

1 O P E N S E S S I O N

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3 JUDGE BHATTACHARYYA: Welcome, Dr. Mannheimer.

4 Do you understand that you are under an
5 obligation to tell the truth in your testimony today?

6 THE WITNESS: I do.

7 PAUL MANNHEIMER,

8 having been first duly sworn and/or affirmed
9 on their oath, was thereafter examined and testified as
10 follows:

11 JUDGE BHATTACHARYYA: Go ahead, Mr. Mueller.

12 MR. MUELLER: It looks like we may have lost the
13 witness. There we go. We're ready to proceed.

14 JUDGE BHATTACHARYYA: Sounds good.

15 DIRECT EXAMINATION

16 BY MR. MUELLER:

17 Q. Good afternoon, Dr. Mannheimer. Can you please
18 introduce yourself to Her Honor?

19 A. Yes. Your Honor, my name is Paul Mannheimer. I
20 live in Los Altos and I work at Apple.

21 Q. Sir, what is your role at Apple?

22 A. I'm a sensor architect and scientist.

23 Q. What is your educational background starting with
24 college?

25 A. I have my undergraduate degree in physics from

1 the University of California at Berkeley.

2 Q. Did you earn any graduate degrees over the years?

3 A. Yes. I obtained My master's degree in applied
4 physics from Stanford University, and my Ph.D. from the
5 University of Lubeck in Germany in biomedical engineering.

6 Q. Now when did you start to work for Apple?

7 A. At the very end of 2014.

8 Q. Before you worked at Apple what were you doing?

9 A. Just prior to joining Apple I was an independent
10 consultant with my own consulting practice.

11 Q. And before serving as an independent consultant,
12 did you work at another company?

13 A. Yes, I did. I worked at Nellcor. Although at
14 the time they were Covidien, when I left, but it was Nellcor
15 and then a variety of flavors of Nellcor.

16 Q. Dr. Mannheimer, for how long did you work at
17 Nellcor?

18 A. I believe it was around 21 years.

19 Q. And would that be from around 1987 to 2008?

20 A. Yes, that's correct.

21 Q. What did you do in those 20-plus years at
22 Nellcor?

23 A. I developed pulse oximetry sensors, some
24 monitoring techniques, alarm handling techniques, I did
25 clinical studies, a variety of roles.

1 Q. Let me put up on the screen RDX-3.02, and,
2 Dr. Mannheimer, what are we looking at on the left-hand side
3 of the of the screen?

4 A. Those are Nellcor products, patient bedside
5 monitors, and a portable monitor at the bottom that uses
6 pulse oximetry technology.

7 Q. And, sir, what setting were these Nellcor
8 products designed for?

9 A. These were prescription-use pulse oximeters
10 intended for use in the hospital or a home care or other
11 critical and home-use settings.

12 Q. Now, in your time at Nellcor, did you become
13 familiar with Masimo?

14 A. Yes.

15 Q. And how are Nellcor and Masimo situated in the
16 industry as compared to each other?

17 A. They were competitors to one another.

18 Q. Did you become familiar, at a high level, with
19 the Masimo product offerings in your years at Nellcor?

20 A. Of that era, yes, I was.

21 Q. If we could go to RDX-3.02.

22 What are we looking at here on the right-hand
23 side of the screen?

24 A. Those are Masimo bedside monitors and portable
25 akin to what we see on the left.

1 Q. Now what are some of the key considerations that
2 you had to deal with personally in working on clinical
3 products at Nellcor?

4 A. Well, they need to be reliable, accurate, they
5 monitor continuously as a bedside safety monitor, relied
6 upon by clinicians. The readings that were provided were
7 generally interpreted by clinicians, and -- that's the bulk
8 of it that I would call out.

9 Q. Now you joined Apple in 2014; is that right, sir?

10 A. Yes.

11 Q. Why did you decide to join Apple?

12 A. I had received a recruiting email from the Apple
13 recruiter that said they were interested. I was intrigued,
14 because I didn't exactly know why. Shortly after, the
15 company had their launch, early September of 2014,
16 announcing the watch, and so I got introduced to this
17 concept of heart rate monitoring and consumer wearables. I
18 knew there were people at Apple from -- with medical
19 backgrounds but did not know other than what the blog sphere
20 suggested that they might have been working on.

21 After meeting a few of the people during my
22 interview process, it seemed like it would be a very
23 interesting place to be and an interesting time to work in a
24 consumer environment, consumer product environment.

25 Q. When you joined Apple in 2014, what assignment

1 were you given?

2 A. I didn't know what it was at the time of the
3 interview, but after joining, and several days later, Brian
4 Land told me that I would be asked to look into doing pulse
5 oximetry at the wrist for the Apple Watch.

6 Q. And you joined, to be clear, Mr. Land's health
7 sensing hardware team?

8 A. Yes, that's correct.

9 Q. Now let's pull up RDX-03.03.

10 MR. MUELLER: And let me go on the Apple
11 confidential record at this point to be safe.

12 (Whereupon, the hearing proceeded in confidential
13 session.)

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21 Dr. Mannheim, how did the blood oxygen sensor
22 you were asked to work on [REDACTED] compare to the blood
23 oxygen sensors that you had worked on [REDACTED]?
24 A. To me, [REDACTED] difference is that
25 it's intended to be used at the wrist. The clinical

1 products that I worked on previously for adults, peds,
2 neonates and fetuses operated on a much more vascularized
3 tissue bed, usually fingers or forehead, or on the fetus it
4 was the cheek.

5 The wrist is just an incredibly different beast.

6 [REDACTED]
[REDACTED] Shrinking things down to
8 be much smaller package and use substantially less power and
9 to be used by a consumer in a nonprescription environment
10 would ultimately add to additional challenges to think
11 through and work through.

The diagram consists of a vertical column of 15 small black squares on the left. From each square, a horizontal black bar of varying length extends to the right. The bars are arranged in a staggered, overlapping fashion, creating a dense, abstract pattern. The bars are arranged in a staggered, overlapping fashion, creating a dense, abstract pattern.

13 Your Honor.

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1 O P E N S E S S I O N

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3 JUDGE BHATTACHARYYA: Moving back to the public
4 record.

5 BY MR. MUELLER:

6 Q. Dr. Mannheimer, just a few more questions.

7 There's been some suggestions in this hearing
8 that the blood oxygen sensor in the Apple Watch is
9 inaccurate.

10 Based on your own personal experience, as a
11 factual matter, is it accurate?

12 A. Absolutely, it is. Relative to the ISO standard,
13 which says the accuracy is calculated as a root means square
14 when tested in the manner precisely like we did from a study
15 protocol perspective, as we did at UC San Francisco, against
16 blood draws measured in a cooximeter, as well as the FDA
17 guidance, which is a similar document more specific to U.S.
18 use, recognizes the international standard plus some
19 additional requirements, and additional set of accuracy
20 requirements, the Apple Watch that we characterized meets
21 both the FDA and the ISO standard guidance for accuracy.

22 Q. Dr. Mannheimer, this case involves five patents
23 asserted by the Complainants.

24 Before this investigation had you ever heard of
25 any of them?

1 A. No, I had not.

2 Q. Dr. Mannheimer, you were part of the research and
3 development project that resulted in the blood oxygen sensor
4 in the Series 6 and Series 7 watch, right?

5 A. Yes.

6 Q. In fact, fair to say you were at the heart of
7 that R&D process?

8 A. Yes.

9 Q. Dr. Mannheimer, did any, any, of the sensors,
10 hardware and software, come from Masimo?

11 A. No.

12 MR. JENSEN: Object, Your Honor, lacks
13 foundation.

14 JUDGE BHATTACHARYYA: Would you explain a little
15 further?

16 MR. JENSEN: How would he know whether the other
17 people did or did not rely upon Masimo information? He can
18 only know what he relied upon, not what was in their heads.

19 MR. MUELLER: I can rephrase, Your Honor.

20 JUDGE BHATTACHARYYA: Okay. Please do.

21 BY MR. MUELLER:

22 Q. From your position at the heart of the research
23 and development of the blood oxygen sensor for the Apple
24 Watch, have you, Dr. Mannheimer, personally seen any
25 evidence that any of the software or hardware came from

1 Masimo ideas?

2 A. No, I have not.

3 Q. Who actually developed the software and the
4 hardware in the blood oxygen sensor in the Apple Watch
5 Series 6 and Series 7?

6 A. The folks from my team in Brian's organization
7 and the HID team under Steve's organization.

8 Q. Thank you, sir.

9 MR. MUELLER: I have no further questions at this
10 time, and I pass the witness, Your Honor.

11 MR. JENSEN: May I proceed, Your Honor?

12 JUDGE BHATTACHARYYA: Yes, please go ahead.

13 CROSS-EXAMINATION

14 BY MR. JENSEN:

15 Q. Good morning for me, Dr. Mannheimer. I think
16 it's your afternoon or getting close.

17 A. Yes.

18 Q. My name is Steven Jensen, one of Masimo's
19 lawyers. Good to meet you. I think we met in the '90s. I
20 will be asking you some questions today.

21 Before we begin, you should have a sealed package
22 or an envelope there that you are welcome to open now. We
23 will be looking at some of the documents in there.

24 Is it in the room with you?

25 A. Yes.

1 Q. If you could open that.

2 If I heard your testimony correctly, you've been
3 designing pulse oximetry sensors and pulse oximetry systems
4 for decades, correct?

5 A. Yes.

6 Q. If I heard you right, you worked on pulse
7 oximetry at Nellcor from 1987 to 2008; is that correct?

8 A. Yes.

9 Q. And so if I calculated in my head right, you were
10 part of the pulse oximetry team at Nellcor during the
11 development and introduction of at least the M3000, the 04,
12 the 05, the 05CI, and the N600 pulse oximeters; is that
13 correct?

14 A. Yes, that's correct.

15 Q. Did I miss any?

16 A. I don't recall if there were additional form
17 factors that were created.

18 Q. But at least those technologies you were involved
19 with the development, correct?

20 A. Yes.

21 Q. And you were at Nellcor in 2004 and testified for
22 Nellcor in a patent trial between Masimo and Nellcor, did
23 you not?

24 A. Yes.

25 MR. MUELLER: Your Honor -- I'm sorry,

1 Dr. Mannheimer. Just give me a moment here.

2 I'm going to object on relevance grounds to
3 discussion of another litigation involving unrelated patents
4 asserted against products of another company developed in
5 another time period. I don't think it's relevant to this
6 case what the infringement allegations were made in another
7 case involving different patents against a different
8 company.

9 MR. JENSEN: Your Honor, I didn't ask any
10 questions about the content of that case, and it just simply
11 goes to bias and the high priority objection on this issue
12 was overruled on the Phillips decision, but I do not plan to
13 ask any questions about the content of that case, one
14 question only, the one I just asked.

15 JUDGE BHATTACHARYYA: The objection is overruled.

16 Q. So did you answer my question? You testified in
17 that trial, correct?

18 A. Yes.

19 Q. Over the years you have designed many sensors for
20 different body locations, correct?

21 A. Yes.

22 Q. And I mean pulse oximetry sensors in that,
23 correct?

24 A. That's how I interpreted it, yes.

25 Q. And you have filed and been granted many patents

1 on your pulse oximetry ideas, correct?

2 A. Correct.

3 MR. JENSEN: At this time, Your Honor, I'm going
4 to need to the move to the Apple confidential record.

5 (Whereupon, the hearing proceeded in confidential
6 session.)

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