

Transcript of Brian Anthony, Ph.D.

Date: July 11, 2024
Case: Alivecor, Inc. -v- Apple, Inc. (PTAB)

Planet Depos
Phone: 888.433.3767
Email: transcripts@planetdepos.com
www.planetdepos.com

WORLDWIDE COURT REPORTING & LITIGATION TECHNOLOGY

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ALIVECOR, INC.,

Petitioner,

v.

APPLE INC.,

Patent Owner

Case No. IPR2023-00948

Case No. IPR2023-00949

U.S. Patent No. 10,866,619 B1

REMOTE DEPOSITION of BRIAN ANTHONY, Ph.D.

Thursday, July 11, 2024

8:01 a.m. CST

Job No.: 544895

Pages: 1 - 178

Reported By: Michelle M. Yohler, CSR, RMR, CRR

The deposition of BRIAN ANTHONY, Ph.D., held remotely pursuant to notice before Michelle M. Yohler, CSR, RMR, CRR, a certified shorthand reporter, CSR No. 84-4531.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
3 of 220

A P P E A R A N C E S

ON BEHALF OF PETITIONER ALIVECORE, INC.:

MR. CHRISTOPHER T.L. DOUGLAS

MR. THOMAS FINCH

MR. J. RAVINDRA FERNANDO

ALSTON & BIRD LLP

1120 South Tryon Street, Suite 300

Charlotte, North Carolina 28203-6818

704.444.1000

christopher.douglas@alston.com

ON BEHALF OF PATENT OWNER APPLE INC. and THE DEPONENT:

MR. MICHAEL A. AMON

MR. RYAN CHOWDHURY

FISH & RICHARDSON

12860 El Camino Real, Suite 400

San Diego, California 92130

858.678.5070

amon@fr.com

(Continued)

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
4 of 220

A P P E A R A N C E S C O N T I N U E D

ALSO PRESENT:

Ms. Briana Sample, Technician

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
5 of 220

E X A M I N A T I O N S

WITNESS		PAGE
BRIAN ANTHONY, PH.D.		
	By Mr. Douglas.....	6
	By Mr. Amon.....	168

E X H I B I T S

EXHIBITS REFERENCED		PAGE
No. 2009	Declaration of Brian W. Anthony in IPR2023-00948.....	13
No. 2009	Declaration of Brian W. Anthony in IPR2023-00949.....	14
No. 1001	'619 Patent.....	18
No. 1004	'828 Patent.....	19
No. 1005	Jung - Patent Publication No. 16/0100499.....	20
No. 1007	Myers - Patent Publication No. 2015/0071509.....	20
No. 1015	'910 Patent.....	21

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
6 of 220

P R O C E E D I N G S

(Technician read-on.)

MS. REPORTER: Before I swear the witness in, can I please have all attorneys identify themselves and who they represent for the record.

MR. DOUGLAS: Hi. Good morning. My name is Christopher Douglas of Alston & Bird, and I represent petitioner, AliveCor. With me today are Ravi Fernando and Thomas Finch, also of Alston & Bird.

MR. AMON: And my name is Mike Amon of Fish & Richardson PC. With me here is Ryan Chowdhury, also of Fish, and we are here on behalf of patent owner, Apple, Inc., and the witness, Dr. Brian Anthony.

(WHEREUPON, the witness was duly sworn.)

BRIAN ANTHONY, Ph.D.,

called as a witness herein, having been first duly sworn, was examined and testified as follows:

EXAMINATION

BY MR. DOUGLAS:

Q Good morning, Dr. Anthony.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
7 of 220

A Good morning.

Q My name is Christopher Douglas. I'm with Alston & Bird, and you and I will spend a little bit of today together. Thank you for joining.

MR. DOUGLAS: Before we get started, just as a matter of housekeeping, I wanted to note for the record that the parties have agreed to take this deposition remotely over video, and so all parties have agreed to be in physically different locations, including the court reporter.

BY MR. DOUGLAS:

Q Dr. Anthony, can you state your full name and address for the record.

A Brian W. Anthony, and my work address, 77 Mass Avenue, Building 35, 132 Cambridge, Massachusetts.

Q Thank you.

And, Dr. Anthony, have you ever had your deposition taken before?

A Yes, I have.

Q And about how many times have you had your deposition taken, Dr. Anthony?

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
8 of 220

A I'd say about eight, ten, on that order.
Q Dr. Anthony, were any of those eight to ten, roughly, depositions in patent cases?
A Yes.
Q Roughly how many of those eight to ten depositions were in patent cases?
A I think all of them.
Q Now, of those roughly eight to ten depositions, were any of those in an inter partes review proceeding before the Patent Trial and Appeal Board like this one?
A Yes.
Q And roughly how many of the eight to ten depositions that you've gone through were part of inter partes review proceedings?
A I'd say all of them, most of them.
Q And what was the most recent case you were deposed in?
A The most recent one would have been, let's see, a couple months ago. I forget the patent number, but -- I don't remember the patent number what it was for.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
9 of 220

Q Fair enough.

And do you recall who you represented in -- or who you were retained by in that most recent deposition?

A That was Apple.

Q Okay. And do you recall the opposing party in that prior deposition?

A That would have been Masimo.

Q And do you recall whether Apple, in your prior deposition, was the petitioner or the patent owner?

A It would have been the patent owner.

Q And are you aware, Dr. Anthony, of the outcome of that matter?

A I am not.

Q Understood.

And looking back at roughly the last eight to ten depositions, do you remember about how many of those cases you represented the patent owner as you did in your most recent case?

A I'd say a quarter of them.

Q So it sounds like, Dr. Anthony, that

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
10 of 220

you -- prior to this particular case in which you're here on behalf of Apple, you've worked with Apple in the past?

A I have, yes.

Q And in what capacity have you worked with Apple in the past?

A On -- as we were just discussing, on these -- similar proceedings to this.

Q And have you worked with Apple in any other ways outside of as an expert witness in patent proceedings?

A No.

Q And do you have any ongoing interest in Apple?

A Other than my iPhone, no.

Q Fair enough. Fair enough.

Well, Dr. Anthony, it sounds like you're experienced in the deposition process, but just to go over a few ground rules, I'm going to be asking you questions today, and you are under oath to answer them truthfully and to the best of your ability.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
11 of 220

Do you understand that?

A Yes.

Q And we have a court reporter today. And although the court reporter is not physically in the room with us, let's please make sure that you respond verbally, so no head shakes and "uh-huhs" so the court reporter can accurately transcribe your answers.

Fair enough?

A Understood.

Q And also for the sake of the court reporter, let's try not to talk at the same time. I know that's going to be hard to do over video, but I'll do my best to make sure you're completely finished talking before I start talking, and I ask that you wait until I completely finish my questions before you start answering.

Is that fair enough?

A Yes.

Q And if you do not understand one of my questions, please let me know. But if you give me an answer, I will assume that you understood the

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
12 of 220

question.

Is that fair?

A Yes.

Q And, finally, we'll take breaks roughly every hour, but at any point feel free to request a break. I only ask that if there's a question pending, that you answer that question before we take a break.

Is that fair enough?

A Yes.

Q Excellent.

And so just another matter of housekeeping, Dr. Anthony, do you have any materials with you today?

A Yes, I did print out a clean copy of my declaration and of the primary references.

Q Excellent.

And we'll also put in the chat a download site to the extent that you'd like to download any of the exhibits. And obviously we'll give you an opportunity to download those if you'd like them, but I understand you do have clean printed copies,

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
13 of 220

and obviously you're welcome to use them.

Just so we're on the same page, you have the declaration that's been marked as Exhibit 2009 or Apple 2009 in the -- in IPR2023-00948?

A Correct.

Q Would you --

A Just to add, I will -- sometimes it's easier for me to read on paper, and sometimes it's easier to read on digital, so I do appreciate the ability to download. So thank you.

Q And we'll get that download link up for you here in a moment.

Sticking with the declaration in the 00948 matter that's been marked as Apple 2009 that I believe you have in front of you, Dr. Anthony, looking at Page 1, do you see your signature?

A Yes.

Q And that is your signature on Page 1?

A Yes.

Q And it's dated April 24th, 2024; is that correct?

A Correct, 4/24.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
14 of 220

Q Yeah. And my copy, Dr. Anthony, has 119 pages, as marked in the bottom middle ending with a section titled "Previous Postdocs."

Do you see that?

A Yes. Noting, however, I did not print out my CV, so my paper stops at 94.

Q Okay. And then on your last page, paragraph -- I'm sorry, Page 94 do you see Paragraphs 150 and 151 under a heading "Conclusion"?

A Yes.

Q And, Dr. Anthony, you also submitted a declaration that's also marked Exhibit 2009 in IPR2023-00949; is that correct?

A Correct.

Q And do you have a paper copy of that declaration in front of you today?

A Yes.

Q Excellent.

And turning to that declaration, Page 1, I see your signature in the, roughly, bottom right corner.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
15 of 220

Do you see that?
A Yes.
Q And that is your signature, Dr. Anthony?
A Yes.
Q And it's dated 4/24/2024; do you see that?
A Yes.
MR. AMON: Mr. Douglas, sorry to interrupt. I clicked on the link for the download site, and either nothing is there yet, or it doesn't seem to be connected, one of the two. I don't know.
MR. DOUGLAS: I just clicked on it and it popped up. Do you want to try to hit "refresh"?
MR. AMON: Sure.
MR. DOUGLAS: My apologies.
THE WITNESS: I just clicked on it. I see 43 items.
MR. DOUGLAS: Okay.
MR. AMON: Okay. It came up now. Thank you. Sorry. I didn't mean to interrupt.
BY MR. DOUGLAS:
Q And since we're there, Dr. Anthony, these

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
16 of 220

are, you know, a set of documents from IPR2023-000948, and they're marked by exhibit numbers. So you'll see your declaration -- at least on my screen it's in the bottom row second-to-last item. So obviously please feel free to download that or all the documents.

And then we also included, right next to it you'll see -- starting with the prefix IPR2023-00949, you'll see your declaration. In an --

A I'm downloading -- I'm downloading them now.

Q Okay. Excellent.

Just to make sure we're on the same page, looking at your declaration, the electronic copy that you just downloaded, which has been marked as Exhibit 2009 in IPR2023-00948, did you receive a PDF that is -- that ends on Page 119, and on Page 119 it has the header "Previous Postdocs" being the end of your CV?

A Yes. 119, and the last line is "University Waterloo."

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
17 of 220

Q And then looking at Exhibit 2009 -- the electronic version of Exhibit 2009 in IPR2023-00949, you should have received a PDF that is 114 pages long, or ends with Page 114, again with the section "Previous Postdocs" ending with "University of Waterloo."

Do you see that?

A Yes. 114 pages, yes.

Q And, to the best of your knowledge as you sit here right now, Dr. Anthony, do Exhibit 2009, your declaration in the 948 IPR, and Exhibit 2009, your declaration in the 949 IPR, appear to be complete and the versions that you submitted in these matters?

A Yes, scrolling through it quickly, they appear to be identical to the clean copies that I received in counsel.

Q Excellent.

And certainly let us know if you see any issues, but it is our understanding that those are the ones that were served on us as well?

Dr. Anthony, we're here to talk about two

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
18 of 220

IPRs today, IPR2023-00948 and IPR2023-00949, correct?

A Yes.

Q And to make our lives easier, will you understand when I refer to "the 948 IPR," I'm talking about IPR2023-00948?

A Yes.

Q And will you understand when I refer to "the 949 IPR," I'm talking about IPR2023-00949?

A Yes.

Q And, Dr. Anthony, do you understand that U.S. Patent No. 10,866,619 is at issue in both the 948 and 949 IPRs?

A Yes. And I also have a printout of that.

Q Excellent.

And, Dr. Anthony, do you understand that U.S. Patent No. 10,866,619 has been marked as Exhibit 1001 in both the 948 and 949 IPRs?

A Yes.

Q And so will you understand when I'm referring to the '619 patent, or Exhibit 1001, that I'm referring to U.S. Patent No. 10,866,619?

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
19 of 220

A Yes.

Q Dr. Anthony, are you familiar with a reference referred to in these proceedings as the Kim reference?

A Kim reference, I believe you're referring to the exhibit that's marked as 1004.

Q That's right. And my apologies. Kim Exhibit 1004, U.S. Patent No. 10,620,828, correct?

A Yes.

Q And, Dr. Anthony, you're aware that the Kim reference has been marked as Exhibit 1004 in both the 948 and 949 proceedings, correct?

A Yes. In the download, it's listed once, but yes.

Q And we're happy to provide you the copy that was filed in the 949 as well if you would like it.

A It's identical to my understanding.

Q And, Dr. Anthony, when I refer to "the Kim reference," will you understand that I'm referring to Exhibit 1004, U.S. Patent No. 10,620,828?

A Yes.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
20 of 220

Q And, Dr. Anthony, are you familiar with U.S. Patent Publication No. 16/0100499 that's been marked as Exhibit 1005 in this proceeding?

A That is the Jung patent, yes.

Q And Exhibit 1005, the Jung reference, is relied on in both the 948 and 949 IPRs, correct?

A Correct.

Q And when I refer to "Jung" today, will you understand that I'm referring to Exhibit 1005, U.S. Patent Publication No. 2016/0100499?

A Yes.

Q Dr. Anthony, are you familiar with Exhibit 1007, which is U.S. Patent Publication No. 2015/0071509?

A Yes, that's Myers.

Q And Exhibit 1007, which we refer to as "Myers," is relied on in both the 948 and 949 proceedings, correct?

A Yes.

Q And when I refer to "Myers" today, you'll understand that I'm referring to Exhibit 1007, U.S. Publication No. 2015/0071509, correct?

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
21 of 220

A Yes.

Q And, Dr. Anthony, are you familiar with Exhibit 1015, which is U.S. Patent No. 10,133,910?

A Yes, that's the Chang reference.

Q And the Chang reference, Exhibit 1015, has been relied on in both the 948 and 949 proceedings, correct?

A Yes. Correct.

Q And you'll understand that when I rely -- when I -- strike that.

And you'll understand when I reference "the Chang reference," I'm referencing Exhibit 1015, U.S. Patent No. 10,133,910?

A Yes.

Q Dr. Anthony, do you understand why you're here today?

A Yes.

Q And why is that?

A To be deposed on my declaration.

Q And that's your declarations in both the 948 and 949 matter, correct?

A Correct.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
22 of 220

Q And for the purposes of the record, will you describe your preparations for today's deposition.

A I reviewed my declaration, the primary references that we discussed, and also had conversations with counsel.

Q And about how long did you spend preparing for today's deposition?

A I'd say 10, 12 hours reading, reviewing.

Q And, Dr. Anthony, do you remember when you were engaged for this matter?

A Certainly before April of '24. So some number of months before that.

Q And do you recall who engaged you for this matter?

A Counsel Amon and Chowdhury.

Q And you prepared two declarations, correct; one for the 948 matter and one for the 949 matter?

A Correct.

Q Will you describe the work that went into preparation of these two declarations.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
23 of 220

MR. AMON: And, Dr. Anthony, I'm going to caution you not to disclose the substance of any conversations that we might have had -- or that you might have had with counsel in preparing declarations, but you can explain the process.

THE WITNESS: Sure.

BY THE WITNESS:

A So I reviewed the -- as I described, I reviewed the patents, the various references that I highlight in Paragraph 12 of -- at least the first declaration, which is the 00948.

I reviewed the conversations with counsel to discuss my opinions and developed my declaration accordingly.

BY MR. DOUGLAS:

Q And, Dr. Anthony, did you write the first draft of your declaration in the 948 matter?

A The declaration is my opinion. I didn't type every single word, but it is -- expresses my opinions on the matter.

Q And, Dr. Anthony, did you write the first draft of the declaration in the 949 matter?

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
24 of 220

A Same thing; this is -- these are my opinions, this is a -- they represent my opinions in the matter.

Q And, Dr. Anthony, were you involved in preparing the documents that have been referred to as the patent owner responses in the 948 and 949 matters?

A I was involved in my declaration.

Q And have you reviewed the patent owner responses that were filed by Apple in the 948 and 949 matters?

A So, as I highlight, you know, the documents I reviewed are on -- in Paragraph 12, the petition, the declaration of Dr. Berger, the patents. You know, those are the materials that I reviewed.

Q And you don't recall reviewing documents called the "Patent Owner Responses" in either the 948 or 949 matters?

A No.

Q As we've already talked about a few times, Dr. Anthony, both of your declarations that we're

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
25 of 220

here to talk about today relate to the '619 patent, correct?

A Correct.

Q And your first declaration, the declaration in the 00948 matter, deals with claims 1 through 10 of the '619 patent, correct?

A That is correct.

Q And your second declaration, Exhibit 2009 in the 949 matter, deals with claims 11 through 20 of the '619 patent, correct?

A Correct.

Q And so in preparation for this deposition and your declaration, you reviewed claims 1 through 20 of the '619 patent, correct?

A I offer opinions on claims 1 through -- or 1 and -- only 1 and 4 in the first and 10 and -- or -- yeah, 11 and -- 10 and 16 -- 11 and 16 in the second one. I reviewed everything, but my opinions are predominantly on those four claims.

Q And, just to be clear for the record, have you reviewed all of claims 1 through 20 of the '619 patent?

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
26 of 220

A I reviewed the '619 patent and all the references that I highlighted earlier.

Q Dr. Anthony, do you recall providing any constructions or claim interpretations for any terms in the claims of the '619 patent?

And your section on claim interpretation starts on Page 20 in the -- I'm sorry -- Page 20 in at least the 00948 declaration, Exhibit 2009.

A So as I describe starting on Paragraph 25 of the first declaration, 948, there was a declaration put forth by -- or a construction put forth by AliveCor on biometric characteristic.

It's my opinion that construction, it was proposed as not correct, so I address it in Paragraphs 27, 28, 29, and 30. Specifically highlighting that -- a POSITA, in Paragraph 30, would have been able to interpret the claim language to understand the biometric sensor is determining a bio -- includes determining a biometric characteristic including such things as heart rate.

Q And just to take a big step back,

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
27 of 220

Dr. Anthony, I think we both have referred to the declaration Exhibit 2009 in the 948 matter as the first declaration. Would it be fair if we just continue to refer to the 948 declaration as the first declaration?

A Yes, please.

Q Okay. Excellent. Excellent.

And so turning to Paragraph 30 of your first declaration, you state that a biometric characteristic is a measurement of absolute capacitance or capacitance change, correct?

A Well, the fuller context is that Paragraph 30, after the following paragraphs, where the -- in Paragraph 28: The '619 patent includes examples of biometric sensor which senses the biometric character -- characteristic that includes a sensor that can identify and determine a physical -- a human physical characteristic, such as fingerprint, palm veins, DNA heart rate, and blood pressure.

In my opinion, heart rate and blood pressure are embodiments of characteristics that

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
28 of 220

are not included in the AliveCor construction and that they are not sufficiently distinctive to enable identification of a particular human individual.

And then I go on in 29: Based on my review, there's no statements in the '619 patent that would have led a POSITA to understand that a biometric characteristic should be understood to exclude embodiments such as heart rate and blood pressure.

And then, finally, in Paragraph 30: As described in claim 1, a biometric sensor is configured to produce an output signal (corresponding to a biometric characteristic) in response to a touch on the input surface.

And a POSITA would have been able to interpret that claim language to understand that it includes embodiments of the biometric sensor where an input i.e. -- (e.g. a touch, a press, or the like) occurs, and a measure of the input includes the measurement of the absolute capacitance or capacitance change in order to

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
29 of 220

determine, for example, a biometric characteristic of heart rate.

Q Dr. Anthony, do you provide your own construction of the term "biometric characteristic" as is used in the claims of the '619 patent?

A I respond to the construction here and don't provide any further construction on what a POSITA would understand, for example, heart rate and blood pressure to include -- be included in things that are biometric characteristics.

Q And so in your view, Dr. Anthony, the Patent Trial and Appeal Board should construe "biometric characteristic" as having its ordinary and customary meaning to a POSITA at the time of the invention, correct?

A And in context of the claims in the specification of the '619 patent.

Q So turning back to Paragraph 30 of your first declaration, you discuss measurements of absolute capacitance or capacitance change; do you see that?

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
30 of 220

A Yes.

Q And, in your opinion, what kind of sensor are capable of measuring an absolute capacitance or capacitance change?

MR. AMON: Objection. Outside the scope. Speculation.

But you can go ahead and answer, Dr. Anthony.

BY THE WITNESS:

A So referring to the full paragraph from the '619 patent, column 4, for example, first on line 35: A capacitive touch sensor is configured to detect an input to the input -- to the button input member.

And then going down the same column, 4, line 51: The biometric sensor may sense a biometric characteristic. The biometric sensor maybe be implemented in any of several configurations; including, for example, a capacitive sensor that can be used to identify a fingerprint.

Biometric sensor as used herein can be

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
31 of 220

referred to a sensor that can identify and determine a human physical characteristic. The sensed human physical characteristics may vary widely, but may include fingerprint, palm veins, DNA, heart rate, and blood pressure.

A capacitive biometric sensor may sense fingerprint characteristics of a touch sensor that may be used to provide fingerprint identification of the user, in addition to providing an output that corresponds to the biometric characteristic.

The output of the biometric sensor may indicate whether a touch or press occurs, approximate location, measure of the input, measurement of absolute capacitance, or a capacitance change.

So a capacitive sensor can be used to measure the capacitance as described in the '619 patent.

Q Looking at the '619 patent, column 15, the paragraph starting at line 39, you'll see that the second sentence that starts around line 41 says, "The sensor 330 may include one or more of the

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
32 of 220

biometric sensor types discussed above to include capacitive, optical, and ultrasonic."

Do you see that?

A Yes.

Q And the '619 patent describes at least capacitive, optical, and ultrasonic sensor types, correct?

A As highlighted there, it describes at least a capacitive, optical, and ultrasonic, yes.

Q And I believe we talked about capacitive fingerprint sensors in column 4 just a moment ago, but are you familiar with optical and ultrasonic sensors, Dr. Anthony?

A There's many types of sensors, yes, I'm familiar with many types of sensors including those.

Q And so looking at column 15, lines 41 through 43, and also looking at Paragraph 30 of your first declaration, would an optical sensor include a measurement of absolute capacitance or a capacitance change in your opinion?

A I didn't mean to specifically opine about

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
33 of 220

whether there were an optical sensor that could be used to ascertain capacitive properties, but it -- a person of ordinary skill in the art reading this would understand that capacitive optical and ultrasonic sensors are discussed.

Various sensors can be used to measure various properties. I didn't need to opine specifically about variance of how capacitive changes would be measured.

Q And, as you sit here today, do you know whether an optical sensor is capable of measuring absolute capacitance or capacitance change as you described it in Paragraph 30 of your declaration?

MR. AMON: Objection. Vague. Outside the scope.

You can go ahead and answer, Dr. Anthony.

BY THE WITNESS:

A As I described, I didn't need to form an opinion as to the multiple ways that a -- different sensors could be used, but in the infinite realm of possibilities, could there be an optical technique that would measure the

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
34 of 220

deflection of a plate that would correspond to the deformation of an electrical charge? Sure.

But that's, you know, just -- there are multiple techniques to measure multiple things, but I didn't need to form an opinion about that in particular for this -- for my opinions here.

BY MR. DOUGLAS:

Q And understanding that there are infinite -- infinite possibilities referring to the optical sensor disclosed in the '619 patent, do you have an opinion as to whether that optical sensor is capable of measuring absolute capacitance or capacitance change as you use it in Paragraph 30 of your declaration?

A I think I did answer that, but I didn't need to opine specifically of the multiple techniques.

Certainly a capacitative sensor and -- you know, are there multiple techniques to combine optical and ultrasonic and capacitive techniques to measure multiple parameters, yes, but clearly here, the biometric sensor can measure input

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
35 of 220

including a measurement of absolute capacitance or capacitance change to determine, for example, a biometric characteristic of heart rate.

Q And referring to the ultrasonic sensor that's disclosed in column 15, lines 41 through 43 of the '619 patent, do you have an opinion as to whether that ultrasonic sensor is capable of a measurement of absolute capacitance or capacitance change as you used it in Paragraph 30 of your declaration -- of your first declaration?

A Again, I didn't need to opine of the multiple ways that different sensors can be used, but I highlight in what I describe in Paragraph 30 that includes a measurement of absolute change -- absolute capacitance or capacitance change to determine ultimately a biometric characteristic of heart rate.

So heart rate is -- the capacitance is not the main point, the biometric characteristic such as heart rate is the point. And are there multiple techniques including capacitive and optical and ultrasound, electromagnetic, others,

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
36 of 220

yes, to extract characteristics such as heart rate, yes.

Q Turning back to your first declaration, Paragraph 28, you use two terms: "Biometric characteristic" and "human physical characteristic"; do you see that?

A Let's see. '619 specification includes examples of the biometric sensor, which senses the biometric characteristic that includes the sensor, quote, that can identify or determine the human physical characteristic and, quote, provides an output that corresponds to a biometric characteristic.

Q And as used in the specification of the '619 patent, and in your opinion, do the terms "biometric characteristic" and "human physical characteristic" mean the same thing?

MR. AMON: Objection to the extent it calls for a legal conclusion.

But you can go ahead and answer, Dr. Anthony.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
37 of 220

BY THE WITNESS:

A Well, as described in column -- of the '619 patent, column 4, line 54: Biometric sensor, as used herein, may refer -- may be used to refer to a sensor that can identify or determine a human physical characteristic. The sensed human physical characteristic may vary widely, but may include fingerprint, palm veins, DNA, heart rate, and blood pressure.

And then there's the sentence on: A capacitive biometric sensor may sense fingerprint characteristics that may provide a fingerprint identification.

In addition to providing an output that corresponds to the biometric -- to a biometric characteristic, the output of the biometric sensor may indicate whether an input occurs, an approximate location where the input occurs, and/or the measure of the input.

So a human physical [sic] as described there, a sensor can identify or determine a human physical characteristic and that human physical

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
38 of 220

characteristic may vary widely but can include fingerprint, palm, DNA, heart rate, or blood pressure.

Q In looking at that paragraph at the bottom of column 4 of the '619 patent, lines 51 through 67 that you were just reading from, does the '619 patent use "human physical characteristic" and "biometric characteristic" interchangeably?

MR. AMON: Objection to the extent it calls for a legal conclusion.

But you can go ahead and answer, Dr. Anthony.

BY THE WITNESS:

A So, you know, in searching in the '619, so, "human physical characteristic" shows up in that one location, and a person -- as described here, the sensor can identify or determine a human physical characteristic and that sensed human physical characteristic may vary widely, may include fingerprint, palm veins, DNA, heart rate, and blood pressure.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
39 of 220

The patent mainly describes using a -- just getting the biometric -- biometric characteristic and describes how those biometric characteristics are aspects of a human physical characteristic.

BY MR. DOUGLAS:

Q Does the term "human physical characteristic" as it's used in the '619 patent include characteristics that would not be included in the term "biometric characteristic" as used in the '619 patent?

A I didn't need to opine as to whether a human physical characteristic was a superset or the same set of biometric characteristic. You know, what's described here is a sensor that can measure biometric characteristics including fingerprints, palms, heart rate, blood pressure.

Q And as you sit here today, are you able to tell me whether a human physical characteristic was a superset or the same set of biometric characteristic as you used it in your last answer?

MR. AMON: Objection. Speculation.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
40 of 220

Outside the scope.

But you can go ahead and answer, Dr. Anthony.

BY THE WITNESS:

A I didn't need to opine in forming my opinions as to what the definition of -- broadest definition of a "human physical characteristic" is, but a person reading -- person of skill in the art reading this would understand what is described in a biometric characteristic, including DNA, blood pressure, heart rate as what can be measured.

BY MR. DOUGLAS:

Q So before we started talking about column 4, you'll recall that we were talking about your first declaration, Paragraph 28. And that is part of the section where you're discussing biometric characteristic; do you recall that?

A Yes.

Q And so while -- and in that same section, in Paragraph 27, you cite to Exhibit 1001, column 5, lines 9 through 14; do you see that?

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
41 of 220

A Yes.

Q If you turn with me to column 5, lines 1 through 14 and review that paragraph, please, Dr. Anthony.

A Okay.

Q And in Paragraph 27, when you are describing that paragraph, or at least lines 9 through 14 of the paragraph at the top of column 5 -- strike that.

Looking at lines 9 through 14 of column 5, is it your opinion that biometric characteristic has to be so distinctive and measurable that a particular human individual may be identified?

A Well, as I describe in Paragraph 28, the '619 patent includes examples of biometric sensor which senses the biometric characteristic that includes a sensor that can identify or determine a human physical characteristic and provide an output that corresponds to a biometric characteristic such as fingerprint, palm veins, DNA, heart rate, and blood pressure.

And as I said in Paragraph 28 as I

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
42 of 220

continue in my opinion: Heart rate and blood pressure are embodiments of biometric characteristics that are not included in the AliveCor's proposed construction because they are not sufficiently distinctive to enable identification of a particular human individual.

Q So in the last sentence of Paragraph 28 where you say, "In my opinion, heart rate and blood pressure are embodiments of biometric characteristics are not included"; do you see that? Do you see that sentence?

A Yes.

Q Just so I understand, when you use the term "embodiments of biometric characteristics," what do you mean by that in that sentence in Paragraph 28?

A As I -- as the earlier sentence: Our examples -- as in the earlier sentence, such as -- that include characteristic such as fingerprint, palm veins, DNA, heart rate, and blood pressure.

Q So we can read heart rate and blood pressure as examples of biometric characteristics

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
43 of 220

that are not included in AliveCor's proposed construction, correct?

A I think that's a fair alternative way to say what I've written there.

Q So in turning to Paragraph 30 of your declaration, based on our discussion just now of Paragraph 28, would it be fair to consider a fingerprint to be a biometric characteristic?

A So, again, as I describe in Paragraph 28, a biometric characteristic such as examples including fingerprint, palm veins, DNA, heart rate, and blood pressure.

Q And when a fingerprint is considered a biometric characteristic, as it's used in the claims of the '619 patent, would it also be fair to characterize the biometric sensor of the '619 patent to be a fingerprint sensor?

A I'm sorry. Can you reask the question?

Q Fair enough. Fair enough.

And if we consider a fingerprint to be a biometric characteristic, would it be fair to characterize the biometric sensor in that case to

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
44 of 220

be a fingerprint sensor?

A I would certainly describe it as a biometric sensor that could include measurement of a fingerprint. May it also measure other things, such that I would only describe it as a fingerprint? Maybe, maybe not. But I didn't need to opine specifically on calling something a fingerprint sensor versus a biometric sensor in forming my opinions here.

Q And if you turn to column 1 of the '619 patent.

And I want to start at line 62 where it starts with, "In another aspect," but please feel free to review that entire paragraph or column, whatever you need to, starting at line 41.

A I'm sorry. You said you wanted to focus on which line?

Q Oh, I'm sorry, line 62, please.

A Okay. I've refamiliarized myself with that section.

Q And starting at line 62, the '619 patent provides an example, in fact, for the biometric

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
45 of 220

sensor as a fingerprint sensor, and the biometric characteristic is a fingerprint, correct?

A In line 62: In another aspect, the biometric sensor is a fingerprint sensor and the biometric characteristic is a fingerprint.

In another aspect, the biometric sensor comprises an array of capacitive sensing elements that are configured to detect either or both of the ridges and grooves of a user's finger.

And then, you know, obviously it goes on. And the other place that I would highlight is when it goes up to the detailed description in column 3, for example, at line 63: The embodiments disclosed herein are directed to a button with a biometric sensor, and, for example, the biometric sensor may be a fingerprint sensor.

And so it's -- it includes fingerprint sensor and the other characteristic that we discussed previously.

MR. DOUGLAS: Dr. Anthony, we've been going for about an hour. Would now be a good time for a first break for you?

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
46 of 220

THE WITNESS: Sure. Yeah, that would be great.

MR. DOUGLAS: Ten minutes okay with you?

We can go off the record.

(WHEREUPON, a recess was had.)

BY MR. DOUGLAS:

Q Welcome back, Dr. Anthony.

Before the break, we had just spoken about some disclosure between columns 1 and columns 3 discussing that the biometric sensor may be a fingerprint sensor.

Do you recall that discussion?

A Yes.

Q And we were also discussing your declaration, Paragraphs 27 through 30, where you had some opinions with regard to biometric characteristic; do you recall that?

A Yes.

Q And so to tie all that together, we had talked about biometric sensors, fingerprint sensor, biometric characteristics, and fingerprints.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
47 of 220

And so what I'd like to do is start where we had left off, and I think that was at the bottom of column 3. And we were talking about the biometric sensor being a fingerprint sensor.

Maybe we can take a step back and look at Figure 1 of the '619 patent.

And, just for your reference, Dr. Anthony, Figure 1 is discussed starting at column 4, line 46 of the '619 patent. We had started our discussion a little bit earlier I think at line 51, but I just want you to be aware that the discussion of Figure 1 starts at line 44.

I'll give you a moment if you want to read that section or review it.

A Okay.

Q And when we look at Figure 1 and the corresponding text, column 4, lines 44 through 50, what's been identified as Item 110 is a biometric button assembly in Figure 1; is that correct?

A The biometric button assembly 110, yes.

Q And it's that biometric button assembly 110 that includes an input member 112 and a

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
48 of 220

biometric sensor; is that correct?

A Yes. It may displace into the enclosure 120. It may include an input member 112 and a biometric sensor.

Q Looking at Figure 1, are you able to tell me the shape of biometric button assembly 110?

MR. AMON: Objection to the extent it calls for a legal interpretation.

But you can go ahead and answer, Dr. Anthony.

BY THE WITNESS:

A It's generally an oval button shape with a rectangular cross-section that goes into the -- into the enclosure 120.

BY MR. DOUGLAS:

Q And from the view of Figure 1 and of button 110, are you able to discern the shape of the biometric sensor?

A Well, in the description in column 4 of the start of Figure 1, it describes: The biometric button assembly 110 may displace into the enclosure and may include an input member 112

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
49 of 220

and a biometric sensor.

And then we know, for example, from claim 1 that the biometric sensor is positioned below the input member of the -- of the button assembly.

Q If you'll turn with me, Dr. Anthony, to Figure 2A as an example or Figure 2B or both, I'd appreciate it.

A Okay.

Q And the description that I'd like to look at for Figure 2A, for example, starts at column 8, line 60, but I'll note that the full description of Figures 2A and 2B start at column 8, line 14.

If you'd be so kind as to review that section, I would appreciate it.

A I missed what -- part of what you said. I heard starts at line 60 in column 8, but I missed what you said after that.

Q My apologies. I was just letting you know that the full description of Figures 2A and 2B start at line 14 of column 8. I wanted to give you an opportunity to review that full section.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
50 of 220

A Okay.

Q And in reviewing Figure 2A and the corresponding text of column 8 starting at line 60, a biometric sensor is marked as Item 230, correct?

A Correct.

Q And looking at Figure 2A, Dr. Anthony, and Item 230, are you able to discern the shape of the biometric sensor?

MR. AMON: Objection to the extent it calls for a legal conclusion. Speculation.

But you can go ahead and answer, Dr. Anthony.

BY THE WITNESS:

A Well, interpreting, you know, Figure 2A and 2B refer back to the slices through the button assembly on Figure 1. Figure A is the -- along the short axis. And at least across that cross-sectional slice as drawn in the figure, it has a generally rectangular shape.

And then the cross-section slice along the long axis of the sidewall is shown in Figure 2B,

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
51 of 220

and that generally has a rectangular shape through that slice as well.

BY MR. DOUGLAS:

Q Dr. Anthony, just to try to make sure we're on the same page, I believe -- and I'm looking now at column 3, starting at line 5, it was my understanding that Figure 2B was the cross-section view of the electronic device of 2A with the button assembly in a second or depressed state.

And so would it be the case that we are looking at the same slice in both Figure 2A and 2B?

MR. AMON: Objection to the extent it calls for a legal conclusion.

You can go ahead and answer.

BY THE WITNESS:

A You are correct. I misstated. So it's described on lines -- column 8, line 16, Figures 2A and B are cross-sections disposed in an opening taken along Section A-A of Figure 1. And in the -- first in the underpressed state and then

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
52 of 220

in the pressed state.

BY MR. DOUGLAS:

Q Thank you for that, Dr. Anthony. I know there's a lot of slices. I was going to ask you next to look at Figures 4A and 4B, which, if you look in that same top of column 3, I believe are talking about that slice B-B that you had told me about just a little bit before.

If you see that?

A So in column -- column, yeah, 19 describes Figure 4.

Q Yes. Starting at -- column 19 starting at line 58.

A Yeah.

Q And so looking, Dr. Anthony, at Figure 4B, 4B includes a biometric sensor 430, correct?

A Yes. Biometric sensor 430 produces an output signal in response to a user touch, yes.

Q And I'm looking at Figure 4B, Dr. Anthony. Are you able to discern the shape of the biometric sensor?

MR. AMON: Objection to the extent it

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
53 of 220

calls for a legal conclusion. Speculation.

But you can go ahead and answer.

BY THE WITNESS:

A Referring to column -- at least column 22, lines -- line 59: With attention to Figure 4B, more detail of the biometric sensing assembly 410 is provided. The biometric sensor 430 is depicted with components of sensing elements 408, which is the hashed rectangular shape that's drawn there.

The sensing elements 408 -- sorry. The biometric sensor 430 is depicted with components of sensing elements 408 and sensor die 411.

And the sensing elements 408 are the active sensing components of a particular biometric sensor 430.

So, as drawn there in the slice, at least in 4B -- and 4B is indeed the slice -- the B-B slice from Figure 1, at least as depicted there, it has a generally rectangular shape through that slice.

Q To continue our discussion, Dr. Anthony, about biometric characteristics as used in the

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
54 of 220

'619 patent and as you talk about them in Paragraphs 27 through 30 of your first declaration, I'd like to look at column 10 of the '619 patent starting at line 15.

If you would review that paragraph and let me know when you have done so.

A Column 10, line, sorry, 15?

Q Yes, please.

A Okay.

Q And in column 10, line 15, starting with the first sentence, the '619 patent provides an example where a fingerprint is used to provide user authentication, correct?

A Sorry. You broke up there for a second. I did not understand your question.

Q Thank you.

And in column 10, line 15, starting with the first sentence, the '619 patent provides an example where a fingerprint is used to provide user authentication, correct?

A Starting on line 1 of column 10: The biometric sensor may be any type of biometric

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
55 of 220

sensor that provides a signal associated with a biometric characteristic of a user based on user action with the input service.

And, for example, the sensor may be a sensor that detects or can be used to identify a fingerprint biometric.

Q And that fingerprint can be used for user authentication, correct?

A It goes on: The fingerprint biometric may be obtained by any means known to the art to include, without limitation, a capacitive fingerprint sensor and ultrasonic fingerprint sensor, an optical fingerprint sensor.

In one embodiment, the biometric sensor is a capacitive system which detects differences in capacitance. Capacitor sensing area may sense or measure such a change.

And starting at line 15: The biometric characteristic such as a fingerprint may be used for any of several purposes such as to provide a user authentication.

Q And it continues that the user

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
56 of 220

authentication may be used to unlock the electronic device, authorize a transaction, or to send an alert, correct?

A Correct.

Q And then at line -- starting column 10, line 20, the '619 patent talks about the biometric button assembly.

Do you see that?

A Line 20 of column 10: A biometric button assembly may be configured, for example, as a power button, a key of a keyboard, a control button, e.g. volume control, a home button, a watch crown, and so on.

Q And so the '619 patent in that sentence you just read starting at column 10, line 20, suggests that a biometric button assembly can be a power button, correct?

MR. AMON: Objection. The document reads what it reads. And objection to the extent it calls for a legal conclusion.

You can go ahead, Doctor.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
57 of 220

BY THE WITNESS:

A So as described there, a biometric button assembly may be configured, for example, as a power button, a key of a keyboard, a control button, a home button, a watch crown, and so on.

BY MR. DOUGLAS:

Q And at the end of that sentence that you just read, Dr. Anthony, where it says, "and so on," do you see that?

A Yep.

Q And, as you sit here today, do you have an opinion of what the '619 meant by "and so on" at the end of that sentence starting at column 10, line 20?

A Forming my opinions I didn't need to opine specifically on what the "so on" would be, but a POSITA reading the '619 would certainly know that, you know, there are examples of power buttons, keys of keyboard buttons, home buttons, watch crowns, and so on meaning other button type things.

Q And so in reading column 10, starting at

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
58 of 220

line 20, would a POSITA have understood that the '619 patent was suggesting that its biometric button assembly was interchangeable and usable as any of those example buttons enumerated in column 10?

MR. AMON: Objection to the extent it calls for a legal conclusion.

But you can go ahead, Doctor.

BY THE WITNESS:

A What's described there is not interchangeability. It's described there: A biometric button assembly may be configured, for example as a power button, a key of a keyboard, a control button, a home button, a watch crown.

BY MR. DOUGLAS:

Q Does the '619 patent discuss any manufacturing changes or challenges to allow these different configurations that are shown at column 10, lines 20 through 23?

A In forming my opinions, I didn't need to opine specifically about the different manufacturing decisions that would go into forming

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
59 of 220

those different configurations, but a POSITA would certainly understand that different configurations may require different manufacturing processing steps.

Q And a POSITA would understand how to incorporate those different configurations and different manufacturing steps to implement those different buttons in column 10, lines 20 through 23, correct?

A I'm sorry. Can you reask -- restate the question?

Q Yes. Absolutely.

In your prior answer, you said a POSITA would certainly understand that different configurations may require different manufacturing process steps. And so my question, Dr. Anthony, is would a POSITA know the different manufacturing processing steps that would be needed to implement the buttons described in column 10, line 20 through line 23?

A So, again, I didn't need to opine upon the particular processing steps that a POSITA would

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
60 of 220

use, but a POSITA would know the different configurations, different embodiments for the different uses would require different processing steps, and a POSITA would be familiar with different processing steps to accomplish such.

Q And just to refresh our recollection, at column 10, line 20 through 23, the '619 patent discloses that a watch crown could take the form of a biometric button assembly, correct?

A As described there, the biometric button may be configured, for example, as a power button, a key of a keyboard, control button, home button, watch crown, and so on.

Q So then turning back to Figure 1 of the '619 patent, Dr. Anthony -- and just so I can understand what the '619 patent was talking about there in column 10, line 20 -- strike that.

Looking at Figure 1, do you see Item 102?

A Yes.

Q And do you understand that Item 102 in Figure 1 is referred to as a "watch crown"?

And the portion of the '619 patent

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
61 of 220

describing Figure 1 and 102 is at column 5, line 61, if you'd like to reference the text.

A So column 7, starting at line 26 as shown in Figure 1: The electronic device 100 also includes a crown 102 -- 102 that receives inputs from user. In one embodiment, the watch crown 102 is configured to rotate about an axis and translate along the axis in response to manipulation.

And then it goes on to describe: The watch crown in this particular embodiment may further include a switch, such as a dome switch to provide tactile response to translation of the watch crown.

Q And --

A And this previously --

Q I'm sorry, Doctor.

A I was just going to continue reading from that paragraph.

Q And so with the understanding that Figure 1, 102 is a watch crown, would a POSITA, when they're reading the section that we are

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
62 of 220

studying, column 10, line 20, would a POSITA reading column 10, line 20, understand that the watch crown 102 could take the form of a biometric button assembly?

MR. AMON: Objection. Vague.

But you can go ahead and answer, Dr. Anthony.

BY THE WITNESS:

A So, as described, for example, in column 6, line 37: Elements of the button assembly 110 may be integrated with other components of an electronic device; for example, a biometric sensor may be integrated with the rotatable watch crown 102 of a watch and such an embodiment a surface of a watch crown may provide an input surface for a biometric sensor of the button assembly while the watch crown 102 maintains an ability to rotate.

In some embodiments, the button assembly 110 may be positioned on a different portion of the electronic device.

And then continuing, skipping, and going

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
63 of 220

over, for example, to column 7, line 26: As shown in Figure 1, the electronic device also includes a crown 102 that receives input from a user.

In one embodiment, the watch crown 102 is configured to rotate about an axis. Along the axis, in response to manipulation the watch crown may further include a switch -- switch such as a dome switch to provide a tactile response to translation of the watch crown.

As mentioned previously, elements or components of the biometric button assembly may be integrated with the watch crown 102, such that the watch crown has some or all of the characteristics of the biometric button assemblies described herein.

Q Thank you.

And turning back to Figure 1 of the '619 patent and watch crown 102, in this example shown in Figure 1, Dr. Anthony, are you able to tell me the shape of watch crown 102?

MR. AMON: Objection to the extent it calls for a legal conclusion.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
64 of 220

But you can go ahead and answer, Doctor.

BY THE WITNESS:

A As drawn there in Figure 1, the watch crown 102 has a -- appears to have a circular face, and it's a generally cylindrical shape.

BY MR. DOUGLAS:

Q And I believe some time ago we spoke about the shape of the biometric button assembly 110; do you remember that discussion, as shown in Figure 1?

A Yes.

Q And would you agree with me that the shape of the button assembly 110 shown in Figure 1 is an asymmetric shape?

MR. AMON: Objection. Vague.

Go ahead, Doctor.

BY THE WITNESS:

A It is not circularly symmetric. It has symmetry about the -- for example, it appears to have symmetry about the A slice and B slice, but it is not circularly symmetric, so it has some asymmetry to it.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
65 of 220

BY MR. DOUGLAS:

Q And, in your opinion, would a button assembly that has an asymmetric shape to it be sufficient to capture fingerprint information from a single-touch input?

A So at least as I describe in Paragraph 66 of my declaration, the first declaration on Page 42: Fingerprint sensor assemblies with asymmetrically shaped contact surfaces are often unable to capture enough information from a single touch input to accurately detect or recognize a fingerprint input.

A POSITA would have recognized that such a fingerprint sensor assembly requires mechanical dynamic gesture input, swiping, fingerprint motion to enable a sufficiently large finger pad area for a sufficient fingerprint detection and/or recognition accuracy.

And I go on to describe one example of such a fingerprint assembly in pi Apple 2006.

Q So is it your opinion then that when we're looking at the button 110 in Figure 1 of the

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
66 of 220

'619 patent, that button 110 would be unable to capture enough information from a single touch input to accurately detect and/or recognize a fingerprint input as you state in Paragraph 66 of your declaration?

MR. AMON: Objection. Mischaracterizes testimony.

You can go ahead, Dr. Anthony.

BY THE WITNESS:

A So part of the inventiveness of the '619 patent is the ability to capture a sufficient level of accuracy. And what I'm highlighting there is prior to this, it was -- it's complex to do so with a single small asymmetric button.

BY MR. DOUGLAS:

Q And so button 110 as shown in Figure 1 of the '619 patent is able to capture enough information from a single touch input to accurately detect and/or recognize a fingerprint input?

A As is described throughout the patent, the button assembly, such as in Figure 1, it has the

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
67 of 220

ability to capture a biometric including a fingerprint.

Q Dr. Anthony, are you able to identify a component or components of button 110 in the '619 patent that enable button 110 to capture enough information from a single touch input to accurately detect and/or recognize a fingerprint input?

A So, for example, in column 15, line 62: If a fine array of capacitive sensors were positioned within the sensor die -- specifically the fine array were positioned within the sensor die to form the sensing elements, the differences in distance to a ridge of a fingerprint and channels between ridges of a fingerprint could be detected. A collection of such capacitive measures allows a fingerprint to be constructed.

So '619 discloses the need for the fine array that helps to capture sufficient detail of the fingerprint.

Q And in column 15, line 62, is the '619 talking about a single capacitive fingerprint

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
68 of 220

sensor?

MR. AMON: Objection to the extent it calls for a legal conclusion.

You can go ahead and answer, Dr. Anthony.

BY THE WITNESS:

A So the sensor die is the sensor. It happens to be an array. A fine array of capacitive sensor, similar to a -- parenthetically like a CCD, a charge coupled display, so an array is the sensor.

The sensor die that forms the sensing elements.

And then the differences in the distance to a ridge of a fingerprint channel between the ridges of the fingerprint could be detected.

BY MR. DOUGLAS:

Q In looking at column 15, the paragraph you're reading from I believe starts at line 52, does the '619 require multiple sensor dies in order to detect a fingerprint?

MR. AMON: Objection. Asked and answered. And objection to the extent it calls for a legal

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
69 of 220

conclusion.

Go ahead, Doctor.

BY THE WITNESS:

A So I would also -- I would go back to column 15, but also highlight in column 10, line 37: In one embodiment, the biometric sensor is a capacitive-based sensor array of a set or group of capacitors. In one embodiment, the biometric sensor is capacitive-based sensor an array -- there's a redundant sentence in the patent.

In one embodiment, the array, or matrix, of capacitive-based sensor is fine enough to decipher the ridges and grooves of a human fingerprint. Each capacitive sensor element of the array of capacitive sensing elements measures the capacitance between the sensor element and a portion of a user finger near or touching the input surface. The differences in distance to the ridges and channels between the ridges of a fingerprint that may be used to produce a fingerprint.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
70 of 220

So the biometric sensor is a capacitive-based sensor array, for example, in this particular embodiment.

BY MR. DOUGLAS:

Q Turning back to Figure 1 and looking at button 110, is it your opinion that the contact surface of button 110 has an access that is smaller than a finger pad?

MR. AMON: Objection. Speculation. And objection to the extent it calls for a legal conclusion.

You can go ahead, Dr. Anthony.

BY THE WITNESS:

A There are no dimensions drawn on the figure, but depending on the size of the finger and the size of the -- it's possible that it would be smaller than or the same size as, depends on the size of the person, size of the embodiment.

MR. DOUGLAS: I apologize, Dr. Anthony. I think we've gone past an hour in that last block. Would this be an okay time for a break?

THE WITNESS: Sure.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
71 of 220

MR. DOUGLAS: Can we go off the record, Michelle?

(WHEREUPON, a recess was had.)

BY MR. DOUGLAS:

Q Dr. Anthony, before -- for most of the morning we've been talking about biometric characteristic, which was Paragraphs 27 through 30 of your first declaration.

I'd like to step back to Paragraph 25 of your first declaration. If you could turn to that, please.

And are you there, Dr. Anthony? I'm sorry.

A Yeah.

Q Sorry about that.

And in Paragraph 25, you state, "I understand the Patent Trial and Appeal Board construes claim terms as having their ordinary and customary meaning to a POSITA at the time of invention (i.e. the same standard used in district court)."

Do you see that?

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
72 of 220

A Yes.

Q And so let's stick with Paragraph 25. I'd also like to look at the claims of the '619 patent.

(Technological issues were discussed off the stenographic record.)

BY MR. DOUGLAS:

Q So, Dr. Anthony, I'd like to look at Paragraph 25 of your declaration and claim 1 of the '619 -- or the claims of the '619.

I'll also note, if it's easier for you, you reproduced the claims of the '619 on Page 14 of your first declaration. Either is fine with me; I just don't know what's easier for you to look at.

So looking at claim 1 -- and I'm going to be looking at the claims as represented in the '619 patent. So claim 1 starts on column 26 starting at line 64.

Do you see that?

A Yeah.

Q And so starting at line 65 is a clause

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
73 of 220

that states, "An enclosure having an enclosed volume and an opening formed in the sidewall."

Do you see that?

A Yes.

Q And, just for completeness, claim 16, which is on column 28, lines 20 through -- 23 through 25 has a similar clause. It says, "An enclosure defining an enclosed volume and an opening formed in a sidewall."

Do you see that?

A Yes.

Q And the term "sidewall" is used in both claim 1 and claim 16, correct?

A Yes.

Q And in preparing your opinions in your reports, Dr. Anthony, did you provide a construction of the term "sidewall"?

A As I highlighted in the later paragraphs, I have not construed any terms except address the construction proposed by AliveCor of a biometric characteristic.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
74 of 220

(Technological issues were discussed off the stenographic record.)

BY MR. DOUGLAS:

Q And so, I believe, Dr. Anthony, we heard you say that you have not construed any terms except, "Address the construction proposed by AliveCor of a biometric characteristic"?

A Correct.

Q And so when you were preparing your reports -- or your declarations, did you apply the ordinary and customary meaning of "sidewall" as it's used in claims 1 and 16 of the '619 patent?

A Again, I didn't construe any terms. You know, a POSITA reading the '619 in the context of the claim and the specifications would understand, you know, what is being conveyed in the descriptions.

Q And, in your opinion, what is the ordinary and customary meaning of a sidewall as used in claims 1 and 16 to a POSITA at the time of the invention?

MR. AMON: Objection to the extent it

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
75 of 220

calls for a legal conclusion.

You can go ahead and answer, Dr. Anthony.

BY THE WITNESS:

A Again, I didn't need to construe it, but, you know, as you're reading it in context, for example: An electronic device, an enclosure having an enclosed volume and its opening formed in a sidewall.

A process or positioned in the enclosed volume, I didn't construe -- didn't need to construe a definition. I think a POSITA reading this in context understands what is being conveyed.

BY MR. DOUGLAS:

Q So will you turn with me to Page 39 of your first declaration. And at the bottom of Page 13 [sic], you included Footnote 5.

Do you see Footnote 5, Dr. Anthony?

A Yes.

Q And in Footnote 5, you provided a definition of a front surface; do you see that?

A So I don't offer that as a definition.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
76 of 220

I'm just clarifying here in my declaration I use the phrase "front surface" to reference surfaces of an electronic device.

A surface that contains a front display, has a width that coincides with the device width of electronic.

Reference to the lateral surface in contrast generally refers to the surfaces on the side of electronic device that are perpendicular to the front surface. For example, a surface that has a width representing a device thickness of the electronic device.

And that's consistent with how the surfaces are referenced in Kim.

Q And considering the phrase "front surface" as you use it in your declaration in Footnote 5 -- strike that.

And based on the ordinary and customary meaning of "sidewall" as used in the complaint of the '619 patent and as you use it when talking about Kim, would the sidewall be considered a front surface as you describe it in Footnote 5?

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
77 of 220

A Are you asking again would the -- sorry. I didn't -- say that again, please.

Q Yes. Absolutely.

And based on the ordinary and customary meaning of "sidewall" as it's used in the claims of the '619 patent, would the sidewall be considered a front surface, as you reference it in Footnote 5 of your declaration?

A So as I describe there, it's more reference to the lateral surface referring to the side of the electronic device.

Q So just to make sure I understand, Dr. Anthony, in your last answers, you said it's more a reference to the lateral surface. Were you saying that the term "sidewall" is used in the claims of the '619 is a lateral surface as you reference it in Footnote 5 of your declaration?

A What I was -- I was reading what I wrote in Footnote 5. The declaration uses: Front surface refers to surfaces on electronic device; surface that contains a front display, has a width that cochides -- coincides to a device width of an

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
78 of 220

electronic device.

And references to lateral surface in contrast to refer to surfaces on the side of an electronic device that are perpendicular to the front surface.

And, for example, a surface that has a width representing the device thickness of the electronic device.

Q And so in trying to understand how you've applied the term "sidewall" in -- as we see it in claims 1 and 16, would you consider a sidewall to be a front surface as you use it in Footnote 5 of your declaration?

MR. AMON: Objection. Asked and answered.

Go ahead, Dr. Anthony.

BY THE WITNESS:

A Again, I think I described it here as the side -- the lateral surface is generally going to be referring to as the side of an electronic device -- so side, lateral surface, as I described in Footnote 5.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
79 of 220

BY MR. DOUGLAS:

Q So a person of ordinary skill in the art reviewing claims 1 and 16 and the term "sidewall" would not consider a front surface as you define it in Footnote 5, to be a sidewall, correct?

A As I describe in Footnote 5, I think a POSITA reading the '619 would consider the sidewall as a lateral surface.

Q And, Dr. Anthony, do you still have the claims of the '619 in front of you? And, if not, do you mind grabbing them?

And so will you look with me on column 27, starting at about line 54, you'll see claim 11.

Do you see that?

A Claim 11, yes.

Q And starting at line 56 of column 27, do you see, "An enclosure defining an enclosed volume and an opening along an exterior surface"?

A Yes.

Q And just in the interest of switching gears, claim 11 is in the 949 declaration, and so I know that you have that in front of you, but I

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
80 of 220

just wanted to make sure that you knew we were switching gears.

A Yes.

Q Can you please turn to Page 14 of the 949 declaration, your second declaration, please.

A Page 14?

Q And so on Page 14, we have the claims listed for your reference -- or you list the claims, and I just want to point that out so you also have it there.

And in the 949 declaration, did you provide a construction for the term of claim 11 "exterior surface" that we recently read?

A No, I have no claim constructions in the second declaration.

Q And similar to your first declaration, when you were analyzing claims 11 through 20, did you apply the ordinary and customary meaning to a POSITA at the time of the invention to the claim terms?

MR. AMON: Objection to the extent it calls for a legal conclusion.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
81 of 220

But you can answer, Dr. Anthony.

BY THE WITNESS:

A And in the context of the claims and the specification.

BY MR. DOUGLAS:

Q And so will you turn with me, Dr. Anthony, to Page 41 of your second declaration. And that's the 949 declaration.

A Page 41?

Q Yes. And at the bottom of Page 41, we see Footnote 5.

Do you see that?

A Yes.

Q And I believe, Dr. Anthony, this is similar to Footnote 5 in your first declaration where you are discussing how -- what you mean when you reference "front surface" and "lateral surface"; is that fair?

A Yes, it is the identical.

Q And when a person of ordinary skill in the art is reviewing claim 11 and the term "exterior surface," would the person of ordinary skill in

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
82 of 220

the art consider a front surface as you define it in Footnote 5 to be an exterior surface?

MR. AMON: Objection to the extent it calls for a legal conclusion.

Go ahead, Doctor.

BY THE WITNESS:

A In my analysis, I did not need to consider what a POSITA would interpret that to be; I was considering what -- the constructions put forth by AliveCor and Dr. Berger. And the constructions proposed there, do not meet the -- the limitations of claim 11, not motivated (inaudible).

(Reporter clarification.)

BY THE WITNESS:

A Wouldn't be motivated to combine and would not have -- my analysis in the construction proposed not in interpreting what a POSITA would understand these particular terms to be.

BY MR. DOUGLAS:

Q And based on the ordinary and customary meaning of "exterior surface" as used in claim 11 of the '619 patent, would the exterior surface be

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
83 of 220

considered a lateral surface, as you defined it in Footnote 5 in your second declaration?

A Again, I didn't need to opine upon exterior surface being a front -- what is meant there as front or lateral. In the construction proposed that I reviewed and opined about, it is on the lateral surface.

Q And in your opinion, would the ordinary and customary meaning of "exterior surface" as used in the claims of the '619 patent also include front surface, as you've used it in Footnote 5 of your declaration?

MR. AMON: Objection to the extent it calls for a legal conclusion.

Go ahead, Dr. Anthony.

BY THE WITNESS:

A I believe I answered it as well. Again, I didn't need to opine about what a POSITA -- how they would interpret that term. My analysis is to review what was proposed as construction of prior art, and those -- that's the basis of my opinion.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
84 of 220

BY MR. DOUGLAS:

Q Turn with me, Dr. Anthony, to Page 64 of that same declaration, the 949 declaration.

A Page 64 or Paragraph 64?

Q Page 64, please. I'm looking at between Paragraphs 90 and 91, so page number seemed appropriate in that case.

A Okay. I'm there.

Q At the top of Page 64, there's a view of the original annotation and alteration to Exhibit 1005 Figure 4A.

Do you see that image, Dr. Anthony?

A Yes. That's from Jung.

Q Correct.

And just so I understand what you were saying about exterior surface and I understood that you -- well, strike that.

Would you consider, looking at Figure 4A as shown on Page 64, the front surface, as you use it in Footnote 5 to be the surface that contains Item 13 and Key H?

A So in that figure is depicted -- so Key H

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
85 of 220

in Figure 13 -- or Item 13 are on the front of the schematic.

Q And so in preparing your opinions expressed in your declaration, did you form an opinion as to whether the front surface of Figure 4A is an exterior surface, as used in claim 11 of the '619 patent?

A Again, as I just answered, I didn't need to opine specifically about how a POSITA would interpret "exterior surface," but as I describe here, you know, in referencing that figure showing where a POSITA would generally have thought it better to put a sensor.

Q And, as you sit here today, would you consider the front surface of Figure 4A to be an exterior surface as it's used in claim 11 of the '619 patent?

MR. AMON: Objection to the extent it calls for a legal conclusion.

But you can answer.

BY THE WITNESS:

A Again, I think I answered. The -- my

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
86 of 220

opinions are based on analysis of the constructions proposed, and I include a commentary here on what a POSITA would have recognized as a more natural positioning.

And certainly all surfaces are -- if they're external surface, they're an external surface, but, you know, I didn't need to opine about how a POSITA would be interpreting that; my job was to interpret the constructions put forth.

BY MR. DOUGLAS:

Q Can we turn back, Dr. Anthony, to the claims of the '619 patent, please.

A Okay.

Q And so looking at claim 1, which starts at column 26, line 64, I'd like to look at the last clause that starts on the next column, column 27, 13. But I'll pause there so you have a chance to review claim 1.

A Okay.

Q And starting on column 27, line 13, the claim states, "A portion of the flexible conduit is sandwiched between the seal and the sealing

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
87 of 220

surface or between the seal and the enclosure."

Do you see that?

A Yes.

Q And do you see the term "sandwiched"?

A Yes.

Q I'd like to look at claims 11 and 16 as well. If we look at column 28, about line 7, claim 11 recites, "A portion of the flexible conduit is sandwiched between the seal and the sealing surface of the retainer or between the seal and the surface of the opening."

Do you see that?

A Yes.

Q And then further down on column 28, we move into claim 16. And starting at about line 45, it states, "Wherein, a portion of the flexible conduit is sandwiched between the seal and the button housing or between the seal and the surface of the opening."

Do you see that?

A Yes.

Q Would it be fair to say, Dr. Anthony, that

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
88 of 220

claim -- each of claims 1, 11, and 16 use the term "sandwiched"?

A Yes, they do use the word "sandwiched."

Q And based on our prior discussions in your first declaration, I believe about Paragraph 25 through 30 -- and I don't believe there's anything in your second declaration -- but did you provide a construction for the term "sandwiched" in either of your declarations?

A I did not. A person reading the patent would use the plain, ordinary, and customary meaning in the context of the claims and the descriptions.

Q And what is the ordinary and customary meaning of "sandwiched" to a POSITA at the time of the invention?

MR. AMON: Objection to the extent it calls for a legal conclusion.

You can go ahead and answer.

BY THE WITNESS:

A Again, I did not need to construe, nor did I construe the term "sandwiched," but, for

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
89 of 220

example, in addition to the places that you highlighted in the claims, for example in column 17, line 35 -- well, starting at line 28: In one embodiment, a portion of the flexible conduit is fitted within a layer of seals and/or PSA -- precious adhesive -- to form a seal region, for example, the PSA may be applied to both upper and lower surface.

It goes on.

And then at line 35: Another example a gasket seal such as a face seal may be further applied below the lower PSA portion, such that a sandwich from outside the button assembly inward is formed of the PSA, the flexible conduit, PSA, and then the gasket seal.

Describing, sort of, a stacking together, sort of, as a sandwiching.

And then as well in paragraph -- or column 23, line 39: In one embodiment, the compressible layer 404 is a heat-activated silicon sandwich. The HAF silicon sandwich is a stack of the following five elements: Heat-activated film,

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
90 of 220

polyimide, silicon, heat-activated film, and the flexible conduit.

So, you know, a positional ordering, you know, for example, but I did not need to construe that term. But a POSITA reading both the descriptions and how "sandwiched" is used in the text and in the claims would understand what it meant to convey.

BY MR. DOUGLAS:

Q And then turning back to the claims, Dr. Anthony, of the '619 patent, I'd like to direct you to claim 4, which is column 27, lines 34 to 35.

Do you see that?

A Yes.

Q And claim 4 is one of the claims of the '619 that you analyzed while putting together your declaration in the 948 matter, correct?

A I analyzed the proposed constructions of that claim, yes.

Q And claim 4 that starts on column 27, line 34 states, "The electronic device of claim 1,

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
91 of 220

wherein the seal is overmolded around the portion of the flexible conduit."

Do you see that?

A I do.

Q And the term -- you see the term "overmolded" in claim 4?

A I do, yes.

Q And, Dr. Anthony, did you provide a construction for the term "overmolded" in your first declaration? Referring you to Paragraphs, roughly, 25 through 30 of your declaration for reference.

A I did not.

Q And in performing your analysis of claim 4, did you apply the ordinary and customary meaning to the term "overmolded"?

A And in the context of the claims and the specifications, yes.

Q And what is the ordinary and customary meaning to a person of ordinary skill in the art at the time of the invention of "overmolded" as you applied it when analyzing claim 4 in your

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
92 of 220

declaration?

MR. AMON: Objection to the extent it calls for a legal conclusion.

Go ahead.

BY THE WITNESS:

A So, again, in forming my opinions, I didn't opine and construct a definition of what overmolding was, but in the context of the '619 patent, overmolding is described in several place -- or used in several places.

Certainly in the claims and then, for example, in column 1, line 52, in another aspect the seal is overmolded around the portion of the flexible conduit.

It's used again in column 9 in describing another embodiment. Line 53: Another embodiment the seal 262 is overmolded about all or a portion of the portion of the flexible conduit affording contact with the seal.

Described further in another embodiment in line 15 -- column 15, line 37: In one embodiment, the encapsulant is overmolded around the sensor

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
93 of 220

die.

And then, again, in column 17, line 44: In one embodiment all or part of the seal region is overmolded around all or part of the flexible conduit.

My analysis of overmolding is not in forming a construction but in the proposed -- the proposed construction, for example, that's describe in Page 90 of my first declaration, Paragraph 143.

In reference to some where I'm talking about overmolding, a POSITA would have recognized that the process proposed there is not overmolding and -- as a POSITA would have understood.

BY MR. DOUGLAS:

Q Will you, Dr. Anthony, turn back a few pages I think in your first declaration to Page 85, Paragraph 133. That's the declaration in the 948 matter?

A Yes.

Q And so looking at the first sentence of Paragraph 133, you are quoting Dr. Berger, I

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
94 of 220

believe, where he said, "A person of ordinary skill in the art would understand that the seal of Kim could be overmolded around the portion of the flexible conduit in order to enhance the quality of the seal." And you cite Paragraph 209 of his report, I believe.

"Because, quote, overmolding, unlike mechanical fasteners such as screws, bolts, snap fit components, et cetera, provides for a liquid-tight seal, which is essential for waterproofing delicate electronic components."

Do you see that?

A I do.

Q And would you agree that the ordinary and customary meaning of "overmolding" includes the provision of a liquid-tight seal as discussed in Paragraph 133 of your declaration?

A I'm sorry, can you reask that, please?

Q Yes.

And would you agree that the ordinary and customary meaning of "overmolding" as it's used in claim 4 includes the provision of a liquid-tight

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
95 of 220

seal, as is discussed in Paragraph 133 of your declaration?

MR. AMON: Objection to the extent it calls for a legal conclusion.

But you can go ahead, Doctor.

BY THE WITNESS:

A As I fully describe in Paragraph 133, Dr. Berger speculates that a person of ordinary skill in the art would understand that the seal in Kim could be overmolded around a portion of the flexible conduit in order to enhance the quality of the seal because overmolding -- quote, overmolding, unlike mechanical fasteners such as screws, bolts, snap fit components, et cetera, provides for a liquid-tight seal which is essential for waterproofing delicate electronic components, but the -- end quote.

But these statements assume, as I say, selected overmolding as a manufacturing means of effecting the assembly of components of Kim's combined button assemblies merely because overmolding was understood to provide for a

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
96 of 220

liquid-tight seal, which is essential for waterproofing delicate electronic components.

Continuing on the next page: However, Dr. Berger does not cite any report references regarding the use of overmolding and the assembly of components similar to those disclosed in Kim.

And so even if I agree that a -- the overmolding can provide a liquid-tight seal, a POSITA around -- at that time would not generally select overmolding as a technique for sealing parts that also needed to be moving.

Overmolding is not obvious prior to the '619 in that it's -- if it provides the sealing, it would also prevent the moving of the parts of said button.

And so, again, my analysis was not in performing a definition of what overmolding was, but I don't believe a POSITA would find it at all obvious to use overmolding as a sealing technique for something that also needs to move.

Q And would you agree with Dr. Berger that overmolding does provide a liquid-tight seal?

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
97 of 220

A Again, I was not opining about whether it would form a liquid-tight seal, but a liquid-tight seal also in the context of a button assembly and a POSITA, as I describe here, would recognize that is not the only choice for sealing and not a good choice because of the fact that the button assembly also has moving components with small dimensions that need to be able to remain open with respect to each other and move with respect to each other.

Q Is it your opinion as you sit here today that overmolding as used in claim 4 provides for a liquid-tight seal?

MR. AMON: Objection to the extent it calls for a legal conclusion (inaudible).

(Reporter clarification.)

MR. AMON: Speculation.

You can go ahead, Dr. Anthony.

BY THE WITNESS:

A As I said, in claim 4, the electronic device of claim 1: Wherein the seal is overmolded around the portion of the flexible conduit.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
98 of 220

And the sealing surface in -- earlier in the patent as described is sealing from dirt, water, moisture.

So different seals would require different levels of complexity, but certainly being able to allow the button to move is a critical piece. And overmolding, a POSITA would not find it obvious at all to use overmolding in that situation, prior to the SAP.

BY MR. DOUGLAS:

Q Overmolding as used in claim 4 of the '619 patent does seal from dirt, water, moisture, correct?

MR. AMON: Objection. Asked and answered.

Go ahead.

BY THE WITNESS:

A So, you know, forming, for example, in column 5 in the descriptions describing how contaminants such as liquids and water, solid matter and lint, dust and food particles to prevent ingress of contaminants to seal.

In line 47: May be used to refer to

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
99 of 220

closing off an opening or a connection. When reference to a part of the component, the term "seal" may be used to refer to an element or group of elements that blocks or inhibits the ingress or entry of foreign debris or contaminants, including moisture.

And as I describe, a POSITA would find multiple options available to do sealing, and an overmolding prior to '619 would not have been an obvious choice, given its tendency to flow and fill gaps and prevent things from entering but also prevent things from moving, such as button assemblies.

BY MR. DOUGLAS:

Q And if we turn to Paragraph 134 of your first declaration, and that's on Page 86. I believe the next page from what you were looking at before, Dr. Anthony.

A Yep.

Q And here, again, in the second sentence, it appears you're quoting Dr. Berger where he talks about different methods such as screws,

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
100 of 220

bolts, snap fit components, adhesives, press fits, et cetera.

Do you see that?

A Yes.

Q And would you agree with Dr. Berger that screws, bolts, snap fit components, adhesives, press fits, co-molded components, or ultrasonically welded components, rotational fits, wedge fits, and other manufacturing means are not examples of overmolding?

A So, as he said there, he also notes one skilled in the art would recognize many different methods that are not overmolding, such as the use of screws, bolts, snaps, et cetera.

So I agree in 135 when Dr. Berger identifies examples of certain mechanical fasteners such as screws, bolts, snap fit components as methods that may not provide a liquid-tight seal, he omits discussions of methods other than overmolding that may also otherwise enable a liquid-tight seal.

Creating water-resistant seals in

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
101 of 220

electronics involves employing various techniques and materials to prevent water ingress to protect sensitive components from damage.

So my opinion, a POSITA would not have understood overmolding to be the only manufacturing method that enabled a liquid-tight seal.

And then as an example, Myers describes the silicon gasket that may form a seal between the trim 805 and a housing of the electronic device.

And then I go on in 136: A POSITA would also recognize there are several common techniques used to achieve water-resistance in electronic devices that are not -- that do not involve the use of overmolding.

In 137 I highlight the use of gasket sealing.

In 138 I highlight the use of potting and adhesives, gel-like materials.

In 139, waterproof adhesives and sealing to bond housing components together, et cetera.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
102 of 220

So I go on in 140: AliveCor also points to no prior art disclosures of overmolding in Kim but does not explain how Kim's rubber seal can be constructed as shown through overmolding.

So, again, I think there are multiple options for overmolding and -- there are multiple options for sealing, and overmolding would not have been an obvious choice for the reasons I described.

Q Looking back to column 34 -- I'm sorry. Looking back to Paragraph 134 of your first declaration -- I apologize, Dr. Anthony -- would you agree that screws are not a form of overmolding, as overmolding is used in claim 4 of the '619 patent?

A So as I describe here, they are methods that are not overmolding but also would not provide a liquid-tight seal, as I further highlight in Paragraph 135.

Q So screws, bolts, snap fit components, adhesives, et cetera, that list is what you're talking about are not overmolding but also would

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
103 of 220

not provide a liquid-tight seal?

A Correct.

Q And I believe a couple answers ago, you took us to Paragraph 137?

A Yes.

Q And a discussion of gasket sealing; you see that in --

A Yes.

Q -- in 137?

So I believe when I read 136 and 137 together, your opinion is that gasket sealing does not involve the use of overmolding.

Am I understanding that relationship correctly?

A As I describe there, a POSITA would have recognized there are several common techniques used to achieve water-resistance in electronic devices that in not -- that do not involve use of overmolding.

One example is gasket sealing, which involves using rubber or silicon gaskets in conjunction with mating surfaces to create a

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
104 of 220

water-tight seal. Gaskets are often placed between housing components or around openings like buttons, cords, and connectors.

And then in 138: Another example is potting, which involves filling electronic enclosures or components with a liquid resin or gel-like material, such as epoxy or silicone, to protect from moisture and other environmental hazards. This technique forms a protective barrier around the components, sealing out water, and providing mechanical support.

139: Waterproof adhesives and sealants can also be used to bond housing components together, sealing gaps, preventing water infiltration.

Other common examples of creating water-tight seals include conformal coating, O-ring seals, ultrasonic welding, and others.

Q And so gasket sealing in 137, as you describe it, potting in 138, as you describe it, waterproof adhesives and sealants in 139, are all not examples of overmolding; do I understand that

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
105 of 220

correctly?

A As I highlight in Paragraph 136, yes.

Q Okay. Understood.

And then in 139, you talk about waterproof adhesives and sealants in the first sentence; do you see that?

A Yes.

Q And then the second sentence, you talk about other common examples, and that continues on to the next page.

Do you see that?

A Yes.

Q And so am I to understand that other competent examples of creating water-tight seals include conformal coating, O-ring seals, ultrasonic welding, among others, and those examples are also not overmolding; is that fair?

A Correct.

MR. DOUGLAS: I think I'm at a good stopping point here, Dr. Anthony. Would this be an okay time for you to have a snack or a lunch break?

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
106 of 220

THE WITNESS: Sure. Yeah, that sounds good.

MR. DOUGLAS: Can we jump off the record, please, Michelle.

(WHEREUPON, a recess was had.)

BY MR. DOUGLAS:

Q Welcome back, Dr. Anthony. I hope you had a nice lunch.

I would like to have you pull out Exhibit 1004, the Kim reference. I believe that you have a paper copy with you, but certainly we'll pause if you want to download a copy as well.

A I have it.

Q Okay. And will you turn with me to Exhibit -- I'm sorry, Figure 7 of Exhibit 1004, the Kim reference.

A Okay.

Q And, for your reference, the description of Figure 7 appears to start as early as column 17, lines -- line 17, and it continues through column 19.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
107 of 220

Have you had an opportunity to review that, Dr. Anthony?

A I'm sorry. Can you repeat that?

Q I was just asking if you had an opportunity to review those -- the sections that I pointed you to in Figure 7 and column 17 through 19?

A Okay. I'm sorry. I missed that. I'll review 17 through 19.

Q And, just to be precise, I was pointing you to the description of Figure 7 which starts at column 17, line 17. It looks like it ends in 19 through 12. And I just want to give you a chance to review that if you'd like.

A Okay.

Q And looking at Figure 7a, do you see Item 760?

A Yes.

Q And in column 17, about line 46, Kim refers to 760 as a combined button -- strike that.

Kim refers to 760 as a home button; do you see that?

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
108 of 220

A Lines 47 you mean, "In the electronic device 701 having only the home button 760"?

Q Yes.

A Okay.

Q And then Kim continues at line 53. It says, "The home button 760, which is the combined button, may include a physical button 760a located on the housing 720 and a virtual button 760b located on the display 710."

Do you see that?

A Yes.

Q And so looking at Figure 7a and the home button 760, is it your opinion that the home button 760 is on a sidewall, as sidewall is used in claims 1 and 16 of the '619 patent?

MR. AMON: Objection. Calls for speculation. Outside the scope. And objection to the extent it calls for a legal conclusion.

But you can go ahead and answer, Dr. Anthony.

BY THE WITNESS:

A Counsel, please, can you ask the question

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
109 of 220

again?
BY MR. DOUGLAS:
Q Yes. And so looking at the Figure 7a and the home button 760, is it your opinion that the home button 760 is on a sidewall as sidewall is used in claims 1 and 16 of the '619 patent?
MR. AMON: Objection. Calls for speculation. Outside the scope. And calls for a legal conclusion.
Go ahead.
BY THE WITNESS:
A Well, in the course of performing my analysis, I was considering what was put forth as constructions and Figure 17 -- or, sorry, Figure 7 was not amongst those, so I was -- I'm more focused on Figures 10 and 18, for example.
I'm happy to continue to read here and -- but it was not -- you know, I was not offering opinions about Figure 7 in my declaration, nor were there particular things I was responding to in the AliveCor or Dr. Berger's statements.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
110 of 220

BY MR. DOUGLAS:

Q And you've reviewed -- in your last answer, you said you reviewed Figure 10 as part of your analysis?

A Yes.

Q And so turning to Figure 10a and the home button 760, is it your opinion that the home button 760 is on a sidewall as sidewall is used in claims 1 and 16 of the '619 patent?

MR. AMON: Objection to the extent it calls for a legal conclusion.

But you can go ahead, Doctor.

BY THE WITNESS:

A So as I describe in Paragraph 41, for example, in my first declaration, Page 29, in referencing Figure 10: Based on AliveCor's mapping the sidewall, the combined button of Figure 10 embodiment does not satisfy requirement 2 because it is not positioned in -- within an opening that is formed in the sidewall. It's on the front surface.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
111 of 220

BY MR. DOUGLAS:

Q And if we can turn to Kim column 19, starting at line 14 that starts, "In Figure 18."

Do you see that?

A Yes: In Figure 18, the combined button located on the lateral surface of the electronic device 701, et cetera.

Q And looking down starting at line 15, do you see that the power button 764 may include a physical button 764a?

A Yes.

Q And Kim also discloses that the power button 764 can include a virtual button 764b; do you see that?

A Starting at line 15, the power button 764, which is the combined button, may include a physical button 764a and a virtual button 764b.

Q And if we jump down to the next paragraph that I believe starts at line 26 of column 19, it starts with, "Under the physical button."

Do you see that?

A Yes.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
112 of 220

Q And there Kim discloses that under physical button 764 of the power button -- I'm sorry. Strike that.

And here Kim discloses under the physical button 764a of the power button 764, a sensor such as a fingerprint sensor may be disposed.

Do you see that?

A Yes.

Q And that fingerprint sensor can include an optical fingerprint sensor, a capacitive fingerprint sensor, or an ultrasonic fingerprint sensor, correct?

A Yes. I see that.

Q And so would you agree that based on this disclosure, that Kim teaches the use of multiple types of different fingerprint sensors?

A Well, as described in that paragraph: Under the physical button 764a, the power button (inaudible) the fingerprint sensor may include (inaudible).

(Reporter clarification.)

MR. AMON: I think for -- it's compressing

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
113 of 220

and speeding up your responses, Dr. Anthony.

(WHEREUPON, discussion was had off the stenographic record.)

(WHEREUPON, a recess was had.)

BY MR. DOUGLAS:

Q Dr. Anthony, just trying to kind of clean up where we all got lost, I had asked: And so you would agree that based on the disclosure, that Kim teaches -- based on this disclosure, Kim teaches the use of the multiple types of different fingerprint sensors.

And then you had started: Well, as I described in that belief under the -- wait a minute. Let's start over.

And would you agree that based on this disclosure, that Kim teaches the use of multiple types of different fingerprint sensors? And we were talking about column 19, lines 26 through 30.

A So, as I was saying, I was not opining in forming my opinions particularly about the variety of sensors that were being disclosed in Kim by itself, but certainly in that paragraph: Under

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
114 of 220

the physical button 764a of the power button 764, a sensor (e.g. a fingerprint sensor) may be disposed, and that fingerprint sensor may include an optical fingerprint sensor, capacitive fingerprint sensor, or an ultrasonic fingerprint sensor.

Q And based on the sensors disclosed by Kim in column 19, lines 26 through 30, a person with skill in the art understands that optical and capacitive fingerprint sensors are different?

MR. AMON: Objection. Outside the scope.

But go ahead, Dr. Anthony.

BY THE WITNESS:

A Yeah, I did need to -- as I said, I wasn't opining about the differences among sensors, but they -- optical fingerprint sensor, capacitive fingerprint sensor, ultrasonic fingerprint sensor would operate under different character -- different ways of sensing, optical, ultrasound, or capacitive.

BY MR. DOUGLAS:

Q And would optical fingerprint sensors,

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
115 of 220

capacitive fingerprint sensors, and ultrasonic fingerprint sensors require different types of processing in order to sense a fingerprint?

MR. AMON: Objection. Outside the scope. Calls for a legal conclusion.

Go ahead.

BY THE WITNESS:

A Again, I did not need to opine particularly about the implementation details of Kim as it relates to any specifics regarding fingerprint sensors of the optical, capacitive, or ultrasonic variety.

In the end, they would produce a signal, so at some point there's going to be some similarities, some point there's going to be some differences. But, again, that was not part of the -- my analysis.

BY MR. DOUGLAS:

Q And so would it be fair to say that a person of skill in the art would know how to implement these different types of fingerprint sensors disclosed by Kim in column 19, lines 25

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
116 of 220

through 30?

MR. AMON: Objection. Mischaracterizes testimony. Outside the scope.

Go ahead, Dr. Anthony.

BY THE WITNESS:

A So, you know, as I was describing, my analysis was not contemplating how a POSITA would implement the ultrasound fingerprint or capacitive or optical sensor.

What I was contemplating by offering my opinions both on the AliveCor's proposed anticipation and obviousness was with respect to Kim, and then just highlighting a few aspects of my commentary on Figure 18 with respect to the anticipation aspects of it.

So, for example, let me go to Paragraph 41: The combined button of Figure 18 embodiment does not satisfy requirement 3, which is the -- because there's no component representing a portion of a flexible conduit that is sandwiched between components representing the seal and sealing surface.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
117 of 220

And then I go on to describe, you know, the combined buttons are different in Figures 10 and 18 in the proposed construction.

And then, furthermore, there's the -- my analysis of AliveCor's obviousness challenges with respect to the Kim -- Kim combination starting on Page 35 where I further discuss the proposed construction.

BY MR. DOUGLAS:

Q And so looking at Paragraph 68 of your declaration, which is on Page 43, you opine in Paragraph 68 on Exhibit 1004, the Kim reference, column 19, lines 26 through 30, correct?

A Yes, in my Paragraph 68 of my first dec, I'm commenting on lines -- column 19, lines 26 through 30 of Kim.

I highlight that the paragraph describes: A fingerprint sensor being integrated in a combined button that is positioned in the lateral surface of an electronic device. There is no situation of the specific assembly structures of Kim's Figure 10 embodiment, (e.g. fingerprint

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
118 of 220

sensors 240p1 and 240p2) -- that should be -- being positioned in the lateral surface. See generally Exhibit 1004.

AliveCor does not identify any other disclosure that would -- has specifically led a POSITA to predict such configuration.

And then my opinion: No such disclosure exists.

Q And when you rendered your opinion on Exhibit 1004, lines 19 through -- 26 through 30, did you form an opinion as to whether the person of skill in the art would know how to implement the optical fingerprint sensor, capacitive fingerprint sensor, and ultrasonic fingerprint sensor disclosed in column 19, lines 26 through 30?

MR. AMON: Objection. Outside the scope.

You can go ahead and answer, Dr. Anthony.

BY THE WITNESS:

A Sorry. Can you repeat the question?

BY MR. DOUGLAS:

Q Sure. And when you rendered your opinions

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
119 of 220

on Exhibit 1004, column 19, lines 26 through 30 in Paragraph 68, did you form an opinion as to whether the person of skill in the art would know how to implement the optical fingerprint sensor, capacitive fingerprint sensor, and ultrasonic fingerprint sensor disclosed in that same section, column 19, lines 26 through 30 of Kim?

A Again, I didn't need to opine upon the exact implementation details as was described there, but highlighting that the -- as discussed, the -- in the proposed construction, it's the incorporating elements of 10 into 18. It's no indication as to why a POSITA would do that or would expect success in doing so.

Q And, as you sit here today, do you have an opinion as to whether the person of skill in the art would know how to implement the optical fingerprint sensor, capacitive fingerprint sensor, or ultrasonic fingerprint sensor as disclosed in Kim column 19, lines 26 through 30?

A Again, I think I answered that. I didn't need to opine upon the implementation details of

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
120 of 220

how a POSITA would do that. Would a POSITA be able to, with complete flexibility be able to implement sensors in some way? Yeah, I didn't need to opine upon that.

What I was discussing was the proposed construction of the elements of 10 into 18, and there's no -- no reason to do so, no motivation, and unlikely they would be successful in doing so.

Q And when you were developing your opinions on column 19, lines 26 through 30 of Kim in at least Paragraph 68 of your declaration, did you render an opinion as to whether the optical fingerprint sensor, capacitive fingerprint sensor, or ultrasonic fingerprint sensor would output the same kind of electrical signal?

MR. AMON: Objection. Asked and answered. Outside the scope.

Go ahead, Dr. Anthony.

BY THE WITNESS:

A Again, I didn't need to consider the exact electrical output of any of the sensors, but as I further describe in Paragraph 69 further going on:

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
121 of 220

Kim does not provide any disclosure or suggestion that incorporating the fingerprint button assembly structures of Figure 10 into a lateral surface of electronic device would have had -- would have been a predictable configuration.

A POSITA would have recognized from Kim's descriptions of Figure 10 that the inclusion of fingerprint sensors 240p1 and p2 are critical the specific type of fingerprint detection used in this embodiment. Both sensors are used to collect fingerprint images 241a and 241b, which are then combined into a single fingerprint image 241.

And then go on describing in the subsequent paragraphs how that embodiment would not have had a reasonable -- as I go into Paragraph 74: A POSITA would not have an expectation of success implementing that combination and would not have been motivated to do the combination.

Q Can you turn with me, Dr. Anthony, to column 22 of Kim. And I'd like to look at the paragraph starting on line 18. It starts with, "A

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
122 of 220

stack."

A How far do you want me to read and review?

Q I was going to ask you about column 22, lines 18 through 24. And I believe this is all part of the discussion of Figure 10.

A Okay.

Q And so looking at column 22, 18 through 24, and if you skip down to starting at line 24, there's a sentence that starts, "In addition to the capacitive fingerprint sensor."

Do you see that?

A Line 24, yes.

Q And it states, "In addition to the capacitive fingerprint sensor 240p2, embedded in the physical button 760a, another capacitive fingerprint sensor 240p2 may be further disposed between the cover glass 725 and the touch screen panel 732."

Do you see that?

A Yes.

Q Now, would it be fair to say that in Kim 22 -- column 22, lines 24 through 28 Kim is

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
123 of 220

disclosing an embodiment with two capacitive fingerprint sensors?

A Kim is describing some two sensors and describing how they're used together to collect first and second fingerprint images and combine into a single fingerprint image.

And as I highlight in my analysis, there's no description or indication of how that would be then translated into Figure 18 in a combination.

Q And one of the capacitive fingerprint sensors disclosed in column 22, lines 18 through 24 is embedded in the physical button, correct?

MR. AMON: Objection. Vague. Calls for a legal conclusion.

But you can go ahead, Doctor.

BY THE WITNESS:

A As described, the button is a -- the combined button is a physical and virtual and includes a button that is both coplanar and under the physical button as well.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
124 of 220

BY MR. DOUGLAS:

Q I'm sorry. I'm referring to the example of 22 -- column 22, lines 24 through 27. I was confirming -- I was trying to confirm that one of the capacitive fingerprint sensors is embedded in the physical button 760a, correct?

A And so one of them is indeed underneath, and one of them is coplanar as I describe in Paragraph 82: The fingerprint sensor 240p1 is coplanar, as I say in Paragraph 82, and not positioned below.

And then they further describe in Paragraph 83 that emission of fingerprint sensor 240p1 is counter then to how it would be combined and no explanation understanding how that would then be combined into the sidewalls associated with Figure 18.

Q I think in the last answer, you might have mentioned 240p1, and I was looking at column 22, lines 24 through 27, which I believe only describe 240p2 and states, "Fingerprint sensor 240p2 embedded in the physical button 760a."

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
125 of 220

Do you see that?

A So I would point to as well, just for clarity, as I describe on Page -- well, starts on Page 51 of Footnote 6: Kim's Figure 10a identifies two sets of fingerprint sensors, 240p2. Kim describes a capacitive sensor 240p2 is embedded in the physical button 680, 760a; whereas, optical fingerprint sensor 240p1 is disposed on the flexible PCB.

Based on its description, Figure 10a is inaccurately labeled optical fingerprint sensor 240p1 as sensor 240p2.

And there on Page 53, above Paragraph 83, I correct Figure 10b to highlight that the -- there's a 240p2 that is below the arrows in the button, and then there's also the additional 240 which should be labeled as p1 that has the field lines pointing to it.

Q And what does Kim mean by using the term "field" and showing those dashed lines in your opinion?

MR. AMON: Objection to the extent it

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
126 of 220

calls for a legal conclusion.

You can go ahead, Dr. Anthony.

BY THE WITNESS:

A Again, I didn't need to opine specifically around what those field lines meant, but sitting here today, offering a reasonable guesstimate, you know, that's the field associated with the -- whatever the sensing technique is being used for those buttons, whether it be capacitive or electromagnetic or...

BY MR. DOUGLAS:

Q I think you had referenced Dr. Anthony, column 22, lines 14 through 17, and that's where you were talking about the optical fingerprint sensor 240p1 may be disposed on the flexible PCB; did I understand that correctly?

And I believe that was from your Footnote 6 when you were reading that --

A Yes.

Q -- Dr. Anthony?

A Yeah, and I believe in reading this now, and specifically where you were highlighting in

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
127 of 220

column 22, I also believe that there's a typo in that line column 22, line 20 -- well, starting at 24: In addition to the capacitive fingerprint sensor 240p2 embedded in the physical button 760a, another capacitive fingerprint sensor -- which I believe should be read 240p1 -- may be further disposed between the cover glass 725 and the touch pad -- touch screen panel 732.

So I believe, as I labeled in -- correctly labeled above Paragraph 83 of my dec on Page 53 is the correct labeling for Figure 10b.

Q And so just to make sure that I'm clear with column 22, lines 24 through 27, the typo is in line 26, and it should read "240p1," not "240p2"?

A I believe that is the case.

Q And so in -- just to make sure we're clear, looking at column 22, lines 24 through 27, and specifically at the clause on 25 that I believe you said was a typo, another capacitive fingerprint sensor should be "240p1," it's still correct that Kim is disclosing, quote, another

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
128 of 220

capacitive fingerprint sensor here; is that right?

A As is described in -- highlighted in Figure 10, when correctly labeled, there is the -- for the functioning of that combined button including the physical and the virtual, it includes buttons that are coplanar with, so the 240p1 and underneath 240p2.

Q And based on what we were reading in column 22, lines 24 through 27, the coplanar buttons, when labeled 240p1, could be capacitive fingerprint sensors, correct?

A Correct. That would be, you know, another fingerprint sensor. Could be capacitive, optical, or ultrasonic.

Q If you turn with me, Dr. Anthony, to Paragraph 140 of your declaration. It's on Page 88.

And we've moved --

A 140?

Q Yes, sir.

And, just for your reference, this section starts with 131, and this is the section about,

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
129 of 220

"This sort of prior art does not render obvious the seal as overmolded as required by claim 4."

And I believe where it's just talking about the Kim reference here in Paragraph 140, but --

MR. AMON: Mr. Douglas, just so we're clear, it's Dr. Anthony's first declaration, right?

MR. DOUGLAS: Oh, yes, I'm sorry. Yes, first declaration.

BY THE WITNESS:

A First declaration, Paragraph 140?

BY MR. DOUGLAS:

Q 140, yes, sir.

A Okay.

Just let me orient myself here.

Q Yep.

A Okay.

Q I'd like to look at the third sentence of Paragraph 140. It's line -- the fourth line, it says, "At the left and right sides of the rubber seal 722, the edges are raised and form a recess

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
130 of 220

760r1 that sits between the rubber seal 722 and the flexible PCB 706."

Do you see that?

A Yes.

Q So just to make sure I understand, Dr. Anthony, is it fair to say that what you're stating in the sentence that I just read is that because we see a recess between a seal and the flexible PCB, there would be no overmolding?

A So as I fully describe in that paragraph, you know, a POSITA looking at that field and looking at Kim, would not have understood the rubber seal to be overmolded.

So as I highlight in 140 including that sentence: AliveCor points to no prior art disclosure of overmolding in Kim. Does not explain how Kim's rubber seal can be constructed as shown through overmolding. A POSITA would not have understood the rubber seal to be overmolded with the flexible PCB in place.

And then as that sentence you highlighted: At the left and right sides of the rubber seal

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
131 of 220

722, the edges are raised to form a recess 76r1 -- 760r1 that sits between the rubber seal 722 and the flexible PCB 706.

If the rubber seal 722 were formed by overmolding as AliveCor defined at the edges of the seal -- rubber seal 722 would not be raised in that recess -- with the recess. 760r1 present, instead the rubber seal 722 would conform to and take the shape of the structure to which it was overmolded. And then it would reside against the flexible PCB without that recess.

Overmolding the rubber seal would not result in the structure shown, and a POSITA would not have found it obvious to construct Kim's rubber seal with overmolding, particularly because AliveCor provides no prior art disclosure of overmolding in its ground.

And then if you also just search for "seal" in the Kim reference, for example, the only place that it talks about how that seal would be adhered is using adhesive, and -- as the technique to place and hold the seal in place.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
132 of 220

Q So would it be fair to say that any time there's a recess between a seal and a flexible PCB, that there would not be overmolding?

A I didn't need to opine upon the general, sort of, properties of overmolding as it relates to all possible variants of how it can be used, but in the context of the proposed construction in Kim, it's clear that that seal would not have been constructed with overmolding.

Q Is it fair to say that any time there are raised edges and there is a recess present, that there's no overmolding?

MR. AMON: Objection. Speculation. Incomplete hypothetical.

Go ahead, Dr. Anthony.

BY THE WITNESS:

A I also think I answered it. I didn't need to opine upon the arbitrary and general way that an overmolding would result in various structures, but in the context of the Kim patent and what's described there, it's clear that a POSITA would not have understood that seal to be constructed

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
133 of 220

with overmolding.

MR. DOUGLAS: I think we're at about another hour, Dr. Anthony. Would this be another good time to maybe take another ten-minute break?

THE WITNESS: Sure. Let's do it.

MR. DOUGLAS: Okay. Can we go off the record, please?

(WHEREUPON, a recess was had.)

BY MR. DOUGLAS:

Q Dr. Anthony, I believe we talked earlier that you have the Jung Exhibit 1005 and Myers Exhibit 1007 references. If you have those, do you mind pulling those out, please.

A Okay.

Q And I believe, Dr. Anthony, you also have the electronic versions of Exhibit 1005 and Exhibit 1007 handy; is that correct?

A Yes.

Q Excellent.

So I'd like to start and have you turn to Paragraph 96 of your first declaration, Exhibit 2009 of the 948 matter.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
134 of 220

And I believe, Dr. Anthony, in Paragraphs 96 and 97 of your first declaration, you're describing adding Jung's flexible printed circuit board 30 to Myers; is that correct?

A So that Paragraph 96 is part of the discussion of my analysis that includes the figure back on Page 58 of the proposed construction of Myers and Jung.

Q And Paragraph 96, you state that, "The POSITA would have arrived at a configuration where the flexible printed circuit board 30 of Jung is sandwiched between Jung's silicon rubber 50 and Myers' button support plate 122."

Do you see that?

A So as I describe there: Additionally, AliveCor does not explain why, even if a POSITA were to combine the Jung and Myers references, a POSITA would not -- for the reasons discussed in the earlier paragraphs, the POSITA would -- why they would have arrived at a configuration where the flexible printed circuit board 30 of Jung is sandwiched between Jung's silicon rubber 50 and

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
135 of 220

Myers' support button plate.

In Myers, the fingerprint recognition circuit that's disclosed above and coupled to the flexible element 116, which can be seen in the annotated Figure 1 on Page 58, provided electrical connections to its button, and a POSITA would have found use of Jung's flexible printed circuit board 30 unnecessary.

Q And then in Paragraph 97, you continue that, "Even if a POSITA would have considered using Jung's flexible printed circuit board 30 to connect a Myers' button, the POSITA would have understood that Jung's flexible circuit 30 would need to be arranged to connect to Myers' button at the same location as the flexible element 116," correct?

A Correct. Also going back to referencing the figure on Page 58.

Q And so is it fair to say that you're providing in Paragraph 97, a POSITA's view of -- strike that.

In Paragraph 97, when you discuss how a

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
136 of 220

POSITA would have considered using Jung's flexible printed circuit board 30 to connect to Myers' button, this is an example of how a POSITA would have modified Myers' with the teachings of Jung, correct?

A So as I was highlighting here in full context, first of all, you know, a POSITA -- you know, the proposed combination was Jung in view of Myers, not Myers in view of Jung.

And then even if though -- as I describe, in going through all that down to Paragraph 97: Even if a POSITA would have considered using Jung's flexible printed circuit board to connect to Myers' button -- which is the other way around from the proposed construction -- even in that case, a POSITA would have understood that Jung's flexible printed circuit board 30 would need to be arranged to connect Myers' button at the same location as the flexible element.

That location is shown in Myers' Figure 1 on Page 58 is above, not below the button, support plate 122.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
137 of 220

And so even if a POSITA would have considered using Jung's flexible printed circuit board 30 to connect, a POSITA would have routed Jung's flexible circuit board above the button support plate 122 to location where the flexible circuit of Myers connects to the button. And a POSITA would not have sandwiched it between Jung's silicon rubber 50 and Myers' support plate 122, the component which is the flexible printed circuit board would not connect.

So this is something that would not function, not some -- the proposed original construction, I took -- hypothetically, even if they were to try to do so, they wouldn't propose it in the way that it was arranged.

Q Got it.

And then looking to the next paragraph, Paragraph 98 of your first declaration, about halfway down, it appears you're taking the same example that may be in reverse -- I don't know if that's fair to say, but where you say, "If a POSITA would have considered adding Myers' button

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
138 of 220

support plate to Jung, the POSITA would have used Myers' button support plate 122 to support Jung's dome switch resulting in Myers' support plate 122 being located under the silicon rubber 50."

Do you see that?

A Yes. And then: With this configuration, Jung's flexible printed circuit board 30 would not be sandwiched between Myers' button support plate 122 and Jung's silicon rubber 50.

Q And so the example that you're proposing in Paragraph 98, if a POSITA would have considered adding Myers' button, is this an example of modifying Jung with the teachings of Myers?

A So as I describe in -- midway through Paragraph 98: If a POSITA would have considered adding Myers' button support plate to Jung -- so starting with Jung adding Myers support plate 122 -- the POSITA would have added -- would have used Myers' support button plate 122 to support Jung's dome switch resulting in Myers' button support plate 122 being located under the silicon rubber 50. And with this configuration, Jung's flexible

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
139 of 220

printed circuit board 30 would not be sandwiched between Myers' button support plate and Jung's silicon rubber.

Q And I believe, Dr. Anthony, you had pointed us back to Paragraph -- I'm sorry, Page 58 as well, and I believe you're referring to Paragraph 91; is that correct?

A Well, the figure that's embedded inside of Paragraph 91.

Q Understood.

And so in -- and so the figure that's embedded in Paragraph 91 is Figure 1 of Myers annotated in the petition at Page 64; is that correct?

A Correct.

Q And is annotated with the -- well, strike that.

Do you see the red rectangle that's beneath Item 122 in Figure 1 on Page 58?

A Yes.

Q And that red -- and what do you understand -- strike that.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
140 of 220

What components of Jung are included in the red rectangle as shown in Figure 1 on Page 58 of your first declaration?

A So going to Paragraph 91 of my dec for a second, the Figure 10 of Jung is what is in the red box. And, in particular, the green is 50, and that is the rubber seal and the -- 30 is the electronic -- the flexible electronic.

So silicon rubber is 50, the flexible printed circuit board is 30, and then there are other components described there. The key bonding portion is 38, rubber and silicon rubber is 50 I said, bracket 40, et cetera.

Q Dr. Anthony, do you provide an opinion with regard to the operability of the figure at -- or the combined figure as shown in Paragraph 91 of your declaration, Page 58, first declaration?

A So in -- as I discussed in Paragraph 97, it needs to be the -- the connection needs to be made to the flexible element -- or to the -- POSITA would have understood that Jung's flexible printed circuit board would need to be arranged

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
141 of 220

and connected to Myers' button at the same location as the flexible element 116, and putting it below would make it inoperable so you couldn't connect it.

Q And other than what you just identified in Paragraph 97, Dr. Anthony, do you identify any other areas where you render an opinion that the combination shown in Paragraph 91 of Page 58 of your declaration would be inoperable?

MR. AMON: Objection. Asked and answered.

Go ahead, Dr. Anthony.

BY THE WITNESS:

A So as I further highlight in that section starting on Page 59, section entitled III: A POSITA would not have had a reasonable expectation of success in implementing the Jung-Myers combination.

As I highlight starting in Paragraph 52: As previously noted, the proposed combination addressing the button assembly requiring the fingerprint sensor assembly positioned on a front surface of an electronic device to be modified in

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
142 of 220

addition to the lateral surface.

And as I described previously: By that relevant time frame, the POSITA would have been aware of the challenges associated with that modification. These challenges would have prevented the POSITA from reasonably expecting success in implementing the teachings as proposed by AliveCor.

And further: A POSITA -- on Paragraph 93 -- would have also perceived various disadvantages involved in implementing the Jung-Myers combination. Like Kim, Myers teaches a button assembly position on a front surface of an electronic device button.

Implementing Myers' button assembly on lateral surface device 100 would have complicated the manufacturing for the resulting mobile device requiring non-planar surfaces.

And, as discussed: The POSITA would have known that non-planar gaskets present a range of challenges, et cetera.

Paragraph 94: The positioning of Myers'

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
143 of 220

fingerprint sensor assembly on the lateral surface of the device reduced the fingerprint detection recognition accuracy.

Go on to describe there.

And in Paragraph 95: A POSITA would have recognized a more natural positioning be on the front face requiring if a -- as described in that figure, it would also be requiring mechanical scanning.

And then further then up to Paragraph 96.

So both the challenges, significant challenges, to get it onto a small sidewall and the fact that we wouldn't also have some -- electrical connectivity in the proposed stacking.

Q Dr. Anthony, I'd like to talk about the figure again on Page 62 of your declaration.

I believe it's between Paragraphs 94 and 95, but it's the figure -- it's Figure 4A from Jung if you see it on Page 62.

A Yes.

Q It may be helpful also to have Jung in front of you if you'd like. And specifically I

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
144 of 220

would like to talk about Paragraph 100 of Jung, which is describing Figure 4A as you see in your declaration on Page 62 and we also see in Jung.

A Okay.

Q In looking at Figures 4A of Exhibit 1005, as we see it on Page 62 of your declaration, Figure 4A is showing the mobile device of Jung, correct?

A Yes. Figure 4A, yep.

Q And what is element H of Figure 4A?

A As in Paragraph 100, as you pointed out: According to an embodiment of the present disclosure, when user presses home key H, the pressure acting on home key H may be applied to silicon rubber 50. And then it goes on.

So home key H.

Q And home key H is a button that the user presses, correct?

A As described in Paragraph 100: The user presses the home key H. The pressure acting on the home key H may be applied to silicon rubber 50. Then the silicon rubber 50 may be pressed by

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
145 of 220

pressure to thereby apply the pressure to a dome switch not shown or (unintelligible) --

(Reporter clarification and admonition.)

BY THE WITNESS:

A I was basically reading Paragraph 100 from the Jung reference, but going back to where you lost me: Silicon rubber 50 may be pressed by pressure. You thereby apply the pressure to a dome switch (not shown) or to transfer the pressure to a piezoelectric element (not shown) to come into contact with a contact electrode to generate a predetermined electric signal and the electric signal may be transferred to a main circuit board.

BY MR. DOUGLAS:

Q And Paragraph 100 is describing home key H as a button, correct?

A So in Paragraph 100, the word "button" is not used, but it's a home key that the user presses, and there's a dome switch.

So insofar as that a POSITA would have -- understand a key and a button having some similar

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
146 of 220

attributes.

Q And turning back to Figure 4A of Jung and home key H, what is the shape of home key H in Figure 4A?

A Ovular in nature. Rectangular with some rounded edges.

Q Can we turn to now Exhibit 1007, which has been marked as -- which has been referred to as the Myers reference in both proceedings.

A Okay.

Q And I'd like to look at Figure 1 of Exhibit 1007 Myers reference.

A I'm sorry, figure what?

Q Figure 1, sir.

A Figure 1. Okay.

Q And, Dr. Anthony, are you familiar with Figure 1 of Myers Exhibit 1007?

A That is the figure that is annotated and shown on my declaration Page 58 and also shown on my declaration annotated on Page 61.

Q Will you turn with me, please, to Figure 8 of the Myers reference.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
147 of 220

A Okay.

Q And, Dr. Anthony, are you familiar with Figure 8 of the Myers reference?

A I think I cite it in my declaration, so not particularly, but I have reviewed this reference, so I have seen it before, yes.

Q Okay. And Paragraph 107 of the Myers reference that starts talking about Figure 8, and I'd like you to look at Paragraph 107, please.

A Okay.

Q And starting at the beginning of Paragraph 107, Myers states that Figure 8 is an exploded view of another embodiment of a biometric sensor stack.

Do you see that?

A I do.

Q And so is it fair to say that Figure 8 is showing a different embodiment of a biometric sensor stack than the one shown in Figure 1 of Myers?

MR. AMON: Objection. Outside the scope.

You can go ahead, Dr. Anthony.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
148 of 220

BY THE WITNESS:

A I don't believe I opined particularly on Figure 8 in forming my opinions which were based on the proposed constructions.

I'm happy to continue to read through this and figure out what's being disclosed in Figure 8, but it was not part of my analysis.

BY MR. DOUGLAS:

Q So, just so I understand, the embodiment of Figure 8 was not part of your analysis that you performed in these proceedings?

A I didn't need to form an opinion on Figure 8 in isolation. You asked me to interpret Figure 8 in isolation. My opinions were based on the proposed construction, and that's what I did.

Q Okay. And so going back to Paragraph 107, Myers describes Figure 8 as an exploded view of another embodiment of a biometric sensor stack, correct?

MR. AMON: Objection. Outside the scope. The document reads what it reads.

Go ahead, Dr. Anthony.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
149 of 220

BY THE WITNESS:

A So as described, if I read Paragraph 107: Figure 8 is an exploded view of another embodiment of a biometric sensor stack. While Figure 9 is a cross-sectional view of the biometric sensor stack in an assembled state.

In the embodiment shown in these figures, a cap 800 may be fitted into a trim 805 and may be externally accessible to a user. For example, the cap may be positioned such that a user may touch the cap during operation of the electronic device or while using the device. The user may touch the cap to permit the device to capture a fingerprint or to depress the cap to provide an input signal to the electronic device.

That's what's stated in Paragraph 107.

BY MR. DOUGLAS:

Q So I'd like to look at Paragraph 130 of the Myers reference, 1-3-0.

A Okay.

Q And you refer to Paragraph 130, at least in Paragraph 91 of your declaration, Pages 58 and

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
150 of 220

59.

A That is correct. At the last sentence of -- or last couple sentences of Paragraph 91 starting on the top of Page 59: Myers already proposes a gasket 1025, such as a silicon gasket, that may form a seal and can prevent dirt, sweat, water, and the like from entering the interior of the electronic device.

And that's from 1007, which is Myers.

Based on this disclosure, a POSITA would not have perceived any benefit from incorporating Jung's key waterproofing structures into the button assembly and has no motivation because it's already sealed. You don't need another seal.

Q And Paragraph 130 of Myers is discussing gasket 1025; is that correct?

A A gasket 1025, such as a silicon gasket, may form a seal between the trim 805 and the housing of the electronic device.

The gasket 1025 may be flexible to permit deformation during a button press and related motion, et cetera.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
151 of 220

Q And you likewise rely on gasket 1025 in Paragraph 91 of your declaration, correct?

A Correct. In Paragraph 50 -- sorry, Paragraph 91 at the top of the Page 59: And Myers proposes a gasket 1025 forming a seal preventing dirt, water, et cetera.

And then as I further describe in the final sentence of that paragraph: Based on this disclosure, a POSITA would not receive any benefit from incorporating Jung's key waterproofing structures into its button assembly.

And, again, this is in the reverse construction, as opposed to the construction that was actually proposed by AliveCor.

Q And turning back to Exhibit 1007, Paragraph 130, gasket 1025 is being described in conjunction with Figures 12 and 13; is that fair?

MR. AMON: Objection. Mischaracterizes the document.

You can go ahead, Dr. Anthony.

BY THE WITNESS:

A The gasket is -- shows up -- or 1025, the

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
152 of 220

numbering shows up in Figure 12, also shows up in Figure 13, also shows in Figure 14. So it shows up in those three figures.

BY MR. DOUGLAS:

Q And looking at Paragraph 127 of the Myers reference.

A 127 you said?

Q 127, yes, sir.

A Okay.

Q This paragraph states, "Figures 12 and 13 are cross-sectional views taken through the biometric sensor stack and surrounding portion of the electronic device of Figure 11 and show the biometric sensor stack of Figures 8 through 10 within the device."

Do you see that?

A I do.

Q Is it fair to say that Figures 12 and 13 are showing views of the sensor we looked at in Figure 8?

A I have to trust what was -- what is written there. This is not forming the basis of

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
153 of 220

my opinions as I was analyzing the proposed construction.

But as written there in Paragraph 127: Figures 12 and 13 with cross-sectional views taken through a biometric sensor stack and surrounding portion of electronic device of Figure 11 and show the biometric sensor stack of Figures 8 through 10 within the device. Generally, both figures illustrate the stack within the structure of the electronic device. Figure 14 is a close-up perspective of cross-section of the biometric sensor stack within the electronic device.

Q And I believe we talked about Figure 8, and I believe you said you hadn't rendered an opinion with regard to whether Figure 8 was a different embodiment from the sensors shown in Figure 1. Is that a fair characterization?

A Again, my analysis was my impression -- in analyzing the proposed construction, I was not analyzing Figure 8 in isolation, but, as I highlight in my declaration through the paragraphs highlighting Jung and Myers combination, all the

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
154 of 220

reasons why it would not work and why a POSITA would not be motivated to combine.

Q Could we turn, Dr. Anthony, to Paragraph 143 of your first declaration, please.

A 143?

Q 143, yes, sir.

A Okay.

Q And in Paragraph 143, the first sentence you state, "In the cited portion of Jung, the process of forming the silicon-not-attached portion (mapped to the seal that is overmolded) is one that is performed after the circuit board bracket and the silicon rubber are sealed through insert injection."

Do you see that?

A Yes.

Q And in forming your opinions in Paragraph 143, what did you understand Exhibit 1005 to be disclosing when it disclosed "insert injection"?

A As I describe in my Paragraph 122: As described above, the electronic device adopting

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
155 of 220

the key waterproof structure in a method of waterproofing a key according to various embodiments of the present disclosure may be made of two processes such as a process of forming the silicon-not-attached portion that is used for assembling the flexible printed circuit board in -- I'm -- I'm not exclusively reading, I'm adding some clarity in my reading, so let me restate that.

As described above, the electronic device adopting the key waterproof structure and a method of waterproofing a key, according to the various embodiments of the present disclosure may be made of two processes, such as a process of forming the silicon-not-attached portion for assembling the flexible printed circuit board in the insert-injected product after the circuit board bracket and the silicon rubber are sealed through the insert injection in the process of bonding only the silicon-not-attached portion for waterproofing.

So the insert injected product, injection

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
156 of 220

molded, and then a gasket such as the silicon-not-attached portion would be then attached to it in a two-step process, for example.

It's not a -- an overmolding process that is being described there.

Q So is it your opinion, Dr. Anthony, that insert injection is not a form of overmolding?

A Insert injection is not considered an overmolding; it's generally a single -- call it a single mold, if you will. As -- yeah, it's not overmolding processing.

Q And what do you mean by -- strike that.

Can I ask you, Dr. Anthony, to turn to the Chang reference that's been marked as 1015 in the 948 and 949 proceedings.

A Okay.

Q And, Dr. Anthony, I believe that you have a paper version and an electronic version of Exhibit 1015, Chang; is that correct?

A Correct.

Q I'd like to look at column 13, lines 1 through 5. Will you turn there, please.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
157 of 220

A Okay.

Q And starting at column 13, line 1, Chang states, "According to an example embodiment, the mutual contact faces between the flexible conductive member 500 and the circuit region 453 may be designed to be bonded with a thin FPCB antenna (TFA) or hot bar soldering structure or an FPCB contact structure."

Do you see that?

A Yes.

Q Dr. Anthony, what is a thin FPCB antenna bond?

MR. AMON: Objection. Vague.

But go ahead, Doctor.

BY THE WITNESS:

A So that's describing in Paragraph -- the top of column 13, the multiple ways the mutual contact between flexible conductive member 500 and the circuit region may be designed to be bonded with a thin flexible PCB -- flexible printed circuit board antenna or a hot bar soldering technique or FPCB contact structure.

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
158 of 220

So multiple techniques with which to bond the flexible conductive member 500 and the circuit region 453 to be electrically connected to each other and may transfer a signal or a pressure which is transferred from the fingerprint recognizing member 450 to the inside of the electronic device.

THE WITNESS: Whenever we're at a convenient pausing point after this, I need to use a quick bio break.

MR. DOUGLAS: Okay. Let me finish this question, if that's okay, Dr. Anthony --

THE WITNESS: Sure.

MR. DOUGLAS: -- and then we'll take a break.

THE WITNESS: Please.

BY MR. DOUGLAS:

Q And so when you read from column 13, lines 1 through 10 and use the term "thin FPCB antenna," what is your understanding of a thin FPCB antenna as it's used in Chang?

A As I said, it's a technique to make

AliveCor Exhibit 1027
AliveCor, Inc. v. Apple Inc.
IPR2023-00949, U.S. Patent No. 10,866,619
159 of 220