were asked the following question:

MASIMO 2029
Apple v. Masimo
IPR2024-00242

MS. VREELAND: Your Honor, if I may just interject. I'm going to object to this because I think there are multiple Seiko references in this case, and I don't think that there's impeachment until we've established that it is the same Seiko that he testified about.

MR. CLAASSEN: I'll ask you generally the same way the question was asked here.

Q. The cover glass 23 discloses through hole 22 in Seiko, correct?

JUDGE BHATTACHARYYA: There's been an objection posed. Can you respond to it, Mr. Claassen?

MR. CLAASSEN: Yes, Your Honor. I could lay a foundation or we could just move on.

JUDGE BHATTACHARYYA: It's up to you, either one.

MR. CLAASSEN: Okay.

Q. Let's go back to your slides, this morning, Dr. Warren, and let's pull up the Seiko 131 reference.

A. To be clear, these are different Seikos.

Q. Is it your opinion, then, is it your opinion that the cover glass in Seiko 131 does not close the through hole?

A. My opinion is that the cover glass in Seiko 131 does close the through hole in terms of the opening at the protrusion, but it's not consistent with my deposition question.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. I understand. I want to make sure that I understand your opinions regarding whether the glass in Seiko 131 closes the through hole.

A. Yes, such that it no longer extends through the protrusion.

Q. Thank you, Dr. Warren.

Dr. Warren, I'd like to talk about --

We'll need to go on the Masimo confidential record for a little bit.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Moving back to the public record.

MR. CLAASSEN: Actually I have -- we can stay on the Masimo --

Q. Dr. Warren, you did no clinical accuracy study on the --

JUDGE BHATTACHARYYA: Wait.

MR. CLAASSEN: I can stay public. This is fine.

JUDGE BHATTACHARYYA: Okay.

Q. Dr. Warren, you did no clinical accuracy study on the CPX-146, right?

A. No, and I did not conduct an RMS calculation as required, which would have been more significant --

Q. You've answered my question, Dr. Warren.

A. I just did.

Q. Dr. Warren, you've answered my question.

You did no RMS calculation, correct?

A. That's correct.

Q. Dr. Warren, you testified earlier today that you did not find any mention of the wrist as a measurement site in the '501 patent, right?

A. That's correct.

Q. But you were being very, very specific about the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

word "wrist" in that testimony, correct?

A. That is correct.

Q. You do know, however, that the '501 patent actually expressly states that, quote, in some embodiments the measurement site 102 is located somewhere along a nondominant arm or a nondominant hand, e.g., a right-handed person's left arm or a left hand, right?

A. Yes.

Q. Dr. Warren, you offered opinions based on the combination of Lumidigm and a patent you called Seiko '131 that we were just about just a few minutes ago, right?

A. Yes.

Q. And you prepared some demonstrative slides regarding your analysis of Seiko '131, right?

A. That's correct.

Q. Let's pull up RDX-8.75.

Dr. Warren, this was your analysis that you presented this morning regarding the chamfered edge, right?

A. This is part of it, yes.

Q. And you see you wrote the limitation at the top of the screen, right?

A. That's correct.

Q. And in this limitation that's on your slide, the protrusion further comprises one or more chamfered edges, right?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. That's what the wording says, yes.
Q. That's what the claim limitation requires, right?
A. That's correct.
Q. I'd like to draw your attention to the bottom left portion of your demonstrative. Do you see that?
A. I do.
Q. You highlighted the protrusion in yellow, right?
A. That's correct, part of it.
Q. When you say "part of it," is that part of it or is that all of it?
A. The whole front of the device protrudes in the tissue, but the light transmittance plate is the convex surface that comprises part of the protrusion.
Q. So you understand that 341A that you've highlighted in yellow is the protrusion, right?
A. The light transmittance plate is the convex portion of the protrusion in Seiko '131.
Q. And you also annotated blue lines on Fig. 28, right?
A. That's correct.
Q. You labeled those blue lines as a chamfered edge, right?
A. Yes.
Q. And those blue lines are not on the protrusion that you highlighted in yellow, right?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. That's correct. I stated earlier they were for comfort.

Q. You've answered my question.

Dr. Warren, you also testified about that Kansas State 6D head. Do you remember that?

A. I do.

Q. And you testified that the 6D head was made of a pliable foam, right?

A. That's correct.

Q. And the pliable material on the 6D head allows the sensor to conform to the measurement site, right?

A. Yes.

Q. The Kansas State 6D sensor head was not designed with a convex surface, right?

A. That's correct.

Q. And the details of the Kansas State 6D system are corroborated by RX-508; is that correct?

A. I don't recall the number of the exhibit.

Q. Okay. Let's take a look at your RDX-8.91.

A. Can you lead me to a tab or a binder?

Q. It's on the screen. This is the demonstrative that you presented on the screen earlier. Do you remember that?

A. Yes.

Q. And the title of this slide is the K-State System

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Corroboration, and it's RX-508, right?

A. Yes.

Q. So the details of the Kansas State 6D system are set forth in RX-508, right?

A. Some of the details, yes.

Q. Dr. Warren, you presented no opinion this morning regarding the secondary consideration of failure of others, right?

MS. VREELAND: Objection to the form of the question.

A. I provided secondary considerations, but I --

JUDGE BHATTACHARYYA: Let's resolve the objection.

What's the problem with the form of the question?

MS. VREELAND: I'm sorry. I thought that -- I thought that he -- well, I'll withdraw the objection. I'll withdraw the objection.

Q. You can answer my question, Dr. Warren.

A. I provided opinions on secondary considerations. I don't recall that I was focusing specifically on failure of others.

MR. CLAASSEN: No further questions.

JUDGE BHATTACHARYYA: Any redirect?

MS. VREELAND: No redirect, Your Honor.

JUDGE BHATTACHARYYA: All right. Thank you very

MASIMO 2029
Apple v. Masimo
IPR2024-00242

much for your time, Dr. Warren.

THE WITNESS: Thank you. I appreciate it.

MS. FRAZIER: With Your Honor's permission, Dr. Warren, you may leave.

Your Honor, Apple's next witness will be Vince Thomas, and he will be presented by my colleague Derek Gosma.

MR. GOSMA: Good morning, Your Honor.

JUDGE BHATTACHARYYA: Good morning.

MR. LAQUER: Good morning, Your Honor.

JUDGE BHATTACHARYYA: Good morning. Good morning, Mr. Thomas. Do you understand that you are under an obligation to tell the truth here today?

THE WITNESS: I do.

VINCENT THOMAS,

having been first duly sworn and/or affirmed on his oath, was thereafter examined and testified as follows:

DIRECT EXAMINATION

BY MR. GOSMA:

Q. Could you please introduce yourself?

A. Sure. My name, full name, is Vincent Alexander Thomas. I'm a senior managing director with FTI Consulting.

Q. What's your educational background?

A. I have a Bachelor of Arts in economics from

MASIMO 2029
Apple v. Masimo
IPR2024-00242

DePauw University and I have a Master's in business administration from Indiana University.

Q. Do you have any professional credentials?

A. Yes. I'm a certified public accountant, certified valuation analyst, certified licensing professional, accredited in business evaluations, and a certified patent valuation analyst.

Q. Have you performed an analysis of domestic industry in other investigations?

A. Yes, in approximately 20 investigations.

MR. GOSMA: Your Honor, we move to admit Mr. Thomas as an expert in the field of economics and financial analysis.

JUDGE BHATTACHARYYA: Any objection?

MR. LAQUER: No objections.

JUDGE BHATTACHARYYA: Mr. Thomas is admitted as an expert in the field of economics and financial analysis.

BY MR. GOSMA:

Q. Mr. Thomas, have you prepared any demonstratives to assist with your testimony today?

A. I have.

Q. Let's call those up now. And for the record these are RDX-9. Let's call up RDX-9.2.

Can you summarize your opinions on the issues of domestic industry and bonding?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Sure. First, my first opinion is that the Complainants through Mr. McGavock have not satisfied the economic prong of domestic industry, either under sub-prong A or sub-prong B. I also -- it's also my opinion that they have not shown that a bond is necessary let alone 100 percent bond.

Q. Thank you.

MR. GOSMA: Your Honor, at this time we need to move onto the Masimo confidential record.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

MR. LAQUER: May I proceed, Your Honor?

JUDGE BHATTACHARYYA: Yes, you may.

BY MR. LAQUER:

Q. Mr. Thomas, you've criticized Mr. McGavock for supposedly having not performed any independent verification of Masimo's domestic industry claim, correct?

A. Correct.

Q. And in your direct testimony, when criticizing activities at Masimo's facilities, you said that you've been to other manufacturers' facilities, correct?

A. Correct.

Q. And in preparing your rebuttal report, you reviewed Mr. McGavock's statement in his report that he visited multiple Masimo facilities in Irvine, California, correct?

A. I can't say verbatim, but he said something to that effect, yes.

Q. But you did not request to visit Masimo's facilities, correct?

A. I did not.

Q. You weren't even aware that Apple had requested that its technical expert conduct a similar inspection of technical materials as Apple's technical expert, correct?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. I don't -- I don't recall if I was -- I don't believe I was.

Q. And you reviewed the photographs of Mr. McGavock's tour of the Masimo facilities, correct?

A. That's correct.

Q. But you are unable to assess whether or not Masimo's manufacturing demonstrated in those photographs is significant, correct?

A. No, that doesn't -- those photographs don't tell me anything.

Q. Let's look at what you said in your deposition at page 130 beginning on line 14.

Question. So are you able to assess whether or not the manufacturing that is demonstrated in those photographs is significant or not?

Answer. Well, again, it's pictures that were taken on a one-day trip in February of, I believe February of 2020, and without any context provided for Mr. McGavock. So I don't know that I'm able to assess and respond to the opinions he set forth and the basis for those opinions given the lack of information and context of the photographs, and that's in one particular day.

That was your sworn testimony, correct?

A. That's correct.

Q. And the pictures you were referring to were

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Mr. McGavock's photos of the tour of Masimo's Irvine facilities, correct?

A. I believe so, yes.

Q. So you were asked to opine whether Masimo had satisfied the domestic industry requirement, but you didn't bother going to Masimo's domestic facilities, correct?

A. That's absolutely correct.

MR. LAQUER: No further questions.

MR. GOSMA: No redirect, Your Honor.

JUDGE BHATTACHARYYA: Thank you.

Thank you, Mr. Thomas. You can step down now.

THE WITNESS: Okay. Thank you.

JUDGE BHATTACHARYYA: Are we on the public record now?

MS. SWAROOP: I believe we are, Your Honor.

JUDGE BHATTACHARYYA: Okay.

MS. SWAROOP: I think we can go on the public record, if we weren't before.

JUDGE BHATTACHARYYA: Let's go back to the public.

MR. MUELLER: Thank you, Your Honor. Thank you, again, for the accommodation this morning. I appreciate it.

JUDGE BHATTACHARYYA: Of course.

MR. MUELLER: A couple housekeeping matters. First, Apple has a list of deposition designations and

MASIMO 2029
Apple v. Masimo
IPR2024-00242

associated exhibits that were submitted to your chambers before the lunch break that we would like to move in. Our understanding is all objections have been resolved. Unless Ms. Swaroop --

MS. SWAROOP: I'm just checking with my team.

Mr. Mueller, you are correct, we do not have any outstanding objections with the clarifications we discussed this morning, so that's correct.

JUDGE BHATTACHARYYA: Okay. I have a list before me, "Respondent Apple Inc.'s Submission of Deposition Designations and Exhibits."

I understand, Ms. Swaroop, you have no objection to this particular list that I have now; is that correct?

MS. SWAROOP: That's correct, Your Honor.

JUDGE BHATTACHARYYA: Then that list of exhibits, the deposition designations and associated exhibits is admitted. Please send a copy to the court reporter.

(Whereupon, the exhibits as recited by counsel and reflected in the attached index were submitted and received in evidence.)

MR. MUELLER: Second, Your Honor, Apple submitted to your chambers this morning a list of exhibits from the evidentiary hearing yesterday, June 9th, that the parties have agreed is ready to be moved in as well, Your Honor. And it was submitted at 9:31 a.m. this morning.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

JUDGE BHATTACHARYYA: I have a list entitled "Table of Admitted Exhibits for the Evidentiary Hearing on June 9th, 2022."

Are there any objections to that -- admission of those exhibits, Ms. Swaroop?

MS. SWAROOP: Your Honor, we do have the outstanding CX-322bC issue, so we both agree that the exhibits can come in, it's just a question of which version, and I think that's been submitted to Your Honor. So that's the current status.

JUDGE BHATTACHARYYA: Okay. I reviewed that exhibit and the various alternative redactions to it. I understand that the parties are fine with me deciding which one I think is more appropriate and moving that in.

If that's the understanding, then the Masimo version I believe is more appropriate, the Apple version still has material in it that goes beyond test protocols and test data, so Masimo's version will be the one admitted.

(Whereupon, the exhibits as recited by counsel and reflected in the attached index were submitted and received in evidence.)

JUDGE BHATTACHARYYA: With that clarification, the exhibits listed on the Table of Admitted Exhibits for the Evidentiary Hearing on June 9th, 2022 is admitted. Please send a copy to the court reporter.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

MR. MUELLER: Your Honor, we'll go over the transcript from this morning, and if there's any additional exhibit that have not been submitted as of the list for yesterday, we'll submit those to Your Honor as well.

But, with that, Apple rests.

JUDGE BHATTACHARYYA: Very well.

MS. SWAROOP: Your Honor, Masimo is ready to begin its rebuttal case, and we understand this will be the third and final phase of the evidentiary hearing.

At this point in time we have four remaining expert witnesses that we intend to present. And I did want the court to know as well that we do have Mr. Kiani listed as a rebuttal witness as well. He is our only remaining fact witness.

And at this point in time, unless testimony elicited by Apple during cross of our remaining experts requires additional factual testimony from Mr. Kiani to rebut, we do not currently plan to call Mr. Kiani as a rebuttal witness.

JUDGE BHATTACHARYYA: Thank you for the clarification.

MS. SWAROOP: And with that, Your Honor, we are ready to begin with Dr. Madisetti. And my colleague, Mr. Claassen, will be conducting that examination.

MR. MUELLER: And Ms. Frazier will do the cross.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

JUDGE BHATTACHARYYA: Hello again, Dr. Madisetti.

THE WITNESS: Good afternoon, Your Honor.

JUDGE BHATTACHARYYA: Just to be on the safe side I will ask you to swear or affirm again.

VIJAY MADISETTI,

having been first duly sworn and/or affirmed on his oath, was thereafter examined and testified further as follows:

DIRECT EXAMINATION

BY MR. CLAUSSEN:

Q. Good afternoon, Dr. Madisetti.

A. Good afternoon, sir.

Q. Did you prepare demonstrative slides regarding your validity analysis for this case?

A. Yes.

Q. Let's take a look at CDX-12C, please. We can turn to slide 2.

Dr. Madisetti, can you please explain the summary of your opinions regarding validity?

A. Yes. I'm offering an opinion with respect to the asserted claims of the '501, the '502, the '648, and the '745. It is my opinion that Apple has failed to show that any asserted claim is anticipated or rendered obvious. They originally had nine grounds challenging '501, '502, and '648 patents and three grounds challenging '745 patent. My

MASIMO 2029
Apple v. Masimo
IPR2024-00242

opinions apply to all these grounds.

The specification in my opinion adequately supports the asserted claims under Section 112, and objective evidence confirms nonobviousness of the asserted claims under the asserted grounds.

Q. Let's turn to the next slide, slide 3.

What materials did you analyze in forming your opinions on validity?

A. I reviewed the patents, the file histories. I also reviewed the product references. I applied the knowledge of a POSITA. I looked at the expert reports. I responded to them. I reviewed the deposition testimonies, where relevant, the documentary evidence that I had at my possession and the physicals and did some testing again.

Q. You mentioned something called a POSITA. What is the level of skill in the art that you applied?

A. Yes. As I describe in the next slide, for these '501, '502, and '648, and '745 patents in the relevant time frame, that's 2008 and 2015, it was a person with working knowledge of physiological monitoring technologies, having a BS degree in the academic disciplines that I list here, electrical, computer, or software; some amount of training; and one to two years of related work experience in these areas. Alternatively, a person could have a higher degree, such as an MS degree, with less than a year of work

MASIMO 2029
Apple v. Masimo
IPR2024-00242

experience. I also -- my opinions also apply under Apple's experts level of skill in the art.

Q. Turning to slide 7, what is shown on this slide?

A. Yes. These are the nine grounds that Apple had originally applied. For the Multi-Detector Patents, which are the '501, '502, and the '648, and now I think based on today's presentation by Dr. Warren, only six of these grounds remain, 1 through 6, which are based on Lumidigm.

As you can see, as I tried to show from this particular chart, that out of the nine grounds almost all the references that I've highlighted in yellow have been presented to the USPTO. And the only references that appear to remain are Lumidigm and Apple 047 and a Bluetooth board.

Q. Turning to slide 9, please explain your analysis regarding Lumidigm.

A. Yes. With respect to Lumidigm, Lumidigm has several problems, and I list them here, and then I will explain a little more.

Lumidigm does not disclose or suggest at least the following claim features and elements:

There is no protrusion comprising a convex surface. This directly applies to claim elements '501, 1C, claim 12, '502, 19C, and 28E, '648, 8D and 20C.

It has no protrusion at all or over an interior surface. This applies to '501, 1C, '502, 28E. It has no

MASIMO 2029
Apple v. Masimo
IPR2024-00242

photodiodes disclosed '501, 1B, '502, 19B, 28C, 6488C, and 20B. It has no openings or through holes in protrusion or windows in opening. And this applies to claim elements 1D of the '501, 19C and 19D of the '502, 28F and 28G of the '502, and 8E, 20D, and 20E of the '648.

It has no disclosure of SpO2 calculations or measurements. This affects the '502, 19 preamble, 28 preamble, and the '648, claim 12. It has no claimed cavities, '502, 28H; no opaque lateral surface or opaque material configured to avoid or reduce light piping, element 1E of the '501, element 28F of the '502, element 24 -- claim 24 of the '648.

It has no thermistor, no adjustment responsive to temperature, claim 20 of the '502, claim 21 of the '502, claimed 28D and 28I of the '502.

And the only passing references to hemoglobin or oxygen levels as something called extended functionality. And I refer here, for example, to Fig. 2 that the Apple seems to include as a part of their analysis.

Q. Turning to the next slide, please explain your analysis regarding the extended functionality of Lumidigm.

A. Yes. As I said, Apple relies on a passing mention of hemoglobin in Lumidigm. Lumidigm is just a biometric identifier device. Looking at RX-411 in columns 3, 35-37, 4, 7-29, 10, 11-21, and 19, 16-28, none of these

MASIMO 2029
Apple v. Masimo
IPR2024-00242

very vague mentions of hemoglobin link it to Fig. 8 embodiment that's shown on the right.

There's no mention of oxygenation and/or hemoglobin levels, other than a broad discussion of what I call as aspirational extended functionality. So, again, there's no link to Fig. 8B. There's no disclosure or suggestion of Lumidigm being configured to noninvasively -- noninvasively measure oxygen or oxygen saturation.

So those are some of the comments I make with respect to how Lumidigm does not disclose this functionality.

Q. Turning to the next slide, please explain your analysis regarding the lack of a protrusion comprising a convex surface in Lumidigm.

A. Yes. Lumidigm sensors have a flat sensor surface, 39, as shown here on Fig. 2.

And Lumidigm says the sensor head 32 may have some compound curvature of the optical surface, which is Lumidigm at column 7, 58-63.

But if you look at that disclosure on the bottom right, that is described that the sensor head may have -- also have a compound curvature on the optical surface to match the profile of a device on which it's mounted.

So if it were a wristwatch and it were mounted on the hand, it would have a concave curvature at best. So

MASIMO 2029
Apple v. Masimo
IPR2024-00242

this is what Dr. Rowe, who is an inventor, confirms that I describe on bullet 3, that Rowe admits that a concave compound curvature would better approximate users tissue, his deposition testimony CX-279C at 68-69.

So even this passing mention, if applied to Fig. 8B would run contrary to Apple's incorrect argument that somehow compound curvature could be convex, which I disagree with.

Second is that Apple's argument is, again, trying to conflate this 39 with some sort of protrusion. It is unclear whether it is conflating this optical surface as having some sort of protrusion. There's no distinction between a protrusion or an interior surface. There's no disclosure of any sort of cavities or any opaque wall that's formed.

All that is disclosed is some sort of movement of this surface 39 up or down. That does not make a protrusion. That does not make an interior surface that's distinct from a protrusion. It does not satisfy all these other features. Therefore, Lumidigm fails to disclose or suggest to a POSITA a protrusion comprising a convex surface arranged over or above the interior surface or photodiodes.

And Dr. Warren admitted that this figure is a flat sensor surface.

Q. Dr. Madisetti, you heard Dr. Warren testify about

MASIMO 2029
Apple v. Masimo
IPR2024-00242

something called Kansas State 6D, right?

A. Yes.

Q. Turning to slide 15, can you please briefly explain Kansas State 6D?

A. Yes. Kansas State 6D was mentioned in passing. It is an undergraduate project from more than 20 years ago. It's a very -- it's not a user-worn device. It has many problems. It has a foam type of description that is shown here in the middle. And there's no evidence that it was ever -- it ever resulted as a user-worn device. So it looks like a very simple, basic undergraduate class project.

Q. Dr. Madisetti, is your understanding that Kansas State 6D is from approximately 2004 or 2005?

A. Yes, it's more than 17 years, that's my understanding.

Q. Turning to slide 23, please explain your analysis of Apple's third reference, Cramer?

A. Yes.

Q. Excuse me. Seiko 131.

A. Yes. Seiko 131 is a second reference suggested by Apple. And there's, again, no protrusion comprising a convex surface with openings. And this applies to elements 1D of the '501, 19C, 28F of the '502, 8E and 20D of '648.

It just talks about one photo transistor, 32, and so there's no protrusion. There is no opaque lateral

MASIMO 2029
Apple v. Masimo
IPR2024-00242

surface/material configured to avoid or reduce light piping. This directly applies to 1E of the '501, 28F of the '502, claim 24 of the '648.

The alleged protrusion, 341, is just transparent glass. And Exhibit 666, column 10 and lines 30-33 and 36-41, there are no windows in the openings or openings in the protrusion. There's no protrusion comprising one or more chamfered edges. This applies to claim 30 of the '648. And the no windows applies to '502, 19D, 28G of the '502, and 8F and 20D of the '648.

So I defer to the embodiment that's related with respect to Fig. 28, that I cross out that and say that that's not a protrusion comprising a convex surface with openings.

Q. Turning to slide 25, please explain your analysis of Apple's third reference, Cramer.

A. Cramer, again, does not disclose or suggest at least the following claim features and elements:

So, first of all, there are three embodiments I show on the right, Figs. 2, Fig. 3, and Fig. 5. Fig. 5 is just a pressure sensor. It's not even an optical sensor. So it's not relevant in my opinion to this matter.

Further, with respect to Figs. 2 and Fig. 3, the side view of Fig. 3 and then the top view as shown in Fig. 2. As you can see, Your Honor, there are just two

MASIMO 2029
Apple v. Masimo
IPR2024-00242

rings. These are called bosses. This is not even a protrusion, as claimed.

There's no covering over -- there's no protrusion arranged over or above the interior surface or the photodiodes. The photodiodes are shown in red -- sorry -- the emitter is shown in red. And in blue you have the detecters.

And as you can see, the protrusion, alleged protrusion, is not a protrusion, it's not over these photodiodes, there is -- as claimed.

So, secondly, this protrusion, this alleged protrusion, in other words, there's no protrusion comprising a convex surface as well. And Fig. 5 embodiment is just a pressure transducer. And it's not having any photodiodes.

The Figs. 2 and 3, the bosses 22 and 22A, are just annular rings. They are not the claimed protrusion with its properties. This directly applies to claim elements 1C of the '501, 19C of the '502, 28D of the '502, 28C of the '648, and then also claim elements 1C of the '501, claim 12 of the '501, 19C, 28D of the '502, 8D and 20C of the '648.

There are no openings or windows in the openings in the protrusion as claimed. Again, elements 1D of the '501, 19C, 19D, and 29F and 28G of the '502, and 8E, 8F, and 20D of the '648.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

And there's no protrusion comprising the opaque surface materials or the chamfered edges. And this affects 1E of the '501, 28F of the '502, claim 24 and 30 of the '648.

Q. Turning to slide 27, please explain your analysis of Webster.

A. Yes. Webster was, again, cited in the grounds. And first, again, they refer to the exhibit, for example, RX-35. What it is referring to, Your Honor, is that it is a transcutaneous P02 sensor. Transcutaneous is not noninvasive. It is invasive.

So there's no thermistor in a user-worn Sp02 sensor. Webster describes a transcutaneous Po2 sensor or electrode using a heating element.

There's no motivation in Webster to add thermistor to adjust operation of Lumidigm's Fig. 8B biometric system. So this affects claim 20, 21 of the '502, 28D and 28I of the '502.

Further, there are no windows and openings/through holes of the protrusion as claimed. This affects 19D, 28G of the '502, 8F and 20D of the '648.

And there's no motivation in Webster to add windows to Lumidigm's biometric system. There's no explanation of how the specific features of the reference is to be combined and no expectation of success.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

I will discuss these a little more after I discuss a couple more of these prior art references.

Q. Turning to slide 29, please explain your analysis of Apple 047.

A. Apple 047 is the reference, I believe, that is in part of Apple's combinations. Again, this is RX-673 shown on the right. It refers to an iPad-type device, and you can see compared to the size of the hand. It's not user-worn physiological measurement device with a touchscreen configured to display oxygen saturation measurements, affecting claim element 28K of the '502.

A person of ordinary skill would not look to the iPad-like device of Apple 047 to improve upon Fig. 8B of the biometric system.

And then there's no motivation to combine Lumidigm's biometric system with a touchscreen of '047 to display a measurement that Lumidigm does not take. We heard from Dr. Rowe that the SpO2 measurement yesterday was not -- was not present.

There's no motivation to combine -- or this is not in the grounds anymore, so we can omit the last bullet.

Q. Now that we have discussed the shortcomings of the references in Apple's combinations regarding Lumidigm, can we turn to the next slide. Can you explain your analysis -- excuse me, slide 14 -- slide 13 --

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Yes. So we have the grounds with --

Q. Let's turn to slide 13, Dr. Madisetti.

A. Yes, slide 13. So here after I have -- we have to go to 13?

Q. Correct.

A. So here after I explain the basic references and what they are missing, I also explain why there's no motivation or reasonable expectation of success for, for example, the protrusion comprising a convex surface.

Adding a protrusion comprising a convex surface would add excessive pressure to the measurement site and displace blood away from the sensor, which was known to cause measurement errors.

So Mendelson '799, which is Exhibit CX-1733, on pages 2 to 47, which is a reference, a prior art reference, explicitly describes that variations in contact pressure between the sensor and the skin can cause large errors in reflection pulse oximetry (as compared to transmission pulse oximetry), so reflection pulse oximetry is what is done in the wrist, since some of the blood near the superficial layers of the skin may be normally displaced away from the sensor housing towards deeper subcutaneous structures.

Consequently, the highly reflective bloodless tissue compartment near the surface of the skin would cause large errors and so on.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

So this clearly discourages one of ordinary skill in the art and provides no motivation or an expectation of success that the combination would actually work or have a reasonable expectation of success.

Further, Rowe confirms that concave, not convex, in the context of Lumidigm, would better approximate tissue shape and provide better coupling with respect to Lumidigm.

So, therefore, one of ordinary skill in the art would not understand the motivation or expect success and, thus, would understand that adding a protrusion comprising a convex surface would undesirably also add to the form factor, in addition to causing measurement errors.

Q. Dr. Madisetti, you mentioned Mendelson '799. That's CX-1733, right?

A. Yes.

Q. Turning to slide 30 --

A. Sorry. Slide 14.

Q. Let's go to slide 14.

A. Yes. Further, continuing on, the motivation to combine and no expectation of success, there's no suggestion or motivation to combine Lumidigm's Fig. 8B biometric system with the alleged protrusions of Seiko 131 or Cramer, for the reasons that are explained in Lumidigm alone.

In addition, the features of Seiko 131 and Cramer that Apple relies on as a protrusion would be less

MASIMO 2029
Apple v. Masimo
IPR2024-00242

comfortable and does not align with Lumidigm's goal of incorporating ergonomic features. I rely, again, on RX-411, column 7, 57-63.

Further, there's no motivation to combine Lumidigm with an opaque lateral surface or an opaque material configured to avoid, prevent, or reduce light piping.

Lumidigm, Seiko 131, and Cramer fail to recognize light piping as a problem at all or motivate a solution to address it. Any discussion in Lumidigm is not a discussion of the light piping problem because it includes the surface of the skin in Lumidigm.

There's no explanation of how these specific features of these references would be combined. And, thus, there's no expectation of success as to the combination of Lumidigm and Seiko 131 or Cramer.

Q. Now that we've discussed the shortcomings of Apple's combinations, can you explain your analysis on slide 30, please?

A. Yes. So going to the Lumidigm by itself, ground 1, whether it's anticipation or obviousness under Lumidigm, Lumidigm has several problems.

It is -- for example, it doesn't have a user-worn device configured to noninvasively measure oxygen saturation as confirmed by Lumidigm and Dr. Rowe. And here is the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

applicable claim elements that I read earlier.

On the right I say this is not present in Lumidigm, and there is no motivation to combine and no expectation of success. And, further, it looks like a hindsight that has driven this sort of combination, where pieces of limitations were added piece by piece using the asserted claims as a roadmap.

Then with respect to the user-worn device configured to noninvasively measure a physiological parameter and determine measurements of a user's tissue, again, with respect to the '501 and the '648, the preambles 1 and 20, these are not present. And there's no motivation to combine or an expectation of success, and they are driven by hindsight.

Similarly, with respect to the emitters and sets of LEDs, each of two or more LEDs, they are not present in Lumidigm. And there's no motivation or expectation of success to modify it. And this affects limitations that I've described here, 19A, 20, 28A, 28B, 8A, and 8B of the '502 and the '648.

And then these additional limitations of at least three photodiodes arranged on an interior surface of the user-worn device, those limitations, again, are not present and there is no motivation or expectation of success, other than hindsight.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

There is no protrusion comprising a convex surface for the reasons that I've described. This is not there. In fact, it teaches away from using a convex surface.

And this is, again, a hindsight in my opinion. And there's no expectation of success or a motivation to combine with respect to the limitations that I described earlier.

Finally, these openings or through holes through the protrusion, and over or aligned with photodiodes is not present. There's no motivation to modify or combine or expectation of success. This is, again, hindsight. It affects the limitations 1D, 19C, 28F, 8E, and 20D of the Asserted Patents.

And, finally, there's no disclosure or obviousness of opaque lateral surface configured to avoid light piping through the protrusion, opaque surface configured to reduce light piping, or other such limitations of 1E, 28F, and 24 of the '501, '502, and the '648. Again, because these are not present, and this is hindsight, and no motivation to modify or expect success, given the teachings of Lumidigm.

Q. Turning to slide 31, Dr. Madisetti, please very briefly explain your analysis on this slide.

A. Yes. With respect to, I think it continues there

MASIMO 2029
Apple v. Masimo
IPR2024-00242

with this additional limitations that are missing. The window or optically transparent material in protrusion openings or through holes is not present. There is no motivation to modify. Again, hindsight.

Again, it does not calculate SpO2. Again, this is not present. That's why I say no. And there's no motivation to modify or expectation of success. Again, hindsight. There's no one or more processors configured to calculate a physiological measurement, network interface, touchscreen memory are not mentioned. Again, the same reasons, MC/ES hindsight.

The thermistor, adjust operation responsive to temperature signal is not present, again, no motivation or hindsight -- based on hindsight, and a protrusion further comprising one or more chamfered edges is not present. And there's no motivation to add it or expectation of success as driven by hindsight.

Q. Turning to the next slide, slide 32, Dr. Madisetti please very briefly explain your analysis on this slide.

A. Yes. As I described in my analysis for Lumidigm and I described Seiko and Cramer, the limitations that are, again, not present and not -- and there's no motivation to modify or expectation of success and driven by hindsight that it's not a user device, it's not a user-worn device

MASIMO 2029
Apple v. Masimo
IPR2024-00242

that is configured to noninvasively measure oxygen saturation, it's not a user device configured to noninvasively measure a physiological parameter, there are no emitter sets, each with two or more LEDs, at least three photodiodes arranged is, again, not present, protrusion comprising a convex surface is not present, openings or through holes through the protrusion over or aligned with the photodiodes are not present, and the protrusion, as I said, there's no motivation or expectation of success to combine it with Seiko 131, for the reasons that I mentioned, and there's no opaque electrical surface that affects all these.

Q. Turning to the next slide, your analysis continues.

A. Yes. With respect to continuing with ground 2, the window or optically transparent material in protrusion openings or through holes again is not present in any of the three in the combination. And there is no motivation or expectation to modify.

It is driven, again, by hindsight. And all these other such limitations, such as one or more processors, network interface, on which Apple depends on Lumidigm, again, are not present. And there's no thermistor, and there's no motivation to modify. It's, again, driven by hindsight, no expectation of success.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Finally, the chamfered edge is not present in any of the references, nor there is a motivation to modify or expectation of success, it is purely hindsight.

Q. Turning to slide 34, please very briefly explain your analysis of this slide.

A. Yes. This ground 3 adds Lumidigm with Webster. And as I described earlier, Lumidigm has lots of problems with respect to these limitations shown here. And Webster only is focused on the thermistor, and thermistor was in the case of an invasive sensor, that was subcutaneous or transcutaneous.

For that reason, for the reasons that I describe here, none of the limitations of '502 patent, claim 22, which depends on claim 19 are either -- are rendered obvious by ground 3.

Q. Turning to slide 35, please very briefly explain your analysis here.

A. Yes. With respect to ground 4, the Lumidigm and Seiko 131, Cramer, and Webster, again, fail because for the '502 patent, claim 22, as I describe here, for each of the limitations in claim 19, they are not present in any of the references. There's no motivation to combine, expectation of success. In fact, Lumidigm teaches away against protrusions.

And, further, there's no optically transparent

MASIMO 2029
Apple v. Masimo
IPR2024-00242

material disclosed within any of the openings. And if you continue on the next slide.

Q. Slide 36, please.

A. Yes; so, again, the limitations 19E, 20, 21 and 22 are not met, because they are not present and there is no motivation to modify, expectation of success, it is all hindsight-driven.

Q. Turning to slide 37, please very briefly explain your analysis on this slide.

A. Yes. Ground 5, the Apple 047, which is the iPad-like interface, again, this, as I described, that is all the features of the '502, claim 28 and are not present for the reasons I described earlier. There's no motivation to combine with Apple, no expectation of success. It is all hindsight-driven.

And if you go to the next slide, where they try to combine the Apple 047, it is for the network interface, touchscreen and memory. And as I describe here, there's no motivation or expectation of success, it is hindsight-driven. And all the limitations I list are not present in any of these references, nor rendered obvious.

Q. Turning to slide 39, please very briefly explain your analysis on this slide.

A. Yes. Slide 39, I rely on my previous analysis for Lumidigm, Seiko 131, Cramer, Webster, and Apple 047,

MASIMO 2029
Apple v. Masimo
IPR2024-00242

again, for the reasons that I described earlier, claim 28 and its limitations are, again, not present, and there's no motivation to modify or expectation of success. And in my opinion they are driven by hindsight for the reasons that I mentioned in the earlier grounds.

Q. Turning to slide 40, please very briefly explain your analysis on this slide.

A. Continuing on ground 6, as I show here, with the, no, no, no, all these are not present in any of these references, Lumidigm, Seiko 131, Cramer, or Webster. And there's no motivation to combine or expectation of success. For these reasons, it's my opinion that ground 6 does not render obvious the asserted claims.

Q. I want to move on now to your analysis of written description support for the Multi-Detector Patents. Do you understand that I'd like to move to that topic?

A. Yes.

Q. Let's turn to slide 44, please. Please explain your analysis regarding written description support.

A. Yes. There is full written description support for multiple LEDs, three or more photodiodes, and opaque lateral surfaces.

So, as I described, with respect to Fig. 7B in Exhibit JX-1, there is full support based on Figures 1, Figures 3 to 4, Figures 7A, 7B, columns -- for the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

limitations based on columns 26, column 27, column 38, column 43, column 44, column 7, and column 6. Multiple LEDs with at least three photodiodes is disclosed because the sensor 301 includes all the features of the earlier sensors 100 and 200, column 18, lines 39 to 42.

So then the specification clearly discloses the sensors can be 701, can be implemented with any of the sensors 101, 201, and 301 described above, column 26, 25 through 29.

Fig. 7B and Fig. 49 confirm that sensor 701 has multiple emitters in housing 704 and multiple detectors. And Fig. 14I discloses emitters 1404 are depicted in the emitter shell, numerous embodiments with multiple emitters and detectors, Figs. 1, 7, and 13.

The specification also describes in column 7, column 27, column 28 that any protrusion embodiment may include hard or opaque plastic with openings as claimed. The shielding enclosure or box made of copper, opaque material that includes openings as claimed.

So in my opinion specification adequately claims configurations with multiple LEDs, three or more photodiodes, and openings with opaque lateral surfaces within the same embodiment.

Q. And, Dr. Madisetti, you said adequately claims; is that correct?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Adequately describes and discloses.

Q. So what is your opinion regarding written description on this issue?

A. It is my opinion that the claims with multiple LEDs, three or more photodiodes and opaque lateral surfaces have full written description support.

Q. Turning to slide 45, please explain your analysis regarding written descriptions support for sets of LEDs in at least four emitters.

A. Yes, as I describe again with respect to the embodiment of Fig. 7B, emitters 104 included in the sensors from 101, 201, 301, and 701 and described throughout the specification as described as including sets of LEDs with different wavelengths.

I refer, again, to columns 12, lines 3-25, column 18, 39-42, and column 26, 25-29, which show that sets of optical sources that are capable of emitting visible and near infrared optical radiation, and then Fig. 13 talks about multistream -- discloses multistream process 1300 applicable to any of the sensors described above and using emitter sets.

So sensors are described as having -- as many sets of LEDs, as a number of -- as the number of detectors or even more sets of LEDs than the number of detectors, Figs. 13, 33, column 33, 18-51.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

The specification, JX-1, column 12, 16-25, provides additional disclosure of claimed sets and emitters as I cite here.

Q. Turning to the next slide, please explain your analysis of written description and enablement for an opaque material configured to substantially reduce light piping?

A. In my opinion written description and enablement are disclosed by the specification itself and supported by the specification itself of the '501, '502, and the '648, where it explicitly describes protrusion can advantageously include hard opaque plastic, helpful in reducing light noise, including by light piping, Exhibit JX-1, column 7, 65-8, column 8, line 7.

The JX-1 at column 25, 48-59, describes adding -- discloses adding height of the protrusion reduces light piping. And I refer to the portion of the specification here that adding height provides for greater thinning of the measurement site and added height assists in deflecting light piped through the sensor.

So I, again, refer to column 7, column 25, column 37, column 43, and Figs. 3C and 7B in the lines that I cite.

Q. Dr. Madisetti, turning back to slide 45, please explain your opinion regarding written description support for the claimed LEDs and emitters.

A. Counsel, which slide are you referring to?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Slide 45, please.

A. Okay. So with respect to the sets of LEDs and at least four emitters, I think I covered this.

Q. Can you please briefly explain the basis for your opinion?

A. As I said here, the emitters 104 included in sensors 101, 201, 301, and 701, I refer to the specification, column 12, 3-25, column 18, 39-42, column 26, 25-29, Figs. 7, 11, and 13 that describe emitters comprising sets of LEDs.

I refer to Figure 13, which refers to multi-process 1300 -- multistream process 1300 applicable to any of the sensors described above and using emitter sets, Figs. 13, column 33, lines 18-51.

And also the specification in column 12, 16 through 25, provides additional further disclosure of the claimed sets and emitters, where it discloses that emitter 104 can be arranged in an array, such as described in U.S. Publication Number 2006/0211924, filed September 21, 2006, titled Multiple Wavelength Sensor Emitters, the disclosure of which is incorporated by reference in its entirety. Other --

Q. Dr. Madisetti, my question may not have been clear enough. What was your overall final opinion based upon this analysis?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Oh, I see. I'm sorry for that. It's my opinion that there is full written description support and enablement support for all the claims and their limitations, including those that I described.

Q. And turning back to slide 47 where we were, what was your opinion regarding enablement of the touchscreen display and indicia of measurements?

A. Yes, as I show in the embodiment of Fig. 2C, there is a disclosure of a touchscreen display that's in the context of the pulse oximeter measurement. And I rely upon specification columns 16, lines 39-42, that talks about -- that discloses the features of monitoring devices 200 shown in Figures 2A through 2D that may be combined with features of other monitoring devices 200 shown.

And the specification further explains the monitoring device 200 can employ any of a variety of user interface designs, such as touchscreens.

And the monitor 209 can include display 210B that can indicate a measurement. Other analytes and other forms of display can also appear on the monitor 209B. And I refer to 209C shown in Fig. 2C, also includes straps 214C that allow the monitor 209C to be attached to the patient's limb or the like. I refer to Figures 2A through 2D, columns 16, 17, 18, and 17.

Q. Going back to slide 46, Dr. Madisetti, could you

MASIMO 2029
Apple v. Masimo
IPR2024-00242

please explain the second bullet point in this slide?

A. The second bullet point describes the specification, column 25, 48-49, that an added height of the protrusion reduces light piping. So specifically in an embodiment, the added height provides for greater thinning of the measurement site.

In an embodiment, the added height assists in deflecting light piped through the sensor. This is because light piped around the sensor passes through the sidewalls of the added height without being directed towards the detectors.

Q. Dr. Madisetti, have we now talked about your analysis for the validity of the Multi-Detector Patents?

A. Yes.

Q. What was your overall conclusion on written description and enablement?

A. My overall conclusion is that, for the grounds -- for the grounds based on the Lumidigm, it is my opinion that there's no anticipation or any obviousness of the asserted claims for the reasons that I cite.

Q. What was your overall conclusion on the lack of written description opinion that was offered by Dr. Warren?

A. I provide -- it's my opinion that full written description and enablement support is present for all the claim limitations.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. And what was your overall opinion regarding obviousness?

A. With respect to obviousness, it's my opinion that for the grounds raised by Apple, it is my opinion that they do not render any of the asserted claims as obvious.

Q. And what was your opinion regarding anticipation?

A. With respect to the anticipation ground, it's my opinion that the grounds on anticipation do not render any of the asserted claims as anticipated.

Q. Turning now to your analysis of the '745 patent, let's look at slide 61, please.

Explain your analysis of the Apple Watch Series 0.

A. Yes. With respect to Series 0, which appears in the '745 patent ground 1 --

Q. Dr. Madisetti, excuse me. I think we actually need to move on to CBI Apple record, unless I'm mistaken from Apple's counsel.

MS. FRAZIER: No, let's please go on to that record.

JUDGE BHATTACHARYYA: We're moving on to the Apple confidential record.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Moving back to the public record.

BY MR. CLAASSEN:

Q. Dr. Madisetti, I'd like to turn to your analysis of the objective indicia of nonobviousness.

A. Yes.

Q. Let's turn to slide 84, please. Will you briefly explain your analysis regarding the objective indicia of nonobviousness of the Asserted Patents?

A. Yes. With respect to the '501, '502, '648, and the '745, I cite these various categories that there was industry skepticism of, for example, SpO2 or oxygen saturation at the wrist, for the '501, '502, '648, and the '745 patents, and there's also skepticism about the protrusion comprising a convex surface.

Also, these were unexpected results of the claimed protrusion. There was a failure of others, such as Apple. There are non-infringing alternatives that Apple could have used for the asserted claims in the patents.

There's evidence of copying, and the commercial success of the Apple Watch Series 6 and 7, and the nexus to the patents and the claims that are asserted in this matter.

Q. Before we move to the next slide, I do need to

MASIMO 2029
Apple v. Masimo
IPR2024-00242

move back on to the Apple CBI record.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Moving back to the public record.

BY MR. CLAASSEN:

Q. Dr. Madisetti, can you explain your analysis regarding skepticism?

A. Yes. There was skepticism in the art for the claimed protrusions. A POSITA would understand and expect that adding undue pressure to the measurement site would displace blood away from the sensor believed to cause measurement errors, Mendelson 799, Exhibit 1733.

The patent specification, for example, JX-1, Figs. 5, 21 through 15, lines 15 to 43, also confirm that this -- confirm this issue, that a POSITA would understand that adding -- confirm the improvement due to the asserted claims.

Further, a POSITA would understand that adding the claimed protrusion would impose such pressure and cause the type of error explained in Mendelson 799.

A POSITA would also have been skeptical of the claimed protrusion comprising a convex surface because increasing the contact pressure between the sensor and the skin in a manner believed to cause errors.

The Multi-Detector Patents' inventors found

MASIMO 2029
Apple v. Masimo
IPR2024-00242

unexpectedly that a protrusion comprising a convex surface can significantly improve -- significantly improved the signal-to-noise ratio SNR of pulse oximetry sensors, as shown, for example, in Fig. 5, Exhibit JX-1, columns 21, 15 through -- 15 through 43.

Eight years after the Multi-Detector Patents, Apple recognized the benefits of a protrusion and other claim limitations, and a protrusion comprising a convex surface has also shown in its patent filing, CX-1569, figures 1B, columns 3, column 9, 26 through 44.

Q. Turning to the next slide, please explain your analysis regarding non-infringing alternatives.

A. Apple can use non-infringing alternatives. I've identified two such alternatives. One is the Withings ScanWatch, shown in Exhibit CX-1555 at 8. As I've shown, the protrusion is flat there. And then the Amazfit GTR 2e. Both these watches measure oxygen saturation without using a protrusion comprising a convex surface as claimed. Amazfit GTR 2e is Exhibit CX-1554.

Apple's choice to use the claimed protrusion in the accused products rather than non-infringing alternative is indicative of the nonobviousness of the asserted claims.

MR. CLAUSSEN: I believe we need to go back on the Apple CBI confidential record again.

(Whereupon, the hearing proceeded in confidential

MASIMO 2029
Apple v. Masimo
IPR2024-00242

session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Moving back to the public record.

BY MR. CLAASSEN:

Q. Dr. Madisetti, please explain your analysis of the commercial success in this case.

A. Yes. Based on my discussion with and review of the report of Daniel McGavock, it is my understanding that the increased sales of the Series 6 and 7 --

MR. CLAASSEN: Dr. Madisetti, I would like to stop you for a moment. I think we do need to move back to the Apple CBI record.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Hello again, Mr. Goldberg. Could you speak up? Are you perhaps on mute still?

THE WITNESS: How about now?

JUDGE BHATTACHARYYA: That's great.

THE WITNESS: Thank you.

JUDGE BHATTACHARYYA: To be on the safe side, I'm going to swear you in again.

JACK GOLDBERG,

having been first duly sworn and/or affirmed on their oath, was thereafter examined and testified as follows:

DIRECT EXAMINATION

BY MR. LATEEF:

Q. Mr. Goldberg, you watched Dr. Sarrafzadeh's testimony yesterday, correct?

A. Yes, I did.

Q. Have you analyzed Dr. Sarrafzadeh's arguments regarding validity of claim 9 of the '127 patent?

A. Yes.

Q. Did you consider Dr. Sarrafzadeh's definition of a POSA in your analysis of the validity of claim 9?

A. I did, and I used that definition in my analysis.

Q. Okay. And did you form an opinion regarding the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

validity of claim 9?

A. Yes, I did.

Q. What is that opinion?

A. My opinion is that claim 9 is valid.

Q. Okay. And have you prepared some demonstratives to assist you in explaining the validity of the '127 patent?

A. Yes.

Q. Could we please put up slide 1?

Is this the first slide of the demonstratives that you prepared?

A. Yes, it is.

Q. Okay. Can you explain why Mendelson 1991 is missing limitations of claim 9?

A. Yes. Mendelson 1991, Respondent's Exhibit 370, has no thermal mass, no disclosure of the structure of its ceramic substrate, and, therefore, does not disclose elements 7A and 7D.

Further, there's no temperature sensor and there's no thermistor disclosed by Mendelson, so elements 7E and 7F and 9 are missing from Mendelson.

Further, there's no evidence that the addition of a thermistor on Mendelson's ceramic substrate would stabilize a bulk temperature such that the thermistor's measurement of the bulk temperature would be a meaningful measurement allowing LED wavelengths to be more reliably

MASIMO 2029
Apple v. Masimo
IPR2024-00242

estimated.

Q. Okay. Could we pull up Respondent's demonstrative 7.27C.

Do you recall Dr. Sarrafzadeh discussing this demonstrative slide?

A. I do, in relation to element 7H, yes.

Q. Okay. And then on this slide near the top right he has written "undisputed."

A. I see that.

Q. Yes. Is there something on this slide that you dispute?

A. Yes. There's a couple of things I'd like to point out on this slide.

First of all, the image figure 1012 from Respondent's Exhibit 458 has been annotated. The annotation in the upper right including the blue arrow and the notation SpO2 is in error. This is a diagram of an ear oximeter, not a pulse oximetry, so that is just not true.

The other thing that he annotated is the blue arrow on the left portion of the slide where it says, any pulse oximeter, and I don't see this figure as being representative of any pulse oximeter.

Q. Are there any materials that informed your opinion about these two points that you brought up?

A. Yes. Fig. 1012 is a very, well, nearly

MASIMO 2029
Apple v. Masimo
IPR2024-00242

identical, to a similar figure in Webster, in the Webster reference. And the Webster reference describes this as a 1970s-era ear oximeter. It's addressed in historical fashion, and it points out that it precedes modern pulse oximetry technology, and the slide does not show the features of a modern pulse oximeter.

Q. Okay. Can we turn to your slide 2?

This looks like part of Dr. Sarrafzadeh's presentation yesterday. Do you recall this?

A. I do.

Q. And have you annotated this slide?

A. Yes. I added the red box shown the center of the image surrounding Cheung, et al. 1993, and I also added the box at the bottom where the Cheung reference is described in more detail as being United States Patent 5,259,381.

Q. Okay. And Exhibit RX-35, is that the Webster --

A. Oh, yes. Yes, Webster is Respondent's Exhibit 35, and the excerpt on the slide is at page 85, and the reference information is from page 87.

Q. Okay. And Dr. Sarrafzadeh did not rely on the Webster reference for a thermal mass; is that correct?

A. No, he did not.

Q. Okay. Turning to slide 3, could you please explain your analysis of what limitations of claim 9 are missing from Cheung?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Yes. Cheung, Respondent's Exhibit 406, the figure here is Fig. 11 from that patent, Cheung's patent, this figure shows a substrate containing LEDs and a temperature sensor.

The point that's being made on the right portion of the slide is from the file history of the '127 patent, JX-008, at pages 360 to 367.

The allowable subject matter section in that particular Office Action explains that the claims at issue are allowed or over -- over the Cheung reference -- so that the thermal mass that's present in Cheung does not satisfy the requirements of the claims that were at issue.

Q. Okay. So in your opinion does Cheung have a thermal mass?

A. Cheung does not have a thermal mass.

Q. Okay. And why is that?

A. Because in Cheung the mere placement of a temperature sensor and LEDs on a substrate, which is not described -- Cheung does not describe any aspect of the substrate. The substrate has no reference number. Thermal properties of the substrate are not described in any manner. The temperature sensor is not there in order to provide a bulk temperature measurement in the sense that it would be meaningful in order to correct the wavelengths.

Q. And what does the temperature sensor of Cheung

MASIMO 2029
Apple v. Masimo
IPR2024-00242

measure?

A. Cheung describes the temperature sensor as measuring the temperature of the sensor as a whole.

Q. Okay. And in your opinion does Mendelson and Webster in combination disclose a thermal mass?

A. No. The combination of Mendelson and Webster does not disclose a thermal mass.

Q. And in your opinion does Mendelson and Webster measure a bulk temperature of a thermal mass?

A. No. My opinion is that that combination does not disclose the bulk temperature measurement either.

Q. Okay. Turning to slide 4, could you please explain why Yamada 605 is missing limitations of claim 9?

A. Yamada 605 is Respondent's Exhibit 381. The figure shown in the slide here is Fig. 5. Fig. 5 includes a substrate.

There is no thermal mass in Yamada 605. Therefore, elements 7A and 7D are not disclosed. Further, there's no temperature sensor that is used for estimating the LED operating wavelengths in Yamada 605, and, therefore, elements 7E, 7F, and 9 are not disclosed.

Q. Why is there no thermal mass disclosed in Yamada 605?

A. Yamada 605 does not describe a thermal mass, which stabilizes and normalizes in a manner that allows the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

bulk temperature as measured by the temperature sensor. There is no temperature sensor here in the diagram such that it can be used for reliably estimating LED operating wavelengths.

Rather, Yamada uses the temperature sensor to sound an alarm or make the system aware when the temperature gets too high for safety reasons, and that's shown in the Exhibit 381 at paragraph 111.

Q. Okay. Turning to slide 5, could you please explain why Noguchi is missing limitations 7A, 7D, and 7F?

A. Yes. Noguchi, Respondent's Exhibit 353, describes a system that, first of all, is not involved with physiological measurements, and there is no description of a bulk temperature on which LED operating wavelengths depend.

Rather, Noguchi has a temperature measurement means for measuring the temperature of an LED or the temperature of the environment in which the LED is disposed.

The purpose of making that temperature measurement, again, is not to provide any information that would allow the system to correct for temperature-dependent operating wavelengths.

Q. Okay. Could you explain why there's no thermal mass in Noguchi?

A. Well, Noguchi doesn't describe a thermal mass that has the thermal characteristics and doesn't have the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

properties that are required by the claim language, as I understand the claim language as a person of skill would understand the claim language. The thermal mass needs to be thermally coupled to LEDs, needs to be thermally coupled to a temperature sensor, and needs to provide a bulk temperature on which the LED operating wavelengths depend.

Noguchi's temperature sensor is not for that purpose and does not provide a bulk temperature.

Q. Turning to slide 6, please explain why Scarlett lacks claim limitations?

A. Yes, Scarlett, Respondent's Exhibit 397, the figure is Fig. 24.30, it's a textbook that discusses printed circuit board broadly, multilayer printed circuit boards, and Scarlett emphasizes, and I'll quote, the problem of heat removal from tightly packaged components, and expresses that, it's an important consideration in board design, and that this type of board that Scarlett is discussing can be manufactured to alleviate the problem.

However, there's no suggestion in Scarlett that removing heat from a thermal mass is the same or provides a bulk temperature measurement that's meaningful in order to estimate LED wavelengths. The --

Q. Why was -- sorry. Go ahead.

A. I was going to say, the purpose of the multi-wired board shown in Scarlett is different. It's

MASIMO 2029
Apple v. Masimo
IPR2024-00242

about -- it's about heat dissipation.

Q. Why did Dr. Sarrafzadeh reference Scarlett in his analysis?

A. Scarlett was referenced as background material in order to show obviousness to add thermal components to a substrate, but Scarlett's purpose in adding those thermal components does not correspond to any of the requirements of the claim.

Q. Okay. Could we turn to your slide 7?

At a high level, in your opinion would claim 9 have been obvious in view of any of the combinations discussed by Dr. Sarrafzadeh?

A. No, it would not. There are no pre-127 -- before the '127 patent, there are no suggestions that disposing a -- a disclosure that disposing a thermal mass within a substrate thermally coupling the LEDs in a thermistor to the thermal mass and measuring a bulk temperature would improve accuracy.

Simply having LEDs and a temperature sensor on a ceramic board does not meet the limitations of claim 9.

Q. And could you please explain your opinion that there's no motivation to combine any of the references?

A. The Webster reference in combination with the Mendelson reference does not meet the claim language. One would not be motivated to combine Mendelson with Webster in

MASIMO 2029
Apple v. Masimo
IPR2024-00242

order to solve the problem that the '127 patent solves.

In terms of Noguchi and Yamada, again, Noguchi is not about physiological measurements, and there would be no motivation to combine because Noguchi is addressing a different issue entirely.

And, also, references to Scarlett doesn't help either, because Scarlett is addressing a problem that is different than what is addressed by the claim.

Q. Okay. Could we turn to your next slide?

Could you explain your analysis of objective indicia of nonobviousness?

A. Yes. My domestic industry analysis shows that claim 9 covers early and current rainbow« sensors. Those rainbow« sensors have enjoyed significant commercial success, and that success obviously depended on them functioning to do what they were meant to do, which was to measure a variety of physiological parameters in a manner that hadn't been done before.

I've looked at Daniel, listened to Daniel McGavock's testimony from earlier, and read his deposition, and I saw his sales data, and I talked with him about the commercial success and the fact that the rainbow« sensors' functionality and success relied on the utilization of the invention, the '127 patent, claim 9.

Further, the rainbow« sensors have received

MASIMO 2029
Apple v. Masimo
IPR2024-00242

significant industry praise. Let me go back one step.

The sales data is shown in Complainants' Exhibit 649C. Complainants' Exhibit 1378 is an exhibit showing many awards that Masimo has received. At page 66, for example, there's an award specifically related to the rainbow« sensors.

So there are many other awards that reference -- that reference the rainbow« sensors as being a significant contribution.

The claim thermal mass and temperature sensor, as I said, claim 9, is essential to the accuracy that drove this commercial success and continues to drive the commercial success and industry praise of the rainbow« sensors.

There's also references that teach away from using a temperature sensor on the substrate, such as the Huiki reference, Respondent's Exhibit 346, at 19, lines 17 through 29, and the Webster reference, 35 at page 36.

Q. What was that teaching away and those references?

A. In Huiki and Webster, alternative methods for ascertaining a measure of temperature in order to help with the correction for temperature-dependent wavelength are taught, and those alternatives are not what is covered by claim 9 of the patent, of the '127 patent, alternatives, such as measuring the forward voltage across the diodes, the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

light-emitting diodes or having an awareness of the current in those diodes.

Q. And were you here to watch Mr. Diab's testimony earlier this week?

A. I was.

Q. And did you rely on any of his testimony regarding the rainbow« sensor technology and the '127 patent?

A. I referenced in my earlier presentation Mohamed's testimony in relation to the inventive material of the '127 patent and of the work that was put in in order to develop the '127 patent and of his surprise.

I don't know if that's the right word, but his delight and surprise that one could balance the thermal properties of the substrate in such a manner and have the success to provide that bulk temperature to estimate the wavelengths in a meaningful way.

Q. So based on your analysis of the prior art and objective indicia of nonobviousness, what is your opinion regarding the validity of claim 9?

A. Again, I feel that claim 9 is indeed valid.

MR. LATEEF: Pass the witness, Your Honor.

MR. SELWYN: May I proceed, Your Honor?

JUDGE BHATTACHARYYA: Yes.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

CROSS-EXAMINATION

BY MR. SELWYN:

Q. Mr. Goldberg, you would agree that all of the individual limitations of the asserted claims of the '127 patent were known in the prior art, correct?

A. I would not.

Q. You would not. Okay. Let's talk about what was known in the prior art then, sir.

Oximeters having a detector capable of detecting light emitted by light-emitting sources after tissue attenuation were known before the '127 patent, correct?

A. Yes.

Q. Multilayer circuit boards were known before the '127 patent, correct?

A. Multilayer circuit boards are not a limitation of the '127 patent.

Q. Sir, were multilayer circuit boards known before the '127 patent, yes or no?

A. Yes, sir.

Q. Were multilayer circuit boards with multiple layers of thermally conductive copper known before the '127 patent?

A. Yes.

Q. Were multilayer circuit boards with a thermal core known before the '127 patent?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Yes.
Q. Were pulse oximeters with ceramic substrates known before the '127 patent?
A. Yes.
Q. Would you agree that oximeters with red and infrared LED and a photodetector mounted on the same circuit board were known before the '127 patent?
A. Yes.
Q. Oximeters with temperature sensors were known before the '127 patent, correct?
A. Yes.
Q. Thermistors have been known for decades, correct?
A. Yes.
Q. As a property of physics, the wavelengths of LEDs change based on temperature, correct?
A. Yes, that's true.
Q. And you'd agree that in prior art pulse oximeters the wavelengths emitted by LEDs change with temperature, correct?
A. Yes.
Q. It was known for an oximeter to adjust its temperature of oxygen level based on temperature before the '127 patent, correct?
A. I did not understand your question. I can't answer that.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Let me ask it again. Was it known for an oximeter to adjust its determination of oxygen level based on temperature before the '127 patent?

A. Yes.

Q. Now, you testified about secondary considerations a moment ago, correct?

A. Yes, I did.

Q. Now, you never saw the '127 patent before you were hired for this matter, correct?

A. I remember being asked that question before, and I'm not sure because I've seen so many Masimo patents over the years I've been involved with the technology for decades.

Q. Sir, isn't it true that the first time you recall having seen the '127 patent is after you were engaged for this matter?

A. I would say that I certainly do not recall the details, knowing the details of the '127 patent, previous -- previous to being involved in this suit.

Q. That's not my question. Let me ask again.

Yes or no, sir, the first time you recall having seen the '127 patent is after you were engaged for this matter, correct?

A. As I sit here, it's the first time I recall, yes.

Q. You've never seen the '127 patent referenced in

MASIMO 2029
Apple v. Masimo
IPR2024-00242

any publication, correct?

A. No. No, I haven't.

Q. You're not aware of any books or papers or articles that mention the '127 patent, correct?

A. That's correct.

Q. You're not aware of any awards or praise for the '127 patent, correct?

A. That specifically addressed the '127 patent, I'm not aware of any awards or praise that specifically mentions the '127 patent.

Q. And you're not aware of any awards or praise received by the named inventors of the '127 patent, correct?

A. I did not -- I don't know.

Q. In fact, you've never seen any reference to the '127 patent anywhere except for Masimo's own documents, correct?

A. I would say yes.

Q. You've never discussed the '127 patent with any of the named inventors, correct?

A. I guess not, no.

Q. That wasn't something you were interested in doing, correct?

A. I didn't confer with the named inventors. I have to think. I know -- I don't know if I could name all the inventors actually, but I certainly -- certainly have had

MASIMO 2029
Apple v. Masimo
IPR2024-00242

discussions with Mohamed Diab broadly. He is aware of my involvement here.

Q. Sir, focus on my question. You've never discussed the '127 patent with any of the named inventors, correct?

A. I don't think so.

Q. You're not aware of any licenses to the '127 patent, correct?

A. I'm not aware of any licenses.

Q. And you haven't identified a shred of evidence, either in your testimony today or in any of your reports in this case, of any copying of the '127 patent by Apple; isn't that true?

A. I'm not sure I can answer that.

Q. Well, let's pull up your deposition. Can we have page 176, lines 7-9?

Question -- were you asked this question and gave this answer:

Question. You haven't suggested in your report that Apple copied the '127 patent, correct?

Answer. I make -- I make no statement like that.

Were you asked that question and did you give that answer?

A. Yes, I did.

Q. One last question, sir. Before the '127 patent,

MASIMO 2029
Apple v. Masimo
IPR2024-00242

it was known to use a temperature sensor on the LED substrate to compensate for wavelength changes due to temperature, correct?

A. I would say so, yes.

MR. SELWYN: Thank you. Nothing further.

MR. LATEEF: We have nothing further, Your Honor. Thank you.

JUDGE BHATTACHARYYA: Thank you, Mr. Goldberg. You may step down.

MR. RE: Good afternoon, Your Honor.

JUDGE BHATTACHARYYA: Good afternoon.

MR. RE: Masimo and Cercacor call as their next witness Mr. Robert Stoll.

JUDGE BHATTACHARYYA: Let's make sure Apple's counsel is here.

MS. FRAZIER: Your Honor, Ms. Vreeland will do the cross-examination for this.

JUDGE BHATTACHARYYA: Good afternoon, Mr. Stoll.

THE WITNESS: Good afternoon, Your Honor.

JUDGE BHATTACHARYYA: Do you understand that you're under an obligation to tell the truth here today?

THE WITNESS: I do.

ROBERT STOLL,

having been first duly sworn and/or affirmed on his oath, was thereafter examined and testified as

MASIMO 2029
Apple v. Masimo
IPR2024-00242

follows:

JUDGE BHATTACHARYYA: Thank you.

THE WITNESS: Thank you.

DIRECT EXAMINATION

BY MR. RE:

Q. Mr. Stoll, where do you work today?

A. I work for Faegre Drinker Biddle & Reath in Washington, D.C.

Q. And can you briefly summarize your experience in the area of Patent Office requirements and procedures?

A. I spent 29 years at the Patent and Trademark Office. I started off as a junior examiner. I was promoted to a supervisory examiner. I had several promotions in the management and policy area. And I finished my career at the Patent and Trademark Office as the Commissioner for Patents where I oversaw eight thousand patent examiners and all policy and procedures related to patent prosecution. And I ended there in the end of 2011, at which time I began at Faegre, and I've been there about ten years, where I supervise patent prosecution, I testify, I've represented people through the Office of Enrollment and Discipline, I do policy issues, and I troubleshoot complex applications.

MR. RE: Your Honor, because I know this is undisputed, Masimo and Cercacor offer Mr. Stoll as an expert on Patent Office practice and procedure.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

MS. VREELAND: No objection, Your Honor.

JUDGE BHATTACHARYYA: At this time -- let me formally -- at this time Mr. Stoll is admitted as an expert on Patent Office practice and procedure.

MR. RE: Thank you, Your Honor.

Q. Mr. Stoll, are you familiar with Apple's allegations that the '501, '502, '648, and '745 patents are unenforceable due to prosecution laches?

A. I am.

Q. And did you analyze specifically those allegations?

A. I did.

Q. And what did you do to analyze the sufficiency or the correctness of those allegations?

A. I looked at the entire prosecution history of the parent, the parents of those applications.

Q. And I understand you prepared a demonstrative slide to help illustrate your testimony.

Can we call that up?

What does this slide generally show?

A. It shows key dates in the parent applications of the '501, the '502, and the '648.

Q. And do you understand that Apple alleges that there was a five-year gap from the filing of the '352 application in 2010 to the filing of the '290 application in

MASIMO 2029
Apple v. Masimo
IPR2024-00242

2015?

A. I do, but I don't really understand what the gap is or what any gap is. This shows quite clearly that prosecution was progressing in these three applications in a normal pace consistent with practice at the Patent and Trademark Office in continuing applications, and I don't see any delay.

Q. Okay. I wonder if you can also explain using this chart that I understand there was an abandonment of the first case. Do you see that?

A. I do.

Q. Did that abandonment in any way cause any delay whatsoever in the prosecution of these patent applications?

A. It did not.

Q. And how do you know that?

A. Because I can see that the 829,352 was filed way before the application of the 534,827 and was progressing in a normal pace for a continuing application.

Q. I also notice that there's a publication date of February 4th, 2010. How does that affect your opinions with regard to prosecution laches?

A. Well --

MS. VREELAND: Your Honor, we would object to the extent there would be any opinions on the ultimate issue. I think Your Honor allowed him for purposes of Patent Office

MASIMO 2029
Apple v. Masimo
IPR2024-00242

practice and procedure.

JUDGE BHATTACHARYYA: That's correct.

Mr. Re, I'm assuming you're not seeking to elicit opinions on the ultimate issue of prosecution laches.

MR. RE: No. I'll withdraw and rephrase.

BY MR. RE:

Q. What's the practical effect of publication of the application back in 2010?

A. Well, you can see that on February 4th, 2010, application number 827 published, which means that the specification is in the public domain, and anyone can look at the specification and the prosecution of the applications after that, and they can know that, in fact, the subject matter contained in that specification could be claimed at a later date in either that particular application or continuing applications as specified by statute.

Q. I understand you've prepared another slide with regard to the '745 prosecution; is that right?

A. I did.

Q. Can we call that up?

What does this slide show?

A. This slide shows the key dates in the prosecution of the parent of the '745 application.

Q. Can you explain your opinion that this shows that the '745 patent application followed normal and acceptable

MASIMO 2029
Apple v. Masimo
IPR2024-00242

continuation practice?

A. Absolutely. You can see that it's published in January of 2017. You can see that there are actions going back and forth between the Examiner and the applicant. You can see that it was issued.

Well, there's a Notice of Allowance on July 29th, 2019, and then there was a Petition to Withdraw to Consider References, and a fairly quick Notice of Allowance after that and payment of the issue fee.

Q. Based on your experience, are you familiar with the ways in which a patentee might delay prosecution?

A. Yes, I am.

Q. And explain what those ways are.

A. Well, you could refuse to take an allowance, you could delay an allowance, you could abandon allowed application, you could not progress the prosecution of an application in a manner that conforms with normal practice, and you can take more time than you should with respect to responding to actions.

Q. And based on your review, did you form an opinion as to whether any of those types of activities took place during the prosecution of the Masimo patents at issue here?

A. I did, and there was no delay, and there was none of those actions that occurred, and this -- the prosecution followed normal prosecution as provided by the statutes.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Now I notice in the first parent it seems like there was some delay with regard to issuance of the first Office Action. Did you notice that?

A. Yes. I think there was one -- there was a delay in another one as well, and it was not uncommon back in that time period to have two and a half to three years before the Patent and Trademark Office picked up an application.

Q. So that's a delay caused by the Patent Office waiting to pick up the application, right?

A. Yes, it is.

MS. VREELAND: Object to the leading.

Q. Why does it take the Patent Office sometimes so long --

JUDGE BHATTACHARYYA: Mr. Re, can you respond to the objection?

MR. RE: I'll withdraw. I'll rephrase.

JUDGE BHATTACHARYYA: All right. Then the answer is stricken to that question.

Q. Why does it take the Patent Office so long to pick up an application to issue a First Office Action allowance or First Office Action response?

A. Back in this time frame, we were in excess of 525,000 patent applications filed per year, they're in a queue, and they normally examine the first received, and it takes a while for the Court to get to the applications that

MASIMO 2029
Apple v. Masimo
IPR2024-00242

are later filed.

Q. So based on your review of the file histories of the patents at issue in this investigation, of which you are opining, what is your final conclusion with regard to the prosecution of the Poeze and '745 patent families?

A. There was a continuous unbroken chain of patent prosecution. There was no delay. And these conform with the practices of continuation as provided for by practice. I saw no issues related to any delay in the prosecution of these applications.

MR. RE: I have no further questions. I pass the witness.

MS. VREELAND: Your Honor, we would like to take up the implications of this testimony in our post-hearing briefing, but we have no questions at this time.

JUDGE BHATTACHARYYA: Thank you.

MR. RE: Thank you.

JUDGE BHATTACHARYYA: Thank you, Mr. Stoll.

THE WITNESS: Thank you. Have a great day, Your Honor.

MS. SWAROOP: Your Honor, our next witness will be Daniel McGavock, and Mr. Laquer will be conducting that examination.

MR. LAQUER: Good afternoon.

THE WITNESS: Good afternoon.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

JUDGE BHATTACHARYYA: Welcome back, Mr. McGavock.

DANIEL MCGAVOCK,

having been first duly sworn and/or affirmed on his oath, was thereafter examined and testified as follows:

DIRECT EXAMINATION

BY MR. LAQUER:

Q. Welcome back, Mr. McGavock.

A. Thank you.

Q. Have you formed any opinion on commercial success in connection with your work in this investigation?

A. Yes. It's my opinion that the Apple Series 6 and 7 Watch products have achieved commercial success, and that that commercial success -- and that there was a nexus between that commercial success and the asserted watch patents in this litigation relating to the blood sensor feature of those products.

And I've also -- I've also concluded that the rainbow« DI product, domestic industry product, has achieved commercial success, and there's a nexus between that commercial success and the '127 patent.

Q. Have you prepared demonstratives to assist with your testimony on that subject?

A. Yes, I have.

Q. Let's go ahead and pull those up.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Have you reviewed public statements from Apple around the time of its launch of the Series 6 Watch? Next demonstrative.

A. Yes, I have. We're looking at CX- --

Q. There's a different version. Why don't you go ahead, Mr. McGavock.

A. Yes. One of the first things I looked at was there was a launch video produced in this case in which Apple introduced the Series 6 watch, and it featured the Chief Operating Officer of Apple.

And in that video they prominently discussed the importance of the blood-sensing feature in the Series 6, and that video -- I encourage you to watch it because there was also discussion about the timing of the launch and the importance of that technology given the COVID pandemic.

Q. Thank you. And let's go to the next slide. There we go.

Do you recognize what's shown on the demonstrative here?

A. Yes. I was just talking about CX-1289. And the Chief Operating Officer talks about an amazing new capability, and he is referring to the blood oxygen sensor right from your wrist.

Q. Let's go on to the next slide.

Have you reviewed Apple's press release from the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Apple Watch Series 6?

A. Yes, this went along with the launch. It was CX-1287, and it states that the Series 6 completely redefines what a watch can do, and it discusses the blood oxygen sensor in app.

Q. Moving on to the next slide, have you reviewed any marketing material from Apple regarding its accused Apple Watch devices?

A. Yes. We're looking at CX-0252, and this is the website for the Series 6 watch, and the first thing you see is the display of the watch featuring the blood oxygen feature.

What I found interesting, if you go to the website, it's animated, it turns around. It shows you the infrared LED sensors. And I also thought that the website did a very good job of describing to consumers the importance of measuring blood oxygen, and then it goes on to state how the sensor works. So I thought that was very relevant to my opinion.

Q. Let's go on to the next slide.

Have you reviewed any third-party material regarding the Series 6 watch?

A. Yes, several things. Here are a couple examples. CX-1643 is a Business Tech publication in which it describes the Series 6, and it says that the blood oxygen sensor

MASIMO 2029
Apple v. Masimo
IPR2024-00242

dominated the introduction and was the feature that Apple spent the most time talking about.

And CX-1301 is an excerpt from The New York Times in which they state that the Apple Watch can be summed up in two words, "blood oxygen."

And it describes the most significant new feature in the Apple Watch Series 6 and also states it was not otherwise that different from the prior year's Apple Watch.

Q. Have you reviewed any market share data regarding the Apple Watch Series?

A. Yes.

Q. Could we go to the next slide?

A. Yes. So the market share data is captured in CX-1285 and CX-1286. So if you look at the top of this chart, this is overall Apple market share.

So the Series 6 was launched in Q4, so Q4 results are the first time you actually see the results of the Apple Watch Series 6. So if you just compare year over year, Q4 of 2019 was 34 percent, and you have a significant jump in share in Q4 of 2020.

And then CX-1295 and CX-1644 refer to an industry publication in which it's recognized that the Series 6, as of August '21, was by far the world's most popular smartwatch model and by far the world's best selling smartwatch at that time. So that's somewhat after the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

launch in August of 2021.

Q. Dr. Madisetti mentioned a conversation that he had with you. Can you describe what you discussed with Dr. Madisetti?

A. Yes. I discussed with him the nature of the patents and just confirmed my understanding that the asserted patents -- the blood oxygen feature incorporated in the Apple Watch Series 6 and 7 Watches are covered by the patents, and they're also fundamental to the performance of that feature.

Q. And how does that --

MR. MUELLER: Your Honor, to the extent these numbers come from any confidential documents, I would just ask that the last minute be on the confidential record and that we go on the confidential record to the extent there's going to be any discussion of confidential numbers.

I don't know if these numbers are from confidential sources or not, but out of an abundance of caution I just wanted to put that on the record.

MR. LAQUER: These are not, and we identified to yesterday to Apple's counsel, which exhibits are confidential. Those exhibits are marked with a C as demonstrative slides.

If there is some concern, we can go on the confidential record and work it out later, though, if that

MASIMO 2029
Apple v. Masimo
IPR2024-00242

would address Mr. Mueller's concern.

MR. MUELLER: That sounds good.

MR. LAQUER: The next slide I plan to go on the confidential record anyways, so if you want to do it now that's fine.

MR. MUELLER: That would be great.

JUDGE BHATTACHARYYA: Moving onto the Apple confidential record.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Moving back to the public record.

MR. LAQUER: May I proceed?

JUDGE BHATTACHARYYA: Yes, you may.

BY MR. LAQUER:

Q. Mr. McGavock, what are your conclusions regarding the commercial success of the Apple Watch Series 6 and 7?

A. That both products have achieved commercial success and there's a nexus between that commercial success and the blood oxygen sensing feature covered by the asserted patents in this litigation.

MR. LAQUER: Your Honor, at this point I would like to go onto Masimo's confidential record.

JUDGE BHATTACHARYYA: Moving onto the Masimo confidential record.

(Whereupon, the hearing proceeded in confidential session.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

O P E N S E S S I O N

JUDGE BHATTACHARYYA: Moving back to the public record.

CROSS-EXAMINATION

BY MR. MUELLER:

Q. May I proceed, Your Honor?

JUDGE BHATTACHARYYA: Yes, please.

Q. Thank you.

Good afternoon, Mr. McGavock.

A. Good afternoon.

Q. Now you've offered opinions today, sir, on the subject of commercial success with regard to the five patents in suit, correct?

A. Yes.

Q. And today you are offering those opinions --

JUDGE BHATTACHARYYA: We lost your sound.

MR. MUELLER: I heard you the entire time. There was some glitch in my system here. I apologize. Is that better?

THE WITNESS: Yes. Thank you.

BY MR. MUELLER:

Q. Okay. So, sir, you're offering these opinions on commercial success today as part of Masimo's rebuttal case on invalidity, correct?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

A. Yes, that's my understanding.

Q. Now let me just try to break this down, if I could.

You just now spoke about the rainbow« sensors which are the alleged domestic industry product for the '127 patent, correct?

A. Yes.

Q. And you also talked about the Masimo Watch, with respect to the -- I'm sorry -- the Apple Watch, with respect to the other four patents-in-suit; is that right, sir?

A. That's correct, as well as the '127 patent.

Q. And for the Apple Watch -- I'm sorry. Let's set the '127 patent to the side, and I want you to have in mind the '745 patent, the '501, the '502, and the '648, so the four other than the '127.

Do you have those in mind, sir?

A. Yes, I do. Thank you.

Q. For those four patents, the alleged domestic industry product is only, only the Masimo Watch, not the rainbow« sensors, correct?

A. That is correct.

Q. But you did not offer any opinion today of the commercial success of the Masimo Watch, right?

A. That is correct, for good reasons. May I explain?

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. And the good reasons are there, in fact, has been no commercial success to date for the Masimo Watch, correct?

A. I wouldn't state it that way. I think they have made significant --

Q. Time is short. If you want to take it up with your counsel, you can. But if you could just answer me yes, no, or you can't answer the question, yes or no. Okay, sir?

A. I was trying to answer. I don't think it was a yes or no question.

Q. Let me pose it as a yes or no question.

As of today, as of today, the Masimo Watch has not achieved appreciable commercial success, yes, no, or you can't answer the question?

A. I disagree and I can explain why.

Q. And, in fact, sir, you know that the Chief Financial Officer of Masimo testified on Tuesday that he wasn't sure whether the Masimo Watch had achieved $1,000 in revenues as of today, and that was on the public record. You understand that, sir, right?

A. Yes.

Q. Now you, in any event, have not offered any opinion on commercial success of the Masimo Watch, correct?

MR. LAQUER: I think you're going into Masimo confidential business information.

Q. No, I'm just saying you have offered no opinion

MASIMO 2029
Apple v. Masimo
IPR2024-00242

--

MR. LAQUER: What you just spoke about regarding sales quantities and dollar amounts --

MR. MUELLER: No, that was in the public report. I can confirm it was in the public record.

Q. Sir, can you please answer my question?

A. Well, I addressed -- I explain in my report that I did not quantify metrics on the commercial success for the Masimo Watch because it's not yet been fully launched.

Q. Sir, yes or no, you have offered no opinion today of commercial success with regard to the Masimo Watch, correct?

A. Correct.

Q. Okay. Now you instead offered an opinion of commercial success with regard to the Apple Watch for these four patents, right?

A. Series 6 and Series 7, correct.

Q. And that's, of course, based on the premise that the Apple Watch Series 6 and Series 7, according to Masimo, infringe those four patents, right?

A. Yes, that's my assumption.

Q. And, in fact, not only infringe, Dr. Madisetti has offered the opinion that Apple copied those patents. Did you see that, sir, that there's copying evidence?

A. I didn't focus on that, but I'll accept that.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Q. Did you hear Dr. Madisetti's testimony today, today, on copying?

A. Yes.

Q. And he suggested there was a nexus to this case, that's why he was offering the testimony today, he said there's copying evidence in the case, right?

A. Yes.

Q. Now you understand that Dr. Goldberg, in contrast, conceded he had no copying evidence whatsoever with respect to the '127 patent. Did you hear him say that not long ago?

A. Yes.

Q. And you also understand that six separate individual Apple engineers took the stand and testified, and every one of them said the ideas of the oxygen sensor in the Apple Watch reflect their own ideas, not Masimo's ideas. Did you hear that testimony?

MR. LAQUER: Your Honor, I'll object, beyond the scope of direct. Mr. McGavock's testimony was specific to the secondary consideration of commercial success.

MR. MUELLER: Your Honor, the reason why I'm getting into this is because he has to have a nexus between the commercial success and the actual products. The asserted nexus here is infringement and copying. That's the claimed nexus between the products and the patents. I'm

MASIMO 2029
Apple v. Masimo
IPR2024-00242

just testing that nexus.

MR. LAQUER: Mr. McGavock did not mention copying in his direct testimony. Mr. Mueller's cross-examination is beyond the scope.

JUDGE BHATTACHARYYA: The objection is sustained.

BY MR. MUELLER:

Q. Now today you showed a few articles or snippets of articles, and I want to pull some of those up, if we could. CDX-19.005.

You say, commercial success, third-party articles regarding Apple Watch Series 6 highlighted blood oxygen sensor.

This is one of the slides that you showed today, correct, sir?

A. Yes.

Q. And you said that Apple had emphasized the importance of the blood oxygen sensor in marketing for the Apple Watch, correct?

A. Yes.

Q. Particularly important during the pandemic, correct?

A. Yes.

Q. And your own opinion is that the sensor was important to Apple's commercial success; is that fair?

A. I'm agreeing with Apple's views that this was a

MASIMO 2029
Apple v. Masimo
IPR2024-00242

very important feature to the product. I'm adopting how they portrayed to the marketplace, to stockholders, to customers, in the launch video, that's --

Q. You think the blood oxygen sensor was an important driver of the commercial success of the Apple watch, correct?

A. Yes.

Q. And you think it's particularly important to the public during a time of --

MR. LAQUER: Your Honor, I'm going to object. Mr. Mueller has repeatedly violated the Commission's order not delegating the public interest to be taking evidence on here.

Apple requested that in response to Masimo filing the complaint. The Commission chose not to delegate the public interest. And a very large amount of Mr. Mueller's speaking during the past week has been seeking to build an evidentiary record on the public interest after Apple was specifically denied that request.

MR. MUELLER: Your Honor, if I might. The witness has offered an opinion on commercial success today. He has described the buying behavior of the public with respect to this watch. I think I'm entitled to ask a few questions about the public behavior with respect to buying the watch.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

This is what he offered an opinion about within the last half hour.

MR. LAQUER: This question was not directed toward public behavior on buying the watch. This is another attempt to build the public interest record for the purpose of review by the Commission on that issue. There will be a time for that, but it is not now.

JUDGE BHATTACHARYYA: Okay. At this time the objection is overruled. I'm not even sure what the question was going to be. It was cut off in the middle.

You may renew your objection if the full question comes out and it appears to be directed to public interest and not directed to commercial success.

MR. LAQUER: Thank you, Your Honor.

BY MR. MUELLER:

Q. Mr. McGavock, you mentioned the pandemic during your direct examination, did you not, sir?

A. Yes, in reference to that video.

Q. And you mentioned that the oxygen sensor was particularly important to the commercial success of the Apple Watch during the pandemic, correct, sir?

A. Well, I wasn't intending to emphasize that point. I was just referring to the content of the video while waiting for the slide to show up.

Q. Sir, I think you just told me two minutes ago

MASIMO 2029
Apple v. Masimo
IPR2024-00242

that you're adopting the views expressed by Apple that you referred to.

Are you, yes or no, taking the view that the fact that the blood oxygen sensor was introduced during the pandemic was a factor in the commercial success of the Apple Watch, yes or no?

A. I believe it was a factor, the notion of measuring blood oxygen, there was a higher awareness, I believe, during that time frame.

Q. In any event, you believe the oxygen sensor in the Series 6 and Series 7 have been an important factor in the commercial success of those two models of Apple Watch, correct?

A. Yes.

Q. And you showed Her Honor these news clips right here. To help validate that opinion, these are articles that discuss the blood oxygen sensor as one of the features in the watch, correct?

A. That's correct.

Q. Now three days ago, on Tuesday, you showed some different news clips. I want to go to those. CDX-15C.019.

This is a slide that you used in your direct examination on Tuesday, correct, sir?

A. Correct.

Q. And you used The Washington Post article,

MASIMO 2029
Apple v. Masimo
IPR2024-00242

which -- the snippet of which talks about some criticism of the blood oxygen sensor in the Apple Watch, right?

A. Yes.

Q. You also showed this engineering.com snippet that also includes some criticism, correct?

A. Yes.

Q. And then you showed a Respiratory Care snippet at the bottom here, again, the snippet refers to some criticism, right, sir?

A. Yes.

Q. And I asked you some questions about this slide on Tuesday. I'm not going to go through all those again. But the purpose of this was to suggest, as you suggested, during your direct examination, that Apple had actually caused injury to the blood oxygen sensor industry by marketing a flawed blood oxygen sensor, correct?

A. Yes. I was in the context of discussing the bond determination, that this is a risk factor for Masimo and its DI product because Masimo has -- believes it has much more accurate technology, medical-grade technology, and so these shortcomings create a risk that I thought -- I suggested might be taken into account in considering the bond.

Q. Right. So let's see if we can put this slide right here, CDX-15C.019, side by side with the slide that I just used, CDX-19.005, see if we can put these side by side.

MASIMO 2029
Apple v. Masimo
IPR2024-00242

So let me just make sure I have this straight. Masimo's position in this case is that Apple is infringing the five patents-in-suit, correct, sir?

A. Yes.

Q. That by using those patents, it has created a sensor that is fundamentally flawed, and you believe that there's a true problem caused by the flaws in that sensor, correct?

A. I'm not providing technical opinions and I'm not sure --

Q. Sir, stay with my question. The slide on the left --

A. You're misstating the slide.

Q. Time is short, and your counsel can ask you questions.

But your opinion is that by creating a blood oxygen sensor that purportedly infringes the five patents in the suit, Apple has actually created a flawed sensor as reflected in your slide, yes, no or you can't answer the question?

A. I can't answer the question. I'm not providing technical opinions, but the spotty performance --

Q. Sir, please, yes, no, or you can't answer the question.

A. I can't answer the question without further

MASIMO 2029
Apple v. Masimo
IPR2024-00242

explanation.

Q. And then today, today, that same flawed sensor you talked about on Tuesday, according to you flawed, is a critical driver of commercial success that has driven sales of the Apple Watch, right, sir? Yes, no, or you can't answer the question.

A. That is correct. So Apple has --

Q. Sir, please, yes, no, or you can't answer the question.

A. Yes.

MR. MUELLER: I have no further questions, Your Honor.

MR. LAQUER: Brief redirect, Your Honor.

JUDGE BHATTACHARYYA: Yes.

REDIRECT EXAMINATION

BY MR. LAQUER:

Q. Mr. McGavock, why didn't you address the --

MR. MUELLER: Your Honor, before he answers, I want to object to any new opinions now. It's way too late for a new opinion of commercial success on the Masimo Watch.

It's Friday, close to 5:00 of the hearing, and there's no way we should hear a new opinion on the Masimo Watch with ten minutes left in the hearing.

MR. LAQUER: This is directly responsive to a question that counsel asked during cross-examination and

MASIMO 2029
Apple v. Masimo
IPR2024-00242

then cut the witness off during his answer.

MR. MUELLER: No, Your Honor. I asked him to confirm he had not offered any opinion on the Masimo Watch, and he confirmed it. It's way too late to be receiving a new opinion on the Masimo Watch. That's not opening the door to anything. That's confirming that he had not offered that opinion.

MR. LAQUER: We disagree. He could have made that confirmation. The record speaks for itself. Just based on the record and the briefing, he asked the question, the door is open. Mr. McGavock has the right to give a full response on Masimo's clock.

MR. MUELLER: Again, Your Honor, I object to any new opinions coming in with ten minutes left in the hearing ones that should have been disclosed months ago, if not all.

JUDGE BHATTACHARYYA: Let's proceed. I'm not sure he's going to be offering any new opinions. We can take it up if he is offering new opinions.

BY MR. LAQUER:

Q. Mr. McGavock, why did you not address the commercial success of the Masimo Watch in your commercial success analysis?

A. Because it was, as described in my report, it's pre-commercial launch, and my reports describe the fact that so far it's achieved positive results with respect to the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

pilot phase, and now they are in the limited marketing phase.

Q. Mr. Mueller also brought up articles that you mention in connection with your bond analysis and compared them to articles that you addressed in your commercial success analysis. And you were, it seemed, attempting to give some more fulsome explanation to your answers there.

Can you explain the difference of your opinion in the articles regarding the bond analysis articles as compared to the commercial success analysis ones?

A. Yes. The commercial success articles were focusing on the market and commercial performance of the product and the way that Apple marketed the blood oxygen feature. And so Apple has clearly achieved commercial success.

The other articles were discussing the actual performance of those, more from a more technical standpoint. And so it's an interesting combination where the introduction -- Apple's achieved significant commercial success using this technology, but at the same time is creating risk for Masimo by not having what it believes to be the appropriate level of medical-grade reliability and quality.

MR. LAQUER: I have no further questions.

MR. MUELLER: I have no further questions for

MASIMO 2029
Apple v. Masimo
IPR2024-00242

this witness, Your Honor.

JUDGE BHATTACHARYYA: Thank you, Mr. McGavock.

THE WITNESS: Thank you.

JUDGE BHATTACHARYYA: You can step down.

MS. SWAROOP: Your Honor, I wasn't sure we could do it, but we have completed all of our witnesses for both sides here over the past five days, and this does complete the presentation of Masimo's rebuttal case.

We do have a couple of housekeeping matters I think we wanted to attend to.

JUDGE BHATTACHARYYA: Yes.

MS. SWAROOP: Would you like to do that now?

JUDGE BHATTACHARYYA: Yes, I would. Actually can we take a break so I can make sure I have these documents in my inbox and I can find them?

MS. SWAROOP: Yes, Your Honor.

MR. MUELLER: Certainly, Your Honor.

JUDGE BHATTACHARYYA: Also, an item that I want to take up is either the page limit or word limit for the post-hearing briefs.

MS. SWAROOP: That was on my list, Your Honor, and I do believe we have agreement on that as well.

JUDGE BHATTACHARYYA: Okay, great. Then let's take a three-minute break or so.

(Whereupon, the proceedings recessed.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

JUDGE BHATTACHARYYA: We can go back on the record.

Can you tell me which lists are being moved into evidence at this time?

MS. SWAROOP: Yes, Your Honor. I believe there's a list that has additional exhibits from June 6, 8, and 9 that were inadvertently omitted from the prior list. I think Ms. Frazier mentioned that earlier today. We have that list submitted to Your Honor.

JUDGE BHATTACHARYYA: Yes, the list entitled Table of Additional Admitted Exhibits for the Evidentiary Hearing on June 6, 8, and 9, 2022.

Are there any objections to admission of these exhibits?

MS. FRAZIER: No, Your Honor.

JUDGE BHATTACHARYYA: Then that list of exhibits is admitted into evidence.

(Whereupon, the exhibits as recited by counsel and reflected in the attached index were submitted and received in evidence.)

JUDGE BHATTACHARYYA: Please send a copy to the court reporter.

MS. SWAROOP: The second thing, Your Honor, I believe we had also submitted a chart of demonstratives for the demonstratives that were submitted yesterday, so that's

MASIMO 2029
Apple v. Masimo
IPR2024-00242

a separate chart from the admitted exhibits.

JUDGE BHATTACHARYYA: Is this the Table of Demonstratives for June 8th?

MS. SWAROOP: Yes, Your Honor.

JUDGE BHATTACHARYYA: I have a list entitled Complainant's Table of Demonstratives for Evidentiary Hearing on June 8th, 2022.

Do we have any objection to receiving these demonstratives as demonstratives but not as substantive evidence?

MS. FRAZIER: No, Your Honor, with that understanding, no objection. And I understand the parties will similarly compile a list based on today and submit that to Your Honor as well.

JUDGE BHATTACHARYYA: Then that list is accepted purely for demonstrative purposes. Please send a list to the court reporter.

Are there any others at this time?

MS. SWAROOP: No, Your Honor. As Ms. Frazier mentioned, the parties have an agreement to create a list for today's exhibits and I believe either exchange that or submit that on Monday. So we'll plan to do that.

JUDGE BHATTACHARYYA: Typically we do it before the close of the hearing today, if that's possible. If it's not possible, there will need to be a motion to reopen the

MASIMO 2029
Apple v. Masimo
IPR2024-00242

record to have those exhibits admitted. That's not a huge problem, if the parties want to go that way, but typically we try to take a 10- or 15-minute break and get it all done today. Let me know what you would like to do.

MS. FRAZIER: Your Honor, Apple is happy, I think, with 10 or 15 minutes we should easily be able to compile the list and hopefully reach agreement with Ms. Swaroop's team.

MS. SWAROOP: Your Honor, I'm not sure that we can. I know there were some issues with exhibits, so I'm not sure 10 or 15 minutes will be enough time for us. Apple had proposed Monday, so we're happy to stick with Apple's proposal and file a joint motion to submit the exhibits on Monday.

JUDGE BHATTACHARYYA: Yes, file a joint motion. Hopefully, there will be no objections that will introduce more complications if there are objections.

Anything further?

MR. MUELLER: Your Honor, one last thing. I wanted to recognize Nina Garcia, who is our NEXT attorney in this program, and thank you for the program. And we thank you, again, for the time and your consideration over the course of the hearing. We appreciate it.

MS. SWAROOP: Your Honor -- please go ahead.

JUDGE BHATTACHARYYA: Just that I'm very pleased

MASIMO 2029
Apple v. Masimo
IPR2024-00242

that both parties are participating in the NEXT Advocates Program. We're really hoping that it will encourage further participation by less-experienced attorneys. So thank you for participating in it.

MS. SWAROOP: Your Honor, I did have one more housekeeping item. We did reach agreement on the post-hearing brief proposal. Did Your Honor want us to set forth what that agreement is on the record today?

JUDGE BHATTACHARYYA: Yes. Let me know your proposal. I may not approve it. I'll issue an order on Monday with the final page limit or word limit, but I'd like to hear your proposal.

MS. SWAROOP: Yes, Your Honor. The proposal we made was, and I believe we have agreement, was from one of your investigations. It would be a word count limit of 125,000 words, images can be included, and if images include more than 20 words, then that would be counted towards the word limit, but if there are 20 words or less on the image, that wouldn't be counted towards the word count.

JUDGE BHATTACHARYYA: Okay. Would you mind sending that to me in an email as well?

MS. SWAROOP: Yes, Your Honor, we would be happy to do that.

Your Honor, on behalf of Masimo and our team here in California, we also wanted to express our sincere thanks

MASIMO 2029
Apple v. Masimo
IPR2024-00242

and appreciation for the time that you spent this week to hear from all of our Masimo and Cercacor inventors and all of our witnesses.

We would have loved to be there in Washington, D.C. with you to present the case, but we did our best with the logistics of the remote hearing, and we do very much appreciate the careful consideration that you've given to the evidence this week.

JUDGE BHATTACHARYYA: Thank you.

MR. MUELLER: We echo that, Your Honor. We really do appreciate all of it, the entire week, we have appreciated your careful consideration at every step along the way, so thank you very much.

JUDGE BHATTACHARYYA: Thank you. I want to thank counsel for their very helpful presentations. This is a contentious case, and I think that your professionalism really helped in moving us through and letting us finish on time. Thank you very much for that.

I also want to thank Linda, our court reporter, who did a wonderful job also getting us through this week, and my attorney advisor, Ted Jou, who has helped at every point in this investigation.

I hope everybody is able to relax over the weekend after this week at work and thank you so much.

MR. MUELLER: You too, Your Honor. Have a good

MASIMO 2029
Apple v. Masimo
IPR2024-00242

weekend.

MS. SWAROOP: Thank you, Your Honor.

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(Whereupon, the proceedings concluded at 5:03 p.m.)

MASIMO 2029
Apple v. Masimo
IPR2024-00242

C O N T E N T S

INDEX OF WITNESSES

WITNESS	DIRECT	CROSS	RE-DIRECT	RE-CROSS
STEVE WARREN,	1181	1260		
VINCENT THOMAS,	1282	1312		
VIJAY MADISETTI,	1327	1383	1388	
JACK GOLDBERG,	1391	1403		
ROBERT STOLL,	1409			
DANIEL MCGAVOCK,	1416	1428	1439	

AFTERNOON SESSION 1312

CONFIDENTIAL SESSIONS 1249-1260, 1269-1271, 1275-1276, 1285-1320, 1355-1368, 1371-1373, 1377-1378; 1380-1390, 1422-1424, 1426-1427

MASIMO 2029
Apple v. Masimo
IPR2024-00242

Additional Exhibits Provided for Admission
Pursuant to Order No. 50
Table of Admitted Exhibits for the Evidentiary Hearing on June 8, 2022

JACK GOLDBERG

CX-0330
CX-0419C
CX-0597C
CX-0839C
CX-0840C
CX-0845
CX-0846
CX-0847
CX-0849
CX-0850
CX-0853
CX-1724
CPX-0154C

VIJAY MADISETTI

CX-0307iC
CX-0329
CX-1038C
CX-1058C
CX-1062C
CX-1068C

MASIMO 2029
Apple v. Masimo
IPR2024-00242

CX-1069C
CX-1072C
CX-1074C
CX-1251C
CX-1406
CX-1407
CX-1447
CX-1449
CX-1451
CX-1492
CX-1532
CX-1546C
CX-1548C
CX-1646C
CX-1647C
CX-1705
CX-1726
CX-1727
CPX-0159
CPX-0159a
VIVEK VENUGOPAL
RDX-4
RPX-0040C
RPX-0041C
RX-0392C

MASIMO 2029
Apple v. Masimo
IPR2024-00242

RX-0895C
CX-1683
SAAHIL MEHRA
RX-0677C
Complainants' Table of Demonstratives for Evidentiary Hearing on June 8, 2022
CDX-0013C
CDX-0011C
Complainants' Table of Demonstratives for Evidentiary Hearing on June 6 and 10, 2022
CDX-0017C
CDX-0012C
CDX-0014C
CDX-0016C
CDX-0019C
Joint Table of Admitted Exhibits
(June 9 and 10, 2022)
DR. MAJIF SARRAFZADEH (June 9, 2022)
CPX-0106a
PROF. STEVEN WARREN, Ph.D. (June 10, 2022)
CX-1789C
CX-0335
RPX-001
RPX-002
RPX-006

MASIMO 2029
Apple v. Masimo
IPR2024-00242

RPX-007
RPX-033
RX-0249C
RX-0252C
RX-0335
RX-0456
RX-0460
RX-0473
RX-0478
RX-0484
RX-0487
RX-0489
RX-0495
RX-0502
RX-0504
RX-0508
RX-0510
RX-0515
RX-0517
RX-0519
RX-0520
RX-0523
RX-0624
RX-0632
RX-0635

MASIMO 2029
Apple v. Masimo
IPR2024-00242

RX-0648
RX-0652
RX-0654
RX-0665
RX-0666
RX-0667
RX-0668
RX-0670
RX-0673
RX-0700
RX-0748
RX-0812
RX-1220
RX-1221
RX-1470C
VINCENT THOMAS (June 10, 2022)
RX-1462C
VIJAY MADISETTI (June 10, 2022)
CX-0097C
CX-0185C
CX-1461
CX-1554
CX-1555
CX-1711C
CX-1733

MASIMO 2029
Apple v. Masimo
IPR2024-00242

JACK GOLDBERG (June 10, 2022)
RX-0346
RX-0370
RX-0406
DANIEL McGAVOCK (June 10, 2022)
CX-0252
CX-1285
CX-1286
CX-1289
CX-1295
CX-1301
CX-1643
CX-1644
CX-1771C
Table of Admitted Exhibits for the Evidentiary Hearing on June 9, 2022
UEYN BLOCK
CX-0187C
CX-1568
CX-1694
CX-1790C
CX-1806
SCOTT CROMAR
CX-1287
STEVE WAYDO

MASIMO 2029
Apple v. Masimo
IPR2024-00242

CX-1606
CX-1608
CX-1684
CX-1802C
CX-1805C
RX-0307C
BRIAN LAND
CX-0177
CX-1793C
CX-1800C
RX-0094C
RX-0319
RX-0897C
RX-0396C
MANNHEIMER
CX-1569
RX-0895
CPX-0191
MEHRA
RX-0087C
RX-0093C
RX-0338C
SARRAFZADEH
CX-0322bC_Resp
CX-0322bC_Compls

MASIMO 2029
Apple v. Masimo
IPR2024-00242

CX-0444
CX-0587C
CX-1375
RX-0023
RX-0035
RX-0041C
RX-0082C
RX-0130
RX-0239C
RX-0240C
RX-0241C
RX-0242C
RX-0243C
RX-0244C
RX-0245C
RX-0246C
RX-0250C
RX-0259C
RX-0260C
RX-0262C
RX-0265C
RX-0266C
RX-0267C
RX-0268C
RX-0269C

MASIMO 2029
Apple v. Masimo
IPR2024-00242

RX-0270C
RX-0271C
RX-0272C
RX-0273C
RX-0274C
RX-0275C
RX-0276C
RX-0308C
RX-0353
RX-0366
RX-0368
RX-0381
RX-0397
RX-0414C
RX-0458

MASIMO 2029
Apple v. Masimo
IPR2024-00242

C E R T I F I C A T E

TITLE: CERTAIN LIGHT-BASED PHYSIOLOGICAL MEASUREMENT DEVICES AND COMPONENTS THEREOF

INVESTIGATION NO.: 337-TA-1276

HEARING DATE: June 10, 2022

LOCATION: Washington, D.C. - Remote

NATURE OF HEARING: Evidentiary Hearing

I hereby certify that the foregoing/attached transcript is a true, correct and complete record of the above-referenced proceedings of the U.S. International Trade Commission.

Date: June 29, 2022

Signed:

ss// LaShonne Robinson

Signature of the Contractor or the Authorized Contractor's Representative

I hereby certify that I am not the court reporter and that I have proofread the above-referenced transcript of the proceedings of the U.S. International Trade Commission against the aforementioned court reporter's notes and recordings for accuracy in transcription in the spelling, hyphenation, punctuation and speaker identification and did not make any changes of a substantive nature. The foregoing/attached transcript is a true, correct and complete transcription of the proceedings.

Signed:

ss// Raymond G. Bynteson

I hereby certify that I reported the above-referenced proceedings of the U.S. International Trade Commission and caused to be prepared from my record media and notes of the proceedings a true, correct and complete verbatim recording of the proceedings.

Signed:

ss// Linda Kinkade

MASIMO 2029
Apple v. Masimo
IPR2024-00242