

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

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SOTERA WIRELESS, INC.,
Petitioner,

v.

MASIMO CORPORATION,
Patent Owner.

-----x

Case IPR2020-00912
U.S. Patent 10,213.108

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Case IPR2020-00954
U.S. Patent 9,788,735

-----x

Case IPR2020-01015
U.S. Patent 9,795,300

-----x

Case IPR2020-01054
U.S. Patent 9,872,623

-----x

REMOTE VIDEO DEPOSITION OF
GEORGE EMANUEL YANULIS, Ph.D.
VOLUME 2

Wednesday, January 27, 2021
11:01 a.m. EDT

REPORTED BY: AMANDA GORRONO, CLR
CLR NO. 052005-01

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January 27, 2021

11:01 a.m. EDT

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REMOTE VIDEO DEPOSITION of GEORGE

EMANUEL YANULIS, Ph.D., taken by Patent Owner

Masimo Corporation, pursuant to Notices, dated

January, 20, 2021, before Amanda Gorrone, a

Certified Live Note Reporter and Notary

Public of the State of New York.

1 A P P E A R A N C E S:

(Via Zoom Videoconferencing)

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I N D E X

WITNESS	EXAMINATION BY	PAGE
GEORGE EMANUEL	MS. LAM	69
YANULIS, Ph.D.		

PREVIOUSLY MARKED EXHIBITS IDENTIFIED

EXHIBIT	DESCRIPTION	PAGE
Exhibit 1001	Al-Ali Patent No. U.S. 9,872,623 B2	70
Exhibit 1005	Goldberg Patent No. U.S. 6,840,904 B2	101
Exhibit 1006	Kiani International Application Published Under the Patent cooperation Treaty No. WO 00/42911	129
Exhibit 1008	Money Patent No. U.S. 5,919,141	172
Exhibit 1003	Declaration of George E. Yanulis in Support of Petition For Inter Partes Review of U.S. Patent No. 10,213,108, 127 pages	228

1 THE TRIAL TECH: The time is
2 11:01 a.m. on January 27, 2021.

3 This is Video 1, Volume 2 of the
4 continued video-recorded deposition of Dr. George
5 Yanulis.

6 Reminder to the witness, you're still
7 under oath.

8 And, Counsel, you may proceed.

9 MS. LAM: Great.

10 G E O R G E E M A N U E L Y A N U L I S, Ph.D.,
11 called as a witness, having previously been duly
12 sworn by a Notary Public of the State of New York,
13 was examined and testified as follows:

14 EXAMINATION BY

15 MS. LAM:

16 Q. Hi, Dr. Yanulis, welcome back.

17 A. Good morning, everybody.

18 Q. I'm going to kind of resume where we
19 left off yesterday. I'm going to show you Tab 5,
20 which has been previously marked as Exhibit 1001 in
21 IPR 2020-00912?

22 THE TRIAL TECH: You said Tab 5?

1 MS. LAM: Yes.

2 THE TRIAL TECH: Okay. Funny enough
3 I don't have that one. Why is that?

4 I can see it from the box. I don't
5 know why it got pulled out of here. Let me just pull
6 this again.

7 MS. HOEKEL: Shannon, what document
8 is it?

9 MS. LAM: The '108 patent.

10 THE TRIAL TECH: The Zoom share
11 closed out anyway so one second, please.

12 (Whereupon, Exhibit 1001, Al-Ali
13 Patent U.S. 9,872,623 B2, was identified.)

14 (Discussion held off the record.)

15 THE TRIAL TECH: Does everybody see
16 the document on the screen?

17 MS. LAM: Yeah.

18 BY MS. LAM:

19 Q. Dr. Yanulis, do you recognize this
20 exhibit?

21 A. Yes, I do.

22 Q. And do you recognize it to be?

1 A. This is the, the '108 patent that's
2 one of the patents up for discussion. It's the arm
3 mountable portable patient monitor, and we were
4 discussing some of the parameter measurements and
5 some of the issues yesterday.

6 Q. And you've reviewed this patent for
7 your Declaration?

8 A. Yes, I did.

9 Q. Let's go to Claim 1 which should be
10 Page 38.

11 THE TRIAL TECH: Believe it or not,
12 I'm actually getting Zoom issues. So, yes, we are.
13 Stand by again. Unbelievable.

14 Okay. I think that should do it.

15 Q. So one of the terms in Claim 1 of the
16 '108 patent is separate monitoring device, correct?

17 A. Yes.

18 Q. What would a person of skill
19 understand the plain and ordinary meaning of
20 "separate monitoring device" to mean?

21 A. Yes, they would.

22 Q. No. What would a person of skill

1 understand that plain and ordinary meaning of
2 "separate monitoring device" to be?

3 A. Basically a device that allows you to
4 monitor and measure, provide a means for measuring,
5 and seeing it displayed, the various parameters that
6 you have chosen to monitor.

7 Q. So a person of skill would understand
8 a separate monitoring device to be any monitoring
9 device?

10 MS. HOEKEL: Object to the form.

11 A. Based on the information provided, in
12 the entire patent itself, including this claim and
13 the figures and what's disclosed and based on my
14 skill as a PHOSITA there's enough enabling technology
15 to realize this monitor is used for measuring some of
16 the parameters of concern, which I discussed.

17 Q. So you agree that a separate
18 monitoring device can be any monitoring device,
19 correct?

20 MS. HOEKEL: Object to the form.

21 A. Again, yes, but I will add that it's
22 the device as far as disclosed and the enabling

1 information provides me with the fact that you are
2 displaying parameters of physiological parameters of
3 interest that can be displayed and monitored, of
4 course, and then displayed.

5 Q. So a person of skill would understand
6 a separate monitoring device is any device that
7 allows you to monitor and measure physiological
8 parameters, correct?

9 A. In this particular case, yes, other
10 monitors that are well-known in the art have been
11 used for other measurements, but as discussed and in
12 this patent and the information provided in my skill
13 as a PHOSITA my answer is still the same as I
14 discussed.

15 Q. Okay. Let's go back to Tab 8, which
16 is the '623 patent?

17 A. Okay.

18 Q. And let's go to Claim 1 towards the
19 end of the patent. At the top of Column 14 one of
20 the claimed terms in the '623 patent is a "separate
21 computing device," correct?

22 A. Correct. But I'd like to go and read

1 the bottom prior to Column 14 at the bottom of
2 Column 13, if I may?

3 Q. Sure.

4 A. Okay. Thank you. Thank you.

5 Q. What would a person of skill
6 understand the plain and ordinary meaning of
7 "separate computing device" to be?

8 MS. HOEKEL: Object to the form.

9 A. Again, based on the information as
10 provided in the patent and including this claim, all
11 the information disclosed in the figures and my
12 expertise as a PHOSITA, this separate computing
13 device would allow -- and if you could go to the
14 bottom basically -- again, allow you to display the
15 measurements of oxygen saturation pulse rate.

16 I'll repeat -- go ahead.

17 Q. So please continue.

18 A. What I was trying to say is I know
19 I'm repeating what the claim says, but the
20 information that's been disclosed not just only in
21 this claim but the entire patent specs, including
22 figures in my knowledge of this particular

1 technology, this is what this, what is Masimo patent
2 is trying to teach us what it's done. This is
3 basically what's being done. I'm just telling you
4 what Masimo has done, with this technology.

5 Q. Would a person of skill understand a
6 "separate computing device" to be any device that
7 allows you to measure and monitor physiological
8 parameters?

9 MS. HOEKEL: Object to the form.

10 A. Again, in the context of the
11 question, it just pertains -- and they should
12 understand it, yes, in the context of what the Sotera
13 patent is trying to do. I'm only just describing
14 what is said in the patent and my knowledge as a
15 PHOSITA.

16 Q. A person of skill would understand a
17 "separate computing device" to be any monitoring
18 device, correct?

19 MS. HOEKEL: Object to the form.

20 A. You're, you're asking the same
21 question and I'm going to revert to the same answer,
22 Counselor.

1 In the context of this patent and
2 what Sotera is describing or teaching in this patent
3 were implicitly trying to explain, these are the two
4 parameters that this separate computing device is
5 capable of performing the measurements of oxygen
6 saturation of pulse rate.

7 Q. The same interpretation of these
8 claims applies in the District Court case, correct?

9 MS. HOEKEL: Objection to the form.
10 Beyond the scope.

11 A. I'm not really qualified as an
12 attorney to answer this; but to the best of my
13 knowledge, it does. But again, I will say I'm not an
14 attorney, I'm not a patent attorney, so I'm not
15 really equipped to comment any more on what I provide
16 as far as I did.

17 Q. Let's go back to Tab 1.

18 Doctor, just so you know this is your
19 Declaration in the '108 patent, correct?

20 A. Yes, it is.

21 Q. Let's turn to Paragraph 36.

22 A. May I read that first, Counselor?

1 Q. Yes. Will you please read it out
2 loud and into the record?

3 A. "Generally the disputes as to claim
4 interpretation are irrelevant to the validity of the
5 '108 patent because it is my opinion that the
6 '108 patent is invalid as obvious under either
7 parties' proposed construction. As such, the board
8 need not construe the claim and may give each and
9 every term it's plain and ordinary meaning because
10 the claims are invalid under the plain and ordinary
11 meaning."

12 Q. What disputes as to claim
13 interpretation are you referring to?

14 A. Could you repeat the question?

15 Q. In the first line, it states, "The
16 disputes as to claim interpretation are irrelevant."
17 What disputes are you referring to?

18 A. Well, in the claim construction, the,
19 this IPR declarations were written, as part of my
20 reasons for the invalidity of the patent itself,
21 prior to the institution of the board instituting
22 this particular patent.

1 Again, I don't know much more about,
2 as far as claim interpretation other than the fact
3 that basically it was irrelevant, because my
4 interpretation was part of my analysis of the patent,
5 and my preparation of this Declaration.

6 Other than that, it was my
7 interpretation, again, I'm not an attorney, was that
8 these claims are invalid, but then, again, I believe
9 that was obvious as far as the proposed construction
10 as far as it went. Other than that, I really can't
11 add anything. And again this whole Declaration was
12 written as part of our, our efforts, or my efforts to
13 have the Board institute this particular patent,
14 which they did.

15 Q. But you did, you are aware of each
16 parties' proposed construction in the District Court
17 case for certain terms?

18 MS. HOEKEL: Object to the form.
19 Beyond the scope.

20 A. I am and I won't say anything more
21 than I've said, because I think any more, any
22 interpretation on my part would require having a law

1 degree. I think I've stated it as simply and as
2 accurately as I can, not being an attorney.

3 But understanding the issues of
4 obviousness as a former patent examiner, as well as
5 working in the areas of patent consulting.

6 Q. But you didn't include any analysis
7 of these proposed constructions in your Declaration?

8 MS. HOEKEL: Object to the form.

9 A. I'm not sure if I didn't answer that
10 question. Yes, I did my due diligence as a
11 nonattorney, as far as understanding the construction
12 of claims by both parties. And I base that analysis,
13 again on my experiences, which I've discussed
14 earlier, that in my opinion, these claims were
15 invalid -- this patent and the claims of this patent
16 were invalid as being obvious.

17 Other than that I can't really add
18 anything more. Based on my expert, or my ability as
19 a PHOSITA to understand the PHOSITA and what is
20 expected from a PHOSITA to understand about
21 obviousness under 103. But going any further than
22 that, I can't really comment.

1 Q. So after doing your due diligence you
2 applied the plain and ordinary meaning of the claimed
3 terms in reaching your opinions in this Declaration,
4 correct?

5 A. I did, Counselor.

6 Q. Let's turn to Paragraph 73 of this
7 Declaration.

8 Will you please read the first
9 sentence for me?

10 A. Sure. "A port is typically a female
11 connection or socket of a wired connection exhibits,
12 exhibit figures 1001, Column 5, line 33 to 36,
13 Figure 4B, respectively."

14 Q. Did you apply this -- sorry.

15 A. No, I was just taking a breath.

16 Q. Did you apply that understanding of
17 "port" in forming your opinions, as to the
18 patentability of the claims in the '108 patent?

19 A. As my understanding of a PHOSITA of
20 what a port is and based on this '108 patent and my
21 ability to understand what the art, which is pretty
22 well-known, that a female connection is basically,

1 one, allows for a means to connect the socket into
2 said female connection.

3 Q. So you applied this understanding of
4 "port" in forming your opinions in this Declaration,
5 correct?

6 A. Correct.

7 Q. Can you please describe to me what a
8 port looks like?

9 A. A port can be a lot of different
10 shapes and configuration. But in this patent, it
11 basically allows a receptacle for attaching a wire to
12 connect to said female connection or female receiver,
13 or whatever. That's basically my understanding, as a
14 PHOSITA, utilizing what's disclosed in this
15 particular patent.

16 Q. And what would the receptacle look
17 like?

18 A. The receptacle could basically be,
19 could be several different configurations. As far as
20 this patent, my understanding and my interpretations
21 that's been disclosed it's basically -- I'll show you
22 on the screen. It could be like this. Like this.

1 Like this. That could be one configuration -- if we
2 could, let's go look at the drawings and make it
3 easier rather than me trying to draw it as I was
4 going by what's disclosed in the figure. So if you
5 don't mind, I'd like to see the sensor port, which is
6 shown in the '108 patent or the drawings, if I may.

7 Q. Sure. Let's turn to Tab 5.

8 A. All right. Can I see some of my
9 other figures, Counsel?

10 Q. Yes.

11 THE TRIAL TECH: Just direct me where
12 you need to go.

13 THE WITNESS: Dan, if I could see
14 some of the other subsequent figures it would
15 probably be a little easier to explain. This is kind
16 of a long patent.

17 All right. This is the prior art.
18 Keep going. So that basically discusses that this
19 was well-known in the art. Keep going past "Prior
20 Art," if you don't mind.

21 All right. Go back a couple. And
22 I'm probably not giving it proper what you're looking

1 for, but the port that's disclosed, basically is a
2 female receptor, as taking conjunction of my
3 knowledge as a PHOSITA and sensor ports that are used
4 in this particular technology.

5 Again, this is maybe not directly
6 stated, it doesn't seem to be directly stated, but
7 it's implied that the sensor port, in this particular
8 technology as disclosed in the '108 patent is a
9 female receptor which receives a male portion, which
10 is the sensor wire. I can't really explain it any
11 more than.

12 Q. Can you provide examples of ports
13 that were available before 2002?

14 A. Sure. Many of the pulse oximeters
15 that I've used and seen, including the ones at USF,
16 basically are of the same and well-known in the art
17 utilizing the female-type receptor with a male
18 connector, which allows the so-called sensor wire to
19 be connected in a very concise and easy manner to the
20 female receptor. They were several, several devices
21 that had the same configuration, which are well-known
22 in the art.

1 Q. Could you identify any specific types
2 of ports for me?

3 MS. HOEKEL: Object to the form.

4 A. Other than I'd have to take out the
5 drawings and figures, for example, some of the male
6 ports some of the other companies and some of your
7 particular companies' ports. But again, these were
8 all well-known in the art prior to 2002, i.e., the
9 female ports receiving the male component into that
10 female part.

11 Q. So in the context of the '108 patent,
12 it is your opinion that a port is a female receptacle
13 that received the removable male portion of a wire,
14 correct?

15 A. What I'm saying, and I'll restate it,
16 is that let's disclose in the patent and my knowledge
17 as a port as a PHOSITA for this particular technology
18 and what Masimo is trying to do in this monitoring
19 system, basically, they may not be directly stated
20 but it's implied; and again, this particular female
21 receptor/male sensor, that fits in it, is well-known
22 in the art. It has been around for a lot of years,

1 prior to 2002.

2 Q. So it is your opinion that a port is
3 a female receptacle that receives a male sensor?

4 A. No, I did not, I did not say that,
5 Counselor. What I said in the context of what's been
6 disclosed and what Masimo is implicitly telling us,
7 for the system as disclosed and my knowledge as a
8 PHOSITA, I'm not saying every sensor is a female that
9 works on a female/male, but the technology that
10 you're asking about what Masimo is telling us about,
11 whether it implicitly is basically describing the
12 female/male, I do not say that every female/male
13 sensor configuration is needed. I just said this is
14 one potential configuration and this, as my knowledge
15 as a PHOSITA, it's what's being enabled me to make
16 this interpretation.

17 I did not say every sensor port or
18 sensor port is a female/male. I'm just saying what's
19 Masimo is teaching us in this patent.

20 Q. What is the plain and ordinary mean
21 of a "port" in the context of the '108 patent?

22 A. Give the plain and ordinary meaning

1 which all PHOSITAs should use, which I use this
2 myself, basically I just described it as, as what
3 Masimo is implicitly trying to tell us maybe not
4 directly, but with this technology being used it's
5 basically implying or giving me enough enabling
6 disclosure to interpret that this is a female/male,
7 call it, mating combination. Whether it is -- I
8 don't believe they directly stated it, but based on
9 the technology that is disclosed by Masimo in the
10 patent, that is my interpretation.

11 Q. Did you also apply this understanding
12 to the three other patents: the '735, '300 and
13 '623 patents?

14 A. To a large extent, yes. But each
15 patent was reviewed on its own merit. Counselor,
16 there are a lot of similarities I don't want to say
17 more but I reviewed each patent on it's own merits.

18 Q. Do ports typically provide a
19 removable wired connection?

20 A. In the technology that is being
21 implicitly described in this particular '108 and some
22 of the other patents that we're going to be

1 discussing today, yes, but there could be any
2 combination of sensor port, or port configuration
3 that I've disclosed. This is only one of many
4 potential configurations for sensor ports that's
5 well-known in the art.

6 Q. Do ports typically include a female
7 connection, or socket, that provides a removal wired
8 connection?

9 A. Again, in the context of this patent,
10 yes, but there are other devices I'm sure, again that
11 are well-known in the art, that may well use another
12 configuration type for the ports. This doesn't have
13 to be used. It just, it works and that's the
14 technology that, that enables me as far as my
15 knowledge as a PHOSITA to make the statements that I
16 made in the IPR and in the discussion.

17 Q. Are you aware of any ports that do
18 not provide a removable connection?

19 A. Yes, they are several.

20 MS. HOEKEL: I was just going to
21 object to the form.

22 But go ahead.

1 A. As I've been saying right along, this
2 female/male compartment-type technology, this is just
3 one of many. There are other sensor port
4 configurations.

5 Q. You would agree that a person of
6 skill would understand a port, in the context of the
7 '108 patent, to be a female connection, or socket,
8 that includes a removal wired connection, correct?

9 MS. HOEKEL: Object to the form.

10 A. Again, I'm going to preface by saying
11 in the context of what's been disclosed and what this
12 Masimo patent is describing, and my knowledge, and my
13 interpretation as a PHOSITA, that this is one
14 potential configuration. This seems to be what they
15 are using. Again, they could have used other
16 configurations, that's not the point I'm trying to
17 make. The point I'm trying to make is that my
18 interpretation of this female/male is one of many
19 configurations. They could have used other
20 configurations based on the enabling technology being
21 disclosed in this patent and as a PHOSITA, I am
22 saying this is more than likely a female/male.

1 You're asking me to add more and I'm not really
2 comfortable adding more.

3 Q. But in forming your opinions for the
4 '108 patent, you applied a construction of a port
5 that includes a female connection, or socket,
6 correct?

7 A. In the context of the enabling
8 disclosure of this technology, and my knowledge as a
9 PHOSITA, yes.

10 But if I may add, Counselor, I'm
11 going to add the same thing. Other configurations
12 could have worked and it doesn't mean that this is
13 the only sensor configuration, i.e., the female and
14 male that could be used. They could have used a
15 number of configurations.

16 Q. But you didn't apply any of those
17 other understandings to the claimed terms in forming
18 your opinions in this Declaration?

19 MS. HOEKEL: Object to the form.

20 A. I'm not sure I understand the
21 question. Again, I'm not an attorney. I did my best
22 to apply the technology, which has been disclosed and

1 my knowledge of a PHOSITA. I'm not an attorney, I
2 can't say anything more than I have said in that I
3 apply the plain and ordinary meaning.

4 Q. You applied the plain and ordinary
5 meaning of the claim terms in your analysis, correct?

6 A. As to what is expected a PHOSITA to
7 explain the sensor port as disclosed in this
8 particular patent, yes.

9 Q. What plain and ordinary meaning of
10 "sensor port" did you apply in your Declaration?

11 MS. HOEKEL: Object to the form.

12 A. I'm not really sure I understand your
13 question. Because I thought I've answered it. If
14 you could clarify that, what you're trying to ask me,
15 that might be helpful.

16 Q. In forming your opinions of the
17 '108 patent, what is your understanding of a, of a
18 plain and ordinary meaning of a port?

19 A. In the most basic understanding,
20 using plain and ordinary meaning, a sensor is nothing
21 more than a device that allows you to connect a wired
22 connection. That's the most basic understanding as a

1 PHOSITA. But based on the technology that's been
2 disclosed and my knowledge as a PHOSITA, it basically
3 implies that it could be viewed as a female/male.
4 But that doesn't mean that it would have to be. But
5 this is an acceptable interpretation of plain and
6 ordinary meaning for this particular sensor port.

7 Q. So for this particular patent, your
8 interpretation of the plain and ordinary meaning for
9 a sensor port includes a female/male connection,
10 correct?

11 A. Based on the previous information
12 I've given, this is one potential configuration of
13 many that's well-known in the art.

14 Q. What -- sorry. Please continue.

15 A. Go ahead.

16 Based on what's been disclosed and my
17 knowledge as a PHOSITA, being able to understand the
18 enabling disclosure, this is a female sensor receptor
19 with a male, at least that's what I've seen from the
20 technology, the patent itself, et cetera, and my
21 knowledge of sensor ports.

22 Q. What other potential configurations

1 would fall within the plain and ordinary meaning of a
2 sensor port in the context of the '108 patent?

3 A. I couldn't tell you all of them right
4 now, but you don't have to have the female/male. You
5 could have another type of configuration. As long as
6 it allows you to lock in this sensor wire into some
7 kind of receptacle. Doesn't have to be a female.
8 And there's hundreds that are well-known in the art.
9 I couldn't tell you all the ones but you don't have
10 to use a female/male. There's other types of
11 arrangements, but this seems to be one of the more
12 efficient design and more effective type of
13 configurations for using. It's not to say some
14 others were used and others which are well-known in
15 the art and well-understood by maybe typical PHOSITA,
16 this is only one.

17 So I'm just applying my plain and
18 ordinary meaning. I gave a basic understanding and
19 then I also provided why I disclosed this such in the
20 IPR declaration.

21 Q. What other arrangements are there
22 other than a male/female connection?

1 MS. HOEKEL: Object to the form.

2 A. Again, I'm not, I'm going to give you
3 the same answer, Counselor, there's hundreds. You
4 don't have to use a female/male. Many of the prior
5 art disclosed is nonfemale/male, and I'm sure we'll
6 get to those. But there are a lot of different
7 configurations that are well-known in the art.

8 Q. But all configurations of sensor
9 ports include a receptacle?

10 A. As a, as a PHOSITA and an engineer,
11 this is one, this seems to be the more effective and
12 efficient design way of doing it. So if some sensor
13 falls off you can see it and it's easy to see that
14 it's connected.

15 Again, this is one potential
16 configuration that seems to work and it's well-known
17 in the art.

18 Q. Can you give me one example of a
19 nonmale/female port?

20 A. The, some of the other monitoring
21 devices don't necessarily not disclose this patent
22 and if we took any kind of sensor configuration of

1 any kind of port to receive it, it could be as simple
2 as just clipping it in or attaching it. You could
3 also hardwire it, which is not very efficient, that
4 would be a connection.

5 So any kind of hardwire connection
6 could be an example of, of connecting being a
7 receptor-type whatever. But again, in this patent in
8 the context of this patent and what's been disclosed
9 in this patent, it's the configuration that's
10 discussed.

11 Now, what are some of the other
12 configurations? I said there are hundreds and I
13 don't know offhand. I'm sorry. But there are
14 several patents as long as you provide the connection
15 for a sensor, whether it be an exact copy or what I
16 have disclosed, if it works, it's fine. And there
17 are a lot of sensors that don't have female/male, I
18 don't know all the different types of configurations
19 but there's hundreds, Counselor.

20 Q. Let's go back to Tab 1, Dr. Yanulis'
21 Declaration. And if we can go to Paragraph 74.

22 A. Okay. Thank you. Can I read that or

1 you want me to read it aloud.

2 Q. Please go ahead and read Paragraph 74
3 to yourself.

4 A. Sure. I read it, Counselor.

5 Q. Could you read the last sentence of
6 the paragraph into the record, please?

7 A. Referring not --

8 Q. Starting with, "More specifically."

9 A. Oh, yes. "More specifically, ports
10 generally provide removable wired connections, so a
11 medical worker would replace the pulse oximeter 104a
12 with a different sensor if a new physiological
13 parameter is to be measured."

14 Q. So ports typically provide a
15 removable wired connection, correct?

16 MS. HOEKEL: Object to the form.

17 A. In the context of what's being
18 disclosed implicitly by, by, by Goldberg, which I
19 used, combination with Kiani, yes, it's a -- and
20 again based on my expertise as a PHOSITA, it provides
21 a removable-type sensor/port arrangement as
22 discussed.

1 Q. So in the context of the '108 patent,
2 it is your understanding that the plain and ordinary
3 meaning of "port" generally includes a removable
4 wired connection?

5 A. No, I didn't say that, Counselor. I
6 said more than likely that's what the '108 patent is
7 implicitly telling us that's what it's doing. It
8 would make sense to do that, and that's why I
9 utilized Kiani and the other patent and Goldberg, to
10 show that this is a removable port connection. I
11 never said this is what's being explicitly discussed
12 in the '108 patent.

13 Q. But in forming your opinions of the
14 '108 patent, you applied a construction to the term
15 "port" that includes a removable connection, correct?

16 MS. HOEKEL: Object to the form.

17 A. Again, I did not say that was
18 explicitly expressed in the '108, but in order has
19 been disclosed I felt it would be more advantageous
20 to show that even though the '108 patent is not
21 explicitly discussed this removable port, utilizing
22 this would make sense for the '108 to use what's

1 disclosed in Goldberg and Kiani in combination in
2 providing a easily removable plug. That's what I
3 said.

4 Q. So in the context of the '108 patent
5 alone, what is your understanding of a port?

6 MS. HOEKEL: Object to the form.

7 A. My understanding of a port, as what's
8 been disclosed, explicitly -- and I forget the
9 names -- I believe that's Al-Ali, or whatever,
10 basically discloses a port that could be utilized to
11 provide a sensor means. Again, it does not
12 explicitly describe a removable port, but I, I, as a
13 PHOSITA, I believe that's what the patent he intended
14 to do, and it would make sense to apply, apply the
15 teachings of Goldberg and Kiani, with the '108 patent
16 and disclose the use of very effective removable
17 port. That's what I said.

18 Q. So in the context of the '108 patent,
19 your understanding is that a port is a female
20 connection or socket, that provides a removable wired
21 connection, correct?

22 MS. HOEKEL: Objection.

1 A. No, Counselor, that's not what I
2 said. I said it's a means or mechanism to provide a
3 sensing of these parameters of entrance. And that's
4 it. It doesn't explicitly discuss what Goldberg and
5 the other patents, but it would make sense to
6 combined the technology as discussed and these other
7 patents, Goldberg, Kiani, to utilize what's taught in
8 the '108. It says to combine that technology, to
9 provide a removable-type connection, but I never said
10 that this is what's being explicitly discussed in the
11 '108.

12 Q. In providing your analysis for this
13 Declaration, you understood a port to include a
14 removable-type connection, correct?

15 MS. HOEKEL: Object to the form.
16 Excuse me.

17 A. My understanding of the '108 patent
18 alone was that it was explicitly discussing a
19 port-type mechanism which could be utilized to sense
20 physiological parameters. Nothing more, nothing
21 less.

22 Q. What is a port-type mechanism?

1 A. It's basically my understanding as a
2 PHOSITA, it's a receptacle that allows you to achieve
3 a wired connection for sensor use.

4 Q. What --

5 A. Sorry.

6 Q. Please continue.

7 A. It's basically -- continuing with
8 that thought, this port as discussed in the '108,
9 with this hardwire sensor, allows you to sense
10 different parameters, like heart rate, pulse oximetry
11 or whatever.

12 Q. So you mention that your
13 understanding as a PHOSITA, is that a port-type
14 mechanism is a receptacle that allows you to achieve
15 a wired connection with a sensor. What is a
16 receptacle?

17 A. I will say I shouldn't use the phrase
18 "mechanism." It's a port. It allows you to
19 incorporate some hardwire sensor which allows you to
20 sense the parameters of interest.

21 Q. And that --

22 A. I've never said it was a receptacle,

1 per se. In the context of the '108 giving it plain
2 and ordinary meaning, I said it was a port which
3 allowed a connection, just being a hardwire which
4 allowed you to satisfactorily, allow you a means for
5 measuring different physiological parameters. That's
6 all I said, Counselor.

7 And these are well-known in the art.

8 Q. Can you give me an example?

9 MS. HOEKEL: Object to the form.

10 Asked and answered.

11 A. Any monitoring device would have to
12 have a sensor physiological -- or any monitor would
13 have to have a sensor some means to receive the
14 so-called hardwire or electrical wire which is
15 nothing more than communication. This is just
16 well-known to any basic electrical engineering
17 student.

18 Q. Let's turn back one page to Page 31.

19 So, Dr. Yanulis, one of the claim
20 limitations you analyzed is Limitation 1E which is
21 shown on this page, correct?

22 A. Yeah, would you like me to read that

1 aloud for the record?

2 Q. Yes, please.

3 A. Okay. A first -- excuse me -- I have
4 to take a swig -- "a first sensor port positioned on
5 a first side of the housing, first side of the
6 housing configured to face toward a hand of the arm
7 of the patient when the housing is secured to the arm
8 of a patient."

9 Q. I'm going to show you Tab 9, which
10 has been previously marked as Exhibit 1005 in IPR
11 2020-00912.

12 Do you recognize this exhibit,
13 Dr. Yanulis?

14 (Whereupon, Exhibit 1005, '904
15 Goldberg Patent, was identified.)

16 A. Are we referring to the '904 patent,
17 Goldberg?

18 Q. Yes.

19 A. Now which line are you referring to,
20 Counselor?

21 Q. Did you review this patent in
22 providing your opinions in the IPR for the

1 '108 patent?

2 A. Yes, I did.

3 Q. Let's look at Figure 2.

4 A. Okay.

5 Q. Does Figure 2 of Goldberg show a port
6 anywhere?

7 A. The port is not explicitly shown, but
8 the enabling technology provides that there is, there
9 has, there is a port type that allows a hardwire,
10 which is connected to the 104a, the pulse oximetry
11 measuring device, that's going into the 112 unit as a
12 whole unit. So it, it implicitly shows a so-called
13 port, which although it was not explicitly disclosed,
14 which is why I used another patent in combination
15 with this, that shows it's a hardwired connection
16 going into some kind of receptacle. And, again, it's
17 not explicitly stated as a port, but again, enabling
18 disclosure -- and if I could, could I read more of
19 the patent description of the abstract to just kind
20 of remember.

21 Q. Yes. Let's go back to the first
22 page.

1 A. And, again, all it's saying in the
2 abstract in the rest of the patent as disclosed is
3 that it's a portable device that resolves how you
4 receive data by one or more sensors. It's not
5 explicitly disclosing a port, per se, which is why I
6 used other art in combination with this to explain
7 why I, as a PHOSITA, a port would be one way of doing
8 it, but it does not explicitly show on that drawing
9 or any of the disclosed specification that it is a
10 port, which is why I felt the need to combine it with
11 other prior art. So it is --

12 Q. So --

13 A. Go ahead.

14 Q. Keep going.

15 A. It is a receptacle. It's a
16 receptacle that allows measurements being received to
17 be monitored. In this case, physiological signals.

18 Q. Where does Figure 2 of Goldberg show
19 a receptacle?

20 A. It doesn't, again, explicitly show a
21 receptacle, but it's implied that there's some kind
22 of receptacle that allows you to receive the data.

1 It's receiving, I'll call it receiving means or
2 whatever. It never says "receptacle," that's why I
3 used other prior art in combination with this.

4 Q. So you would agree that Figure 2 of
5 Goldberg doesn't actually show a port, correct?

6 MS. HOEKEL: Object to the form.

7 A. Again, it doesn't explicitly show it,
8 but based on what is disclosed and my knowledge as a
9 PHOSITA it would make sense to assume that it's a
10 receptacle of some type, which is why I combined it
11 with other prior art.

12 Q. Isn't it equally plausible that the
13 wire shown in Figure 2 of Goldberg is hardwired?

14 A. I would agree with that statement to
15 the context of what the question is asking me, but
16 again, a hardwire would not be what I'm applying as
17 my knowledge as a PHOSITA and this technology is
18 being disclosed as patent.

19 Q. But it is equally plausible that a
20 person of skill would assume the wire shown in
21 Figure 2 of Goldberg is hardwired, correct?

22 MS. HOEKEL: Object to the form.

1 A. It could be, but it could not be.
2 You're implying one interpretation.

3 Q. If it's not hardwired, what other
4 options are there?

5 A. If it's not hardwired, the typical
6 well-known art applied -- well, it's a hardwire, but
7 it's removable, not explicitly disclosed in this
8 patent. It has to be a hardwire because a hardwire
9 is a wire, a communications mechanism. That's
10 Electronics 101.

11 Yes, it is a hardwire. It's going to
12 some kind of device which allows you to receive data.
13 So I'm not sure I'm understanding your question
14 correctly. So, yes, it is a hardwire, going to that
15 particular receiving device.

16 Q. But it's not a hardwire connection,
17 correct, in your opinion?

18 A. In my opinion, it doesn't, you're
19 kind of mixing up what I'm saying.

20 A wire is a wire. It more than
21 likely is hardwired and you're hardwiring it to some
22 sensor which allows you to collect data. It's still

1 a hardwire connected or wired, or whatever you want
2 to call it, to a sensor. And that sensor has to go
3 into some device which allows you to receive the
4 data. So, yes, I would assume that it's a hardwire
5 that's connected to some type of sensor.

6 Q. Is it plausible that a person of
7 skill would assume that the wires shown in Figure 2
8 of Goldberg is not removable?

9 A. A PHOSITA could assume that, but
10 based on what's been disclosed in patents of interest
11 and the patents I used to combine it, a PHOSITA,
12 including myself, would probably want to use a
13 removable-type connection so if it became faulty it
14 would be easy. But it's not explicitly discussed in
15 this patent or in the '108.

16 Q. But in the context of Goldberg alone,
17 it's plausible that the wire shown in Figure 2 of
18 Goldberg is not removable, correct?

19 A. Again, that could be one
20 interpretation. It could be removable, but it
21 doesn't have to be. That's why I utilized other
22 prior art. It would make sense to have a removable

1 connection especially if you have a faulty sensor and
2 you would be able to easily reattach a new sensor
3 rather than trying to figure out how to hardwire a
4 new sensor to a receiving device.

5 Again, that's well-known in the art.

6 Q. In the context of Goldberg alone, how
7 is the hardwire connected to the device on the wrist?

8 MS. HOEKEL: Object to the form.

9 A. It's a, it is a, again in the context
10 of just the Goldberg patent, it's a secure connection
11 which allows you to effectively sense these
12 parameters. Nothing more, nothing less.

13 Q. So Goldberg doesn't show any details
14 for how this sensor is actually attached to the
15 housing, correct?

16 A. Correct. That's why I said it
17 doesn't explicitly show that, and why I used other
18 prior art in combination with that, so it would make
19 sense to use something that will allow you to remove
20 it. I would agree it's not removable, he does not
21 show it specifically, but again, a PHOSITA should
22 understand you have to provide a secure connection,

1 and which is well-known in the art, trying to sense
2 these parameters.

3 Q. Earlier we discussed that your
4 Declaration stated that a port is typically a female
5 connection, or socket, of a wired connection. Does
6 Figure 2 of Goldberg show a female connection or
7 socket?

8 A. It doesn't explicitly show that,
9 which is why I never said in my Declaration that it
10 does. I said it would make sense to combine other
11 art to use what's talked in Goldberg to have a
12 removable connection. That's what I said, Counselor.

13 Q. Let's go back to Tab 1, Dr. Yanulis'
14 Declaration. Let's turn to Paragraph 73.

15 A. Can I take a moment to read it or is
16 there a particular line you'd like me to read?

17 Q. Please go ahead and read the
18 paragraph to yourself.

19 A. Okay. All right.

20 Q. Do you see the sentence that starts
21 with "Indeed," on the second page?

22 A. Give me a second Counselor. Tell me

1 the exact line. Oh, I'm sorry. Yes. "Indeed,
2 clinicians demand control over their patients and
3 what vital signs to monitor, so a PHOSITA designing a
4 medical would know that the end user would expect an
5 adaptable and configurable patient monitor that
6 allows a clinician to utilize different sets of
7 sensors."

8 Q. Can you finish reading the rest of
9 the sentence, please.

10 A. "It allows a clinician to utilize
11 different sets of sensors to monitor the vital signs
12 that the clinician deems most important in caring for
13 a patient and monitoring a patients health. One way
14 to provide this adaptability is to connect wired
15 connections through ports, which provide the end user
16 the ability to disconnect and connect a variety of
17 sensors as needed. Thus, because Goldberg teaches an
18 adaptable system, a PHOSITA would assume the wired
19 connections of this adaptable device 100 includes
20 ports."

21 Q. Are you a clinician?

22 A. No, I'm not, but I work with

1 clinicians, I've worked as a clinical engineer, I've
2 been in the operating room, I've designed instruments
3 for clinicians, I've been in the cardiac care unit
4 hundreds of times, I've worked with cardiologists,
5 anesthesiologists. No, I'm not a clinician. I do
6 respect their opinions when I'm involved in a design
7 of a particular medical monitoring device.

8 Q. Did you speak to any clinicians
9 coming to this conclusion stated in Paragraph 73?

10 A. No, I did not because this is a
11 matter of privacy. I looked at references that I
12 had, and my knowledge as a PHOSITA, clinical care
13 type environments using medical monitoring, so, no, I
14 did not consult any clinician.

15 Q. Do you have any specific evidence for
16 your assertion that the clinician would expect an
17 adaptable and configurable patient monitor before
18 March 2002?

19 A. Yes, I've been an operating
20 technician for almost five years on and off after
21 graduate school, I was a clinical engineer. I've
22 done monitoring of animal-type subjects for almost

1 25 years. I've been involved in designing pulse
2 oximetry-type devices. I've been exposed and had to
3 instruct students as an academian as to how these
4 devices are designed. I'm also writing a textbook
5 based on my knowledge. So I'm extremely familiar.
6 But as a PHOSITA, I understand the clinical user
7 needs, and I've had enough direct experiences in
8 these various clinical environments to do such and
9 formulate said opinions.

10 Q. Do you have any specific evidence for
11 this assertion in your Declaration?

12 A. I do based on my experience in the
13 earlier part of the Declaration, describing my
14 experiences in, for instance, a monitoring atrial
15 fibrillation patients, designing atrial fibrillation
16 devices. Those are my two immediate. I've been
17 involved in other designs.

18 I'm also presently involved -- I
19 think I said this yesterday -- with a heart rate
20 monitoring system. So I have consulted clinicians
21 and working with clinicians I can't really say more
22 it's patently -- or potentially patentable. I have a

1 lot of experience.

2 But as a PHOSITA you should
3 understand that one should consider the clinician's
4 end-user needs, which includes clinicians, nurses,
5 and you should understand that the end user is also
6 the patient. And I understand that and a PHOSITA
7 should understand that.

8 I do want to add that you may not
9 want to monitor every single physiological parameter
10 at one time. That's why I made the statement.

11 Q. Why wouldn't you want to do that?

12 A. As an example, if you had somebody in
13 heart failure it probably would be very concerned
14 about the EKG potential or cardiac cycle timing
15 changes. If you were a patient in hypertension, you
16 probably very concerned about blood pressure. If you
17 were an ambulatory patient or if you were involved in
18 going to surgery, probably would just be concerned
19 about pulse oximetry and heart rate. If you were a
20 prediabetic or a patient in diabetes, you would
21 probably want to monitor glucose levels. That gives
22 you an idea every patient doesn't have the same

1 clinical monitoring needs. That should be well-known
2 by a PHOSITA.

3 Q. So you are aware of patient monitors
4 that only utilize one type of sensor, correct?

5 A. They are devices of that type. So,
6 yes, Counsel.

7 Q. Can you provide some examples for me,
8 please?

9 A. You can have, as an example, a pulse
10 oximeter, that just basically attaches to the ear
11 lobe and does nothing more than attach or monitor
12 pulse oximetry or heart rate. Standard blood
13 pressure cuff that we talked about yesterday is
14 another device that does nothing but measure
15 fluctuations in blood pressure. A thermistor is a
16 device that's applied just to measure temperature,
17 nothing else.

18 Q. Why does a person of skill design a
19 system that only measures a signal parameter?

20 A. Most PHOSITAs have knowledge of these
21 devices and most sensors used in the context of these
22 patents would utilize multi-sensing capabilities.

1 You just asked me what are examples of simple type
2 devices. Most patients, especially in a critical
3 care setting would have at least two sensing
4 parameters they monitor.

5 Q. Can you give me a specific example of
6 an end user prior to March of 2002 who expected an
7 adaptable and configurable patient monitor?

8 MS. HOEKEL: Objection.

9 A. An anesthesiologist comes to mind
10 because he's monitoring or keeping the patient alive
11 during surgery. So different clinical -- critical
12 events may or may not occur.

13 Another example would be a, not so
14 much a surgeon, but a cardiologist, prior to that
15 time frame would be very concerned about timing cycle
16 changes in, for instance, in a patient in heart
17 failure or experiencing potential heart failure or,
18 for example, has a pacemaker or ICD device.

19 Q. I'd like to go back to the last two
20 sentences of Paragraph 73.

21 A. Which line, Counselor? "'108 will
22 provide"?

1 Q. Can you scroll up a little? The
2 bottom is cutoff for me. The last two sentences
3 starting with "One way." Can you please read this?

4 A. "One way to provide this adaptability
5 is to connect wire connection through ports, which
6 provides end user the ability to disconnect and
7 connect a variety of sensors as needed. Thus,
8 because Goldberg teaches an adaptable system, a
9 PHOSITA would assume that the wired connections of
10 this adaptable device 100 include ports."

11 Q. Where does Goldberg teach that
12 different sensors could be connected and disconnected
13 as needed?

14 A. He doesn't. He provides an adaptable
15 system. Again I combined Goldberg with other patents
16 to say that Goldberg would utilize or make sense as a
17 PHOSITA to combine the other patents that have a
18 means of this adaptable system that could remove
19 wired sensors easily. I never said Goldberg. I said
20 he teaches an adaptable system. That's it. Which
21 assumes that the wired connections of the acceptable
22 devices would include a port. I never said it would

1 in Goldberg, would include wire connections where
2 it's specifically said in Goldberg.

3 Q. So Goldberg didn't specifically teach
4 an adaptable system, correct?

5 A. No, I didn't say that. I said he
6 teaches an adaptable system, but the -- no.
7 Combining Kiana's, I've been saying in the next
8 couple of sentences, would make sense to combine it
9 with Goldberg to allow you to have this adaptable
10 mechanism to quickly disconnect and connect a variety
11 of sensors.

12 So, no, Goldberg does not teach that,
13 he only teaches an adaptable system that would make
14 sense for Goldberg to utilize what Kiani has
15 described as far as the input ports.

16 Q. How does Goldberg alone teach an
17 adaptable system?

18 A. If we go to the Goldberg patent,
19 again. In the abstract -- he teaches an adaptable
20 system. Yes, Goldberg. If we go to Goldberg,
21 please.

22 MS. LAM: It's Tab 9, Dan.

1 A. Okay. Again, he does not explicitly
2 state an adaptable. He just says "a portable device
3 that receives data." I agree with you. That's why I
4 combined it with Kiana and the others that I've
5 disclosed in this Declaration that would make sense
6 to include what is taught in these other patents only
7 saying it's received data that's why as a PHOSITA you
8 should have a logic for combining patents, which I
9 presented in the IPR.

10 So I would agree with you, he's only
11 talking about receiving data. He says nothing about
12 "adaptable." But it's implied you're assuming the
13 device would be adaptable because you're measuring
14 different parameters.

15 Q. So Goldberg itself does not teach
16 adaptable system, correct?

17 A. Not explicitly, Counselor.

18 Q. With the port connection, is it
19 possible for the connection to come loose?

20 A. Happens lots of times. I've seen it.

21 Q. And a loose connection would be
22 undesirable, correct?

1 A. Yes, then you would stop sensing the
2 parameter, that would not be good especially if you
3 were the operating room trying to sense very critical
4 factors or any type of critical care environment.

5 Q. With a port connection is it possible
6 for the connection to accidentally detach?

7 A. Yes, because, give you an example
8 moving a patient from a gurney to a operating table
9 or you're moving a critical care patient as an
10 example, for example, having an MRI and patients are
11 not always cooperative with moving around a lot. So
12 that happens a lot of times. So you want to make
13 sure they are at least somewhat connected well,
14 especially transporting a patient, in moving the
15 patient around.

16 Q. And accidental detachment would be
17 undesirable, correct?

18 A. Yes, because then you would stop the
19 sensing of that particular parameter.

20 MS. LAM: I'd like to take a
21 five-minute break now. We've been going an hour or
22 so, if that's okay with everyone.

1 THE WITNESS: All right. And I'll
2 stop playing by the way.

3 THE TRIAL TECH: Stand by, everybody.
4 The time is 12:13 p.m. and we're going off the
5 record.

6 (Recess taken.)

7 THE TRIAL TECH: The time is 12:22
8 p.m., and we're back on the record.

9 BY MS. LAM:

10 Q. Dr. Yanulis, did you have any
11 discussions with Counsel during the break?

12 MS. HOEKEL: I would just like to say
13 that I think discussions are privileged and therefore
14 not allow the witness to answer, but I will answer
15 for him that there were no discussions during the
16 break.

17 BY MS. LAM:

18 Q. Were there any discussions between
19 when we ended yesterday and started again today?

20 MS. HOEKEL: Same answer, but I'll
21 answer on behalf of witness that they were not.

22 MS. LAM: Okay.

1 MS. HOEKEL: Other than the
2 technology issues that we were facing certainly.

3 MS. LAM: Okay. Let's go back to
4 Tab 1.

5 BY MS. LAM:

6 Q. Turn to Page 36.

7 THE TRIAL TECH: Just to be sure 36
8 of the document or 36 of the PDF.

9 MS. LAM: Oh, the page numbered 36.

10 THE TRIAL TECH: All right. Very
11 good.

12 Q. Could you please read Limitation 1h
13 into the record?

14 A. Be happy to, Counselor.

15 "A second sensor port positioned on
16 the housing and configured to receive a signal from a
17 second sensor arrangement via a wired connection."

18 Q. Let's take a look at Paragraph 80.

19 A. All right. Starting with
20 "Furthermore, because the connection between the
21 blood pressure sensor 104b and the housing 112 and
22 controller 102 is a wired connection, a PHOSITA would

1 assume that the housing 112 includes a port that
2 facilitate the wired connection between the blood
3 pressure sensor and the 104b and the housing
4 112/controller. As I said in paragraph 72 to 74, a
5 PHOSITA looking at Figure 2 of Goldberg would assume
6 that the wired connection between the blood pressure
7 sensor 104 and the portable device 100a would occur
8 via second sensor port."

9 Q. Let's go back to Tab 9, the Goldberg
10 patent.

11 A. Okay.

12 Q. Can we go to Figure 2.

13 A. Okay.

14 Q. Does Figure 2 of Goldberg show a
15 sensor port between the housing 112 and the blood
16 pressure sensor 104b?

17 A. No, as I said in the Declaration, it
18 would assume that that would be the arrangement. I
19 never said it doesn't explicitly state that. Where
20 does the figure show that?

21 Q. Why do you assume there is a port
22 between the housing and the blood pressure sensor?

1 A. Based on my knowledge as a PHOSITA,
2 and the fact that you're monitoring blood pressure,
3 this would be a conceivable arrangement to monitor a
4 patient's blood pressure.

5 And again I used the word "assume,"
6 based on the information that's been disclosed in
7 this patent and my knowledge as a PHOSITA.

8 Q. Where would the port be located?

9 A. Again, restating what I said in the
10 Declaration, I said I would assume that's, that it
11 would be -- and in this figure it's not explicitly
12 shown -- between the two elements 104 and 104b.
13 Again, this is, I assume as a PHOSITA, does not
14 explicitly disclose that or does it show that
15 explicitly, either in the Figure 2 or in the context
16 of the specifications of this patent.

17 Q. So you agree that Goldberg doesn't
18 actually disclose a sensor port between the housing
19 112 and the blood pressure sensor, 104b?

20 MS. HOEKEL: Object to the form.

21 A. Again, that's why I use the word
22 "assume." It doesn't explicitly state that. But as

1 a PHOSITA, you could assume that's what the
2 arrangement is as disclosed in my Declaration.

3 Q. Isn't it equally plausible that there
4 is a hard connection between the housing 112 and the
5 blood pressure sensor 104b?

6 MS. HOEKEL: Object to the form.

7 A. Again, yes, there could be, but it
8 would make sense to have the arrangement as
9 disclosed, and that's why I used other prior art in
10 combination with this particular patent.

11 Q. Where exactly on the housing do you
12 assume the port to be?

13 A. Are we talking about the blood
14 pressure?

15 Q. Yes.

16 A. Your blood pressure, which is 104b,
17 is connected to the main unit and again, I'm assuming
18 that the arrangement is disclosed as I stated in the
19 IPR. I'm not sure what you're asking me. Again,
20 it's not explicitly stated, which is why I used the
21 word "assume." But I used the word "assume" as a
22 PHOSITA and what's been disclosed in this patent and

1 itself.

2 Q. What said of the housing 112 would
3 you assume the port to be located on?

4 A. Again, based on my knowledge as a
5 PHOSITA and what's been disclosed in this patent, I
6 would assume that it's attached from the sides. But
7 again, this is an assumption as a PHOSITA would
8 understand it, which is why I would utilize other art
9 to explicitly state what this patent would have been
10 probably used to effectively monitor blood pressure.

11 Q. And when you say "sides" is that with
12 respect to the display showing the front?

13 MS. HOEKEL: Object to the form.

14 A. Again, I can't explicitly state what
15 he intended, I assume that this is what he was
16 intending to do. Again, this is an assumption as a
17 PHOSITA. I don't know how else to state it,
18 Counselor. It's not explicitly stated, that's why I
19 used the word "assume."

20 Q. So earlier we discussed that a port
21 is typically a female connection, or socket, of a
22 wired connection. Is there a female connection, or

1 socket, of wired connection shown between the housing
2 and the blood pressure sensor?

3 MS. HOEKEL: Object to the form.

4 A. Again, not explicitly. And again, I
5 said this female/male is one configuration that could
6 be assumed as a PHOSITA. It doesn't necessarily have
7 to be, but based on the technology that's disclosed
8 in this patent and my knowledge as a PHOSITA, one
9 would assume that.

10 May I just say one other thing,
11 Counselor?

12 Q. Sure.

13 A. When I use the word "assume," that's
14 why you're combining other arts which would basically
15 demonstrate why this patent would use other
16 well-known art to describe, as I said, the assumption
17 for sensing blood pressure, which is not explicitly
18 shown, which is why I used the word "assume."

19 Q. So Goldberg alone does not have a
20 port between the blood pressure sensor 104b and the
21 housing, correct?

22 A. I never said that. I said it could

1 be assumed that probably the intent of Goldberg,
2 which he's trying to teach, would assume that that's
3 what he would probably want it to be used as or like,
4 which is why it would make sense to combine the other
5 art, to show the type of arrangement involving the
6 sensor and the adaptability of removing sensors,
7 et cetera. But in itself, no, it's not explicitly
8 stated or shown.

9 Q. You were making these assumptions
10 that that sensor port is not actually disclosed in
11 Goldberg, correct?

12 MS. HOEKEL: Objection to form.

13 A. I'm making the assumption based on my
14 knowledge as a PHOSITA for this technology and what's
15 known in the art. These are not just simple
16 assumptions. These are made as a PHOSITA, being
17 understandable the technology that's disclosed in
18 Goldberg. These are not just basic assumptions that
19 anybody would make. These are assumptions made by a
20 PHOSITA, given plain and ordinary meaning as
21 disclosed in this patent.

22 Q. Are there other ways the blood

1 pressure sensor 104b could be connected to the
2 housing 112?

3 A. Yes.

4 Q. And what are those other options?

5 A. There are pretty much, there is a
6 few -- again, you don't have to have a hardwire
7 sensor, you could just utilize the simple type of
8 attachment that does incorporate that, or you could
9 use just a simple blood pressure cuff attached, which
10 would not incorporate exactly as assumed as shown.
11 So, they are several well-known prior to this, but
12 all would effectively measure blood pressure, not
13 necessarily using the configuration that's implied in
14 Goldberg.

15 Q. How would a simple blood pressure
16 cuff be attached to the housing?

17 A. It wouldn't be. I'm just saying as
18 an alternative means, I mean, there's other ways to
19 connect this blood pressure sensor, not -- as long as
20 it's allowed to be received, that's all that's
21 required. Now, what particular sensor configuration
22 is varied and there's hundreds, and I couldn't, I

1 couldn't tell you one, but I could tell you anything
2 that attaches securely to this particular 112 unit
3 would work fine. Now do I know of one specifically?
4 No. But I know there's several that could be done.
5 I've seen them. But they are not used that often and
6 they weren't used -- I'll just leave it at that,
7 Counsel.

8 Q. Would those other options include a
9 nonremovable connection?

10 MS. HOEKEL: Object to the form.

11 A. They could.

12 Q. Let's turn to Paragraph 81 of --
13 sorry, let's go back to Tab 1, Dr. Yanulis'
14 Declaration. Paragraph 81.

15 A. You said 81, Counselor?

16 Q. Yes, could you please read the first
17 sentence?

18 A. I'll be happy to.

19 "Even" -- you don't have to make it
20 any larger. It's fine. "Even so, Kiani shows that
21 the sensor input ports 550 were a well-known
22 electrical structure for wired communication.

1 Exhibits 106. Like I said before, Kiani expressly
2 teaches something a PHOSITA would assume reading
3 Goldberg. However, if for some reason Goldberg
4 didn't teach a port, it would it would have been
5 obvious to combine Goldberg and Kiani to include a
6 second port as part of the wired connection between
7 the blood pressure sensor 104b and the housing 112 of
8 Goldberg."

9 Q. I'm going to show you Tab 10.

10 A. I'm sorry, Counselor. I didn't hear
11 you.

12 Q. I'm going to show you Tab 10, which
13 has been previously marked as Exhibit 1006 in IPR
14 number IPR 2020-00912.

15 A. Uh-huh.

16 (Whereupon, Exhibit 1006, Kiani
17 International Application Published Under the Patent
18 cooperation Treaty No. WO 00/42911, was identified.)

19 Q. Do you recognize this exhibit,
20 Dr. Yanulis?

21 A. Yes, this is the Kiani patent.

22 Q. Okay.

1 A. Kiani.

2 Q. And you reviewed this document in
3 providing your opinion in this IPR for the
4 '108 patent?

5 A. Yes, I have read it several times.

6 Q. Let's take a look at Figure 5. In
7 your Declaration you just say that, "Kiani shows that
8 sensor input ports 550 were a known electrical
9 structure for wired communication."

10 How many sensor input ports do you
11 see in Figure 5 of Kiani?

12 A. This patent only shows one port, but
13 it's assumed other ports could be -- it's just
14 showing one port, period.

15 Q. And where is that one port?

16 A. That one port is shown in
17 Element 540. And I'll just leave it at that.

18 Q. Did you mean 540 or 550? And we can
19 go to the text if you'd like to read it.

20 A. Yeah, that might be better if we
21 could.

22 Q. Sure. Let's turn to Page 8 of the

1 text.

2 A. Okay.

3 Q. The last paragraph.

4 A. Figure 5 depicts a, so called,
5 handheld UPO, universal pulse oximetry, and it's
6 showing that a sensor input is 550. So that's
7 probably why I should have read the text. But if we
8 can continue on in the description of this figure
9 would be helpful to get my memory. The print is
10 somewhat small but it's okay.

11 Okay. Output 40 is a 540. So the
12 actual input port itself is the element sensor input
13 550.

14 Q. If we go back to Figure 5.

15 A. Okay.

16 Q. Kiani only discloses one sensor input
17 port, correct?

18 A. Correct.

19 Q. Let's go back to Tab 1. Paragraph 81
20 again.

21 A. Okay. Okay.

22 Q. And can you read the third sentence

1 starting with "however"?

2 A. "However, if for some reason Goldberg
3 didn't teach a port, it would have been obvious to
4 combined Goldberg and Kiani to include a second port
5 as part of a wired connection between the blood
6 pressure sensor in 104b and the housing 112 of
7 Goldberg."

8 Q. In your opinion where would you
9 include the second port?

10 A. In my opinion as a PHOSITA, it could
11 be incorporated anywhere near that first sensor port,
12 it's not explicitly shown, the, in the Kiani patent,
13 in which, which is why, as I said Goldberg didn't
14 teach a port. And I had to combine other art with
15 Kiani, because it's just explicitly discussing the
16 use of one sensor port. That does not mean you could
17 use that, Kiani could not, would not want to use the
18 teachings of other patents or other well-known art to
19 just include a sensor, a second sensor port which is
20 also well-known in the art. Or at that time, excuse
21 me.

22 Q. If you were to modify Goldberg to

1 include a second port, between a blood pressure
2 sensor and the housing, where would you position a
3 port?

4 MS. HOEKEL: Object to the form.

5 A. I would have to think about it, but
6 the design is pretty much well-known, right. As a
7 PHOSITA, where I would do it exactly, I would really
8 have to look at the device and study the device a
9 little bit more. But based on what I know about
10 Goldberg and what's implied, I don't, it would not be
11 difficult to apply a second sensor port very near to
12 where the blood pressure or is.

13 But again, this is just a preliminary
14 answer to your question. Where exactly, I couldn't
15 tell you, but it could be very proximal, very nearby.
16 Where it would be exactly, I don't know from this
17 discussion. But it would be conceivable to easily
18 design a second sensor port based upon the prior art
19 that's well-known at that time.

20 Q. On Page 37, do you see Limitation 1i?

21 A. Yes, ma'am.

22 Q. Can you please read that limitation

1 for me too?

2 A. Sure. "A third sensor port
3 positioned on the housing configured to receive a
4 signal from a third sensor arrangement via a wired
5 connection."

6 Q. Let's take a look at Paragraph 86?

7 A. Okay. Would you like me to read that
8 at some point?

9 Q. Could you please read the first
10 sentence into the record?

11 A. Sure. "Finally, even though Figure 2
12 does not, doesn't expressly illustrate a third port
13 or a third sensor exclusion of a generic third port
14 would have been obvious as a mere duplication of
15 parts. I have been informed by Counsel the
16 duplication substantially similar parts is an obvious
17 modification to the device. A PHOSITA would
18 understand a third sensor or a third port would be
19 easily included with a portable device 100 just as
20 the first and second or the first and the first and
21 second port."

22 MS. HOEKEL: Just for the record, I

1 don't think he read that exactly correctly.

2 A. Let me read it again. "Finally, even
3 though Figure 2 doesn't expressly illustrate a third
4 port or a third sensor, inclusion of a generic third
5 port would have been obvious as a mere duplication of
6 parts. I have been informed by Counsel that
7 duplication of substantially similar parts is an
8 obvious modification to a device. A PHOSITA would
9 understand that a third sensor and a third port would
10 have been easily included with a portable device 100
11 just as the first or second sensor and a first and
12 second port. As such, a PHOSITA would find inclusion
13 of additional second, third sensors and ports on the
14 housing be an obvious modification to any housing
15 having a sensor and a port."

16 Q. Which port would you duplicate to
17 provide the third port?

18 A. Again, you're asking me generically.
19 All the sensors should be designed as a PHOSITA to
20 monitor any number of your known physiological
21 parameters. But it would be obvious to design as
22 such, to include as discussed in this IPR

1 Declaration, that I developed. It would not be
2 difficult to modify it, as shown, as my knowledge.
3 Now, where exactly, I can't tell you. Just, again it
4 could be anywhere as long as the device works, and
5 you still have a device that's, that disclosed in
6 this patent, you may have to use other prior art or
7 you would, you would expect someone as a PHOSITA to
8 combine well-known art to include this simple
9 modification, this simple design modification of the
10 second and third sensor and ports respectively.

11 Q. Would you duplicate the first sensor
12 port for the pulse oximetry sensor?

13 A. You may not be able to, depending,
14 you know, most -- and I know we're going to discuss
15 this later -- most pulse oximetry receive analog
16 data. So you would have to be careful about
17 designing a port that is capable of receiving analog
18 data.

19 So the pulse oximetry sensor and port
20 may not be exactly, if you're duplicating a second or
21 third to monitor other parameters, that may be of a
22 digital nature, then, no, you can't utilize the same

1 type of design modification. But again that would
2 not be a difficult design modification to receive
3 either analog or digital information.

4 Q. Would you duplicate the second sensor
5 port?

6 A. Again, if you design a port, you have
7 to determine or second or third, you have to
8 determine is analog or digital or both being
9 received.

10 Now, any signal, any sensor, is
11 capable of receiving even the pulse oximetry analog
12 is digital, which you may want to modify it
13 accordingly. Again these are simple design
14 modifications. I haven't gone into detail what's
15 expressly -- implicitly implied in Goldberg, is that
16 it could be an easy design configuration depending on
17 what signals you're trying to monitor or -- excuse
18 me -- sense.

19 But most sensor ports have been
20 designed and well-known in the art that you can
21 receive either analog or digital type signal.

22 Q. Depending on whether you would like

1 to receive an analog or a digital signal, would the
2 port have to change?

3 A. In rethinking my answer, more likely
4 not because most sensors can receive analog or
5 digital. But you can expect, if you're trying to
6 measure pulse oximetry using the current techniques
7 and what's disclosed in this patent, then, you know,
8 you want to -- it would be very difficult to use a
9 digital sensor to capture analog pulse oximetry data.
10 And there are digital sensors that just receive
11 digital signals. And we'll just leave it at that.

12 So, depending -- as again, most
13 sensors will allow you to receive either analog or
14 digital. It's not a big deal. And it's well-known
15 in the art.

16 Q. Would you duplicate the port shown in
17 Kiani?

18 A. If it can conceivability measure the
19 parameters that you have set up to measure, sure, but
20 then again, you may want to combine it with other art
21 depending on what type of signal. But again, most
22 sensors will allow you to receive either analog or

1 digital type signal.

2 Q. What signal does the pulse oximetry
3 sensor in Goldberg receive?

4 A. As a PHOSITA, and my knowledge of
5 pulse oximetry, I'm assuming, again, that it's of the
6 light and it's not expressly stated, which is why I
7 combined it with another patent or patents, it's not
8 expressly stated that it's utilizing the normal LED
9 initial detection. But one would assume that's what
10 Goldberg had intended the device that's measuring
11 pulse oximetry. But again he doesn't expressly teach
12 the LED technology and receiving this signal as an
13 analog.

14 Q. When you said, "most sensors would
15 allow you to receive analog or digital," did you mean
16 sensors or sensor ports?

17 A. I'm sorry. Sensor ports. I
18 apologize.

19 Q. I'd like to turn to Page 93 of this
20 Declaration.

21 A. Okay.

22 Q. Sorry, Page 93. As numbered?

1 THE TRIAL TECH: Here we go with Zoom
2 issues again.

3 THE WITNESS: Take your time.

4 THE TRIAL TECH: Is there anything on
5 the screen for you guys?

6 MS. HOEKEL: Paragraph 93 is still
7 on. Now it's gone.

8 THE TRIAL TECH: Okay. Big delay
9 again. Let me kill the share and try again.

10 THE WITNESS: Okay. You're doing a
11 great job, Dan.

12 THE TRIAL TECH: I wish I were doing
13 better if Zoom would cooperate. I apologize again
14 for the technicalities.

15 Okay. Page 93 let's try this again,
16 share screen. Is that on the screen? And is, no, it
17 didn't, wow. It totally just flipped back. Very
18 strange.

19 THE WITNESS: Well, are we looking at
20 the patent itself or are we looking at --

21 THE TRIAL TECH: Yeah, let me start
22 again with the document. Give me the Tab again.

1 MS. LAM: Tab 1.

2 THE TRIAL TECH: Let's try this
3 again. Come on Zoom. All right. Page 93. Okay.
4 All right. I have it on my screen, now let's see if
5 gets shared properly. Share screen.

6 MS. HOEKEL: There we go.

7 THE WITNESS: Okay.

8 BY MS. LAM:

9 Q. One of the limitations you reviewed
10 is Limitation 9f. Can you please read that
11 limitation, please?

12 A. "The signal from the pulse oximetry
13 including analog information."

14 Q. What would a person of skill choose
15 to transmit the signal as an analog signal?

16 A. Most the pulse oximetries that were
17 designed around this time, received analog signals.
18 That's not to say you cannot receive a pulse oximetry
19 that received digital signals. But in this case,
20 it's the preferred, according to most of the pulse
21 oximetry devices, and as a PHOSITA, I would assume
22 that you would want to receive analog information,

1 but again you don't have to. But this would be more
2 preferred, and most of the devices which are
3 well-known in the art utilized receiving, I should
4 say the pulse oximetry sensor devices basically
5 utilize receiving analog information.

6 But again, it doesn't matter if it's
7 analog or digital, but most utilized analog at this
8 particular junction in time. And most modern day
9 utilized analog type pulse oximetry sensors.

10 It's going to be transmitted or
11 eventually processed to digital signals so it really
12 doesn't matter.

13 Q. Without specifically limiting
14 yourself to pulse oximetry sensors, why would a
15 person of skill choose to transmit the signal from
16 the sensor as an analog signal?

17 A. Again, this is just one possibility.
18 And based on what Goldberg teaches, that, you know,
19 we can assume that it's operating in the analog
20 domain at least for pulse oximetry is explained. And
21 then Kiani expresses this explicitly in his
22 particular patent.

1 Q. Are there reasons why a person of
2 skill would transmit an analog signal to a monitor?

3 A. Again, it's just a preferred design
4 of most pulse oximetries and most PHOSITAS would
5 appreciate that fact; but, again, it doesn't have to
6 be an analog signal.

7 Q. You testified that analog signals
8 were preferred. Why is that?

9 A. Most of the pulse oximetry that I'm
10 used to seeing and working with at that time received
11 analog signals, and most of the current pulse
12 oximetry sensors. But, again, just talking in the
13 context of Goldberg and the prior art, basically
14 utilized or preferred to utilize pulse oximetry
15 sensors that were receiving information in an analog
16 domain. And can I expand on that, Counselor?

17 Q. Sure.

18 A. I know we're going to get into this,
19 but analog is a continuous signal. So you want to
20 try to obtain as much of the time varying changes in
21 pulse oximetry. So it would be advantageous to
22 obtain the continuing signal in time rather than

1 taking discrete segments of the pulse oximetry being
2 measured.

3 Q. Does that same rationale apply to
4 another types of sensors?

5 A. No. It could. Now, let me just back
6 up a little bit, give you an example for measures.
7 You could receive analog or digital. Most digital --
8 most thermistors who are monitoring temperature, just
9 receive digital information. Information looking at
10 EKG probably want to receive analog signal because
11 there's a lot of potentially critical cardiac timing
12 cycle events, and if you try to do it receiving just
13 digital, you use -- you lose a lot of very important.
14 So it depends on what your type, what you're sensing
15 and what's the curtness of -- and how quickly or
16 over time it may change. So you have to consider
17 those additional parameters as well. It's not just a
18 simple yes or no. But it would depend on, again, are
19 you looking at a particular parameter over a period
20 of time, or are you just, for example, temperature
21 just looking at one measurement, which really is not
22 going to vary over time.

1 Q. So if you're interested in looking at
2 data over a period of time, a person of skill would
3 want to transmit that signal as an analog signal?

4 MS. HOEKEL: Object to the form.

5 A. No, what I said what you would want
6 to receive it in the analog format.

7 Q. So if a person of skill was
8 interested in looking at data over a period of time,
9 they would want to receive the signal in analog
10 format, correct?

11 MS. HOEKEL: Objection to form.

12 A. Not exactly what I said. You have to
13 look at the particular parameter being monitored and
14 are you concerned with the signal as a whole over a
15 period of time. And as an example, I saw -- I said
16 timing cycles, especially if you're trying to monitor
17 timing cycle of a patient that is in heart failure or
18 has a ICD or pacemaker. Or are you just concerned
19 with temperature. Now, a patient in hyperthermia or
20 hypo, you might want to utilize an -- receive
21 information in analog, because in hypothermia when a
22 patient's core temperature is too low or hyperthermia

1 when it's too high, you're looking at temperature
2 variation, or you want to look at temperature
3 variation. But most patients are not going to be in
4 hyperthermia or hypothermia.

5 Q. Okay. How would you measure
6 temperature using a thermistor?

7 A. You could utilize -- there's several
8 digital thermistors, and I've actually utilized
9 digital thermistors when I was doing my monitoring of
10 dogs as part of my heart failure study. I could just
11 apply a thermistor to the earlobe of a dog's ear and
12 just obtain the digital signal that way. That's just
13 one way. I mean, there's several -- there's several
14 thermistor design types that are pretty well-known.
15 It would just be a matter of, of the end user's
16 choice.

17 Q. Can you please explain what a
18 thermistor is?

19 A. Oh, I'm sorry. A thermistor is a
20 transducer, which transforms one form of energy to
21 another, which allows you to obtain a measurement
22 which reflects the temperature.

1 Q. And is that measurement analog or a
2 digital signal?

3 A. Again, it could be either analog or
4 digital. Another example of a type of a device where
5 you would want to measure something, and just one
6 parameter, would be, for example, the eye changes or
7 whatever if you're dealing with a patient that's in
8 some kind of neurological critical care type of
9 scenario. Again, it's going to depend on what
10 critical -- or what clinical setting you're in.
11 Obviously an ambulatory patient coming in, it's
12 probably just simple to context the thermistor or put
13 a thermistor under your tongue and just take the
14 temperature that way, which is pretty much used now.

15 Q. But there are conditions in which a
16 person of skill would want to receive information
17 from the thermistor as an analog signal?

18 A. Yes. One example would be a patient
19 in hypothermia and extreme heat conditions. An
20 example, patients in the operating room, you want to
21 consider the temperature changes because if a patient
22 goes into some type of extreme temperature change,

1 they could go into shock. So you don't want to take
2 that lightly. Because a patient's -- usually
3 monitoring temperature over sometimes two-, five-,
4 seven-hour period.

5 Q. In general, are there, are there
6 reasons why a person of skill would chose to transmit
7 signals to a monitor as digital signals?

8 A. You're eventually -- you could either
9 transmit -- a process of transmit is either analog or
10 digital. That's, that's not really that big of a
11 deal, but depending how you want to transmit that
12 information. Because, again, most of the hard
13 signals or timing signals you would want to transmit,
14 but that's eventually going to be processed as a
15 digital signal. But you're receiving it on the front
16 end as an analog signal.

17 I don't want to get into processing,
18 but you can always transmit a signal either as an
19 analog or digital, depending on what, what you're
20 looking at at that particular signal or why you're
21 looking at it.

22 Q. Do you mind explaining how that

1 processing works?

2 A. Processing is pretty much none by
3 every engineer from the day he starts his engineering
4 curriculum. There's modulation technicians that
5 incorporate frequency-shift keying modulation. You
6 can use phase-shift modulation. These are pretty
7 much well-known, and you're basically trying to pass
8 the signal so it could be displayed on a monitor.
9 What modulation device, obviously it's going to
10 incorporate the multiplexer because you have multiple
11 signals being received. And then demultiplexer
12 separating the signals. So, again, that's pretty
13 well-known, and that's giving you an example of some
14 of the pulse oximetry techniques. Excuse me, some of
15 the processing techniques. But as I've said in a
16 number of declarations, including this one or several
17 others, this is pretty much well-known in the art by
18 PHOSITA.

19 Q. And the processing techniques you
20 just described, that explains how to convert an
21 analog signal to a digital signal?

22 A. It's part of the whole process. I

1 mean, you still have to incorporate -- if you're
2 trying to change an analog to digital, an analog to
3 digital converter, if you're trying to convert a
4 digital analog, then you use DVA. You also have
5 logic gates that are going to determine how the
6 digital information is going to be transmitted. But,
7 again, it's pretty well-known in the art, pretty much
8 understood by every PHOSITA in this type of systems.

9 Q. Is there anything else you would
10 need?

11 A. Any processing technique that's
12 utilized, it doesn't matter if it's a signal or
13 medical imaging signal, is used to make the signal
14 better. It's a more -- you get rid of all the noise
15 and all the other stuff. And especially
16 physiological signals, you're trying to remove as
17 much noise and process it effectively so you have a
18 nice signal being displayed. Whether it be an analog
19 or digital, you want to make sure you have the
20 quality signal that's going to be well understood by
21 a clinician.

22 Q. Is there anything else you need to

1 produce the quality signal?

2 A. You could -- there's a lot of -- it
3 depends, again, on, on the type of signal that you're
4 trying to display. You're asking me for a yes or no.
5 I mean, there's a million modulation techniques that
6 are well-known. Again, it depends on what -- in some
7 cases phase modulation may not be effective. Some
8 cases frequency-shift modulations. You may have to
9 use different -- other frequency-type modulations.
10 Again, it depends on how you're doing it. I mean,
11 again, this is not a simple yes or no.

12 But I'll just say you're trying to
13 process a signal. Now, which modulation signal you
14 used, how you transmit the signals, what
15 communication protocols are numerous. It depends,
16 again, a lot on the person designing it. But there
17 is a multiplicity of processing techniques that could
18 be applied to develop or end up with a nice quality
19 signal.

20 Q. What types of considerations would
21 affect a person of skilled decision to transmit an
22 analog signal versus a digital signal?

1 A. Most would be transmitting or
2 displaying a digital signal. But some, as an
3 example, may want to look at the time varying
4 display. For example, timing cycles of the heart.
5 You want to display, for example -- and I don't want
6 to get too much into physiology, but as a specific
7 example, you want to look at the R-to-R interval
8 between QRS timing cycles -- and I don't want to get
9 too detailed, but especially in a patient in heart
10 failure, you'd want to see an analog signal that you
11 can analyze a little it more carefully a digital
12 display may not accurately reflect what's going on
13 clinically in the patient.

14 Q. Are there any other considerations
15 you can think of?

16 A. Respiration comes to mind, because a
17 person in respiratory failure, which always
18 accompanies heart failure or any kind of cardiac
19 anomaly, respiration changes may be another one, I
20 mean, I'm sure I could think of other, but these --
21 again, it depends on type of patient you're
22 monitoring. Like a cardiologist has different needs

1 than a neurologist. An anesthesiologist has
2 different needs than an anesthesiologist [sic].

3 So, you know, that would depend, you
4 know, on whether you want to display those particular
5 signals as analog or digital. Now, if we're just
6 talking temperature, you probably just want to just
7 display a digital signal. And most times a digital
8 signal is fine; but then, again, if you're worried
9 about timing variations -- an example, a patient who
10 has an ICD implanted or a pacemaker, then that's a
11 little bit different.

12 Q. So what about EKG?

13 A. Well, when I say EKG, an EKG is
14 basically a device that looks at the timing cycle.
15 It looks at the -- for example, how effective is the
16 heart contracting. The EKG is nothing more than
17 giving you the cardiac activity. I mean, a simple
18 stethoscope in a trained clinician can tell what's
19 going on clinically as far as the cardiac cycle. I'm
20 not sure I answered the question.

21 Q. Since you're interested in a cardiac
22 activity with an EKG, would that be an example where

1 you would want the analog signal?

2 A. Yes, only because a lot of times they
3 look at trends. For example, they look at R-to-R
4 trends if they've changed. Hopefully they've changed
5 for the better. Sometimes they change for the worse.
6 So you may have to look at those and change the --
7 for example, the pacing mode in your pacemaker. You
8 may have to make it less active or more active. If
9 the patient is getting worse, obviously he has to do
10 something.

11 Q. What about with respect to blood
12 pressure monitoring?

13 A. The same could apply. A patient
14 comes in the emergency room that's sustained serious
15 head trauma, you want to look at the pressure changes
16 a little -- maybe a little bit more closely in the
17 analog debate, because the pressure changes are very
18 critical in a patient that's sustained some kind of a
19 head trauma, car accident or something, or is having
20 a stroke.

21 Q. Is hardware a consideration that
22 would affect a person of skill's decision to transmit

1 an analog versus digital?

2 A. It should be an important
3 consideration.

4 Q. Why is that?

5 A. Again, depending on the type of
6 signal and how you want to transmit it and how you're
7 receiving it, whether it be analog or digital, or how
8 you want it to be displayed. So, yes, hardware is
9 going to be of concern. You want to be somewhat
10 cognizant of, I mean, cost analysis benefit, which
11 I've done, as well with any kind of design
12 modification. I mean, if there's a better way of
13 doing something, you do it. If it works, don't fix
14 it. And limiting the number of components, the
15 design rule is the least number of parts you have the
16 better, less likely of failure. Design 101.

17 Q. Would a person of skill consider the
18 cost benefit analysis to putting the hardware in the
19 sensor versus in the monitor?

20 A. Again, it's depending on what you're
21 trying to monitor, how you're trying to monitor and
22 what parameters are more important. It's kind of

1 not, again, not a yes -- no-yes answer. But he
2 may -- a lot of times as a good design exercise, in
3 every company that develops an innovative design --
4 you go to any company website, including Masimo,
5 whenever they have a design innovation, they list the
6 advantages and disadvantages.

7 Now, if I'm using a particular device
8 or wanting to innovate that, I'm going to look at the
9 advantages versus disadvantages and weighing the cost
10 effective to make a change that's not really
11 providing a real increased benefit to the patient.

12 Q. In general, when designing sensors,
13 does a person of skill try to reduce the cost of the
14 sensor?

15 A. Most sensors -- for example, pulse
16 oximetry, I don't know how much they cost. Well,
17 pretty much -- really, there's not a lot of
18 innovative changes that need to be done, unless a lot
19 of times you're doing particular research studies
20 that may need to modify, but most don't need to.
21 But, again, you want to look at the advantages and
22 disadvantages. And most times most of the pulse

1 oximetry devices that are used at the time of this
2 patent of prior art, they worked very well. Again,
3 it's just a good design exercise to look at a
4 particular model and look at what are the advantages,
5 disadvantages, and you also want to look at what do
6 the contraindications for using a particular device
7 on a particular patient.

8 Q. We just talked about specifically
9 about pulse oximetry sensors, but are there other
10 sensors at the time period before 2002 where a person
11 of skill would consider the cost benefit analysis
12 when designing a sensor?

13 MS. HOEKEL: Object to the form.

14 A. Again, it depends on the situation.

15 Q. Is the size of a device a
16 consideration that would affect a person of skill's
17 decision to transmit signals in analog or digital?

18 A. Are you referring, Counsel, to the
19 size of the actual device monitoring these?

20 Q. Let's start with the size of the
21 sensors.

22 A. The size of the sensors should allow

1 for not causing discomfort on the patient. They
2 should be configured in such a way that they can
3 apply to the monitoring device that could be worn
4 comfortably by the patient, including the sensors
5 that are hanging away from the display. Again,
6 patient comfort should be an optimal consideration,
7 especially if you have somebody that's been in the
8 hospital for a long period of time.

9 Q. So would a person of skill interested
10 in increasing the comfort of the sensors try to
11 decrease the size of the sensors?

12 A. He should try to utilize a monitoring
13 sensor arrangement that optimizes monitoring of the
14 parameters, but by the same token, it can be
15 comfortably worn by the patient on a particular limb.
16 Most of the ambulatory devices are worn on the wrist.
17 So you don't want something too big or too heavy or
18 sensors that -- wires hanging all over the place.
19 You're trying to minimize the size and -- all of the
20 components of the sensor monitoring unit being
21 utilized.

22 Q. Is power consumption a consideration

1 that would affect a person of skill's decision to
2 transmit in analog versus digital?

3 A. Very much so. A lot of the devices,
4 especially in these patents, power consumption is a
5 very important consideration. The type of battery
6 used, how long are you going to be [audio fades], is
7 there a mechanism to quickly charge the battery. Or
8 do the components utilize too much power which
9 increases the probability of component failure. As a
10 PHOSITA, you should be concerned with these
11 parameters.

12 Q. How would a person of skill try to
13 improve power efficiency?

14 A. One which would maybe be use a more
15 efficient battery. Another would be trying to --
16 miniaturization of components revolutionized the
17 whole medical monitoring. And I don't want to get
18 into that too much, but the smaller the components,
19 the less likely for large power use, the less likely
20 for failure of each component.

21 Q. Is there anything else you can think
22 of?

1 A. I'm sure I'll think of 100 after this
2 deposition, but, again, minimizing power
3 requirements, minimizing size. The lower the power
4 use, the lower power requirements, the longer the
5 device is going to last, and less likely to fail.

6 Q. So you would agree that whether the
7 signal is received in analog or digital is relevant
8 to the designing of a monitoring device?

9 A. Again, it depends on the parameter
10 being measured.

11 Q. But it is a consideration?

12 A. It should be on the part of a
13 PHOSITA.

14 Q. Let's look at Paragraph 222.

15 A. Okay. Would you like me to read
16 that?

17 Q. The first sentence, please.

18 A. Sure. "Even if the pulse oximetry
19 sensor 104a of Goldberg did operate in the digital
20 domain, a PHOSITA need only include a
21 digital-to-analog converter as part of the pulse
22 oximetry sensor 104a to cause the portable device ...

1 to receive an analog signal. Analog-to-digital and
2 digital-to-analog converters are one of the most
3 fundamental and basic building blocks of any circuit.
4 Circuitry for converting between the analog and
5 digital domain have been known for decades."

6 Q. Why would a person of skill have
7 included a digital-to-analog converter if the signal
8 was already digital?

9 A. Repeat the question.

10 Q. Why would a person of skill have
11 included a digital-to-analog converter if the signal
12 was already in the digital domain?

13 MS. HOEKEL: Object to the form.

14 A. Because at some point -- and, again,
15 you're asking me to specify it. I'm trying to keep
16 this generic. You may have an analog signal, but you
17 may want to convert it to a digital as part of the
18 processing that you do with all kinds of signals.
19 Specific examples I can't give you, but I can tell
20 you that if you want clean up your signal in terms of
21 noise parameters and you want to have a crisper,
22 nicer signal to display, then you may want to convert

1 that analog to digital and then convert it back to a
2 digital analog if you're looking at the analog
3 quickly --

4 Q. You're cutting out.

5 A. How about now?

6 MS. HOEKEL: When you get too close
7 to the microphone, you cut out. So you got to sit
8 back.

9 THE WITNESS: All right, sorry.

10 A. Again, if you have an analog signal,
11 why would you want to convert it to digital, because
12 as part of your processing mode, you may want to
13 process the signal using digital techniques to clean
14 up the noise, extract the noise out and get a much
15 cleaner signal to be displayed on your final display
16 device.

17 Q. But why would you include the
18 digital-to-analog converter?

19 A. I just give you an example. As part
20 of -- if you're trying to -- a person skilled in the
21 art may know that certain signals need to be cleaned
22 up as far as noise. I'm not saying you'd have to do

1 that. You just said would that be one way; and, yes,
2 if it's an analog signal that's -- most signals are
3 converted anyways to digital, but some signals remain
4 in the digital. Some are converted back to the
5 analog. But just to answer as a yes, no, it's very
6 difficult. But I gave you one example, any
7 processing technique involving -- whether it be
8 analog to digital or digital to analog with filtering
9 techniques, which basically is a filtering in the
10 analog-type signal domain where you want to clean up
11 your signal a little bit better and get rid of some
12 of that noise.

13 Q. And after you clean up the signal,
14 would you convert the signal back to digital for
15 display?

16 A. You may. More than likely -- most
17 signals are displayed digitally. But as I explained
18 about R-to-R timing cycle changes, you want to
19 display that as an analog signal so you can look at
20 trends or whatever. And the other good thing about
21 processing using digital to analog, it allows you to
22 go back and change the trends easier, so you make

1 analysis much easier.

2 So, again, you're asking me very --
3 very specific questions; and, again, it's going to
4 depend on what you're trying to transmit, how it's
5 being transmitted. Again, most signals are displayed
6 in digital domain. I don't know what else to say.

7 Q. Before the R-to-R, you would receive
8 that single in analog, not digital, correct?

9 A. It would be displayed -- on the front
10 end you'd receive as an analog, and on the back end
11 when you're trying to get it ready to be displayed,
12 you may want to display as an analog signal,
13 especially with a cardiac patient, potentially. But
14 most patients are not going into heart failure. So
15 you're fine with just showing the signals digitally
16 displayed. It's going to depend on the patient, the
17 type of patient and the situation where the
18 monitoring is being used.

19 Q. So in the specific context of the
20 pulse oximetry sensor of Goldberg, if it did operate
21 in the digital domain, why would a person of skill
22 convert the digital to analog converter?

1 A. Most of the pulse oximetry sensors
2 that are discussed in Goldberg -- and Goldberg, I'm
3 assuming, teaches analogs that are received in the
4 analog domain, as they seem to be the preferred way
5 of monitoring pulse oximetry because you want to look
6 at the whole signal all time and how it varies.

7 Q. But if it receives digital signals
8 you've suggested in the first sentence of
9 Paragraph 222, why would a person include a
10 digital-to-analog converter?

11 A. A digital analog converter is part of
12 the processing. Before you -- oh, why did I said
13 including a digital analog converter? Again, if you
14 wanted to display that pulse oximetry signal, as it
15 may change in a certain type of patient, so you would
16 need -- before you displayed it, if you want to
17 display it as an analog signal. So here's another
18 example where you want to look at the time varying
19 display of your pulse oximetry measurement.

20 Q. Would you be able to capture that
21 time-related data, even if the sensor operated in the
22 digital domain?

1 A. You'd lose a lot if you -- on the
2 front end if you did digital pulse oximetry
3 measurements. You'd lose a lot of very valuable
4 clinical data, which is why sensing in the analog
5 domain for pulse oximetry is the preferred way of
6 doing it.

7 Q. If you lost data in the digital
8 domain, would the digital-to-analog converter help?

9 A. It has nothing to do with it. Analog
10 data is time varying, means where you're looking at
11 the changes of the signal over time. And this is on
12 the front end. Again, pulse oximetry is usually
13 measured or usually used as a preferred embodiment of
14 receiving the signal in the analog domain. Now, what
15 you do afterwards to process it, is not the same
16 thing as I'm discussing here. So, the bottom line is
17 most preferred embodiments, most of the pulse
18 oximetry devices that most PHOSITAS would see as
19 being implicitly discussed in Goldberg, receive the
20 pulse oximetry measurements to the analog domain.

21 Now, what happens afterwards is part
22 of the processing; it's not part of this sentence.

1 We are only talking what happens on the front end.

2 Now, a PHOSITA may want to use
3 digital analog at the final end or display; but,
4 again, that's a design choice and, again, determining
5 the environment which this pulse oximetry was
6 utilized.

7 Q. So a person of skill would utilize a
8 digital-to-analog converter at the back end to
9 display the data in analog?

10 A. I never said that. You're putting
11 words that I'm not saying. Again, analog to digital
12 and digital analog converters -- for example, analog
13 to digital, you're using a processing means to
14 convert your continuous time signal to discrete
15 signal. You're using -- for digital analog
16 converters, you may use filters to filter out noise
17 on the back end before your -- as part of the
18 transmission mechanism for displaying your signals.

19 All I'm talking about in the pulse
20 oximetry sensor of Goldberg, did not operate in a
21 digital domain as far as what the signal received,
22 because it would -- most of the preferred embodiments

1 measure -- receive pulse oximetry sensors in the
2 analog domain.

3 Q. Would receiving the pulse oximetry
4 data in the analog versus the digital domain change
5 the cabling requirements?

6 A. It may or may not. Usually it
7 doesn't, because most sensors can receive -- and it's
8 well-known are capable of receiving either analog or
9 digital.

10 Q. You mentioned that it may. In what
11 instances would it change the --

12 A. Let me rephrase that. More times
13 than not, it would not require different sensors.
14 Most sensors can sense signals, and they can be
15 analog or digital.

16 Q. And you would use the same cable?

17 A. More times than not, depending on,
18 let's just say more times than not, because most
19 sensors, it's well-known in the art, can receive
20 signals in either analog or digital domain, period.

21 Q. In what cases would you not use the
22 same cable?

1 A. If a particular anomaly developed,
2 but 99 percent or higher, most of the sensor cables
3 that are available well-known in the art receive
4 analog or digital domain signals on the pulse
5 oximetry signal being measured. So the sensors that
6 existed are well-known that were designed to sense --
7 I don't want to say 100 percent because there's
8 always an exception in every rule. But the vast --
9 99 percent or higher utilized sensors that could
10 receive signals in the analog digital domain, period.

11 MS. LAM: Maybe we can take our lunch
12 break now if that works for everyone.

13 THE WITNESS: Yeah, that's fine.

14 THE TRIAL TECH: Okay. Stand by,
15 everybody. The time is 1:33 p.m., and we're going
16 off the record.

17 (Whereupon a lunch recess was taken
18 at 1:33 p.m. EDT.)

19

20

21 * * *

22

1 A F T E R N O O N S E S S I O N

2 (Time noted: 2:18 p.m. EDT)

3

4 * * *

5

6 THE TRIAL TECH: The time is

7 2:18 p.m., and we're back on the record.

8 BY MS. LAM:

9 Q. Dr. Yanulis, can you please read
10 Element G of Claim 19 shown on this page for me.

11 A. Sure. "A second, a second sensor
12 port positioned on the housing and configured to
13 receive a signal from a second sensor arrangement via
14 a wired connection, the signal from the second sensor
15 arrangement including digital information."

16 Q. Let's go to Paragraph 226.

17 A. Okay. Which part would you like me
18 to start reading?

19 Q. The sentence that begins with, "For
20 example"?

21 A. "For example, Money teaches a system
22 that receives analog signals from some sensors and

1 digital signals from others. EX1008, Column 5, lines
2 48 through 51, Column 5 line 61." And then, "Money
3 explains that circuitry and power requirements are
4 necessary to communicate with both analog and digital
5 sensors. EX1008. So Money fully teaches a portable,
6 wearing patient monitoring device that receives
7 analog data from one sensor and digital data from
8 another sensor."

9 Q. Isn't it true that Money teaches a
10 particular sensor arrangement for receiving an analog
11 signal from a temperature sensor?

12 MS. HOEKEL: Object to the form.
13 Excuse me.

14 A. I'd like to see the Money patent
15 where it says "temperature data." All I'm seeing
16 written is analog data from one sensor, digital data
17 from another sensor. So could we go back to those
18 columns.

19 Q. Yes. I'm going to show you Tab 12.

20 A. Okay.

21 Q. Which has been previously marked as
22 Exhibit 1008 in IPR 2020-00912.

1 A. Okay.

2 (Whereupon, Exhibit 1008, Money
3 Patent U.S Patent No. 5,919,141, was identified.)

4 Q. Do you recognize this exhibit?

5 A. Yes, I do, Counsel.

6 Q. And what do you recognize it to be?

7 A. This is the device, as disclosed by
8 patent, for monitoring of the patient's vital signs
9 incorporating a portable housing, which is a wearable
10 ambulatory device. It allows for measurement or
11 connection of pulse oximetry, ECG respiration and
12 other physiological parameters. And it also
13 discusses an RF transmitter transmitting analog and
14 digital vital signal -- vital sign data to a remote
15 monitoring station.

16 Q. And you reviewed the Money patent in
17 providing your opinion for this IPR?

18 A. Yes, I did.

19 Q. Let's take a look at Column 5.

20 A. Okay. Okay. I'm just kind of
21 reading.

22 Q. It's around the paragraph line

1 starting at 45.

2 A. That would be patients --

3 "noninvasive blood pressure data is received from a
4 blood pressure cuff transducer. 70 by blood pressure
5 interfaces. Circuit 25." And then "patients
6 respiratory rate is preferably monitored by an
7 abducted pneumography respiration belt transducer.
8 Element 23,23." Excuse me. "53, which provides a
9 raw respirations data to Device 10, through the
10 Respirations Interface Circuit 26. Finally a
11 conventional electronic temperature probe Transducer
12 77 provides analog temperature data to Device 10 to
13 temperature interface Circuit 27."

14 Q. Okay. So you agree that Money
15 teaches a particular sensor arrangement for receiving
16 an analog signal from a temperature sensor, correct?

17 MS. HOEKEL: Object to the form.

18 A. I would agree that appears that's
19 what he's teaching.

20 Q. Turn to Figure 5B?

21 THE TRIAL TECH: Unless I'm missing
22 something, Counsel, 5B, do you have a reference page

1 for that?

2 THE WITNESS: I think it's before
3 that.

4 MS. LAM: Figure 5B is on Page 13.

5 THE WITNESS: Oh, maybe after -- I'm
6 sorry. All right. I'm looking at the circuit.

7 Q. Does this figure show a diagram of
8 Money's temperature interface circuit?

9 A. I would like to see the discussion of
10 Figure 5B to refresh my memory rather than looking at
11 a circuit. I see thermistor 77, but I'd like to see
12 the text describing Figure 5B, if I may.

13 Q. Let's turn to Column 4 on Page 45.

14 A. Okay. Column 3, Counselor?

15 Q. Column 4, around line 8.

16 A. All right. Figure 5, Figure 5 is a
17 schematic diagram of the blood pressure and
18 temperature interface circuits of the remote patient
19 monitoring device.

20 Q. So would you agree that Figure 5B
21 shows a diagram of Money's temperature interface
22 circuit?

1 A. I'd like to see Figure 5B's text. I
2 see Figure 5 on Column 4, but I'd like to see the
3 description for Figure 5B, if I may.

4 Q. Unfortunately there seems to be a
5 typographical error in Money, but based on your
6 reading of this description and looking at Figure 5B,
7 would you agree that Figure 5B shows a diagram of the
8 temperature interface circuit?

9 A. Based on what I've seen in the
10 patent, as disclosed and Figure 5B I would lead to
11 believe that. It would have been nice to have
12 Figure 5B described in text. But it doesn't, so,
13 anyways.

14 Q. But would you agree that Figure 5B
15 shows a diagram of a temperature interface circuit?

16 A. Yes.

17 Q. Isn't it true that Money teaches a
18 particular sensor arrangement for receiving a digital
19 signal from a pulse oximetry cuff?

20 A. Yes, ma'am it does.

21 Q. So you agree that the pulse oximetry
22 sensor cuff of Money transmits digital signals?

1 A. It receives digital signals
2 representing pulse oximetries. I would have to read
3 the rest of the spec to remind me, but I will agree,
4 yes, at the front end it's receiving pulse oximetry
5 measurements in a digital domain.

6 Q. Can you turn to Figure 2A?

7 A. Okay. Sure. Okay.

8 Q. I'd like you to just look through
9 Figures 2A through 2E?

10 A. Okay. Okay. If I may, may I see the
11 text description of these figures?

12 Q. Sure. Can we go all the way through
13 C, D and E?

14 A. Oh, okay. I'm sorry. It's showing a
15 converter transistor Logic R2S -- and now, 2D I
16 guess. Okay. 2E.

17 Q. If you're ready, I can show you in
18 the text.

19 A. That would be great.

20 Q. Let's turn back to Page 45, Column 4.

21 A. Okay.

22 THE TRIAL TECH: That kind of garbled

1 up. What did you say, Counsel?

2 MS. LAM: Page 45, please.

3 Q. Column 4.

4 A. Again, they've done it again. They
5 are basically including all figures 2A through E,
6 which is okay. It's showing the logic circuitry and
7 power supply circuits of the remote monitoring
8 device.

9 Q. You would agree that figures 2A
10 through 2E show the diagram of the logic and power
11 supply circuits?

12 A. I would agree with that.

13 Q. Let's turn back to Figure 2C?

14 A. Okay.

15 THE WITNESS: One more, Dan.

16 THE TRIAL TECH: (Complying.)

17 BY MS. LAM:

18 Q. Does Figure 2C show the SpO2
19 circuitry?

20 A. I'm seeing 2C on my screen.

21 Q. Yes, this is the correct figure.

22 A. And could you repeat your question

1 again, Counsel?

2 Q. Does Figure 2C of Money show the SpO2
3 circuitry?

4 A. I see the ECG circuitry and the SpO2.
5 Yes.

6 Q. Let's go back to Tab 1. Just so you
7 know it's the Declaration.

8 A. Okay.

9 Q. Paragraph 226 again on Page 95.

10 A. Okay. Where would you, would you
11 like me to read that aloud?

12 Q. The sentence beginning with "Money
13 explains."

14 A. "Money explains that circuitry and
15 power requirements are necessary to communicate with
16 both analog and digital sensors. So, Money fully
17 teaches a portable, wearable monitoring device that
18 receives analog data from one sensor and a digital
19 data from another sensor."

20 Q. Do you agree that Money chose its
21 specific configuration of analog and digital sensors
22 to meet certain power requirements?

1 A. Based on what's been disclosed, I
2 will agree to that, to some extent. I don't know
3 what Money's full motivation was, but I would agree
4 with it to some extent.

5 Q. Let's go back to the Money patent on
6 Tab 12.

7 A. Okay.

8 Q. Turning to Column 3 on Page 45.

9 A. Column 3, lines 45.

10 Q. Excuse me. Page 45. But line 36,
11 it's beginning with, "Efficient power conversion."

12 A. "Efficient power conversion and
13 utilization are key factors in determining the
14 success of a remote patient monitoring with patient
15 mobility and comfort being the chief concern.
16 Accordingly, the present is intended to limit the
17 device weight to more than 16 ounces including
18 batteries. It was also determined that the nominal
19 battery life of four to six days would be required to
20 minimize disruption of patient data input into the
21 system. This led to the decision to use four 'AA'
22 alkaline batteries configured for 6 volt output as

1 the main power source. The blood pressure pump which
2 is designed to operate at four to six volts is
3 powered directly from the battery supply thus
4 ensuring maximum energy efficient power transfer to a
5 single largest consumer in the device. Conversion
6 from the battery supply to three volts at 87 to
7 92 percent efficiency is attained by utilizing a
8 switch mode circuit designed to operate with 3.6 to
9 6.5 volts."

10 Do you want me to continue on?

11 Q. No, that's enough. Thank you.

12 Do you agree that Money chose a
13 specific configuration of analog and digital sensors
14 for efficient power conversion and utilization?

15 A. Based on what he's disclosed and my
16 knowledge as a PHOSITA, yes, I would agree to that.

17 MS. LAM: Let's go back to Tab 1,
18 Dr. Yanulis' Declaration.

19 A. Right.

20 Q. Paragraph 227 on Page 95.

21 A. Okay.

22 Q. Can you read the first sentence into

1 the record for me, please?

2 A. Sure. "It would have been obvious to
3 modify Goldberg with Money, so the system of Goldberg
4 would function with more sensors and more sensor
5 type. Goldberg teaches that it wishes to communicate
6 with any conventional sensor, some conventional
7 sensors communicate digital data and some
8 conventional sensors communicate using analog data.
9 Goldberg provides the motivation to adopt the
10 teachings of Money to be able to communicate with any
11 conventional sensors (both analog and digital)."

12 Q. So, in the first sentence, you
13 mentioned "more sensors," what additional sensors
14 would Goldberg work within your proposed
15 modification?

16 A. Well, the standard parameters that
17 Goldberg articulates is fine, but there may be a
18 specific requirement for glucose monitoring. It can
19 also be a desire to monitor electrolytes, especially
20 in cardiac patients. For example, sodium and
21 potassium levels, concentrations.

22 Q. How would the teaching of Money cause

1 Goldberg to function with more sensors and more
2 sensor types?

3 A. The reason for Goldberg to be
4 combined is that he talks about sensing both analog
5 and digital signals. Goldberg implicitly directs us
6 to that, but it would make sense to combined what
7 Money teaches, that sensors could receive signals on
8 either the analog or digital domain.

9 Q. How would the teachings of Money
10 cause Goldberg to function with more sensors?

11 A. Could you repeat the question,
12 please? I'm trying to think about what I was --

13 Q. Okay. How would the teachings of
14 Money cause Goldberg to function with more sensors?

15 A. You're just, I'm not sure the format
16 of the question. Again, Money is only explaining the
17 fact that you could sense different analog and
18 digital sensing parameters in those different
19 domains. Goldberg doesn't explicitly express that.
20 So all I'm just saying it's well-known in the art to
21 use just additional sensors, whether you would or
22 not, again, would be dependent on some of the factors

1 we discussed this morning.

2 But it's well-known that you could
3 add any number of sensors, but then again, you have
4 to balance it. You're just adding sensors for the
5 sake of adding sensors or you definitively need those
6 sensors for those parameters to be sensed.

7 For example, the blood glucose. You
8 may not need to worry about that.

9 Q. Are there particular teachings in
10 Money that would motivate a person to add more
11 sensors?

12 A. I think Money may not directly state
13 it, but it had utilized some of the prior art which
14 is well-known at the time of all these patents, it
15 wouldn't be hard to do a design configuration change
16 to add more sensors to monitor more parameters of
17 interest.

18 Q. Would the teachings of Money cause
19 you to modify the connection between the blood
20 pressure sensor in Goldberg and it's portable device?

21 A. Would the, would you repeat that
22 question, Counsel?

1 Q. Would the teachings of Money cause
2 you to modify the connection between Goldberg's blood
3 pressure sensor and it's housing?

4 MS. HOEKEL: Object to the form.

5 A. Again, based on what's been disclosed
6 in Money in view of Goldberg, more likely not, but
7 then again, if there's particular signals that are
8 not being monitored that need to be -- for example,
9 electrolyte, yes -- but the modifications would not
10 be all that significant and are well-known in the art
11 as to how to do that.

12 Q. Let's take a look at Paragraph 27.

13 A. In what?

14 Q. Beginning with the second sentence.

15 A. Oh, in 227?

16 Q. Yes.

17 A. "It would have been obvious to modify
18 Goldberg with Money so that the system of Goldberg
19 would function with more sensors and more sensor
20 types. Goldberg teaches that it wishes to
21 communicate with any conventional sensor. Some
22 conventional sensors communicate digital data, some

1 conventional sensors communicate using analog data.
2 Goldberg provides motivation to adopt the teachings
3 of Money to be able to communicate with any
4 conventional sensors, both analog and digital. The
5 combination of Money and Goldberg would have
6 predictably allowed for the portable device of
7 Goldberg to communicate with both analog and digital
8 sensors. The circuitry described by Money provides
9 exactly the necessary electrical infrastructure to
10 allow for this compatibility with both analog and
11 digital sensors."

12 I felt the need to add both of those
13 in the record.

14 Q. So, going back to Paragraph 227 you
15 stated, "Some conventional sensors communicate
16 digital data and some conventional sensors
17 communicate using analog data."

18 Isn't it true that the blood pressure
19 sensor in Money communicates using analog data?

20 A. I didn't hear the last part.

21 Q. Isn't it true that Money's blood
22 pressure sensor communicates using analog data?

1 A. I'd like to see the patent if I may
2 for Money and the section that you're referring to
3 before I answer that.

4 Q. Let's go back to Tab 12, the Money
5 patent. Column 8?

6 A. Column 8.

7 Q. On Page 47.

8 A. Okay. Column 8.

9 Q. Yes, beginning on line 20.

10 A. Okay. Could you go up a little bit.
11 I'd like to read the section before and after. Okay.
12 Previous section talks about modulation techniques.
13 "Of course, processor 14 also has inputs to receive
14 analog and digital pulse train ECG from first and
15 second channel ECG interface circuits 22 and 23,
16 pulse oximetry data for pulse oximetry interface
17 circuit 24, analog data from non-invasive blood
18 pressure interface circuit 25, analog and digital
19 pulse train from respirations interface circuit, and
20 analog data from temperature interface circuits.
21 So yes, to your question.
22 Q. You would agree that Money's blood

1 pressure sensor communicates using analog, correct?

2 A. Based on what he's disclosed and what
3 he's teaching, yes.

4 Q. Let's go back to Tab 1, Dr. Yanulis'
5 Declaration.

6 A. Okay.

7 Q. And Paragraph 227 on Page 95.

8 A. Okay. So you want me to start with
9 "Some conventional sensors"?

10 Q. No. Beginning of the last line
11 "Goldberg provides."

12 A. "So, Goldberg provides the motivation
13 to adopt the teachings of Money to be able to
14 communicate with any conventional sensors, both
15 analog and digital."

16 Q. So would a person of skill modifying
17 Goldberg adopt the analog blood pressure sensor of
18 Money?

19 MS. HOEKEL: Object to the form.

20 A. Not necessarily. You're isolating
21 one patent. And the motivation, would be, whether
22 you would -- again, all sensors are going to function

1 both analog and digital, based on what Money said.

2 And Goldberg talks about possibility of functioning
3 with more sensors, so it would depend.

4 Q. But you agree that the teachings of
5 Money provide for an analog blood pressure sensor,
6 correct?

7 MS. HOEKEL: Object to the form.

8 A. Again, just limited to the context of
9 that statement, yes.

10 Q. And Paragraph 227 of your Declaration
11 states that "Goldberg provides the motivation to
12 adopt the teachings of Money," correct?

13 A. Correct. With more sensors that
14 could be utilized and more sensory paths.

15 Q. And that would include an analog
16 blood pressure sensor, correct?

17 A. In this case, based on what's
18 disclosed in Goldberg, yes.

19 Q. Okay. Let's turn to Paragraph 228.
20 Can you read the first sentence for me, please?

21 A. Sure. "The combination of Money and
22 Goldberg would have predictably allowed for the

1 portable device of Goldberg to communicate with both
2 analog and digital sensors. The circuitry described
3 by Money provides exactly the necessary electrical
4 infrastructure to allow for this compatibility with
5 both analog and digital sensors."

6 Q. Does the first sentence of
7 Paragraph 28 [sic] suggest that the modified Goldberg
8 device would have ports that would communicate with
9 both analog and digital sensors?

10 MS. HOEKEL: Object to the form.

11 A. Again, Goldberg, it would be
12 advantageous to modify Goldberg using Money to be
13 able to communicate with both analog and digital
14 sensors. And with the circuitry that Money describes
15 allow that to help. But you combine that, the
16 motivation for combining Money into the teachings of
17 Goldberg in order to get a predictable result.

18 Q. In the first sentence when you say
19 "communicate with both analog and digital sensors,"
20 are you suggesting that a single port would be able
21 to communicate with both analog and digital sensors?

22 A. No. What I'm attempting to say is

1 any sensor port could receive the analog and digital
2 sensors using the teachings of Money combining
3 Goldberg. That's what I'm saying. Money provides
4 the electrical circuitry to do that.

5 Q. Would there be separate ports for
6 analog sensors and separate ports for digital
7 sensors?

8 A. No. Again, any sensor port, which is
9 pretty much well-known in the art to any PHOSITA,
10 including myself, could receive either analog and
11 digital signals as discussed by Money and is implied
12 by Goldberg, are receiving signals for particular
13 sensors.

14 Q. So are you, so you are saying that a
15 single sensor report can receive both analog and
16 digital signals?

17 A. Most sensor ports are designed, that
18 they can receive signals in either the analog and
19 digital domain, those are pretty much well-known in
20 the art, not just in these patents.

21 Q. Let's talk about the second sentence
22 of this paragraph.

1 A. Okay. Would you like me to read
2 that?

3 Q. Yes, please.

4 A. "The circuitry described by Money
5 provides exactly the necessary electrical
6 infrastructure to allow for this compatibility with
7 both analog and digital sensors."

8 Q. And Money describes electrical
9 infrastructure for a digital pulse oximeter and an
10 analog temperature sensor, correct?

11 A. Based on what's been disclosed to the
12 best of my knowledge, yes.

13 Q. Okay. And isn't it true that the
14 electrical infrastructure of Money would have to
15 change to accommodate a different sensor
16 configuration?

17 MS. HOEKEL: Object to the form.

18 A. That's not what I'm trying to imply.
19 What I'm saying, it would be advantageous to use what
20 was taught by Goldberg, the teachings of Money, to
21 allow you to be able to set signals in both the
22 analog and digital domain.

1 Q. Can you explain how you would do
2 that?

3 A. Using the teachings of Money and the
4 circuitry -- and in terms of the, some of the
5 transistor logic and some of the other circuitry
6 used, that could be adopted as taught by Money. It's
7 well-known to any electrical engineering student to
8 use those teachings in Goldberg to modify the device
9 to allow you to communicate with both analog and
10 digital-type parameters being sensed.

11 Q. Is Money showing any sensor ports
12 that receive both analog and digital signals?

13 A. Could you repeat the question? I'm
14 not sure of the context of the question.

15 Q. Does the Money patent disclose any
16 sensor ports that receive both analog and digital
17 signals?

18 A. Are you saying that have they been
19 modified or can they receive -- I'd like to go back
20 to the Money patent which describes the sensors.

21 Q. Sure. We can go back to Tab 12, the
22 Money patent.

1 A. Okay.

2 Q. Is there a particular figure you
3 would like to look at?

4 A. No, I mean this device, in the
5 abstract, just begin I'd like to see some of the core
6 description of what the device does as far as in the
7 embodiment. That would be helpful.

8 And the abstract, all it's telling
9 you is that the transmitter transmits analog and
10 digital vital signals to remote monitors without
11 specifying. So I'd like to refresh my memory and
12 look at some of the embodiments.

13 Q. Earlier, we had a discussion of
14 Column 5, so maybe we can start there. Column 5 on
15 page 46.

16 A. So line 46?

17 Q. Page 46.

18 A. Page 46, line? What line, ma'am?

19 Q. Well, the discussion of Figure 1
20 starts on --

21 A. Yes, "The remote patient monitoring
22 device," starting on line 2, "designated at 10 on

1 Figure 1 is self-contained portable patient-wearable
2 unit, with all hardware and software mounted in a
3 housing." "The housing 5 has a front panel having a
4 liquid crystal display and four front panel switches.
5 Device 10 is preferably adapted for use as both a
6 stand-alone patient vital sign monitor and for
7 wireless transmission of vital systems, to sign data
8 to a central monitoring system."

9 I'm reading on about Figure 1,
10 control -- "sense, process, transmit two ECG channels
11 heart rate, pulse rate, pulse oximetry."

12 "Accordingly, the first and second
13 channel ECG interface circuits are provided to
14 receive two bipolar leads."

15 So the pulse -- continuing on, on
16 line 38, "Pulse oximeter interface circuit receives
17 raw data from a conventional pulse oximeter cuff
18 transducer 39."

19 And the next paragraph, "Non-Invasive
20 blood pressure data is received from a blood pressure
21 cuff transducer." Which interfaces with circuit 25.

22 So repeat your question again,

1 Counsel.

2 Q. Does Money disclose a sensor port
3 that can receive both analog and digital signals?

4 A. No, it does not directly state that,
5 which is why I used other prior art, in combination
6 with Money, incorporates the sensor port technology
7 which I believe Money would have combined to get the
8 result that's discussed in the Declaration.

9 Q. Did any of the references you
10 reviewed disclose a sensor port that receives both
11 analog and digital signals?

12 A. I'm sure there's art that does that,
13 but that, the combining Kiani with Money with
14 Goldberg, is a good starting point to allow you to
15 sense either analog or digital signals utilizing
16 sensor ports. Because Goldberg does not directly
17 state ports itself, whereas Money also does not
18 disclose ports, but all three of these -- and I'm not
19 sure of the third and fourth -- but the combination
20 would be advantageous to adopt what's taught in
21 Money, Kiani and Goldberg to sense signals in either
22 the analog or digital domain which would not

1 necessitate any kind of modifications in the sensor
2 ports based on combining all three. Or it wouldn't
3 be a significant design modification.

4 Q. Let's go back to Tab 1, Page 96.

5 A. Okay.

6 Q. We've been looking at Paragraph 228.

7 A. Okay. "The combination of Money and
8 Goldberg would have predictably allowed for the
9 portable device of Goldberg" -- again I'm say
10 predictable results -- "to communicate with both
11 analog and digital sensors." The circuitry described
12 by Money provides the electrical circuitry to do
13 these things. "Exactly the necessary electrical
14 infrastructure to allow for this compatibility with
15 both analog and digital sensors." As discussed in
16 the figures or shown in the figures.

17 Q. So if a person of skill modified
18 Goldberg to include the exact electrical
19 infrastructure in Money --

20 A. I did not say the exact structure,
21 it's a potential infrastructure that could be used.
22 You could say that this would be adequate to do this,

1 but there may be other ways to accomplish the same
2 thing. But the bottom line, it allows the capability
3 of sensing both in the analog and digital sensing
4 domain.

5 Q. You agree that Money describes the
6 electrical infrastructure for a digital pulse
7 oximeter and an analog temperature sensor, correct?

8 A. Just looking at that Money patent in
9 that context, yes.

10 Q. If a person of skill adopted those
11 teachings of Money, there would be digital --
12 circuitry for a digital pulse oximeter and an analog
13 temperature sensor, right?

14 A. Counselor, I never said that. What I
15 said that Money teaches a particular way of
16 monitoring certain signals on a digital analog. I
17 utilized Money to say how this compatibility with
18 both analog and digital sensing could be achieved. I
19 never said one way or the another. I'm saying
20 adopting the teachings in terms of the circuitry
21 could be combined with Goldberg. But I never said
22 anything about changing the design that's taught by

1 Goldberg.

2 Q. You stated in Paragraph 228 that
3 "Money provided exactly the necessary infrastructure
4 to allow for this compatibility with both analog and
5 digital sensors," correct?

6 A. Okay. Correct, but again, I'm just
7 talking about the circuitry. I'm not talking about
8 exactly the sensors, whether they are sensing analog
9 or digital. All I'm doing is describing that this
10 could be utilized to allow this compatibility of
11 sensors to receive signals on the analog and digital.

12 Q. So you could adopt the exact
13 electrical infrastructure from Money in the Goldberg
14 device?

15 A. Yes. Again, I want to add the
16 statement that I'm not changing what's taught by
17 Goldberg, I'm just saying Money provides the
18 circuitry that could be utilized; and in combination
19 with Goldberg, to allow you to send signals in both
20 the analog and digital domain.

21 Q. Sitting here today, can you identify
22 any sensor ports, prior to March 2002 that could

1 receive both analog and digital signals?

2 A. There are hundreds of examples in the
3 prior art and it's well-known by any PHOSITA. And
4 I've seen pulse -- ambulatory monitoring devices in
5 my experience as a vital medical engineer, involved
6 in this technology on numerous occasions.

7 Q. Can you provide a specific example of
8 the type of port?

9 A. A lot of these sensor ports were
10 basically of the female/male way of securing the
11 so-called sensor wires to the display. Numerous
12 manufacturers have done this prior to these
13 particular patents.

14 Q. Are there any other features that
15 enable them to receive both analog and digital
16 signals?

17 MS. HOEKEL: Object to the form.

18 A. Most of these that are well-known in
19 the art do exactly what I just said. I can say it a
20 different way, but the bottom line is these devices
21 made by several manufacturers to monitor pulse
22 oximetry heart rate have exhibited or used sensors,

1 as discussed using the port-like female/male.

2 Again, that's only one type of
3 configuration. Other sensors that we used
4 previously, may have used other types of connections.
5 But again, these configurations will allow to secure
6 it attach the sensors monitoring the various
7 parameters effectively and they've been shown to work
8 and they are well-known in the art.

9 And I've seen them used clinically,
10 prior to this time frame, when this, this patent or
11 the original '108 or the other patents were
12 developed.

13 Q. Other than the female/male
14 description, can you provide a name of a type of
15 sensor port?

16 A. Not offhand. You asked me this
17 question several times, and I'm saying it's
18 well-known in the art. I can't tell you exactly -- I
19 didn't look at this, I looked at the case in context
20 and know that other type of mechanisms for securing
21 including, just hardwiring or going through and doing
22 a hardwire interchange, which is not very effective,

1 have been used in the prior art. Most of the
2 preferred prior art or the preferred monitoring prior
3 to this, utilized the sensor arrangement as discussed
4 using the male/female.

5 Again that's most of the devices by
6 most the companies, Nellcor, Masimo there's several
7 pulse oximetry companies that existed prior to this
8 that are not around and I can't remember them.
9 Nellcor is another big player in this whole art of
10 pulse oximetry monitoring. And I have a lot of
11 experience using Nellcor pulse oximetries that
12 utilized this and some others. But I don't want to
13 belabor the point.

14 Q. Is there any specific circuitry in
15 Money that shows a sensor port that receives both
16 analog and digital signals?

17 A. Not directly stated, but it's
18 implied. Again, you may, I was using other art in
19 addition to Money. I don't want to isolate Money in
20 itself, but just the Money patent, no, not directly
21 stated.

22 Q. Let's go to Page 56 of this

1 Declaration.

2 A. Okay. Okay.

3 Q. Your opinions in this Declaration
4 based on Akai are based on two different embodiments
5 disclosed in Akai, correct?

6 A. Correct.

7 Q. I'm going to show you Tab 11.

8 A. Okay. Okay. This is the Akai
9 patent.

10 Q. It is Exhibit 1007 in IPR 2020-00912.

11 A. Okay.

12 Q. Do you recognize this document?

13 A. Yes, I do.

14 Q. What do you recognize this to be?

15 A. It's another system for remotely
16 various physical conditions or parameters in a
17 patient or in a person and utilizing different, the
18 workstation or utilizing tracking units to keep track
19 of the different parameters of vital signs being
20 monitored. For example, in this case, blood glucose.

21 Q. And you reviewed this publication in
22 providing your opinions in this IPR?

1 A. Yes, I did.

2 Q. Earlier you mentioned you relied on
3 two different embodiments in Akai. Are these
4 embodiments shown in Figures 1 and 3? We can turn to
5 the figures.

6 A. Yes, I see Figure 3 now. I don't
7 think this had a lot of figures.

8 Q. Let's turn to Figure 1.

9 A. I see Figure 3 here. I don't see
10 Figure 1. Maybe Figure 1 is further down. And I
11 don't see any of the Figure 1s. I see Figure 3. I'm
12 sorry. I see Figure 1. Okay. There's Figure 3,
13 Figure 1, which shows the ambulatory device connected
14 to the wireless network to allow you to remotely
15 display the units. Okay.

16 Let me look at 2. Okay.

17 And that shows the light, emitter
18 light receiving technology that's utilized in Akai,
19 that allows you to monitor and transmit the signals
20 that are being monitored.

21 Q. Let's go back to Figure 1.

22 A. Okay.

1 Q. Looking at this figure, the sensor
2 unit 112 is shown outside of the measuring unit 113,
3 correct?

4 A. Based on what I can see, I mean, I'm
5 not going to -- probably be helpful to go over to the
6 text -- but looking at the figure, as shown, it would
7 appear, yes.

8 Q. And we can go back to the text, if
9 you'd like.

10 A. Yeah, that would be helpful.

11 Q. I think the description of Figure 1
12 begins on Page 3.

13 A. Okay. All right. (Inaudible).
14 Figure 1 shows the blood glucose monitoring system;
15 two, basically is one embodiment; Figure 3 shows the
16 physical layout of the system, with the remote,
17 remote system; Figure 4 discuss, again, the remote
18 monitoring device it could be hooked up or connected
19 with this or allow signals to be transmitted from
20 this wearable device. Figure 6 is just basically an
21 embodiment utilizing home use, hospital or whatever.
22 And this device allows you to measure blood glucose

1 changes in the patient, primarily. You want me to
2 read on or?

3 Q. It might be helpful if you start at
4 Line 40 of Column 4.

5 A. Column 4, Line 40. I'd like to start
6 from the -- if you could -- read, you don't have to
7 enlarge it to save time -- Column 4, prior to reading
8 Figure 1, it talks about responsive to the
9 instructions from the said unit for transmitting the
10 signal.

11 Figure 1 is a perspective view of the
12 blood glucose monitoring system with one embodiment.

13 Figure 2 shows the blood glucose
14 monitoring system, which is the first embodiment
15 invention.

16 Figure 3 is the perspective view of
17 location and physical condition, monitoring system
18 which is the second embodiment of invention.

19 Figure 4 shows the details of the
20 location and physical condition monitoring, which is
21 the first embodiment of the invention.

22 Figure 5 shows a perspective view

1 when taking care of a person at home, which is
2 another embodiment.

3 Figure 6 shows the details of systems
4 for taking care of a person at home, which is a third
5 embodiment.

6 Q. Can you read beginning on line 40 the
7 sentence starting with "blood glucose"?

8 A. "Figure 1 is a perspective
9 illustration of blood glucose monitoring system 110
10 in accordance with the present invention. Blood
11 glucose monitoring system comprises sensor unit 112
12 attached to a person's body and data processing unit
13 113 connected to sensory unit 112 and the embodiment
14 showed in Figure 1. Sensory unit 112 is attached on
15 a finger of a person. Sensory unit 112 may be
16 attached into an external auditory meatus," which is
17 the ear, "data processing unit 113 includes
18 microprocessor. The data detected by a sensor unit
19 112 is analyzed by the data process 13 and the blood
20 glucose value is calculated. And the calculated
21 blood glucose value is compared with the person's
22 blood glucose data in the past and determined whether

1 the detected and calculated values are within the
2 normal range." And, if necessary, there is an
3 attention or some kind of alarm signal which is
4 transmitted if it's outside this range.

5 Q. So based on your readings of Akai and
6 what is shown in Figures 1 and 2, you would agree
7 that the sensor unit 112 is external of the measuring
8 unit 113?

9 A. Based on what I've seen disclosed and
10 shown in the figure and my knowledge as a PHOSITA to
11 the best of my ability, yes.

12 Q. Let's take a look at Figure 4A.

13 A. Okay.

14 Q. On Page 17.

15 A. Okay. 4A, okay. Showing pulse wave
16 sensor, the body movement. So there's other sensors,
17 but the primary focus is the blood glucose. But
18 there's other sensors.

19 Q. You mentioned a pulse wave sensor and
20 a body movement sensor. Do you see the SpO2 sensor?

21 A. Yes, ma'am, SpO2 sensor, and body
22 movement sensor which is very helpful because most

1 people when in their normal activity move a lot. We
2 want to make sure the values don't change
3 dramatically. The pulse, pulse wave sensor and the
4 controller for the different sensors. And the
5 transceiver network interface which allows displaying
6 of all the parameters being measured as well as the
7 Beacon Generator which can be utilized by the
8 clinicians to keep track of the patient, any
9 situations of concern, especially with blood glucose
10 changes.

11 Q. So these components you just
12 described, these are a part of the measuring
13 unit 213?

14 A. They are part of 212 and the second
15 I'm sorry, the unit 213, yes. I apologize. The 212
16 is specifics for receiving and processing and
17 remotely displaying the measurements.

18 Q. And the sensors you identified the
19 pulse wave sensor, the body movement sensor, and the
20 SpO2 sensor, those are internal of the measuring unit
21 housing?

22 A. Based on what I could see in

1 discussion, I would assume that. But again, it might
2 be helpful if I looked at the text to say whether
3 it's external or internal before I guess.

4 Q. We can go back to the text.

5 A. Okay.

6 Q. Page 5.

7 A. Okay. Figure?

8 Q. Column 7?

9 A. Right. Figure? Looking at Column 8
10 but that's not what your -- "Measuring unit 213
11 includes pressure change detector which is connected
12 to those enclosing air-pad"... "flexible material,"
13 which allows you to measure the pressure changes.

14 Measuring unit 13 [sic] comprises a
15 thin film thermistor for temperature taking, which is
16 attached to the person's body. So, it's external.
17 That's why I wanted to see the text, and the
18 measuring unit comprises the light emitter and the
19 detector technology. Basically having the wavelength
20 from a visible region infrared. Very well-known.
21 The measuring unit comprises means for detecting
22 sound waves generated by the blood flow, which is

1 good. If you measure pulse wave from pulse rate.
2 Also comprises the acceleration sensor means which
3 allows any kinds of changes or drastic changes in
4 person's movement. Also comprises amplifier, which
5 is the logarithmic basically allows you to get rid of
6 any noise from body movements. Maybe tracking the
7 quality of the measurements being obtained.

8 And I'd like to read into the record
9 these methods that I've previously -- have not, are
10 just only as illustrated and other means could be
11 used. This is just a possible invention structure
12 delineation, but other methods could be used.

13 Q. Based on you're reading of Akai and
14 what is shown in Figures 3 and 4, would you agree
15 that the pulse wave sensor 220 is internal of the
16 measure unit, measuring unit 213's housing?

17 A. Could you repeat the question?

18 Q. Based on your reading of Akai and
19 what is shown in Figures 3 and 4A --

20 A. Uh-huh.

21 Q. -- the pulse wave sensor 220 is
22 internal of the measuring unit housing, correct?

1 A. I'm just reading some of the patents
2 so bear with me. I'd like to see the figures again.

3 It would appear that they're within
4 the unit, but I can't, you know, without -- I know
5 we're going back and forth with figures. It would
6 make sense that there are, that there are internal in
7 the unit. But there has to be some sensor which
8 attaches to the display which allows it. So could
9 you go back to the figures.

10 Q. Sure, let's go back to Figure 4A on
11 Page 17.

12 A. Okay. Appearing in this, and just
13 looking at this figure, yes, I would say that they're
14 internal as far as the sensor. This so-called that
15 there are calling a "measuring unit 213."

16 Q. So would you agree that each of the
17 pulse wave sensor, the body movement sensor, and the
18 SpO2 sensor is internal of the housing?

19 A. It's internal to the housing but
20 there has to be some kind of sensor wires that attach
21 to this to allow you to obtain those measurements.

22 Q. What do you mean by that?

1 A. Yes, I'll just say that the sensors
2 are internal, but there's some kind of communication
3 that will allow -- the sensors are internal, let's
4 leave it at that.

5 Q. Since they are no -- sorry. Since
6 the ports are internal there are no ports in this
7 embodiment, correct?

8 MS. HOEKEL: Object to the form.

9 A. Based on what's disclosed, I would
10 have to disagree with you.

11 Q. Since the sensors are internal of the
12 housing, there are no ports in this embodiment,
13 correct?

14 MS. HOEKEL: Object to the form.

15 A. Again, what's being disclosed --
16 that's why I read that additional paragraph saying
17 that could you, doesn't mean that Akai, not
18 potentially use it, but what's been potentially
19 disclosed is what you just said, but that doesn't
20 have to be the one and only.

21 Q. So Akai does not specifically
22 describe ports with respect to the embodiment shown

1 in Figure 4A, correct?

2 MS. HOEKEL: Object to the form.

3 A. Just in the context of the Money
4 patent. But again, you're adding a limitation, which
5 is not provided for in that patent. That's why I
6 read the additional sentence, which said this is just
7 one or these are just some of the embodiments that
8 could be used with what Akai is teaching.

9 Q. Are there any ports shown in
10 Figure 4A of Akai?

11 A. Looking back at Figure 4, not
12 directly expressed, which is why I combined other
13 prior art to show that it would have been
14 advantageous to use what's been taught in Akai to
15 incorporate a port, a sensory port. But no, Akai
16 does not directly state the use.

17 Q. If the sensors are internal of the
18 housing, why does Akai need ports?

19 A. This is based on the way it was
20 designed, you still have to have some means to
21 communicate with the wires that are communicating
22 with these sensors. Sensors can't just operate in

1 isolation. There has to be some kind of connection
2 or electrical connection.

3 Again, I'm not sure what you're
4 asking of me. They are internal based on what I'm
5 looking at. But other than that, you have to have
6 some kind of communication to the sensors, from the
7 patient, which allows you to measure these
8 parameters?

9 Q. Let's take the pulse wave sensor,
10 220?

11 A. Okay.

12 Q. Is it possible that sensor is just
13 exposed to the patient through the housing?

14 A. That could be a possibility. I have
15 to read the whole patent again. The way it seems to
16 be described in the text, and what I can remember,
17 this unit 213 -- and it's not very clear, whether
18 it's internal or external, to be honest with you and
19 we're spending a lot of time when that.

20 The bottom line is providing a means
21 for measuring these parameters. Based on what I've
22 seen in the text and what I've seen it's very -- one

1 would assume that these are externally connected to
2 the patient in some way or there would be no way to
3 measure these parameters.

4 Q. But they would be externally
5 connected to the patient through the measuring unit,
6 correct?

7 A. Yes. You asked me the sensors, you
8 did not ask me the whole sensing system. The sensing
9 system as a whole is connected to the patient, which
10 is connected to the ambulatory unit for monitoring
11 said pulse body movement and the other parameters.

12 Q. By "sensing system," do you mean
13 measuring unit 213?

14 A. Yes.

15 Q. Turn back a page to Figure 3.

16 A. And that's why I mentioned there's
17 some kind of communications through these sensors.
18 And I've said that a few times.

19 Q. Do you see those communications in
20 this figure?

21 A. Yes.

22 Q. Where?

1 A. I'm not sure what you're calling
2 "communication." There is a mechanism that, what
3 appears to be units that are physically connected to
4 the patient at different areas which allow those
5 systems. Other more than that, there's not really a
6 lot of detail and it's very hard to see and
7 determine. I'm using the information that I have
8 available. This drawing is very -- other than what
9 I've said, discloses its entirety a means for
10 monitoring ambulatory, or a patient moving, not so
11 much in a critical care environment just a normal
12 patient allowing you to measure these parameters.

13 Q. And measuring unit 213 in Figure 3 of
14 Akai's attaches to the user's wrist, correct?

15 A. Again, I said there has to be some
16 mechanism. Yes, the monitoring unit is connected to
17 the wrist as shown in Akai, the main display unit.

18 Q. And the measuring unit 213 would be
19 in contact with the user's skin, correct?

20 A. Correct.

21 Q. And the measuring unit 213 would need
22 to be in contact with the user's skin, so the sensors

1 could take measurements, correct?

2 A. And that's what I've said numerous
3 times. There has to be some mechanism that has to be
4 in direct contact with the patient's skin in the area
5 that you're trying to monitor these parameters.

6 Q. And one of those sensors would have
7 to be the pulse wave sensor, correct?

8 A. Yes.

9 MS. LAM: I think we can take a
10 five-minute break here.

11 THE WITNESS: Okay.

12 THE TRIAL TECH: All right. Stand
13 by, everybody.

14 We'll go off the record. The time is
15 3:29, and we're going off the record.

16 (Recess taken.)

17 THE TRIAL TECH: The time is
18 3:37 p.m. We're back on the record.

19 BY MS. LAM:

20 Q. Let's go back to Tab 1 of your
21 Declaration. You can go to Page 64.

22 A. Okay. Okay.

1 Q. One of the limitations you reviewed
2 in the '108 patent is claim Limitation 1E, can you
3 read it for me. Please?

4 A. Sure. "First sensor port position on
5 a first side of the housing, the first side of the
6 housing configured to face toward a hand of the arm
7 of the patient when the housing is secured on the arm
8 of the patient."

9 Q. Let's go back to Tab 11, the Akai
10 reference.

11 A. Okay.

12 Q. Take a look at Figure 1.

13 A. Okay. Okay.

14 Q. Does Figure 1 of Akai show a port
15 anywhere?

16 A. No, it does not.

17 Q. Let's go back to Tab 1 to your
18 Declaration?

19 A. Okay.

20 Q. Let's take a look at Page 70.

21 A. Okay. Okay.

22 Q. One of the limitations you reviewed

1 is Limitation 1i, can you please read it for me?

2 A. Okay. "Third sensor report position
3 on the housing configured to receive from a third
4 side arrangement via wire connection."

5 But I'd like to read before on
6 page 69 what I said.

7 Q. Sure.

8 A. All right. "Finally, even though
9 Figures 1 and 4A don't expressly illustrate a second
10 port, inclusion of a generic second port would have
11 been obvious as a mere duplication of parts. A
12 PHOSITA would understand that a second port would
13 have been easily included within measurement device
14 113 just as the first port. As such, a PHOSITA would
15 find the inclusion of the additional second and third
16 ports on the housing to be an obvious modification to
17 any housing having a wired connection."

18 Q. Let's talk about this paragraph you
19 just read, Paragraph 157.

20 A. Okay.

21 Q. And you mentioned "mere duplication
22 of parts," would you be duplicating the sensor input

1 port disclosing Kiani?

2 A. You could and there's other prior art
3 that's well-known that you could utilize. Again,
4 this mere duplication is not that of a hard thing to
5 accomplish. It's been well illustrated in prior art,
6 not just what's disclosed here. It's well-known.

7 Q. Okay. Let's go back to the next
8 page, go to 70.

9 A. Okay.

10 Q. So here you were discussing a third
11 sensor port?

12 A. Right.

13 Q. Let's go to Paragraph 160?

14 A. 160, okay.

15 Q. Can you read that first sentence
16 please?

17 A. Would you like me to read it? "Also,
18 Akai teaches that the measurement unit can receive
19 data from an electrocardiogram, ECG. The PHOSITA
20 would know that electrocardiogram includes numerous
21 electrodes that are positioned on various places,
22 including over the patient's heart. Thus, inclusion

1 an electrocardiogram would necessitate a third port
2 on the housing to connect the wire necessary to run
3 from the patient's wrist to at least the electrodes
4 positioned over the patient's heart. Such a wired
5 configuration would look and function very similarly
6 to the wired connection housing 113 and sensor 112
7 shown in Figure 1, but that the wire would instead
8 extend from a different side, such as the rear of the
9 housing 113. So Akai also suggests a third port by
10 teaching that the measurement unit 113/213 also
11 measures electrocardiogram."

12 Q. So before the break, we were looking
13 closely at the measurement unit 213 in Akai. Did the
14 figures showing measurement unit 213 include an ECG?
15 And we can go back, if you'd like.

16 A. Yeah, I'm going to say yes, but I'd
17 feel more comfortable looking at it.

18 Q. Sure. Let's go back to Tab 11, the
19 Akai reference. Figure 4A.

20 A. Yeah, in Figure 4A I don't see an
21 ECG. Do you mind if I look at some of the other
22 figures?

1 Q. Sure.

2 A. All right. Let me go back and see
3 the context. Keep going.

4 There are some other figures I want
5 to see, if you don't mind, okay.

6 Patient monitor. Let me see
7 Figure 6. There is no Figure 6 -- okay.

8 Now let me also read the text that
9 also goes along with figures -- refresh my memory,
10 I'd like to see my Declaration, where I answer that
11 question.

12 Q. I think we can go to Page 5 of Akai.

13 A. All right. I don't specifically see
14 the ECG measurement but I believe I used Akai in
15 combination with the other references showing that
16 you could measure using the teachings of Money to
17 measure ECG.

18 Q. Would adding the ECG and its numerous
19 electrodes increase the number of sensors attached to
20 the patient?

21 MS. HOEKEL: Objection to the form.

22 Shannon, can you re ask that? You

1 broke up a couple of times.

2 Q. Would adding the ECG and its numerous
3 electrode to measuring unit 213 increase the number
4 of sensors attached to the patient?

5 MS. HOEKEL: Object to the form.

6 A. It should not, but then again based
7 on what I've seen disclosed by Akai, it doesn't
8 appear to be that that would be a requirement or it
9 would be anything significant as far as design
10 changes.

11 But then again, I'm looking at the
12 fact that Akai itself does not disclose an ECG. But
13 the other prior art discussed in this IPR, as well as
14 it's well-known in the art, it would be very easy to
15 modify the teachings of Akai to include a means for
16 measuring or sensing the ECG.

17 The number of electrodes really
18 shouldn't affect because there was obviously numerous
19 electrode systems that utilized today. I don't want
20 to go into. That is not really germane. But you
21 would not really need to change the sensors that
22 much. But, again, Akai doesn't specifically disclose

1 an EKG or ECG measurement, which is why I included
2 other prior art.

3 Q. So adding the ECG would increase the
4 number of sensors in the measuring unit 213?

5 A. No. I said no it would not. More
6 than likely. But again, I'm kind of a hands-on
7 engineer, which is why it's kind of hard. I like to
8 have the device in my hands. But looking at this, it
9 would appear based on my knowledge as a PHOSITA, no.
10 But then again, in combining what's well-known in the
11 other prior art and what's well-known in the existing
12 technology at this point in time.

13 Q. Let's go back to Figure 4A.

14 A. Okay.

15 Q. How many sensors do you see in
16 Figure 4A?

17 A. I only see three illustrated.

18 Q. Are any of the illustrated sensors an
19 ECG?

20 A. No, but you could derive some kind of
21 clinical, if you will, a clinical vital sign using
22 pulse and pulse wave, because that could allow

1 clinician to at least look at or at least kind of
2 gauge what's going on with the ECG.

3 Because a pulse wave is, if I
4 remember correctly, allows you to look at blood flow
5 if I'm not mistaken.

6 Could we go back to the text, so I
7 could just confirm that?

8 Q. Yes.

9 A. All right. There's a pressure
10 change, which is capable of detecting pulse rate,
11 which pulse rate can be indicative of the ECG or at
12 least some indication. The so-called SpO2 is telling
13 you oxygenation, which is telling you blood flow,
14 which, as I said -- and it comprises a unit for
15 measuring blood flow. So, between measuring blood
16 flow and measuring pulse rate, you, you have a pretty
17 good idea of what's going on with the patient's ECG
18 even though you're not directly measuring.

19 Q. But if you were to directly measure
20 ECG, that would add an additional sensor to the
21 measuring unit 213?

22 A. It may or may not, it may be able to

1 utilize a sensor that's discussed in Akai. But
2 again, that's why you would modify what is taught by
3 Akai to incorporate some of the prior art that was
4 disclosed in the IPR, which will accomplish measuring
5 ECG.

6 Q. Would you need to add electrodes to
7 measure the ECG?

8 A. Well, you need an electro -- I mean
9 an ECG but I'm going in all of physiology. You have
10 different electrode configurations, lead
11 configurations, that could be attached either to the
12 chest or leg or chest and leg and arm, and will allow
13 you to reflect what's known as the "Einthoven
14 triangle," which allows you to measure ECG.

15 Now the number of electrodes is not
16 germane in this discussion, but again, could
17 incorporate what's taught in the prior art to measure
18 ECG using the standard lead configurations that were
19 well-known in the art at this time.

20 Q. And at a minimum, how many electrodes
21 would you need to measure ECG?

22 A. That is a great question. Clinicians

1 would argue -- and I'm not trying to be sarcastic --
2 some clinicians like to keep it simple using three or
3 six lead systems. Some like to use 12. Some like to
4 use floating lead configurations, which is another
5 discussions. It's going to be the discretion of the
6 clinician and the type of clinician and what you're
7 looking at.

8 Obviously, you want to look at more.
9 Probably want to use the 12-lead in patients that
10 have significant cardiac issues. Now with a regular
11 patient, someone in great shape, like I like to think
12 I am, but you know with young people like yourself or
13 any of the other people in the room, and I'm being
14 serious, there probably would be no need.
15 Six-electrode or three-electrode system would be
16 fine.

17 Q. Is it possible to measure the ECG
18 with less than three electrode?

19 A. Not that I'm aware of, because you
20 have to establish, a develop what's called the
21 Einthoven triangle, which basically is a dipole
22 representation of the ECG. And I'm probably rambling

1 on too much. But you would need multiple, more than
2 one lead, unless you want to use the standard
3 stethoscope and blood pressure to gauge it that way
4 and some of the old time clinicians still do that.

5 Q. I'd like to show you Tab 2.

6 A. Okay. Okay. '735 one of my
7 favorites.

8 Q. This has been previously marked as
9 exhibit 1003 in IPR 2020-00954, do you recognize this
10 document?

11 A. Yes, I do Counsel.

12 (Whereupon, Exhibit 1003, Declaration
13 of George E. Yanulis in Support of Petition For Inter
14 Partes Review of U.S. Patent No. 10,213,108, 127
15 pages, was identified.)

16 Q. Is this a true and accurate copy of
17 your Declaration in the IPR for the '735 patent?

18 A. Yes, it is.

19 Q. Does your Declaration set forth all
20 of your opinions regarding the patentability of the
21 '735 patent's claims?

22 A. Yes, it does.

1 Q. Have you formed any opinions in this
2 IPR other than the opinions contained in this
3 Declaration?

4 A. No, I have not.

5 I apologize. I have one of the
6 nicest mailmen, works for the US. I wanted to say
7 good-bye to him. I apologize.

8 Q. Okay. No problem.

9 A. I'm sorry, I didn't mean to
10 interrupt.

11 Q. I was just looking back at the last
12 question.

13 MS. LAM: Amanda, is this question
14 showing on realtime elapsed?

15 (Discussion held off the record.)

16 Q. As you are sitting here today, are
17 you aware of any corrections that need to be made to
18 this Declaration?

19 A. No. Not at this point, having reread
20 it two times now, I don't believe so.

21 Q. Did you carefully prepare this
22 Declaration?

1 A. Yes, I did.

2 Q. Were you asked to investigate any
3 issues related to this IPR that do not appear in your
4 Declaration?

5 A. No, I wasn't. Everything is pretty
6 much inclusive in this Declaration. Everything is in
7 included that I intended to include.

8 Q. Let's turn to Page 7.

9 A. Okay. Roman numeral VII or --
10 THE TRIAL TECH: It's -- yeah, or
11 numeral 7.

12 MS. LAM: Numeral 7.

13 THE WITNESS: Okay. Just to clarify.

14 BY MS. LAM:

15 Q. Is this the list of documents you
16 considered in preparing your Declaration?

17 A. Before I say yes, can I see the next
18 page?

19 Q. Yes.

20 A. Now, both pages do reflect all the
21 documents listed as the exhibits, and all the
22 patents, all the other prior -- and all the other

1 materials I reviewed.

2 Q. Anything missing from this list?

3 A. No, there is not.

4 Q. Did you review Sotera's petition for
5 the '735 patent in preparing this Declaration?

6 A. Yes, I did.

7 Q. Did you review any nonfinal drafts of
8 the petition?

9 A. I did look at the entire patent
10 history as reflected for this patent. If that's what
11 you're referring to, yeah, I did look at the file
12 history for this patent, which pretty much reflects
13 everything in here. In terms of the prosecution
14 history, Exhibit 1002, which I'm calling the file
15 history.

16 Q. Did you review any nonfinal drafts of
17 Sotera's IPR Petition?

18 A. To the best of my knowledge, I did
19 not see and did not have access to it.

20 Q. Let's turn to Page 38.

21 A. Okay. Okay. Any particular line?

22 Q. Sorry, just one moment. Sorry. Can

1 we go to Page 88.

2 A. Okay.

3 Q. Just for your reference, you can read
4 the preamble shown as Element 1a.

5 A. "A body worn mobile medical
6 monitoring device configured to minimize cable wiring
7 from a sensor by placement of one or more sensor
8 communication ports, the mobile medical monitoring
9 device comprising:

10 "As I explained involving figure --
11 paragraph 55, the preamble is entirely a statement of
12 use."

13 Do you want me to continue reading?

14 Q. No. I'd like to turn to Page 90.

15 A. Okay.

16 Q. Can you read the first sentence of
17 Paragraph 195, please?

18 A. "It would have been obvious to modify
19 Money's housing in our view -- view of Akai primarily
20 because it would be obvious to substitute a pulse
21 oximetry cuff transducer 39, as taught by Money, with
22 a light-based pulse oximetry sensor 112 as positioned

1 on a patient's finger, as taught by Akai. Pulse
2 oximetry cuff transducers are largely obsolete in
3 modern medicine and are largely obsolete even in 2002
4 (prior to the date of the '735 patent). Pulse
5 oximetry cuff transducers like the one taught in
6 Money are bulky and uncomfortable when worn by a
7 patient. In contrast, light-based pulse oximetry
8 sensors are completely noninvasive, far smaller, and
9 therefore -- thereby, more comfortable when worn by
10 the patient. I have been informed by Counsel that a
11 simple -- simple substitution of one known,
12 equivalent element with another to obtain predictable
13 results demonstrate obviousness. Here, it would have
14 been obvious to replace the pulse oximetry cuff 39 of
15 Money with a light-based pulse oximetry sensor 112
16 Akai to predictably measure oxygen saturation using
17 lights."

18 Q. What is your understanding of what a
19 pulse oximetry cuff looks like?

20 A. I'll be honest with you, Counsel,
21 I've not seen many, and I can't recall when I have
22 seen one. Most of the ones I've seen in this time

1 frame that are pretty well-known utilize the
2 lightweight and the so-called light technology of the
3 LED emission and the LED detector technology to
4 measure the ratios of the infrared, red waves that
5 were left after being absorbed. So I'll be honest
6 with you, I have not seen any. I know they existed,
7 but I don't recall ever seeing one.

8 Q. So it's your understanding that a
9 pulse oximetry cuff transducer would utilize LEDs?

10 A. No, no. No. I'm saying I haven't
11 seen a cuff like -- because you're talking about
12 substituting a pulse oximetry cuff as discussed by
13 Money with what I'm familiar with, a noninvasive
14 light-based sensor that attaches to the finger and
15 uses the standard LED light technology to measure or
16 extract the pulse oxygenation level or the
17 oxygenation level in the patient.

18 So, no, I'm saying I haven't seen the
19 old style pulse oximetry cuff, which Money talks
20 about.

21 Q. Do you know if the pulse oximetry
22 cuff transducers used LEDs at all?

1 A. To be honest with you, I don't know
2 if they did. But to my best knowledge as a PHOSITA,
3 I would say no. They did use light technology. I
4 believe Money discusses using a visible -- just
5 within the visible light spectrum. But this is not
6 the technology that's currently used as far as the
7 red and infrared that are on the 660 and 990
8 Navigator range.

9 Q. Are you aware of any pulse oximetry
10 devices that do not utilize light?

11 A. Again, I'm saying, I -- I have not
12 seen it. I've heard that they -- that they did
13 exist. I know I look old, but I don't recall
14 honestly seeing, in all seriousness, of that type.

15 Also, there are a lot of devices in
16 Europe that lagged behind the devices used in the US.
17 But the current -- the technology I had experience
18 with was the light-based technology. That's light,
19 and it's somewhat noninvasive. Much easier on the
20 patient.

21 Q. Can you describe for me any features
22 of the pulse oximetry cuff transducer?

1 A. Honestly, I -- I couldn't, because
2 I'd have to go back, and look at some of the old
3 pulse pressure cuff. To be completely transparent,
4 at this time I could not. I could after looking at a
5 few. I really didn't spend a lot of time because
6 that's not the current technology.

7 Obviously, I did look at Akai. But,
8 again, Akai is not the way they do things. During
9 this time with this patent. The prior art utilized
10 in the IPR that was used for the '735 declaration --
11 or in the other declaration.

12 So the answer -- simple answer, no, I
13 don't know any specifics. And I'm not sure you'd
14 want to use a cuff, because they're very
15 uncomfortable.

16 Q. Let's go to Paragraph 225.

17 A. Okay. Okay. Would you like me to
18 start with "Alternatively"?

19 Q. Well, first let's go back to
20 Page 102, so you can read the claim limitation.

21 A. Yeah, that would be good.

22 In the Akai patent, correct? So go

1 ahead, show me.

2 Q. Oh, Page 102 of your Declaration.

3 A. Okay.

4 Q. Can you please read Limitation 1h?

5 A. "A plurality of additional sensor
6 communications ports positioned on the housing and
7 configured to provide wired, wired communication with
8 a plurality of additional physiological sensors at
9 least partly in the digital domain."

10 Q. Now let's go back to Paragraph 225.

11 A. Okay. Okay.

12 Q. Can you read the last sentence for
13 me, please?

14 A. "Use of standardized ports and cables
15 would allow for easier to purchase equipment, like
16 cabling to connect the sensors to the monitor."

17 Q. So standardized ports, would a person
18 of skill be motivated to make all the ports on the
19 device the same?

20 A. No. Again, reading the first part,
21 which I think is important, is that signals like
22 temperature would usually be sensed in a digital

1 domain where some of the others would not. But not
2 sure what you're asking other than that.

3 We're only talking about temperature
4 in this sense. We're not talking about any other
5 signals.

6 Q. Can you elaborate on how use of
7 standardized ports would allow for, for easier
8 equipment purchasing?

9 A. Well, I think anytime you use digital
10 components rather than analog it's much cheaper and
11 less power consuming. But then again, we're talking
12 about how we sense and process the temperature, which
13 is usually sensed in the digital domain because we're
14 not concerned about the time during aspects of
15 temperature in most patients. So these types of
16 ports and cables would obviously be a lot easier.
17 Again, but again, the ports, the sensor ports for any
18 of the technology disclosed in any of these patents
19 or prior art basically could utilize sensors, which
20 receive either digital or analog. But this paragraph
21 is only alluding to temperature sensors. Nothing
22 else.

1 Q. In this paragraph you're specifically
2 talking about a RS232 serial port, correct?

3 A. Correct.

4 Q. And that is an example of a
5 standardized port?

6 A. Yes. The serial -- the particular
7 RS232 is utilized for debugging and, you know, the
8 firmware and making sure that you're obtaining a good
9 digital representation of the signal, plugging and
10 upgrading any kind of firmware upgrades.

11 Q. You mentioned digital representation.
12 Does a RS232 serial port receive analog signals?

13 A. I don't believe I said that. I said
14 that could receive from, from data according to
15 conventional standardized digital connections. I
16 don't think I said analog there.

17 Q. But sitting here today, do you know
18 if RS232 ports receive analog signals?

19 A. There's been a lot of changes. But
20 my, my take as being a PHOSITA in this art, it -- why
21 would you want to use an analog RS232 because that's
22 all going to just basically add to the cost and add,

1 add to more power requirements. And if you're,
2 again, if you're measuring something that you're not
3 concerned about time varying factors, like
4 temperature, I don't see why -- to answer your
5 question, I don't know of any RS232 serial ports that
6 are of an analog nature. That's not to say there are
7 not, but I don't see why you would want to use an
8 analog RS232 serial port.

9 Q. So standardized ports, would a person
10 of skill be motivated to use the same RS232 port for
11 all of its sensors?

12 A. No, they would not, because, again,
13 some signals utilize sense analog signals and some
14 utilize sensing digital. Now, this RS232 is
15 something that I saw in just the, the Money patent.
16 I don't recall seeing it in any of the other patents
17 that I utilized or disclosed in any of these IPRs.
18 Again, this was something that was utilized in the
19 Money patent.

20 Q. Was it common to use RS232 ports in
21 wearable devices?

22 A. Perhaps at this time, because Money

1 is utilizing a different configuration. But I've not
2 seen it. Doesn't mean it couldn't be used. But I
3 did not recall seeing it, and it's very well-known
4 that we really not use -- I mean, you could use any
5 other thing that's exactly equivalent. Now, are
6 there equivalents to the RS232 serial port, I'm sure
7 there are. I don't know offhand. But there's been
8 so much work in transistor to logic circuitries for
9 digital components. I'm not familiar with
10 everything.

11 Q. When you said "at this time," did you
12 mean at the time Money was filed as a patent
13 application?

14 A. Yes. But most of the prior art is
15 pretty well-known for the -- conventional technology
16 did not really disclose the use of this particular
17 type of serial port, not that it didn't or it
18 wouldn't imply it or it couldn't be used but, again,
19 in the context of just this patent.

20 Obviously, I focused on this serial
21 port for the Money patent as used for the matter
22 which it was disclosed. We're just talking about the

1 Money patent. We're not talking about combining any
2 of the other patents, per se. We're just talking
3 about the function and the use of this RS232 serial
4 port.

5 Q. Do you know whether it was common to
6 use RS232 ports in wearable devices in March 2002?

7 A. I'm sure I could find some prior art
8 that there was some use. But the technology that's
9 disclosed by Money was not really common to most of
10 the existing technology that I'm familiar with.

11 Q. The next paragraph, 225, you also
12 mention standardized cables. How would standardized
13 cables be beneficial?

14 A. Well, it would make the system more
15 efficient. And, again, this S230 is only one
16 example. Any kind of component which would
17 accomplish the same function if you were designing it
18 as such. It accomplished the same thing. It's just
19 in Money, they just happen to use this type of
20 serial -- this type of component.

21 Q. Does the RS232 port require a certain
22 type of cable?

1 A. I really don't have enough
2 information that was disclosed to answer that
3 question. But, again, I was more concerned about
4 utilizing -- teaching this Money in combination to
5 show the unpatentability of this particular patent.
6 So I didn't use everything that was disclosed in the
7 Money to -- to substantiate the obviousness
8 combination.

9 All I used Money for, in a nutshell,
10 was to say you can receive data using the analog or
11 digital domain. That's all I used. Is the primary
12 reason for using Money.

13 Q. Do you know if the RS232 port
14 requires a certain type of cable?

15 A. I honestly do not know. I would
16 imagine it probably does. What that cable would be
17 based on what's disclosed in the Money patent, I
18 couldn't give you a specific yes or no. I would, I
19 would imagine it probably most likely requires a
20 certain type of cable, but I can't answer that
21 definitively.

22 Q. When designing a wearable monitor,

1 would a person of skill be motivated to use the same
2 cables for all their sensors?

3 MS. HOEKEL: Objection to form.

4 A. It would be good design logic to
5 incorporate sensors that are equivalent in design
6 that would save the cost of -- the overall cost and
7 probably be more efficient as a monitoring device in
8 the -- in the stance of a PHOSITA for this type of
9 technology.

10 Q. So a person of skill would be
11 motivated to use the same type of cable for all of
12 its sensors?

13 A. If it could be done to accurately
14 obtain quality signals, whether they be digital type
15 signals or analog signals. Any type of equivalency
16 in components is desired. Whether it could always be
17 accomplished, I would say more than likely yes. So I
18 don't want to add any more to that. But it behooves
19 someone to utilize sensor cables that are equivalent
20 or almost equivalent in design and power requirements
21 or use of power and the ease of monitoring to the
22 patient.

1 Q. Would a person of skill be motivated
2 to make all the ports on the monitor the same?

3 MS. HOEKEL: Object to the form.

4 A. Again, it would be advantageous to do
5 so. Can you do it all times, no. There maybe times
6 when you can't. But with the technology that existed
7 at the time that was well-known to use ports that
8 were equivalent in terms of the dimensions and the
9 type of attachment to the, to the receiving end and
10 to the sensor wires being inputted into the sensor
11 port.

12 Q. Okay.

13 MS. LAM: Everyone, I'd like to take
14 a ten-minute break.

15 MS. HOEKEL: I'll come back at 3:30.

16 THE TRIAL TECH: Okay. Stand by
17 everybody while we go off the record.

18 The time is 4:19 p.m., and we're
19 going off the record.

20 (Recess taken.)

21 THE TRIAL TECH: Stand by once again
22 everybody.

1 The time is 4:30 p.m., and we're back
2 on the record.

3 THE WITNESS: Hello again.

4 MS. LAM: Hi, Dr. Yanulis.

5 BY MS. LAM:

6 Q. I'd like to go back to
7 Paragraph 33 --

8 A. Okay.

9 Q. -- on Page 14.

10 A. 30 --

11 Q. Actually, Paragraph 34.

12 A. Okay. Okay. Would you like me to
13 read that?

14 Q. Yes. Paragraph 34, please.

15 A. "I believe that all claims, for the
16 purposes of inter partes review can be given their
17 plain and ordinary meaning."

18 Q. So in forming your opinions in this
19 Declaration, you applied the plain and ordinary
20 meaning to all of the claim terms?

21 A. Yes, I did.

22 Q. So after reading the specification of

1 the '735 patent, is your opinion that all of the
2 claim terms can be given their plain and ordinary
3 meaning, correct?

4 A. Correct.

5 Q. I'd like to show you Tab 6.

6 A. Okay.

7 MS. LAM: Which has been previously
8 marked as Exhibit 1001 --

9 THE WITNESS: Okay.

10 MS. LAM: -- in IPR 2020-00954.

11 A. Okay.

12 Q. Do you recognize this document?

13 A. I do.

14 Q. And what do you recognize it to be?

15 A. Another -- it's basically, again, a
16 body worn mobile medical monitoring device which
17 allows us to monitor with the pulse oximetry is
18 pretty much disclosed in the other three patents, and
19 using this ambulatory monitoring system. It's very
20 conveniently and comfortably attached to the
21 patient's wrist. In this case, it allows you to
22 obtain signals, pulse oximetry and whatever other

1 parameters you're attempting to monitor. I'd have to
2 look through the text to see all the parameters that
3 they did monitor in this particular '735.

4 Q. And you reviewed this patent in
5 preparing your Declaration for the --

6 A. Yes, I did.

7 Q. -- '735 patent?

8 A. Yes, I did.

9 Q. Let's go to the last page.

10 A. Okay. Okay.

11 Q. And go forward.

12 A. Certificate of Correction.

13 Q. Previous page, please.

14 A. Okay.

15 Q. So in the last limitation in
16 Column 18, one of the terms -- claimed terms in the
17 '735 patent is a separate computing device, correct?

18 A. Correct.

19 Q. And after reading the '735 patent,
20 your understanding is that a separate computing
21 device should get its plain and ordinary meaning?

22 A. Correct.

1 MS. HOEKEL: Objection to form.

2 Q. And what would a person of skill
3 understand a separate computing device in the
4 '735 patent to be?

5 A. Just in the context of the '735 and
6 what's been disclosed, which is just as not to repeat
7 the same sentence, but it's basically a separate
8 computing device which allows you to, to process or
9 allow you to compute all the parameters which have
10 been monitored on the screens which can be displayed
11 representing oxygen saturation pulse rate blood
12 pressure, et cetera. But I should add it's pretty
13 well-known to anybody in the art as a PHOSITA as far
14 as a separate computing device having this
15 capability. So there's nothing really novel. It's
16 pretty well-known.

17 Q. So would a person of skill understand
18 the plain and ordinary meaning of separate computing
19 device?

20 A. Yes, a PHOSITA should, including
21 myself, and I do understand a separate computing
22 device and what its function is.

1 Q. And that plain and ordinary meaning
2 would include any device with a processor?

3 A. No, I never said that. It could
4 include a processor. But any separate computing
5 device or any computing device which allows it's
6 parameters to display, first of all, it's well-known
7 in the art, especially those particular parameters.
8 So, there's, again, separate computing devices are
9 well-known and I've seen several examples in the
10 prior art, not just in these -- not just this patent.

11 Q. Could a person of skill understand
12 any separate computing device to be any monitoring
13 device?

14 MS. HOEKEL: Object to the form.

15 A. Again, in the context of just this
16 patent, you could interpret this separate computing
17 device to also be the monitoring device, but you
18 don't -- again, it's a pretty well-known in the art.
19 So there's not really any more discussion saying that
20 you could say that one would regard it as such being
21 a PHOSITA.

22 Q. Is there anything in the '735 patent

1 that limits the type of device that can be a separate
2 computing device?

3 MS. HOEKEL: Object to the form.

4 A. Again, what's been disclosed and my
5 knowledge as a PHOSITA and what's well-known in the
6 art, I don't think that really has been specifically
7 disclosed other than what I articulated in the IPR as
8 being a separate computing device configured to
9 display these particular parameters that's being
10 monitored.

11 Q. Based on your review of the
12 specification of the '735 patent, did the
13 specification limit the types of devices that could
14 be a separate computing device?

15 MS. HOEKEL: Object to the form.

16 A. Again, I'm not trying to answer the
17 question any differently. What's been disclosed and
18 what's described and taught by this patent and what
19 someone of myself of being a PHOSITA would
20 understand, the separate computing device has been
21 adequately disclosed which enables me to make a
22 determination that we don't have to really focus on

1 the separate computing device because it's pretty
2 well-known in the art. And I'm only going by what's
3 said in the patent. I haven't invented it. I'm just
4 going by what I've seen in the figures and what's
5 disclosed.

6 Q. Did you review the file history of
7 the '735 patent?

8 A. I did.

9 Q. Based on your review of the file
10 history, is a separate computing device limited to
11 any particular type of device?

12 MS. HOEKEL: Object to the form.

13 A. Again, in the context of this patent,
14 I don't see how I could really state that this
15 separate computing device can't be regarded in a, in
16 a way that I've discussed in the IPR. I don't know
17 how else to say it. Again, the technology for
18 separate computing devices and this type of
19 technology, not just in this patent but the prior art
20 that's well-known, pretty much reflects what I stated
21 in the IPR declaration.

22 Q. Can a separate computing device be

1 located remotely?

2 MS. HOEKEL: Object to the form.

3 A. Again, based on what's disclosed, it
4 could, or it doesn't have to be. I mean, there's no
5 real reason. I mean, it hasn't really been expressly
6 stated as such one way or another, but using one's
7 knowledge as a PHOSITA, without any other
8 information, again, I'm just repeating what was in
9 the file history and what's disclosed to provide an
10 enabling determination of this separate computing
11 device and the means by which it was used in this
12 particular patent.

13 Q. Just give me one moment.

14 A. Take your time, Counsel.

15 Q. If we can go to Page 45 -- is it --
16 go back to Tab 2. Page 45 of the Declaration. Do
17 you see Element 1k, Dr. Yanulis?

18 A. Yes, I do.

19 Q. Can you read this limitation, please?

20 A. Wireless -- "Wirelessly transmit
21 information indicative of the physiological
22 measurements to a remote computing device."

1 Q. Is a remote computing device the same
2 as a separate computing device?

3 MS. HOEKEL: Object to the form.

4 A. Again, it could be. But based on
5 the -- what's been disclosed in this patent and
6 what's well-known, it could be indicative of
7 measurements that you're monitoring to a remote
8 computing device. This is one method that could be
9 used to wireless transmit this information using this
10 remote computing device. And, again, that's pretty
11 well-known in the art as being a viable way to do
12 this.

13 Q. So in the context of the '735 patent,
14 it is your opinion that a separate computing device
15 is the same as a remote competing device?

16 MS. HOEKEL: Object to the form.

17 A. I never said that, Counselor. What I
18 said is what's disclosed is just exactly what
19 Goldberg teaches in this particular patent. It's a
20 means to wireless transmit information indicative of
21 the measurements being obtained to be sent to a
22 remote computing device.

1 Q. Can you read the first sentence of
2 Paragraph 89, please?

3 A. "Goldberg teaches that the
4 communication unit 110 wirelessly transmits sensor
5 data and measurement, which can include oxygen
6 saturation, glucose, blood pressure, and temperature
7 (physiological measurements) to a remote computer.
8 By the time of the invention, wireless transmission
9 was well known, as Goldberg shows, and, of course,
10 information is transmitted to a remote computer so
11 hospital staff can monitor all patients from a
12 central location."

13 Q. So in your opinion, Goldberg's remote
14 computer 302 satisfies the limitation of a remote
15 computing device?

16 A. To the best of my knowledge in what
17 Goldberg has disclosed, I would say yes.

18 Q. So based on your reading of the
19 '735 patent, any remote computer would satisfy the
20 limitation of a remote computing device?

21 MS. HOEKEL: Object to the form.

22 A. Again, I'm going to answer it by

1 saying it could, it could do that.

2 Q. Why does Goldberg's remote computer
3 302 satisfy the limitation of a separate computing
4 device?

5 A. Why does it satisfy it?

6 Q. Yes, in your opinion.

7 A. Well, again, it's my opinion, as a
8 PHOSITA based on what he's taught in this particular
9 patent, this is what he teaches, the invention
10 involves. It's not my opinion, it's what he teaches
11 in the invention. And, again, that's why I said it's
12 also well-known in the art around this time that
13 these patents were written, and including also the
14 Goldberg patent. This is well-known technology for
15 accomplishing this.

16 Q. Are there any examples of remote
17 computers that would not satisfy this limitation of a
18 remote computing device?

19 MS. HOEKEL: Object to the form.

20 A. Again, in the context of this patent,
21 there could be, but Goldberg just teaches this remote
22 transmitting of information of these particular

1 parameters.

2 Q. Outside of Goldberg, can you give me
3 an example of a remote computer that would not
4 satisfy this limitation of a remote computing device?

5 MS. HOEKEL: Object to the form.

6 A. Again, I'm taking, I'm talking about
7 the technology. As to specifics, this is what
8 Goldberg discloses and the means for transmitting
9 this information to a remote device so hospital staff
10 can review the information from all patients. And,
11 again, this is pretty much well-known at the time of
12 this invention, and I've seen it implemented in the
13 clinical environment.

14 Q. Can we turn to Paragraph 265?

15 A. Okay.

16 Q. Can you please read this paragraph
17 for me?

18 A. "Money teaches that RF transmitter 21
19 wirelessly transmits physiological measurements,
20 which can include oxygen saturation to a central
21 monitoring station based at least in part on signals
22 received from the pulse oximetry sensor."

1 Q. So in your opinion, Money's central
2 monitoring station satisfies the limitation of, of
3 remote computing device?

4 A. Based on the information disclosed in
5 Money, yes, it, it is a mechanism for transmitting
6 these different physiological measurements, i.e.,
7 oxygen or, for example, oxygen saturation. Again,
8 this is well-known in the art.

9 Q. Are there any central monitoring
10 stations that would not be a separate computing
11 device?

12 MS. HOEKEL: Object to the form.

13 A. Again, looking at this patent and
14 looking at this statement in the context of Money and
15 how I've used Money to teach the use of wireless
16 transmitting. I'm not looking but -- I'm not looking
17 at any other prior art at this point in time. I'm
18 just using Money to show that this mechanism for
19 wireless transmitting these measurements to a central
20 remote area, for example, the ICU unit which has a
21 number of patients.

22 Q. So sitting here today, can you think

1 of any computing devices that would not satisfy the
2 limitation of a separate computing device?

3 MS. HOEKEL: Object to the form.

4 A. Again, in the context of this patent,
5 Money patent, I'm just disclosing what's taught by
6 Money. I haven't discussed any prior art other than
7 Money. That's how he does it in this particular
8 section of the IPR.

9 MS. LAM: So we're approaching end of
10 business on the East Coast, and we would be moving on
11 to the next IPR. We would propose to end here for
12 today and resume on Monday.

13 MS. HOEKEL: That's fine.

14 THE WITNESS: Thank you, Counsel.
15 Have a good weekend.

16 THE TRIAL TECH: So if we are going
17 to go off the record and there are no further
18 statements, stand by while we do that. The time is
19 4:52 p.m. on January 27, 2021. We are going off the
20 record completing today's videotaped session.

21 (Time Noted: 4:52 p.m. EDT)

22

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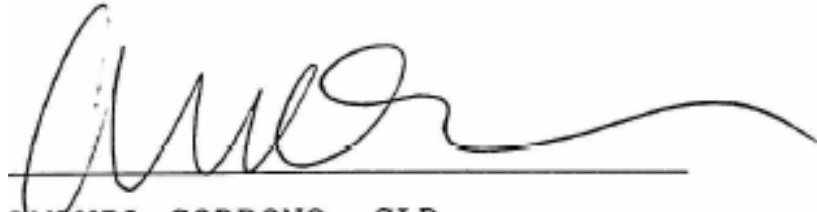
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Case: Sotera Wireless, Inc. v. Masimo Corp.

4 Date of deposition: January 27, 2021

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