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Transcript of Bjorn Markus Jakobsson, Ph.D.

Date: March 20, 2019

Case: Apple Inc. -v- Universal Secure Registry LLC (PTAB)

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Apple 1127
Apple v. USR
IPR2018-00809

1 UNITED STATES PATENT AND TRADEMARK OFFICE

2 -----
3 BEFORE THE PATENT TRIAL AND APPEAL BOARD
4 -----

5 APPLE INC.,

6 Petitioner,

7 v.

8 UNIVERSAL SECURE REGISTRY LLC,

9 Patent Owner.
10 -----

11 Case No. IPR2018-00809

12 U.S. Patent No. 9.530.137

13
14 DEPOSITION OF BJORN MARKUS JAKOBSSON, Ph.D.

15 Redwood Shores, California

16 Wednesday, March 20, 2019

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25 Reported By: Charlotte Lacey, RPR, CSR No. 14224

1 DEPOSITION OF BJORN MARKUS JAKOBSSON, Ph.D., held
2 at the offices of QUINN EMANUEL URQUHART &
3 SULLIVAN, LLP, 555 Twin Dolphin Drive, 5th Floor,
4 Redwood Shores, California

5

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7 Pursuant to notice, before Charlotte Lacey,
8 Certified Shorthand Reporter, in and for the State of
9 California.

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A P P E A R A N C E S

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P R O C E E D I N G S

BJORN MARKUS JAKOBSSON, Ph.D.,

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

EXAMINATION

BY MR. SELWYN:

Q Good morning, sir.

A Good morning.

Q Could you tell us, please, your full name for
the record.

A Bjorn Markus Jakobsson.

Q Dr. Jakobsson, do you understand that you have
taken an oath to tell the truth?

A Yes, sir.

Q Is there any reason you cannot give your best
and most complete testimony here today?

A No.

Q Have you ever been deposed before?

A Yes, I have.

Q How many times?

A Maybe 20.

Q What is your current occupation?

A I'm a chief of science -- no. Chief of --
sorry. Chief of security and data analytics. It's a
title that's a little bit awkward, and that's why I'm

1 hesitant about it.

2 Q Who is your employer?

3 A It's a company called Amber Solutions
4 Incorporated.

5 Q How long have you been employed by Amber
6 Solutions?

7 A I have been there since August of last year.

8 Q How many times have you been retained as an
9 expert in patent litigation or in IPRs?

10 A Maybe on the order of 30 times.

11 Q How many of those were for patent litigation?

12 A Almost all of them.

13 Q And how many times for IPRs?

14 A Oh, I'm sorry. I -- I thought of patent
15 litigation and IPR are similar. So...

16 Q I'll break it down. How many of those were
17 for district court litigation?

18 A So district court, I would say two-thirds and
19 IPRs, one-third.

20 Q What is your currently -- current hourly rate,
21 sir?

22 A 625.

23 Q How long has that been your rate?

24 A For maybe three years.

25 Q What percentage of your professional time in

1 the last two years have you spent consulting in
2 connection with patent litigation, in which I include
3 IPRs?

4 A Between and 10 and 15 percent.

5 Q And what percentage of your annual income is
6 derived from consulting for patent litigation, including
7 IPRs?

8 A I don't know for the tax year 2018. For the
9 2017 tax year, I believe it's about a sixth of my
10 income.

11 Q By whom have you been retained in these
12 matters?

13 A By USR.

14 MR. KAERICHER: Objection; vague.

15 Q And when were you retained?

16 A I don't recall the exact date. Approximately
17 two years ago.

18 Q Approximately how much have you billed to date
19 in these matters for USR?

20 MR. KAERICHER: Objection; vague as to "these
21 matters."

22 Just wait a second also before you answer.

23 Thanks.

24 A I don't know really. At least a hundred
25 thousand. But not much more.

1 Q And how much have you been paid to date?

2 A So I think there are two invoices out, and I
3 don't know the exact numbers for those. So I've been
4 paid up until approximately December.

5 Q Have you been paid more than a hundred
6 thousand dollars to date?

7 A You mean for the previous work?

8 Q Correct. By USR.

9 A Yes.

10 Q What did you do, sir, to prepare for today's
11 deposition?

12 A Among other things, I reviewed the -- my
13 declarations.

14 Q Did you do anything else to prepare?

15 MR. KAERICHER: Just a caution not to reveal
16 any communications with us or anything we asked you to
17 review at our direction.

18 THE WITNESS: Of course.

19 A Yesterday, I met with counsel at these offices
20 to review the -- the declaration.

21 Q Did you do anything else to prepare for
22 today's deposition?

23 A Among other things, we also had a couple of
24 phone calls over the last few of days to review, and I
25 have read the declarations in addition to that.

1 Q Did anyone participate in those phone calls
2 other than yourself and counsel for USR?

3 A Not that I'm aware of.

4 Q Did you do anything else to prepare for
5 today's deposition?

6 A No.

7 Q Let me hand you --

8 A Thank you.

9 Q -- what I believe to be the declarations that
10 you signed in connection with the IPRs for the '826 and
11 '137 patents.

12 You should have before you what has been
13 marked as USR Exhibit 210, USR Exhibit 214,
14 USR Exhibit 2003, USR Exhibit 2013, USR Exhibit 2101,
15 and USR Exhibit 2111.

16 A Yes, I do.

17 Q Do you recognize those?

18 A I do.

19 Q What are they?

20 A Three of them are declarations in support of
21 patent owner's response, and three of them are
22 declarations in support of motions to amend.

23 Q And those are declarations that you signed,
24 correct?

25 A That is correct.

1 Q And those are declarations that were submitted
2 in connection with IPRs for USR's patent numbers
3 9,530,137 and 9,100,826?

4 A That's correct.

5 Q Will you understand me today if I refer to
6 U.S. patent number 9,530,137 as the '137 patent?

7 A Yes.

8 Q And will you understand me today if I refer to
9 U.S. patent number 9100826 as the '826 patent?

10 A I would, yes.

11 Q Are the six declarations before you that you
12 signed in connection with the '137 and '826 patents
13 complete and accurate in all respects?

14 A I saw that there was one subtitle that was
15 wrong.

16 Q Do you want to correct that now?

17 A Just a moment. So the 813 document section 3A
18 should be titled the "'826 Patent Specification." It
19 says the "'539 Patent Specification."

20 Q Are your declarations complete and accurate in
21 all other respects?

22 A To the best of my knowledge, yes.

23 Q Do your declarations contain all the support
24 for your opinions?

25 MR. KAERICHER: Objection; form.

1 A Yes.

2 Q Who wrote your declarations?

3 A Some of them -- some of the sentences were not
4 written by me but written by others for me guided by me.
5 And some sentences, such as my understanding of the law,
6 I think, are probably boilerplate. And I have seen them
7 before, and I understand them, but I did not write them,
8 as such. All the arguments, as such, I either wrote or
9 dictated to be written.

10 Q What percentage or proportion of the
11 declarations did you write?

12 MR. KAERICHER: Objection to form.

13 A I would say the majority of the text falls
14 into the category that I described.

15 Q Let me show you what has been previously
16 marked as Apple Exhibit 1104 in IPR 2018-813. That's
17 also Apple Exhibit 1113 in IPR 2018-809 and Apple
18 Exhibit 1005 in IPR 2018-810.

19 Do you recognize that?

20 A I do.

21 Q And what is it?

22 A Beg your pardon?

23 Q What is it?

24 A It's publication number WO 2004/051585 A2,
25 which is an application that I'm a coauthor of.

1 Q Will you understand me today if we refer to
2 this as the '585 reference?

3 A Yes.

4 Q You are a named inventor of the
5 '585 reference, correct?

6 A That's correct.

7 Q And there are two other named inventors,
8 correct.

9 A That's correct.

10 Q One of them is Dr. Ari Juels, correct?

11 A Yes.

12 Q And the other is Dr. Burton Kaliski, correct?

13 A Yes.

14 Q Do you know Dr. Kaliski and Dr. Juels?

15 A I do.

16 Q How do you know Dr. Juels?

17 A For one thing, we used to be colleagues at the
18 RSA. Also, I used to mentor him when he started in the
19 field of cryptography.

20 Q Would you agree that Dr. Juels is a well-known
21 and well-respected expert in the field of cryptography?

22 A Yes.

23 MR. KAERICHER: Objection to form.

24 Q And you have a great deal of respect for
25 Dr. Juels, correct?

1 A I do.

2 Q Would you agree with -- that Dr. Juels is a
3 well-known and well-respected expert in the field of
4 computer security?

5 A When you say "expert," do you mean in the
6 context of patent litigation?

7 Q No, in the context of computer security.

8 A Yes, I agree.

9 Q And would you agree that he's a well-known and
10 well-respected expert in the field of user
11 authentication?

12 A Yes, I agree.

13 Q Would you agree that he's a well-known and
14 well-respected expert in the field of biometrics?

15 A Slightly less so, but he's knowledgeable.

16 Q Dr. Jakobsson, I have handed you copies of the
17 '137 patent, which is Apple Exhibit 1101, and the '826
18 patent, which is Apple Exhibit 1001 in IPR 2018-810.

19 Do you recognize those?

20 A Yes. This one has not been marked.

21 Do you want to mark it?

22 Q Sure. Hand it back to me.

23 MR. KAERICHER: Thanks.

24 A Thank you.

25 Q And for convenience today, I'll refer to these

1 by the patent numbers rather than the exhibit numbers.

2 Is that acceptable?

3 A Understood.

4 Q You've read both the '137 and '826 patents,
5 correct?

6 A Yes, I have.

7 Q When was the first time that you read them?

8 MR. KAERICHER: Objection to form.

9 A I don't remember the exact time, but after I
10 was retained on this case.

11 Q You first became aware of the '137 and '826
12 patents after you were retained by USR, correct?

13 A Or in conjunction with retaining.

14 Q You were not aware of the '137 patent or the
15 '826 patents before you were contacted by counsel?

16 A That's correct.

17 Q For USR, correct?

18 A That is correct.

19 Q So the first time that you became aware of the
20 existence of the '137 and '826 patents was in connection
21 with these IPRs, correct?

22 A No. Because I think I was not aware of the
23 IPRs by the time I was retained.

24 Q Fair enough. But to be clear, the first time
25 that you ever learned of the existence of the '137 and

1 '826 patents was when you were contacted by counsel for
2 USR about the possibility of you being retained.

3 A In conjunction with that, yes.

4 Q The '826 and '137 patents have never been
5 mentioned in any academic papers, correct?

6 MR. KAERICHER: Objection; calls for
7 speculation.

8 A I wouldn't know.

9 Q The '137 and '826 patents have never been
10 discussed at any industry conferences, to your
11 knowledge, correct?

12 MR. KAERICHER: Same objection. Objection to
13 form.

14 A To my knowledge, they have not.

15 Q The '137 and '826 patents have never been the
16 subject of any academic industry or other praise or
17 acclaim, to your knowledge, correct?

18 MR. KAERICHER: Same objections.

19 A Yeah. I would not have known about it if they
20 were.

21 Q You are not aware of the '137 or '826 patents
22 ever having been licensed, correct?

23 MR. KAERICHER: Same objections.

24 A I don't know about the licensing history for
25 these.

1 Q You are not aware of anyone requesting a
2 license to the '137 or '826 patents, correct?

3 A My work as an expert witness here has not
4 involved looking into the license histories at all.

5 Q And, therefore, you're not aware of anyone
6 requesting a license to either the '137 or '826 patents,
7 correct?

8 A I'm absolutely unaware of the licensing
9 history.

10 Q You're not aware of any awards being given for
11 the '826 or '137 patents, correct?

12 MR. KAERICHER: Objection to form.

13 A In general, I'm not aware of awards being.
14 Given for patents -- if you mean scientific awards?

15 Q Awards of any type.

16 A So do you mean settlements as an award?

17 Q That would be an example.

18 A I'm not familiar with any settlements, either,
19 for these patents.

20 Q Okay. So you're not aware of any praise,
21 acclaim, or awards for the '826 or '137 patents,
22 correct?

23 MR. KAERICHER: Objection to form.

24 A I have not been asked to review that or to --
25 I have not been given information about that either.

1 Q And, therefore, you're not aware of any,
2 correct?

3 A I've only studied these in the context of what
4 I've been asked to do. So I'm not aware of anything
5 beyond what I've been asked to review.

6 Q And you're not aware of any praise, acclaim,
7 or awards for the '826 or '137 patents, correct?

8 MR. KAERICHER: Objection to form.

9 A I am not aware of such.

10 Q Had you -- you see the inventor named on the
11 136 -- strike that.

12 You see that the --inventor named on the '826
13 and '137 patents is Kenneth P. Weiss?

14 A Yes.

15 Q Had you ever heard of -- of Ken Weiss before
16 you were contacted by counsel for USR?

17 A Yes.

18 Q Okay. When have you heard of him?

19 A He developed technology that was key component
20 of RSA -- by the acquisition of Security Dynamics, I
21 believe, and I used to work for RSA. Much of the work
22 that I did while at RSA was in context of the security
23 token, which was an invention of his.

24 Q You never discussed the '826 or '137 patents
25 with Mr. Weiss, correct?

1 MR. KAERICHER: Lacks foundation, form.

2 A I have never met Mr. Weiss.

3 Q Have you ever talked to Mr. Weiss?

4 A Not knowing that I did so. If he were ever on
5 a phone call with me, I was not aware of it.

6 Q Would you recognize Mr. Weiss?

7 A No.

8 Q Do you know if Mr. Weiss is an engineer?

9 MR. KAERICHER: Objection; form. Calls for
10 speculation.

11 A I -- I don't know anything about him really
12 other than his achievements.

13 Q Have you ever spoken to anyone other than
14 counsel about Mr. Weiss?

15 A Not in any great detail, but when I worked at
16 RSA, of course, much of what we worked on related to the
17 technology that he invented. And so probably, in
18 passing, somebody would say something about Mr. Weiss.

19 Q Do you remember the specifics of any of those
20 conversations?

21 A Not whatsoever.

22 Q Okay. All right. Could you put in front of
23 you USR Exhibit 2014.

24 A Yes.

25 Q This is your declaration in support of the

1 conditional motion to amend the '137 patent; is that
2 right?

3 A That's right.

4 Q And will you turn, please, to paragraph 33.

5 A Give me a moment to review it, please.

6 Q Of course.

7 A Yes.

8 Q In paragraph 33, you testify that you reviewed
9 the provisional applications, correct?

10 A That is correct.

11 Q Did you read all of the provisional
12 applications?

13 A Are you saying did I read the entirety of the
14 provisional applications cited in here?

15 Q Yes.

16 A I did not.

17 Q What portions did you read?

18 A The portions that I deemed to be relevant, and
19 the other portions I skimmed.

20 Q How did you determine what portions you deemed
21 relevant?

22 A In the context of the claim amendment, if I
23 saw that a paragraph was not addressing anything that
24 seemed relevant, then I would skim it as opposed to read
25 it carefully.

1 Q How many provisional applications are there?

2 A I don't remember.

3 MR. KAERICHER: Objection to form.

4 A There are at least two, but I know that there
5 are more. I don't recall the exact number.

6 Q You testify in paragraph 33 of your
7 declaration that, quote, It is my opinion that each
8 limitation of the proposed substitute claims 13
9 through 21 is disclosed in and fully supported by the
10 provisional applications to which the '137 patent claims
11 priority.

12 Did I read that correctly?

13 A Yes.

14 Q So is it your opinion that each limitation of
15 the proposed substitute claims 13 through 21 is fully
16 supported by the first provisional application filed in
17 February of 2006?

18 MR. KAERICHER: Objection to form.

19 A That's not what I said.

20 Q Is each limitation of the proposed substitute
21 claims 13 through 21 fully supported by the provisional
22 application filed February 2006?

23 A I wasn't asked to consider that, and I would
24 have to review it more carefully to tell if that is so.

25 Q Do you know, as you sit here today, whether

1 each limitation of the proposed substitute claims 13
2 through 21 is fully supported by the first provisional
3 application filed in February 2006?

4 A I don't know it to be the case.

5 Q Do you know, as you sit here today, whether
6 each limitation of the proposed substitute claims 13
7 through 21 is fully supported by the second provisional
8 application filed in June of 2006?

9 MR. KAERICHER: Objection to form.

10 A And by that, you mean by itself.

11 Q Yes.

12 A Not to my knowledge, but I haven't been asked
13 to review that and consider that.

14 Q Have you considered the second provisional
15 application filed in June of 2006 at all in determining
16 whether the proposed substitute claims are supported?

17 MR. KAERICHER: Objection to form.

18 A I don't refer to the applications by the
19 filing date, and I actually don't remember the filing
20 dates. What application are you asking about?

21 Q The provisional application filed in June of
22 2006.

23 A Right. Does it have a number that we could
24 refer to?

25 Q Sure. Let me hand you what I've --

1 A Thank you.

2 Q -- what has been marked as USR Exhibit 2009.

3 Do you recognize that?

4 A Yes, I do.

5 Q Have you reviewed that?

6 A Yes, I have.

7 Q And my question to you is, is each limitation
8 of the proposed substitute claims 13 through 21 fully
9 supported by the second provisional application filed in
10 June of 2006 marked as USR Exhibit 2009?

11 MR. KAERICHER: Objection to form.

12 A I'm sorry. I haven't considered that question
13 before, and I don't know. If you would like me to, I
14 could review them, the claims.

15 Q You have set forth in your declaration marked
16 as USR Exhibit 2014 the full basis for your belief that
17 each limitation of the proposed substitute claims 13
18 through 21 is fully supported by the provisional
19 applications, correct?

20 A I have provided evidence for it. There might
21 be additional evidence. You could see for each claim
22 limitation in each claim there's a long list of support.
23 I did not go to great pains to make that exhaustive and
24 complete; just sufficient.

25 Q Okay. Dr. Jakobsson, devices existed before

1 2006 that used codes that varied over time for
2 authentication, correct?

3 MR. KAERICHER: Objection to form.

4 A That is correct.

5 Q Are you familiar with the RSA SecurID token?

6 A Yes, I am.

7 Q Can you tell us what that is?

8 A It's a password replacement technology that
9 has a small screen that displays for each time interval
10 a multidigit code, typically, I believe, six digits
11 long, and the time here, I believe, is set to 30 seconds
12 or 60 seconds based on the exact product. And a user
13 would use this instead of a password when logging in to
14 a resource. So one would enter one's user name as
15 normal in a normal login interface, and then one would
16 enter the code from this device into the password field.
17 And a verifier would compute the same code based on the
18 record associated with your user name and determine if
19 that same -- if that code is indeed the same, and, if
20 so, that would result in a login approval. That would
21 be the same action as if the password were correct.

22 Q Would you agree that the RSA SecurID token was
23 sold before 2006?

24 A It was.

25 Q So the RSA SecurID token is an example of a

1 device that existed before 2006 that used codes that
2 varied over time for authentication, correct?

3 MR. KAERICHER: Objection to form.

4 A That is correct.

5 Q The RSA SecurID token was first sold in 2002,
6 correct?

7 MR. KAERICHER: Objection; calls for
8 speculation.

9 A I don't know actually know.

10 Q Did you ever use or own a SecurID token
11 yourself?

12 A I was a user of the security token.

13 Q And did you do so before 2006?

14 A I cannot remember exactly when. I believe I
15 did. I believe I did at least while I was working at
16 RSA, which was before 2006.

17 Q The RSA SecurID used a time-varying value to
18 authenticate users, correct?

19 MR. KAERICHER: Objection to form.

20 A I'm not sure it's a time-varying value as in
21 the limitations here, but it was a value that varied
22 over time, which is this code that we've been speaking
23 about.

24 Is that the question you are answering?

25 Q It is. But let me ask it again just to make

1 sure we're clear, and I'll try to use your words.

2 The RSA SecurID token used a value that varied
3 over time to authenticate users, correct?

4 A So let me clarify that, actually. So the
5 output would not be the same for each time period; the
6 output being this multidigit code. So that one was
7 different over time.

8 I understand that, for example, Dr. Shoup
9 argues that the time-varying value is not the code that
10 resulted in the screen, but he argues that it's the
11 value that, in some of these documents, is referred to
12 as T, which is a counter corresponding to time. So
13 that's why I mention that in the context of the claim
14 limitations, it -- my answer does not apply to the claim
15 limitations unless we look at each particular claim
16 limitation and consider what the question is.

17 Q Okay. I'm -- I'm just asking you about the --
18 the SecurID token.

19 A The SecurID token has an output that varies
20 over time.

21 Q And the output of the SecurID token varies
22 over time to authenticate a user, correct?

23 MR. KAERICHER: Objection to form.

24 A It doesn't vary over time in order to
25 authenticate a user.

1 Q You would agree that the SecurID token has a
2 output that varies over time, correct?

3 A That is correct.

4 Q And you'd agree that publications existed
5 before 2006 that describe codes that varied over time
6 for the purpose of authentication, correct?

7 MR. KAERICHER: Objection to form;
8 speculation.

9 A They did not vary over time in order to
10 authenticate the user. They authenticated the user, and
11 they varied over time.

12 Q You'd agree that publications existed before
13 2006 that described codes that varied over time,
14 correct?

15 MR. KAERICHER: Same objections.

16 A Yes.

17 Q And, in fact, the '585 reference discloses
18 time-varying values, correct?

19 MR. KAERICHER: Same objections.

20 A '585 describes a password replacement device
21 that has an output that is different by time intervals.

22 Q So is the answer to my question yes?

23 A I believe I understood your question, but
24 would you restate it?

25 Q Sure. The '585 reference describes

1 time-varying values, correct?

2 MR. KAERICHER: Objection to form.

3 A Yes, it does.

4 Q In fact it uses the expression "time-varying
5 value," correct?

6 A I believe it does.

7 Q So the '585 reference is an example of a
8 publication that existed before 2006 that described
9 time-varying values, correct?

10 A It does describe time-varying values, and I
11 believe it was published in 2004.

12 Q And the time-varying values disclosed in the
13 '585 reference were used in connection with
14 authenticating users, correct?

15 MR. KAERICHER: Objection to form.

16 A It was part of the construction, yes.

17 Q Would you agree that the '137 patent does not
18 disclose any new ways of generating time-varying codes
19 that didn't exist already in 2006?

20 MR. KAERICHER: Objection to form.

21 A I haven't specifically been asked to consider
22 that; so I'd have to take a good look at it to see. I
23 can't remember seeing anything that does, but I also
24 haven't made sure that there's nothing that does.

25 Q As you sit here, you don't know of any

1 disclosure in the '137 patent of a new way of generating
2 time-varying codes, correct?

3 MR. KAERICHER: Same objection.

4 A Give me a moment, please.

5 The specific generation of the time-varying
6 codes, I do not believe that I ever -- have seen a new
7 method of generating them in '137.

8 Q And the provisional patent applications to
9 which the '137 patent claims priority don't discuss any
10 new ways of generating time-varying codes, correct?

11 MR. KAERICHER: Objection to form.

12 A Again, this is one of those things that I was
13 not asked to verify, and I did not spend any great time
14 looking for this. When I skimmed things, if there were
15 such a disclosure, it's probably one that I would have
16 skipped through rather quickly.

17 Q You are not aware of anything in the
18 provisional patent applications, to which the
19 '137 patent claims priority, that discloses new ways of
20 generating time-varying codes, correct?

21 MR. KAERICHER: Same objection.

22 A Not that I recall sitting here today.

23 Q The '826 patent also does not discuss any new
24 ways of generating time-varying codes, correct?

25 MR. KAERICHER: Same objection.

1 A I believe the specifications are, if not the
2 same, then almost the same for these two. So the answer
3 would be the same.

4 Q And you are not aware of the provisional
5 patent applications to which the '826 patent claims
6 priority discussing any new ways of generating
7 time-varying codes, correct?

8 MR. KAERICHER: Same objection.

9 A Not as I'm sitting here today.

10 Q Neither the '137 patent nor the '826 patent
11 discuss any inventive time v-a-r-y-i-n-g code, correct?

12 MR. KAERICHER: Objection to form.

13 A Any what? I'm sorry.

14 Q Inventive.

15 A Inventive.

16 Q Yes.

17 A Time-varying code. What do you mean by that?

18 Q Any new time-varying code.

19 A They discuss the use of time-varying codes
20 rather than the generation of the time-varying codes.

21 Q So would you agree with me, sir, that the
22 '137 patent and the '826 patent don't disclose any
23 time-varying code that did not already exist before
24 2006?

25 MR. KAERICHER: Objection to form.

1 A They don't describe or disclose any that I'm
2 aware of.

3 Q Time-varying codes are prior art to both the
4 '137 and '826 patents, correct?

5 A That is correct.

6 Q And as of 2006, time-varying codes were known
7 for use in authenticating one device to another,
8 correct?

9 A Yes.

10 Q That's the way the SecurID token used -- was
11 used?

12 A People sometimes phrase it differently. They
13 would say that the time-varying code is used to
14 authenticate a user to a back end.

15 Q Encryption techniques existed before 2006,
16 correct?

17 A That is correct.

18 Q Encrypting data before transmitting it from
19 one device to another was known before 2006, correct?

20 A Yes.

21 Q And before 2006 -- strike that.

22 Before 2006, techniques to encrypt messages
23 sent between two devices was known, correct?

24 A Yes.

25 MR. KAERICHER: Objection to form.

1 Q Before 2006, it was known that encrypted
2 messages could include authentication information from
3 the transmitting device, correct?

4 MR. KAERICHER: Objection to form.

5 A Would you please say the question again.

6 Q Sure. Before 2006, it was known that
7 encrypted messages could include authentication
8 information from the transmitting device?

9 MR. KAERICHER: Same objection.

10 A These devices that we're speaking about here,
11 there was no need to necessarily encrypt the outputs.

12 Are you asking in the context of the SecurID
13 token and the publication.

14 Q No. I'm asking you about what was known in
15 2006.

16 A Yes.

17 Q Okay. And my question to you is before 2006,
18 it was known that encrypted messages could include
19 authentication information from a transmitting device,
20 correct?

21 MR. KAERICHER: Objection to form.

22 A Yes, it was.

23 Q And before 2006, it was known that encrypted
24 messages could include information from the transmitting
25 device that could be used to verify the identity of an

1 individual, correct?

2 A Yes.

3 Q And prior to 2006, it was known that encrypted
4 messages could include an encrypted account number from
5 the transmitting device, correct?

6 MR. KAERICHER: Objection to form.

7 A I -- I cannot think of particular instances
8 where the device would send an account number. Do
9 you -- is there anything in particular that you are --
10 have in mind?

11 Q Let me try it this way. Before 2006, it was
12 known that encrypted messages could include an encrypted
13 bank account number or credit card number from the
14 transmitting device, correct?

15 MR. KAERICHER: Objection to form.

16 A That's possible, yes.

17 Q And before 2006, it was known that encrypted
18 messages could include biometric information from the
19 transmitting device, correct?

20 MR. KAERICHER: Objection to form.

21 A That's a -- that it was understood that one
22 could communicate biometric information in an encrypted
23 fashion.

24 Q Before 2006, it was known that encrypted
25 messages could be used by the receiving device to

1 authenticate the transmitting device, correct?

2 MR. KAERICHER: Objection to form.

3 A Yes.

4 Q Before 2006, it was known that encrypted
5 messages could be used by the receiving device to
6 authenticate the user of the transmitting device,
7 correct?

8 MR. KAERICHER: Objection to form.

9 A When you say "message," do you want to be more
10 specific what you mean? I'm sorry.

11 Q The encrypted information. The encrypted
12 data.

13 A The input to the encryption function?

14 Q Yes.

15 A Yes.

16 Q So before 2006, it was known that the input to
17 the encrypted function could be used by the receiving
18 device to authenticate the user of the transmitting
19 device, correct?

20 MR. KAERICHER: Objection to form.

21 A Yes.

22 Q Are you familiar with the term "public key"?

23 A Public key?

24 Q Public key.

25 A Yes, I am.

1 Q Thought you might be. What is it?

2 A It's a concept in cryptography where there is
3 a pair of keys. One is referred to as the private key,
4 and one is referred to as the private -- public key.
5 The public key cannot be used to compute the private
6 key. But it can be used to verify a computation
7 performed using the private key. So, for example, one
8 can compute what's called a digital signature using a
9 private key and later verify it, this digital signature,
10 using among other things, the public key. That is one
11 application of this technology. But using the public
12 key, one cannot construct this transcript that was
13 constructed from knowledge of the private key. And when
14 I say "cannot," I mean with a reasonable probability,
15 within a reasonable amount of time.

16 Q Who is credited with having developed public
17 and private key cryptography?

18 MR. KAERICHER: Objection; form, foundation.

19 A There is some disagreement about that. Some
20 people that often get credited are Diffie and Hellman
21 for describing one genial way of doing it.

22 Q Encryption techniques that used public keys
23 were known before 2006, correct?

24 A Yes.

25 Q Are you familiar with the term, "key

1 encryption key"?

2 A Yes.

3 Q Key encryption key is sometimes referred to as
4 KEK; is that right?

5 A It's not a commonly used term, but it might
6 be.

7 Q What is a key encryption key?

8 A So using public key cryptography, one can
9 encrypt inputs of various types. Those can be stored,
10 those ciphertexts, or they can be transmitted. And
11 using the appropriate secret key, one can later decrypt
12 it -- sorry -- using the appropriate private key, one
13 can later decrypt these ciphertexts. That is somewhat
14 computationally involved. For some applications, that
15 is more overhead than the user wishes to see. In such
16 applications, it would have been desirable to use a less
17 computationally involved encryption method, which is
18 what's referred to as a symmetric-key encryption
19 technique. In a symmetric-key encryption technique, the
20 same key is used for encryption and decryption, and,
21 therefore, it doesn't have some of the properties in the
22 public key encryption. But it is much faster. So a key
23 encrypting a key relates to when one uses public key
24 cryptography to encrypt a key that is a symmetric key.
25 And the symmetric key is used to encrypt some other

1 message. And one would decrypt that particular message
2 by first decrypting the key, the symmetric key that was
3 used, using the private key that is correspond to the
4 public key.

5 Q So is a key encryption key an example of a
6 symmetric key?

7 A Key encryption keys can be symmetric. I gave
8 you an example in which the key encryption key is not
9 symmetric.

10 Q Key encryption keys were known before 2006,
11 correct?

12 A Yes.

13 Q For a key encryption key known before 2006, a
14 person who wished to send an encrypted message would
15 first encrypt the message with a session key, right?

16 MR. KAERICHER: Objection to form.

17 A There's not necessarily an ordering. One
18 would not have to do this first.

19 Q For a key encryption key known before 2006, a
20 person wishing to send an encrypt -- encrypted message
21 could first encrypt a message with a session key,
22 correct?

23 MR. KAERICHER: Objection; form.

24 A Is the session key the symmetric key that I
25 mentioned before?

1 Q Yes.

2 A Yes.

3 Q Then the session key in my example would be
4 encrypted with a key encryption key, correct?

5 MR. KAERICHER: Same objection.

6 A You mean after that took place?

7 Q Yes.

8 A That one possibility.

9 Q And then both the session key encrypted
10 message and the key encrypted -- key encrypted session
11 key would be sent to the recipient, correct?

12 MR. KAERICHER: Objection; form.

13 A Would you please say that again?

14 Q Sure. Both the session key encrypted message
15 and the key encryption key encrypted session key would
16 be sent to the recipient.

17 MR. KAERICHER: Same objection.

18 A I need to parse this carefully. I agree to
19 the first part that the message encrypted using the --
20 what you call the session key would -- could be
21 transmitted, if that's the purpose, of course.

22 Would you read the other part back to me?

23 Q Sure. The -- my question is both the session
24 key encrypted message and the key encryption key
25 encrypted session key would need to be sent to the

1 recipient, correct?

2 MR. KAERICHER: Objection; form.

3 A Did you say key encrypted key?

4 Q Key encryption key encrypted session key.

5 A Yes. Could be sent.

6 Q The recipients would have to know the key
7 encryption key before receiving the session key
8 encrypted message and the key encryption key encrypted
9 session key, correct?

10 MR. KAERICHER: Objection to form;
11 speculation.

12 A You have to say that slower. I'm so sorry.

13 Q No problem. The recipient would have to know
14 the key encryption key before receiving the session key
15 encrypted message and the key encryption key encrypted
16 session key, correct?

17 MR. KAERICHER: Same objection.

18 A Before receiving -- did you say before
19 receiving?

20 Q Yes.

21 A One could receive it without knowing.

22 Q If the recipient didn't know the key
23 encryption key, the recipient would have to find out the
24 key encryption key if the recipient wanted to decrypt
25 the session key, correct?

1 MR. KAERICHER: Objection to form.

2 A In the example I gave before, the key
3 encryption key is a -- is not a symmetric key but a
4 private key. No. I'm sorry. Is a public key in the
5 example I gave you before. The key encryption key is a
6 public key in the example. And that would actually not,
7 per se, have to be known in order to determine what you
8 call a session key.

9 Q So is it your view that the recipient could
10 decrypt the session key without the key encryption key
11 in my example?

12 MR. KAERICHER: Objection to form.

13 A The key encryption key in the example that you
14 and I constructed together by merging my initial example
15 with your follow-up of the example would be a public
16 key. And one would not, per se, have to know the public
17 key, even though it's knowable, in order to decrypt the
18 message and obtain the session key.

19 Q How would you define a symmetric encryption
20 key?

21 A A symmetric -- a symmetric session key?

22 Q Or a symmetric encryption key.

23 A Symmetric encryption key is one that is used
24 in order to encrypt messages in a symmetric key
25 algorithm where the same or a related key that can be

1 derived from this key can be used to decrypt the same --
2 the associated ciphertext.

3 Q Would you agree that before 2006, a person of
4 ordinary skill in the art would not refer to the key
5 encryption key as a public key?

6 MR. KAERICHER: Objection; form.

7 A Would not refer to the session -- the key
8 encryption key?

9 Q Yes.

10 A I don't have any opinion about that.

11 Q Before 2006, would a person of ordinary skill
12 in the art refer to the key encryption key as a private
13 key?

14 MR. KAERICHER: Objection to form.

15 A That would not make sense.

16 Q If the key encryption key was a public key, it
17 could not be used to both encrypt the session key and
18 decrypt the session key, correct?

19 MR. KAERICHER: Objection to form.

20 A When in a public key cipher, one uses a
21 different key for encryption and decryption. One uses
22 the private key for decryption.

23 Q So is the answer to my question correct?

24 A Would you say the question again?

25 Q Of course. If the key encryption key was a

1 public key, it could -- it could not be used to both
2 encrypt the session key and decrypt the session key,
3 correct?

4 MR. KAERICHER: Objection to form.

5 A Assuming the session key is what is being
6 encrypted and decrypted, that's correct. One uses a
7 different key for decrypting in a public key cipher.

8 (Deposition Exhibit 1 was marked for
9 identification.)

10 Q Dr. Jakobsson, I've marked as Exhibit 1
11 Chapters 3 and 4 from RSA Security's Official Guide to
12 Cryptography.

13 Do you have that before you?

14 A I do.

15 Q Are you familiar with the book "RSA Security's
16 Official Guide to Cryptography"?

17 A I'm embarrassed to say that I'm not. I might
18 have reviewed contents of it at some point, and I
19 certainly recognize the concepts, but I don't recognize
20 the cover or the authors.

21 Q Okay. If you could turn, please, to page 54
22 of Exhibit 1.

23 MR. KAERICHER: I'm going to raise an
24 objection that the questions about this document are
25 outside the scope of this declaration -- or of this

1 deposition and also for foundation.

2 Can I have a standing objection so I don't
3 have to make any more?

4 MR. SELWYN: Sure. And I think they're within
5 the scope, at least in light of the motion to amend.

6 Q Do you have page 54 in front of you?

7 A Yes, I do. Let me take a quick look at it.

8 Q Of course.

9 A Yes, I have reviewed this page and portions of
10 the next now.

11 Q And you see this page describes a key
12 encryption key?

13 A Yes. I might add that the technique described
14 in here are not commonly seen as secure.

15 Q Let's walk through, if we might, figure 3
16 point -- 3-1 together.

17 A Yes.

18 Q Figure 3-1 shows that a message is encrypted
19 with a session key, correct?

20 A Yes.

21 Q And figure 3-1 also shows that the session --
22 that the session key that the -- strike that.

23 Figure 3-1 also shows that the session key
24 that encrypted the message is encrypted with a key
25 encryption key, correct?

1 A That seems likely to be what the figure says.

2 Q And in order to decrypt the session key
3 encrypted message, someone who knows the key encryption
4 key would decrypt the session key using the key
5 encryption key, correct?

6 MR. KAERICHER: Objection to form;
7 speculation.

8 A In this case yes.

9 Q In order to decrypt the session key encrypted
10 message in this case, the message could then be
11 decrypted using the decrypted session key, correct?

12 MR. KAERICHER: Objection to form.

13 A That is correct.

14 Q For messages that are encrypted with
15 asymmetric keys, a public key is used to encrypt
16 messages. But a private key is used to decrypt the
17 message, correct?

18 A That is correct.

19 MR. KAERICHER: Objection to form.

20 Q Are you familiar with hybrid cryptosystems?

21 A Yes, I am.

22 Q What is a hybrid cryptosystem?

23 A They use the encryption of a symmetric key
24 using a public key. In order to convey a key to be used
25 for an action later which may be the decryption of the

1 large ciphertext that was constructed using the
2 symmetric key.

3 Q Hybrid cryptosystems existed before 2006,
4 correct?

5 A That is correct.

6 Q Hybrid cryptosystems existed at least in the
7 1990s, correct?

8 MR. KAERICHER: Objection; speculation.

9 A I do not know when they were first introduced.

10 Q A hybrid cryptosystem was a public key
11 encryption technique known before 2006, correct?

12 A That is true.

13 Q In a hybrid cryptosystem before 2006, a person
14 wishing to send an encrypted message would first encrypt
15 the message with a session key, correct?

16 A Not necessarily.

17 Q In a hybrid cryptosystem before 2006, a person
18 wishing to send an encrypted message could first encrypt
19 a message with a session key, correct?

20 A That's correct.

21 Q Then the session key would be encrypted with
22 the recipient's public key, correct?

23 MR. KAERICHER: Objection; form.

24 A Are we speaking about the hybrid?

25 Q Yes.

1 A Yes. So that is true. That is one way of
2 doing it.

3 Q And both the session key encrypted message and
4 the public key encrypted session key would then be sent
5 to the recipient, correct?

6 MR. KAERICHER: Objection to form.

7 A It could be, yes.

8 Q The recipient could then use his or her
9 private key associated with his or her public key to
10 decrypt the -- the session key, correct?

11 A Yes.

12 Q And then the recipient could decrypt the
13 session key encrypted message with the session key to
14 obtain the message, correct?

15 A That is correct.

16 MR. KAERICHER: Objection; form.

17 Q And, in that way, the message could be
18 securely sent to a recipient, correct?

19 MR. KAERICHER: Objection to form.

20 A Yes. It would be encrypted.

21 Q And prior to 2006, a person of ordinary skill
22 in the art would have recognized hybrid encryption
23 systems to be a form of public key encryption, correct?

24 A They would use public key encryption. I'm not
25 sure they would be considered hybrid -- that they would

1 be considered public key encryption.

2 Q The hybrid cryptosystem encryption technique
3 that I just walked through with you was known before
4 2006, correct?

5 A Yes.

6 MR. KAERICHER: We've been going for a little
7 over an hour. So if you're about to transition, maybe
8 this is a good --

9 MR. SELWYN: Sure. This is fine.

10 (A recess ensued from 10:02 a.m. to
11 10:11 a.m.)

12 (Deposition Exhibit 2 was marked for
13 identification.)

14 BY MR. SELWYN:

15 Q All right. Dr. Jakobsson, I have handed you
16 what has been marked as Exhibit 2, which is titled "An
17 Introduction to Cryptography." Do you have that in
18 front of you?

19 A Yes, I do.

20 Q Do you recognize this book?

21 A I know the book.

22 MR. KAERICHER: So I'll object to -- to this
23 line of questioning also as outside the scope. Can I
24 have a standing objection?

25 MR. SELWYN: Yes.

1 Q Is this a book that you have reviewed or
2 referenced before?

3 A I don't remember doing that.

4 Q Would you, please, turn to page 16, sir. Do
5 you see in the second line on page 16, it says "PGP is a
6 hybrid cryptosystem"?

7 A Yes, I do.

8 Q Do you agree that PGP is a hybrid
9 cryptosystem?

10 A Yes, I do.

11 Q PGP existed before 2006, correct?

12 A Yes.

13 Q PGP was introduced in the early 1990s,
14 correct?

15 MR. KAERICHER: Objection speculation.

16 A I don't actually remember when it was
17 introduced.

18 Q What is PGP?

19 A PGP allows encryption using public keys, and
20 one of the algorithms it uses is the RSA cryptosystem.
21 It doesn't use the now-familiar certification
22 infrastructure but a web of trust in order to determine
23 what public keys to associate with what parties.

24 Q Do you see on page 16, figure 1-4, which is
25 entitled "How PGP Encryption Works"?

1 A Yes.

2 Q Figure 1-4 shows that plaintext is encrypted
3 with a session key, correct?

4 A I see that's what it says.

5 Q And figure 1-4 shows that the session key that
6 encrypted the plaintext is encrypted with a public key,
7 correct?

8 A That's also what it says, yes.

9 Q Do you see the last sentence of the third
10 paragraph on page 16 explains that in PGP, the session
11 key encrypted ciphertext and the public key encrypted
12 session key are transmitted to the recipient?

13 MR. KAERICHER: Objection to form.

14 A What sentence did you refer to? I'm sorry.

15 Q I'm sorry. The last sentence of the third
16 paragraph on page 16.

17 A So this public key encrypted session key is
18 transmitted along with the ciphertext to the recipient.

19 Q Yes.

20 A Yes, I see that sentence.

21 Q And that sentence explains that in PGP the
22 session key encrypted ciphertext and the public key
23 encrypted session key are transmitted to the recipient,
24 correct?

25 A Yes.

1 Q Do you see agree that before 2006, PGP enabled
2 the session key encrypted ciphertext and the public key
3 encrypted session key to be transmitted to the
4 recipient?

5 MR. KAERICHER: Objection to form.

6 A Yes.

7 Q Figure 1-4 shows encrypting information with a
8 first key called a "session key" and encrypting the
9 first key with a second key called a "public key,"
10 correct?

11 A Yes.

12 Q And the information encrypted with the first
13 key and the first key encrypted with the second key are
14 transmitted to the recipient, correct?

15 MR. KAERICHER: Objection; form.

16 A In this example, yes.

17 Q And in this example, the first key is a
18 session key, correct?

19 MR. KAERICHER: Objection; form.

20 A As you mentioned it, the -- in your statement,
21 it would have been the first key, yes.

22 Q And in this example, the first key encrypted
23 with the second key is the public key?

24 MR. KAERICHER: Same objection.

25 A I think --

1 Q Strike that. In my example, the second key is
2 the public key, correct?

3 A Yes, I think so.

4 Q Let me hand you what's been previously marked
5 as USR Exhibit 2008.

6 A Thank you.

7 Q Do you recognize this?

8 A Yes, I do.

9 Q What do you recognize it to be?

10 A This is one of the provisionals, I believe. I
11 don't know which one. I recognize the images. It might
12 be either the application that became '137 or the one
13 that became 86 -- '826.

14 Q Could you please turn to page 49 of USR
15 Exhibit 2008.

16 A Yes.

17 Q And let me focus your attention, please, on
18 lines 24 through 32. Let me know after you've had an
19 opportunity to read that to yourself.

20 A Okay. Yes.

21 Q Lines 24 through 32 on page 49 describe a
22 DES key, D-E-S?

23 A There's mention of a DES key, yes.

24 Q A person of ordinary skill in the art at the
25 time of USR Exhibit 2008 would have understood that the

1 DES key described on page 49 would be a symmetric
2 encryption key, correct?

3 MR. KAERICHER: Objection to form.

4 A Yes.

5 Q Page 49, lines 24 through 32 also describes a
6 DES key encrypted biometric data field that is encrypted
7 using the DES key, correct?

8 A Yes.

9 Q Page 49, lines 24 through 32 also explains
10 that the DES key can be a PKI encrypted DES key,
11 correct?

12 MR. KAERICHER: Objection to form.

13 A Yes.

14 Q That passage also explains that the key that
15 encrypts a DES key is the public key of the first user,
16 correct?

17 MR. KAERICHER: Same objection.

18 A Let me just look at it again. That's what it
19 says, yes.

20 Q A person of ordinary skill in the art reading
21 USR Exhibit 2008 would have understood that the public
22 key of the first user described in this passage would be
23 an asymmetric key, correct?

24 A Yes.

25 Q Now, if you would, sir, turn to page 50. And

1 I'd like to focus your attention on lines 24 through 31.
2 Let me know after you've had an opportunity to read that
3 to yourself.

4 A Yes.

5 Q Page 50, lines 24 through 31 of this exhibit
6 describes how to decrypt the PKI encrypted DES key
7 described in page 49, lines 24 through 32, correct?

8 A That's what it looks like, yes.

9 Q Page 50, lines 28 through 31 of this exhibit
10 explain that the PKI encrypted DES key is decrypted with
11 the public key of the first user, correct?

12 MR. KAERICHER: Objection to form.

13 A It said "The second wireless device uses the
14 first public key to decrypt the PKI encrypted DES key at
15 step 526."

16 Q So is it fair to say that lines 28 through 31
17 describe the PKI encrypted DES key being decrypted with
18 the public key of the first user?

19 A It says that it uses the first public key to
20 decrypt. It doesn't say how.

21 Q The PKI encrypted DES key is decrypted with
22 the public key of the first user, correct?

23 MR. KAERICHER: Objection; form.

24 A That's what it says.

25 Q If the public key of the first user is an

1 asymmetric key, then decrypting the PKI encrypted DES
2 key with the same public key would not yield the DES
3 key, correct?

4 MR. KAERICHER: Objection; form.

5 A That's why I'm saying it's what it says,
6 because I believe that this is a typographical error in
7 here. It should say "the private key of the second
8 party."

9 Q Can you explain what the typographical error
10 is that you believe?

11 A One would use a private key to decrypt an
12 asymmetric encryption scheme, not a public key.

13 Q So, again, directing your attention to lines
14 28 through 31 on page 50, if the public key of the first
15 user is an asymmetric key, then decrypting the PKI
16 encrypted DES key with the same public key would not
17 yield the DES key, correct?

18 MR. KAERICHER: Objection; form.

19 A That's why I'm saying. A person of skill in
20 the art reading this would understand that it's a typo
21 because one does not decrypt using a public key. One
22 decrypts using a private key.

23 Q So is it fair to say that page 49, lines 24
24 through 32 and page 50, lines 24 through 31 do not
25 describe how the DES key can be encrypted in a way that

1 could then be decrypted?

2 MR. KAERICHER: Objection to form.

3 A It's clear that there is a typo here because a
4 person of skill in the art would know that one would
5 decrypt using a private key, not a public key.

6 Q But based upon the words in page 49 and
7 page 50, would you agree that they do not describe how
8 the DES key can be encrypted in a way that could then be
9 decrypted?

10 MR. KAERICHER: Objection to form.

11 A So let me explain like this. If you were to
12 give these two paragraphs to a person of skill in the
13 art, say an engineer tasked with implementing a system,
14 the engineer would say you must have made a typo here.
15 One doesn't decrypt using the public key. And I
16 understand what you mean, but you wrote the wrong word.
17 And would then go ahead and implement the traditional
18 hybrid encryption and decryption scheme.

19 Q So a person of ordinary skill in the art
20 reading pages 49 and 50 would say they don't make sense
21 as written, correct?

22 MR. KAERICHER: Objection to form.

23 A They would say there's clearly a typo here. I
24 know what is being conveyed. It's conveyed the -- what
25 we have referred to before as hybrid encryption and

1 associated decryption and then would go about and say,
2 if you want to do this, this should use a private key,
3 of course.

4 Q You'd agree, though, that pages 49 and 50
5 don't make sense as written, correct?

6 MR. KAERICHER: Objection to form.

7 A They make sense in the regard that they give
8 guidance to a person of skill in the art what was meant
9 to convey. There would be no misunderstanding.

10 Now, if you take a person of skill in the art,
11 that person has sufficient knowledge to know that one
12 does not decrypt using a public key and would know that
13 one decrypts using the corresponding private key. And
14 so this person of skill in the art would explain that
15 there's a mistake here, would not start attempting to
16 decrypt using a public key.

17 Q Before 2006, a person of ordinary skill in the
18 art would have understood that one known example of a
19 public key encryption was a hybrid cryptosystem,
20 correct?

21 A One example of what, I'm sorry?

22 Q Sure. Let me re-ask it. Before 2006, a
23 person of ordinary skill in the art would have
24 understood that one known example of a public key
25 encryption system was a hybrid cryptosystem, correct?

1 A I don't know if they would have called it like
2 that and characterized it like you do. One would have
3 understood -- a person of skill in the art at the time,
4 would have understood that a hybrid cryptosystem has a
5 public key component but would not necessarily qualify
6 the entire system as a public key cryptosystem.

7 Q Before 2006, a person of ordinary skill in the
8 art would have understood that decrypting a value
9 encrypted using a hybrid cryptosystem would involve
10 decrypting a session key with a private key, correct?

11 MR. KAERICHER: Objection to form.

12 A It doesn't have to be a session key. They
13 would understand that in order to decrypt, the key
14 used -- the symmetric key used in this context, one
15 would need a private key. Or in the case that it's
16 multilevels, it could be that one needs another
17 symmetric key. But one would not use a public key, and
18 a person of ordinary skill in the art reading that would
19 know that.

20 Q Before 2006, a person of ordinary skill in the
21 art would have understood that decrypting a value
22 encrypted using a hybrid cryptosystem would involve
23 decrypting a key with a private key, correct?

24 A Yes.

25 Q In 2,000 -- strike that.

1 Before 2006, a person of ordinary skill in the
2 art would have understood that decrypting a value
3 encrypted using a hybrid cryptosystem would involve
4 decrypting the value with a key, correct?

5 MR. KAERICHER: Objection; form.

6 A There would -- no, I wouldn't characterize it
7 as such. You -- the value is the input to the
8 cryptosystem. So you would not do what you said.

9 Q Could you turn to the '585 reference.

10 A Yes.

11 Q And if you would, please, turn to page 23.

12 A Yes.

13 Q You see that lines 9 through 11 on page 23
14 say, "In some embodiments, the verifier 105 decrypts a
15 value encrypted by the user authentication device 120
16 using symmetric-key encryption or asymmetric encryption
17 techniques such as public key encryption."

18 A Yes.

19 Q Those lines describe decrypting a value
20 encrypted using public key encryption, correct?

21 A Yes.

22 Q Can you turn back to the '137 patents. And if
23 you would, please turn to figure 23. Do you have
24 figure 23 in front of you?

25 A Yes, I do.

1 Q Figure 23 shows various fields that can be
2 included within first or second wireless signals,
3 correct?

4 MR. KAERICHER: Objection to form.

5 A I don't recall the exact context, but it shows
6 a set of fields that would have been included in a
7 signal.

8 Q The '137 patent refers to each of the elements
9 302, 304, 306, 308, 310, 312, and 314 as fields,
10 correct?

11 A Yes.

12 Q And the '826 patent includes the same
13 figure -- or -- strike that.

14 The '826 patent includes the same figure 23 as
15 the '137 patent, correct?

16 A Yes.

17 Q Figure 23 shows some of these fields next to
18 each other, correct?

19 MR. KAERICHER: Objection to form.

20 A Yes, it does.

21 Q For example, header field 302 is next to
22 public ID field 304, correct?

23 A In this particular field, yes.

24 Q And in figure 23, public ID field 304 is next
25 to digital signature field 306, correct?

1 A Yes.

2 Q Figure 23 shows the fields appended to each
3 other, correct?

4 MR. KAERICHER: Objection to form.

5 A It doesn't actually describe -- one would
6 understand that that's one way of doing it.

7 Q Figure 23 shows each field joined to the end
8 of each previous field, correct?

9 MR. KAERICHER: Objection to form.

10 A It's not specific about this. They're
11 separate fields.

12 Q The fields shown in figure 23 are separate,
13 correct?

14 A These are separable fields.

15 Q So if the message were to be received in the
16 form shown in figure 23, the receiving device could --
17 could recover, for example, only field 302?

18 MR. KAERICHER: Objection to form.

19 A I don't think I understand your question. It
20 could only recover it? Or it could recover only that if
21 it wished to?

22 Q The latter, if it wanted to just recover one
23 of the fields, it could do so.

24 MR. KAERICHER: Objection; form.

25 A I haven't asked -- been asked to consider that

1 question.

2 Q So you don't know?

3 A It depends on what you mean. For example, by
4 recovering the field, if the field is the 312 field
5 that's encrypted biometric data, you could recover just
6 that field. But if you mean by "recover" to actually
7 get the biometric data, then one needs, in this example,
8 another field.

9 Q If a message were to be received in the form
10 shown in figure 23, the receiving device could recover
11 each individual field separately, correct?

12 A Yes.

13 MR. KAERICHER: Object to form.

14 Q I believe you told me a moment ago that the
15 fields shown in figure 23 are separable, correct?

16 A Yes.

17 Q What is it about how figure 23 is illustrated
18 that demonstrates to you that the fields are separable?

19 MR. KAERICHER: Objection to form.

20 A Figure 23, by itself, may or may not describe
21 that. Reading it with a specification makes it clear
22 that these are values that are not combined, for
23 example, in the sense that one cannot determine what a
24 particular value is. So using the example you used, one
25 could read the data in the header field, and so that

1 has -- that is separate or separable from other fields.

2 Q So one of ordinary skill in the art reading
3 figure 53 together with the specification would know
4 that the fields can be individually recovered after
5 transmission, correct?

6 A Just a moment.

7 MR. KAERICHER: Objection to form.

8 A Did you say 53?

9 Q 23.

10 A 23. I'm sorry.

11 Q Do you want the question again?

12 A Yes, please.

13 Q One of ordinary skill in the art reading
14 figure 23 together with the specification would know
15 that the fields can be individually recovered after
16 transmission, correct?

17 A Yes. And by that, I mean that the party who
18 receives it would be able to compute each one of these
19 values and output those. No. Let me clarify that.
20 Would be able to output those. There's no, necessarily,
21 computation going on. But, for example, for the DES key
22 encrypted biometric data, in order to output the
23 biometric data, one would need the DES key.

24 Q Bear with me one second.

25 Okay. Can you turn to figure 7 in the

1 '137 patent.

2 A Let me take a quick look at it.

3 Q Take your time.

4 A Yes.

5 Q Can you also, please, look at column 17,
6 lines 60 through 65 and read that to yourself.

7 A Yes.

8 Q According to column 17, line 61 of the
9 '137 patent, figure 7 shows a method of using USR
10 software 18 and USR database 24, correct?

11 A Yes. This gives one example of one use.

12 Q And that description also describes a user's
13 electronic ID device, a merchant, and a credit card
14 company, correct?

15 MR. KAERICHER: Objection to form.

16 Q Let me rephrase it in light of the objection.

17 The description of figure 7 in the
18 '137 patent, beginning at column 17, line 61 and going
19 through column 18, line 34 also describes a user's
20 electronic ID device, a merchant, and a credit card
21 company, correct?

22 A I'd need to review those paragraphs.

23 Q Go ahead.

24 A Just a moment, please.

25 What's your question? I'm sorry.

1 Q The description of figure 7 in the '137 patent
2 beginning at column 17, line 61, and extending through
3 column 18, line 34, describes a user's electronic ID
4 device, a merchant, and a credit card company, correct?

5 A Yes. This is an example that they describe.

6 Q And in figure 7, each of the user's electronic
7 ID device, the merchant, the USB, and the credit card
8 company is a separate device or operates on a separate
9 device from the others, correct?

10 MR. KAERICHER: Objection to form.

11 A It doesn't explicitly say so.

12 Q But you would understand it that way, correct?

13 A Yes. I would understand that that's one way
14 of doing it.

15 Q In figure 7, each of the user's electronic ID
16 device, the merchant, the USB, and the credit card
17 company is a separate element from the other, correct?

18 MR. KAERICHER: Objection to form.

19 A It doesn't explicitly say so, but I would
20 understand that that's one possibility.

21 Q In figure 7 and the accompanying description
22 on columns 17 and 18, the user of the electronic ID
23 device presents a code to the merchant, right?

24 A That's the code from the SecurID, yes.

25 Q And to present a code to a different entity as

1 described in columns 17 and 18, you would understand
2 that the electronic ID device must be different from the
3 merchant, correct?

4 A The person -- I'm sorry. Would you say that
5 again.

6 Q Sure. To present a code to a different entity
7 as described in the text in columns 17 and 18, the
8 electronic ID device must be different from the
9 merchant, correct?

10 A You mean, this -- the electronic device is not
11 belonging to the merchant?

12 Q Yes.

13 A Are you asking about the SecurID now? I'm...

14 Q Figure 7.

15 A Figure 7, yes.

16 Q So let me back up.

17 A Yes.

18 Q In figure 7, the user of the electronic ID
19 device presents a code to the merchant, correct?

20 A Yes.

21 Q And the user of the electronic ID device is
22 different from the merchant, correct?

23 A Yes.

24 Q So if the electronic ID device and the
25 merchant were implemented using the same physical

1 device, the electronic ID device wouldn't have to
2 present any code to the merchant, correct?

3 A It actually doesn't say that it presents it
4 here in the figure. Do you have a place in mind in the
5 text where it does?

6 Q Looking at figure 7, block 702 shows that the
7 user of the electronic ID device presents a code to the
8 merchant, correct?

9 A No. It says the user enters the secret code
10 in SecurID.

11 Q Let me direct your attention, then, to
12 column 17, lines 66, through column 18, line 4. Why
13 don't you read that to yourself.

14 A Yes.

15 Q We can agree, can we not, that that text makes
16 clear that the user of the electronic ID device presents
17 a code to the merchant?

18 A It ends with saying "or otherwise presents the
19 code to the merchant."

20 Q Right. So in figure 7, the user of the
21 electronic ID device presents a code to the merchant,
22 correct?

23 A But --

24 MR. KAERICHER: Objection; form.

25 A -- you referred to 702 for that.

1 Q No. Let me start over. Column 17, lines 66,
2 through column 18, line 4 indicate that in figure 7, the
3 user of the electronic ID device presents a code to the
4 merchant, correct?

5 A That's correct.

6 Q And the user of the electronic ID device is
7 different from the merchant, correct?

8 A In this particular example, I believe they
9 are.

10 Q Turning back to figure 7. In step 704, a
11 merchant transmits three things, a code from SecurID, a
12 store number, and an amount of purchase to a credit card
13 company, correct?

14 A Yes.

15 Q And then in step 706, the credit card company
16 sends the code received from the SecurID to the USR,
17 correct?

18 A It doesn't specifically say in this figure
19 that it's the same code.

20 Q But that's the way you understand it to work,
21 correct?

22 A Yes.

23 Q Okay. If the code is valid in step 706,
24 seven -- step 708 shows that the USR transmits a credit
25 card number to the credit card company, correct?

1 MR. KAERICHER: Objection to form.

2 A I don't understand what you say that in --
3 it's -- it's valid in 706. I don't think that there is
4 a verification of the validity in 706.

5 Q Step 708 shows that the USR transmits a credit
6 card number to the credit card company, correct?

7 A Yes.

8 Q And it would only do that if a determination
9 has been made that the code is valid, correct?

10 A Yes.

11 Q The specification at column 18, lines 13
12 through 34, also describes an embodiment where the USR
13 sends a multidigit public ID code to the credit card
14 company to map to the credit card number, correct?

15 A Yes.

16 Q And figure 8 shows another method of using USR
17 software 18 and USR database 24, correct?

18 A Let me review that for a moment.

19 Q Have you reviewed figure 8?

20 A Yes.

21 Q Figure 8 shows another method of using USR
22 software 18 and USR database 24, correct?

23 A Yes.

24 Q And in reaching your opinions for this matter,
25 did you consider any differences between figures 7 and

1 8?

2 MR. KAERICHER: Objection; form.

3 A Are you asking was I specifically asked to
4 compare these figures?

5 Q Well, let's start with that.

6 A I was not asked to specifically compare
7 figure 7 and figure 8.

8 Q And in reaching the opinions expressed in the
9 declarations that you have signed for these -- the '137
10 and '826 IPRs, did you consider any differences between
11 figures 7 and 8?

12 MR. KAERICHER: Objection; form.

13 A I did not go about it like that. I considered
14 lots of material, and we can go to the list of material
15 I did consider. As I'm sitting here, I do not recall
16 specifically comparing these two. Instead, I was
17 looking for -- to understand in general the disclosures.

18 Q Would you agree that figure 8 differs from
19 figure 7, at least in that the merchant transmits the
20 code from SecurID, store number, and amount of purchase
21 to the USR in step 804 instead of to the credit card
22 company?

23 A I agree with that.

24 Q And in step 806, the USR determines if the
25 code is valid, correct?

1 A That's what it says.

2 MR. KAERICHER: Objection; vague. Sorry.

3 Form.

4 And just wait a second before you answer.

5 THE WITNESS: My apologies.

6 Q And in step 808, the USR transmits the credit
7 card number, store number, and amount of purchase to the
8 credit card company, correct?

9 A Yes, that's what it says.

10 Q If the embodiment of figure 8 were instead to
11 use a multidigit public ID code as in figure 7, the USR
12 would send that code to the credit card company,
13 correct?

14 MR. KAERICHER: Objection; form.

15 A It doesn't say so. I haven't considered that
16 question.

17 Q In the embodiments of figures 7 and 8, the USR
18 performs the validation of the code in steps 708 and 808
19 respectively, correct?

20 MR. KAERICHER: Objection; form.

21 A I don't think so. I think it's 708 and 806.

22 Q In the embodiments of figure 7 and 8, the USR
23 performs the validation of the code in steps 708 and 806
24 respectively, correct?

25 A I think that's correct.

1 Q In the embodiments of figures 7 and 8, the
2 credit card company does not perform the validation of
3 the code, correct?

4 MR. KAERICHER: Objection; form.

5 A Now, when you're saying "the code," is that
6 the code from the security?

7 Q Yes.

8 A And your question is whether the merchant
9 validates the secure -- the SecurID code?

10 Q My question is in the embodiments of figures 7
11 and 8, the credit card company does not perform the
12 validation of the code, correct?

13 A Can we take these one by one?

14 Q Sure.

15 A So it doesn't say that the merchant does
16 anything to the code from the SecurID except sends it to
17 the USB in 7 -- figure 7. And, of course, it receives
18 it in some way.

19 Q So taking these one at a time, nothing in
20 figure 7 suggests that the credit card company performs
21 the validation of the code, correct?

22 A The code from the SecurID.

23 Q Right.

24 A It doesn't say so.

25 Q And nothing in figure 8 suggests that the

1 credit card company performs the validation of the code,
2 correct?

3 A Again, speaking of the SecurID code, it
4 doesn't say so.

5 Q And to the best of your memory, nothing in the
6 specification suggests that the credit card company
7 performs the validation of the code, correct?

8 MR. KAERICHER: Objection; form.

9 A I -- I really can't say that, sitting here
10 today. I -- there may or may not be embodiments such.

11 Q Well, focusing your attention on column 17
12 beginning at line 60 through column 18, line 35, nothing
13 in that text suggests that the credit card company
14 performs the validation of the code, correct?

15 A Give me a moment, please.

16 MR. KAERICHER: Objection; form.

17 A It doesn't say one way or the other.

18 Q A person of ordinary skill in the art looking
19 at figure 7 and 8 in the accompanying text would
20 understand that the device that performs the validation
21 of the code in steps 708 and 806 must be different from
22 the device that maps the multidigit public ID code to
23 the credit card company, correct?

24 MR. KAERICHER: Objection; form.

25 A Where's the mapping that you address? The

1 figure doesn't mention the mapping here, I think. I --
2 I don't see mapping performed in the figures.

3 Q Let me follow up on your answer. Can you turn
4 to figure 23. Do you see in figure 23, the public ID
5 field 304?

6 A Yes, I do.

7 Q The '137 patent nowhere describes the public
8 ID field 304 being used to map to a credit card number
9 of a user, correct?

10 A I haven't been asked to consider that.

11 Q You're not aware of any place that the
12 '137 patent describes the public ID field 304 being used
13 to map to a credit card number of a user, correct?

14 A Sitting here --

15 MR. KAERICHER: Objection; form.

16 A -- right now, I do not, but I can look for it.

17 Q You're not aware of the provisional
18 applications to which the '137 patent claims priority
19 describing the public ID field 304 being used to map to
20 a credit card number of a user, correct?

21 MR. KAERICHER: Objection; form.

22 A I read the provisionals several weeks ago, and
23 my goal was not to look for this. I wasn't asked
24 particularly to look for that. I might have read
25 something about it, but I would not remember that today.

1 I'm sorry.

2 Q Would you agree that the public ID field 304
3 shown in figure 23 does not function in a similar way to
4 the multidigit public ID code referenced at column 18,
5 line 16 through 22?

6 MR. KAERICHER: Objection; form.

7 A I need to refresh my recollection about the
8 public ID field. Do you know where to find information
9 related to that?

10 Q You can look at whatever you'd like, but if it
11 will help, you can look at column 3 -- 32 which
12 describes figure 23.

13 A This only gives information on things it might
14 comprise. It says, "Any of name information, a badge
15 number, an employee number, an e-mail address, social
16 security number, and the like of the first user."

17 So these are identifiers associated with a
18 user.

19 Q Okay. Would you agree that the public ID
20 field 304 shown in figure 23 does not function in a
21 similar way to the multidigit public ID code referenced
22 at column 18 in line 16 through 22?

23 MR. KAERICHER: Objection; form.

24 A I'm a little bit confounded by your question,
25 because I'm not sure what you mean by "functions in the

1 same way." Do you, for example, mean to identify
2 something?

3 Q The public ID field 304 functions differently
4 than the public -- strike that.

5 The public ID field 304 in figure 23 functions
6 differently than the multidigit public ID code
7 referenced at column 18, lines 16 through 22, correct?

8 A I think that depends on how you frame it.
9 Both are used to, for example, select a record. That's
10 one possible way of doing it. Now, there might be
11 differences as well as similarities. So unless you're
12 being more specific, it's very difficult to respond.

13 Q What are the differences?

14 MR. KAERICHER: Objection; form.

15 A So it doesn't speak of the differences here.
16 I'm saying there could be differences.

17 Q What are the similarities?

18 MR. KAERICHER: Same objection.

19 A For example, it could be used to identify a
20 record.

21 Q Anything else?

22 A Well, in -- in the example of figure 7, I
23 believe, it's used to identify a credit card associated
24 with a person; although it doesn't say so.

25 Q It nowhere says so, correct?

1 A I beg your pardon?

2 Q It nowhere says so, correct?

3 MR. KAERICHER: Objection; form.

4 A I'm looking for it. Do you have a particular
5 paragraph to...

6 Q I don't.

7 A It says that the -- this may be avoided by
8 instant transmitting on approval a multidigit public ID
9 code for the credit card holder, which the credit card
10 company can map to the correct credit card number. So
11 if you're asking, can one perform a similar action using
12 the field public ID in 304, one could also perform a
13 mapping with those. So it depends on -- your question
14 is very general.

15 Q Okay. We -- I asked you a minute ago whether
16 the '137 patent describes anywhere the public ID field
17 304 being used to map to a credit card number and user.
18 And your answer was?

19 A I'm say -- you're asking if it could be?
20 That...

21 Q No. My question is, does the '137 patent
22 describe -- does it say -- does it disclose the public
23 ID field 304 being used to map to a credit card number
24 by user?

25 MR. KAERICHER: Objection to form.

1 A I don't know where, if it does.

2 Q Could you turn back to figure 23. Do you see
3 figure 23 includes a digital signature 306?

4 A Yes.

5 Q Are you familiar with the digital signature
6 306 described in the '137 patent?

7 A In general, yes.

8 Q The '826 patent describes a similar digital
9 signature of 306 as the '137 patent, correct?

10 A Yes, it does.

11 Q A person of ordinary skill in the art before
12 2006 would have known what a digital signature is,
13 correct?

14 A Yes.

15 Q Digital signatures have existed since at least
16 the 1990s, correct?

17 MR. KAERICHER: Speculation.

18 A I don't know exactly the date, but yes.

19 Q X.509 digital signatures have existed since at
20 least the 1990s, correct?

21 MR. KAERICHER: Same objection.

22 A Again, I -- I don't know the exact date, but
23 yes, they are fairly old.

24 Q Certainly before 2006, correct?

25 A Yes, I believe so.

1 Q You, yourself, wrote about digital signatures
2 in your own articles before 2006, correct?

3 A Yes.

4 Q You wrote about digital signatures in your own
5 patents before 2006, correct?

6 A I believe so, yes.

7 Q A person of ordinary skill in the art before
8 2006 would have known that digital signatures could be
9 used to authenticate the generator of the digital
10 signature, correct?

11 MR. KAERICHER: Objection; form.

12 A Normally a digital signature is used to
13 associate a public key in a potentially associated
14 certificate with a message that is being sent.

15 Q Okay. Is it fair to say that before 2006, any
16 person of ordinary skill in the art would have known
17 that you could use a digital signature to authenticate
18 the entity that generated the digital signature?

19 A That would be one potential use of it, yes.

20 Q Before 2006, a person of ordinary skill in the
21 art would have understood that one purpose of generating
22 a digital signature is to verify the device that
23 generated it, correct?

24 MR. KAERICHER: Objection to form.

25 A What do you mean by verify the device?

1 Q To confirm the authenticity of.

2 A That's -- would -- I would need more
3 information to understand that question.

4 Q Before 2006, a person of ordinary skill in the
5 art would have understood that one purpose of a digital
6 signature is to verify that a device is what it purports
7 to be, correct?

8 MR. KAERICHER: Objection to form.

9 A There are many aspects of being what you
10 purport to be. What you would be able to verify is that
11 a particular private key was used in association with an
12 input by applying the associated public key. But the
13 private key might reside in more one -- than one place,
14 for example.

15 Q Do you know why digital signatures are called
16 digital signatures?

17 A I could imagine that it is because it conveys
18 the same or similar notion to a layman as a handwritten
19 signature, that it associates an entity with, say, a
20 contract; like, public key and private key become
21 associated with an input to a digital signature
22 algorithm.

23 Q In what way is a digital signature similar to
24 a handwritten signature?

25 MR. KAERICHER: Objection; form.

1 A That's very vague. So one way would be that
2 it allows an association of some kind. In the case of
3 the digital signature, it's all the public key and
4 associated private key and potentially associated
5 certificates to a message; whereas in the handwritten
6 signature, of course, one could have a handwritten
7 signature that associates the signer, the person, with
8 the message that is being signed. It's a bit different,
9 of course.

10 MR. KAERICHER: We've been going for an hour,
11 so whenever you get to a good point.

12 MR. SELWYN: Yeah, this is good. Let's take a
13 break.

14 (A recess ensued from 11:14 a.m. to
15 11:21 a.m.)

16 BY MR. SELWYN:

17 Q Dr. Jakobsson, before the break, we were
18 talking about digital signatures. Do you remember that?

19 A Yes, I do.

20 Q Okay. Before 2006, a person having ordinary
21 skill in the art would have understood that forming a
22 digital signature would require information to be
23 encrypted and a private or secret key, correct?

24 A No.

25 MR. KAERICHER: Objection; form.

1 Q Before 2006, a person of ordinary skill in the
2 art would have understood that the digital signature is
3 formed by encrypting the data with the private or secret
4 key, correct?

5 A No.

6 MR. KAERICHER: Objection; form.

7 Just wait a second.

8 THE WITNESS: My apologies.

9 Q When one device sends a digital signature to
10 another device, a person of ordinary skill in the art
11 would understand that this digital signature is sent for
12 verification purposes, correct?

13 MR. KAERICHER: Objection to form.

14 A I'd say that a person of skill in the art
15 would understand that one could verify certain things,
16 given the digital signature having access to the
17 appropriate information. Whether that's the purpose, I
18 don't want to speculate on.

19 Q A digital signature serves no purpose if it is
20 never sent to another device for verification, correct?

21 MR. KAERICHER: Objection to form.

22 A I disagree with that.

23 Q A digital signature can be verified because
24 only those having the signer's private key can create an
25 encrypted message content for the expected data,

1 correct?

2 A I disagree.

3 MR. KAERICHER: Objection.

4 Q Okay. Let me hand you what has been --
5 previously been marked as Exhibit 1115. Do you
6 recognize this?

7 A Yes.

8 Q What do you recognize it to be?

9 A This is a patent application that I have
10 referred to as the Schutzer application and at least one
11 of my declarations.

12 Q And we'll understand each other today if I
13 refer to this as the Schutzer -- as the Schutzer
14 reference?

15 A Yes, I do.

16 Q Could you turn, please, to page 5, column 7 of
17 the Schutzer reference?

18 A Yes.

19 Q And if I could direct your attention to
20 lines 18 through 36.

21 A Just a moment, please.

22 Yes.

23 Q Lines 18 through 36 describe sending a card
24 number and a secret PIN or password or hash of a PIN or
25 password from the user's computing device 10 to an

1 issuing bank 8, correct?

2 A Yes, it does.

3 Q The issuing bank 8 issued the bank or credit
4 card, correct?

5 MR. KAERICHER: Objection to form.

6 A I would presume that's one of the ways to use
7 this.

8 Q This passage also discloses sending additional
9 information such as digital signatures to the issuing
10 bank, correct?

11 A Yes.

12 Q Before 2006, a person of ordinary skill in the
13 art would have understood that upon receipt of a digital
14 signature, the issuing bank 8 would then verify that
15 digital signature, correct?

16 A Rather, it could verify it.

17 Q That would be the purpose of the issuing bank
18 having been sent the digital signature, correct?

19 A Not necessarily.

20 MR. KAERICHER: Objection to form.

21 A It could be another party that would verify
22 the digital signature under some context. I would have
23 to review more material in Schutzer in order to
24 determine whether this digital signature would be
25 verified by the issuing bank.

1 Q But we can agree that before 2006, a person of
2 ordinary skill in the art would have understood that
3 upon receipt of a digital signature, the issuing bank 8
4 could then verify that digital signature, correct?

5 A Yes.

6 MR. KAERICHER: Objection to form.

7 A That said, this paragraph doesn't say so.

8 Q Could you put back in front of you the
9 '137 patent.

10 A Yes.

11 Q If I could direct your attention, please, to
12 column 30 of the '137 patent beginning at line 51.

13 A Just a moment please.

14 Q More particularly, I'm going to ask you
15 questions about lines 51 through 62.

16 A Okay. Thank you. Yes.

17 Q The passage on column 30 from lines 51 through
18 line 62 describe part of a periodic communication
19 process between a first device and a secure database,
20 correct?

21 A Yes, it does.

22 Q And in that communication process, the first
23 device periodically communicates with the secure
24 database after the first user authenticates his or
25 herself to the second device, correct?

1 A Let me take a look at that again.

2 Q Yep.

3 A That's one example they give up.

4 Q If the first device successfully communicates
5 with the secure database after expiration of the
6 periodic interval, the data remains on the first device,
7 correct?

8 MR. KAERICHER: Objection; form.

9 A Would you read that question back to me,
10 please?

11 Q Sure. If the first device successfully
12 communicates with the secure database after expiration
13 of the periodic interval, the data remains on the first
14 device in this description, correct?

15 MR. KAERICHER: Objection; form.

16 A It doesn't say so.

17 Q Would you agree that one of ordinary skill in
18 the art reading this passage in column 30 from lines 51
19 through 62 would understand if the first device
20 successfully communicates with the secure database after
21 expiration of the periodic interval, the data remains on
22 the first device?

23 A What it actually says is, "If the first device
24 does not communicate with a secure database at such
25 periodic intervals at step 208, then the first device

1 can be configured to delete any or a portion of this
2 data storage in memory at step 206."

3 So it speaks of deleting something as a -- as
4 a result of not communicating.

5 Q If the first device does not check in with the
6 secure database after expiration of the periodic
7 interval, the first device deletes data on the first
8 device, correct?

9 A That's what it says here.

10 Q And that deletion of the data on the first
11 device occurs automatically, correct?

12 MR. KAERICHER: Objection; form.

13 A What do you mean by "automatically"?

14 Q Well, if the communication does not occur in
15 the periodic interval, the deletion of data on the first
16 device happens regardless of the first user's input,
17 correct?

18 MR. KAERICHER: Objection to form.

19 A That would be my understanding, yes.

20 Q If a user doesn't want to delete the data, the
21 user should simply authenticate him or herself to the
22 first device, correct?

23 MR. KAERICHER: Objection to form.

24 A That would not be sufficient. You would also
25 have to have the communication.

1 Q If the user successfully authenticated him or
2 herself to the first device, the data would not be
3 deleted, correct?

4 MR. KAERICHER: Objection to form.

5 A I don't think it speaks of that. It says that
6 "If the first device does not communicate with the
7 security database at such periodic intervals at
8 step 208, then the first device can be configured to
9 delete any or a portion of the data stored in the memory
10 at step 206."

11 Q Well, would you agree that if the user wanted
12 to delete the data, the first user could simply skip the
13 authentication step, and the first device would
14 automatically delete the data at the expiration of the
15 periodic interval?

16 MR. KAERICHER: Objection; form.

17 A It's a peculiar question to me because I don't
18 think necessarily the user is aware of the data that is
19 being deleted or not. So I don't know if the intent of
20 the user is a meaningful part of the question here.

21 Would you rephrase it without the user in mind
22 so that I understand what you're really asking.

23 Q Well, look at -- look at column 30, lines 51
24 through 53.

25 A Yes.

1 Q You see the reference there to automatic
2 deletion?

3 A Yes.

4 Q And that's automatic deletion of data,
5 correct?

6 A Yes.

7 Q Would you agree that this passage discloses
8 that the deletion of data on the first device occurs
9 automatically?

10 A Under some conditions, yes.

11 Q And because this deletion is automatic under
12 some conditions, the first device would have no way of
13 stopping this deletion without authenticating the first
14 user and communicating with a secure database, correct?

15 MR. KAERICHER: Objection; form.

16 A That's not what it says.

17 Q If the user wants to intentionally delete the
18 data, there's nothing in the patent that explains what
19 the first device or the secure database can do to stop
20 it, correct?

21 A See, the reason I don't understand your
22 question is that I'm not sure that the user is aware of
23 the data being deleted or not. So when you're speaking
24 about the wishes of the user, for example, the user
25 might not know the time interval and when it expires and

1 would not understand how the technology works. So the
2 user's wishes might be rather irrelevant in this
3 context.

4 Can we -- would I -- could I please ask you to
5 ask the question without the user's intent in mind so I
6 understand what you're asking?

7 Q If it's desired to intentionally delete the
8 data of the first user, there's nothing in the patent
9 that explains what the first device or the second -- or
10 the secure database can do to stop it, correct?

11 MR. KAERICHER: Objection to form.

12 A That's not what this paragraph speaks of. It
13 doesn't give an answer to your question. For example,
14 if it's desired not to delete the data, maybe the data
15 is stored in another way and not in this way. For
16 example, say that there's data that should not be
17 deleted. The software would be configured so to exclude
18 the -- this from deletion. The deletion is a desired
19 aspect.

20 Q Let me ask you this. The concept of deletion
21 of data doesn't appear anywhere in the '137 patent other
22 than from column 30, line 51 through column 31, line 18
23 and associated figure 22A, correct?

24 A I really don't know that, but I could review
25 it with that in mind and see if I could find instances

1 of deletion elsewhere.

2 Q Well, as you sit here today, based upon all
3 the work that you've done in this case, can you tell me
4 whether the concept of deletion of data appears anywhere
5 in the '137 patent other than from column 30, line 51
6 through column 31, line 18 in figure 22A?

7 A I cannot. But I also would not have been able
8 to pinpoint a location that it did speak about it. I
9 just know that it's in the disclosure, and I don't know
10 the locations. So I appreciate you pointing me to it,
11 but I don't know whether it's also in other places.

12 Q There's nothing in the '137 patent that
13 explains how the first device or the second device would
14 discern intentional or unintentional deletion of data
15 from the first device, correct?

16 MR. KAERICHER: Objection; form.

17 A I do not know of such a description. But then
18 again, this is not what I was asked to look for and to
19 understand. So if there is one, I would be embarrassed
20 to say that I might very well have overlooked it and
21 not -- not understood its significance.

22 Q Let me ask you some questions about what's
23 claimed in the '137 patent. The '137 patent claims
24 generally relate to verifying an account holder's
25 identity, correct?

1 A To --

2 MR. KAERICHER: Objection to form.

3 A I'm sorry. To do what?

4 Q The '137 patent claims generally relate to
5 verifying an account holder's identity, correct?

6 MR. KAERICHER: Same objection.

7 A I don't think they use those exact words. One
8 aspect is to authenticate a user.

9 Q The verification that's described in the
10 '137 patent is used to enable a transaction, correct?

11 MR. KAERICHER: Objection to form.

12 A The goal, of course, is to enable or not
13 enable a transaction. But, of course, there's much more
14 to it than just that.

15 Q And the patent describes verifying an account
16 holder's identity based on codes, correct?

17 MR. KAERICHER: Objection to form.

18 A Would you draw me to the patent and the
19 limitation -- the patent claim and the limitation that
20 says this because I just want to make sure that I use
21 the right words.

22 Q Well, is it correct or not that the
23 '137 patent describes verifying an account holder's
24 identity based on codes?

25 MR. KAERICHER: Objection; form.

1 A So maybe it's my shortcomings here, because I
2 don't remember exact phrases very well. And -- and I
3 don't know if that particular phrase is here in the --
4 in the claim language. If you have a particular portion
5 of the claim that you want to point me to, it's much
6 easier for me to accurately describe.

7 Q Okay. Let me ask you to keep in mind the
8 claimed invention of the '137 patent. Are you familiar
9 with that?

10 A Yes.

11 Q Okay. The claimed invention of the
12 '137 patent involves verifying an account holder's
13 identity based on codes, correct?

14 MR. KAERICHER: Objection; form.

15 A But you're asking me about the claim language,
16 right?

17 Q Let me ask you a new question. Okay?

18 A Yes.

19 Q The '137 patent describes verifying an account
20 holder's identity based on codes, correct?

21 MR. KAERICHER: Objection; form.

22 A Yes.

23 Q The '137 patent describes verifying an account
24 holder's identity based on information related to an
25 account holder, correct?

1 A Yes.

2 Q The '137 patent relates to verifying an
3 account holder's identity, correct?

4 A Do you mean to verify that there's an
5 authentic transaction?

6 Q Yes.

7 A Yes.

8 Q The '137 patent is generally directed to the
9 idea of verifying an account holder's identity to enable
10 a transaction based on codes, correct?

11 MR. KAERICHER: Objection to form.

12 A When you say a transaction based on codes,
13 what do you mean?

14 Q Let me rephrase the question. The '137 patent
15 is generally directed to the idea of verifying an
16 account holder's identity to enable a transaction based
17 on codes or information related to an account holder,
18 correct?

19 MR. KAERICHER: Objection to form.

20 A Yes.

21 Q And the verification that's described in the
22 '137 patent is used to enable a transaction, correct?

23 A That's one of the things.

24 Q Okay. Can you put back in front of you the
25 '585 reference?

1 A Yes.

2 Q Let me direct your attention, please, to
3 paragraph 3.

4 A Just a moment, please.

5 Yes.

6 Q In paragraph 3, the '585 reference states
7 that, existing, quote, security systems can use one or
8 more of several factors alone or in combination to
9 authenticate identities. Correct?

10 A Yes.

11 Q And the last sentence of paragraph 3 lists
12 three examples of factors, including something that the
13 entity knows, something that the entity -- something the
14 entity is, or something that entity has, correct?

15 A Yes.

16 Q And these factors are used to authenticate
17 entities, correct?

18 A Yes.

19 Q An entity can be a user, correct?

20 A Yes.

21 Q Paragraph 4 of the '585 reference provides
22 examples of, quote, something than an entity knows that
23 can be used to authenticate a user. Correct?

24 A Let me take a look.

25 Q Yep.

1 A Yes.

2 Q The first sentence of paragraph 4 describes a,
3 quote, code word, password, personal identification
4 number, PIN, as examples of something an entity knows.
5 Correct?

6 A Yes.

7 Q Paragraph 4 also explains that a code word,
8 password, and personal identification number PIN are
9 used to authenticate the identity of the entity,
10 correct?

11 A Yes.

12 Q Paragraph 4 also explains that these values
13 are kept secret, correct?

14 A Where does it say that?

15 Q Second sentence, third sentence.

16 A Oh, of a secret, yes. It -- it's referred to
17 as a secret. It doesn't say that it's kept secret.
18 There are -- there are many secrets that aren't kept
19 secret.

20 Q One of ordinary skill in the art reading
21 paragraph 4 would understand that these values are kept
22 secret, correct?

23 MR. KAERICHER: Objection; form.

24 A That's the best way of doing it.

25 Q The '585 reference discloses authenticating a

1 user based on a secret PIN, correct?

2 A Yes.

3 Q And PIN-based authentication was known before
4 2006, correct?

5 A That's correct.

6 Q PIN-based authentication has existed since at
7 least the '60s or '70s, correct?

8 MR. KAERICHER: Speculation.

9 A I would not know. I'm sorry.

10 Q PIN-based authentication has existed at least
11 since the 1980s?

12 MR. KAERICHER: Same objection.

13 A I -- I believe you're right.

14 Q Let's turn to paragraph 5.

15 A Just a moment please.

16 Q Why don't you take a moment to read that to
17 yourself.

18 A Yes.

19 Q Paragraph 5 describes, quote, examples of
20 something the entity is. Correct?

21 A Yes.

22 Q And paragraph 5 lists examples such as
23 physical, biological, and physiological characteristics,
24 correct?

25 A Yes.

1 Q Paragraph 5 lists fingerprints, handwriting,
2 eye retina patterns as examples, correct?

3 A Those are three examples, yes.

4 Q Fingerprints, handwriting, eye retina patterns
5 are examples of biometric information, correct?

6 A Yes.

7 Q The second-to-last sentence in paragraph 5
8 reads, quote, The verifier typically can observe the
9 characteristic and compare the characteristic to records
10 that associate the characteristic with the entity.

11 Did I read that right?

12 A Yes, you did.

13 Q That sentence is describing a biometric
14 authentication, correct?

15 A Yes.

16 Q Biometric authentication was known before
17 2006, correct?

18 A Yes.

19 Q Turning back to paragraph 3.

20 A Of '585?

21 Q We're still at the '585 reference.

22 A Okay.

23 Q In paragraph 3, the '585 reference states that
24 existing, quote, Security systems can use one or more of
25 several factors alone or in combination to authenticate

1 entities.

2 Do you see that?

3 A Yes.

4 Q When the '585 reference says that secure
5 systems can use one or more factors in combination,
6 those factors include personal identification numbers,
7 PINs, correct?

8 A Yes.

9 Q When the '585 reference says that secure
10 systems can use one or more factors in combination,
11 those factors include biometric information, correct?

12 A Yes.

13 Q It was known before 2006 that authentication
14 could be based on the use of a PIN and biometric
15 information, correct?

16 A You mean in conjunction?

17 Q Yes.

18 A I think so.

19 Q The '585 reference discloses combining the use
20 of a PIN with biometric information, correct?

21 MR. KAERICHER: Objection to form.

22 A Yes.

23 Q The '585 reference discloses combining the use
24 of a PIN with biometric information to authenticate a
25 user, correct?

1 MR. KAERICHER: Same objection.

2 A That's somewhat simplified, but the -- what
3 you're saying are parts of the components.

4 Q So is the answer correct?

5 A Would you re- --

6 Q Sure.

7 A -- restate the question?

8 Q The '585 reference discloses combining the use
9 of a PIN with biometric information to authenticate a
10 user, correct?

11 A Yes.

12 Q It was known before 2006 that PINs and
13 biometric information could be combined to authenticate
14 a user, correct?

15 A Yes.

16 Q Okay. Could you turn, please, to
17 paragraph 59.

18 A 59?

19 Q 59.

20 A Just a moment, please.

21 Yes.

22 Q The first sentence of paragraph 59 says "a
23 first authentication of user 110 is performed by the
24 user authentication device 120." And it continues,
25 correct?

1 A Yes.

2 Q This sentence describes local authentication,
3 correct?

4 MR. KAERICHER: Objection to form.

5 A It doesn't actually specify that it's local,
6 but one way of doing it would be local authentication.

7 Q One of ordinary skill in the art reading that
8 sentence would understand that it's disclosing local
9 authentication, correct?

10 MR. KAERICHER: Same objection.

11 A A person of skill in the art would have
12 recognized that that's certainly an option.

13 Q And the '585 reference discloses local
14 authentication, correct?

15 A Yes, it does.

16 Q Local authentication was known before 2006,
17 correct?

18 A Yes.

19 Q Later in the same paragraph, paragraph 59, it
20 says, quote, If the first authentication is successfully
21 verified by the authentication device 130, the
22 device 120 generates an identity authentication code
23 which is verified by the verifier 105.

24 A I think it says something slightly similar but
25 not quite. I see the paragraph I think you have in

1 mind.

2 Q Did I misread it?

3 A I -- I think you said 130, and I don't see
4 that being mentioned here. Do I have another paragraph
5 that I'm looking at?

6 Q Oh, I misread it.

7 A Okay.

8 Q Let me try it again because that was not my
9 intent.

10 Do you see the sentence in paragraph 59 that
11 reads "If the first authentication is successfully
12 verified by the authentication device 120, the
13 device 120 generates an authentication code which is
14 verified by the verifier 105"?

15 A I see the sentence.

16 Q That sentence is describing remote
17 authentication, correct?

18 MR. KAERICHER: Objection; form.

19 A It describes a part of what could be used for
20 remote authentication.

21 Q The '585 reference discloses remote
22 authentication, correct?

23 A That's correct.

24 Q Remote authentication was known before 2006,
25 correct?

1 A Yes.

2 Q And combining local and remote authentication
3 was known before 2006, correct?

4 A Yes.

5 Q Combining local and remote authentication is
6 prior art to the '137 patent, correct?

7 A Yes.

8 Q Credit cards are used for financial
9 transactions, correct?

10 A Yes.

11 Q Is a credit card transaction an example of a
12 financial service?

13 MR. KAERICHER: Objection to form.

14 A I -- I have not thought of it in that sense.
15 Financial service seems like it's a slightly different
16 thing for me, to service related to the financial
17 transaction.

18 Q A credit card transaction is a service related
19 to a financial transaction, correct?

20 A A credit card transaction is related to
21 financial service.

22 Q Credit card -- I'm sorry.

23 Can you turn -- strike that.

24 The '585 reference discloses an authentication
25 system, correct?

1 A That is correct.

2 Q Can you turn, please, to paragraph 37 of the
3 '585 reference?

4 A Did you say 37?

5 Q I did.

6 A Just a moment, please.

7 Yes.

8 Q The first sentence of paragraph 37 indicates
9 that figure 1 shows authentication system 100, correct?

10 A Yes. Let me just look at figure 1 for a
11 moment, please.

12 Yes. I remember this.

13 Q Authentication system 100 is used to help
14 securely authenticate the identity of exemplary user 110
15 according to paragraph 37, correct?

16 A I think 100 refers to the entire architecture
17 here, including the user. Did I misunderstand your
18 question?

19 Q I think we're saying the same thing, but let
20 me ask the question again.

21 Authentication system 100 is, quote, used to
22 help securely authenticate the identity of exemplary
23 user 110, correct?

24 A Yes.

25 MR. KAERICHER: Objection to form.

1 Q Can you turn, please, to paragraph 39.

2 A Yes.

3 Q Paragraph 39 indicates that authentication can
4 result in, quote, providing access or privileges, taking
5 action, or enabling some combination of the two,
6 correct?

7 A Yes.

8 Q And it also discloses that "Access includes
9 access to such services as financial services," correct?

10 A Now, you have to remember in this context,
11 Jakobsson or '585 describes what we might call a
12 "password substitute." So just like you could log in to
13 your bank with a password -- user name and password,
14 '585 describes that you could log in with a user name
15 and this type of code. So it is not performing the
16 transaction, financial transaction. It's pretty much a
17 gatekeeper mechanism. It allows people to be verified
18 for whatever purpose. The purpose could be to enter a
19 building. It could be to log in to your online bank.

20 Q I guess that's -- that wasn't my question. So
21 for the record, I will move to strike.

22 I'm focusing your attention on the second
23 sentence of paragraph 39. Okay?

24 A Yes.

25 Q And that sentence begins "access includes,"

1 correct?

2 A Yes.

3 Q And then it identifies various forms of
4 access, correct?

5 A That is correct.

6 Q And one of the forms of access that's included
7 is access to such services as financial services,
8 correct?

9 A So the reason I clarified before was to
10 distinguish it from other financial services we might
11 talk about. Here, it's described as a gatekeeping
12 instead of a password. '585 is a password replacement
13 system. So when it says that access to such services,
14 financial services, you should imagine what a password
15 would do and then think that this has additional
16 features that are beneficial; namely, that if the code
17 that is exposed -- if a code is exposed, it can't be
18 used later on like a password would.

19 Q I'm just asking you right now what the words
20 say. It says, "Access includes access to such services
21 as financial services and records," correct?

22 A In the sense of logging in to services, such
23 as an online bank, for example, it would allow the user
24 to be verified with a user name and a code instead of a
25 user name and a password.

1 Q So, then, can we agree that the authentication
2 system described in the '585 patent can be applied to a
3 financial transaction?

4 A That's a little bit vague. It can be applied
5 for you to gain access to any kind of service. It's
6 instead of a password that you would use this; so for
7 example, in combination with a user name and a code. In
8 this case, instead of a user name and a password, you
9 can gain access to any online service or offline, for
10 that matter, one of which might be, say, your bill
11 payment. It's for the case of '585, it doesn't matter
12 what the service is.

13 Q So one service could be a credit card,
14 correct?

15 MR. KAERICHER: Objection; form.

16 A What does it mean with the service being a
17 credit card?

18 Q A credit card transaction, correct?

19 A Still, it's a little bit unclear to me what
20 you mean as a credit card transaction is not something
21 that you have a gatekeeping of this kind to. I don't
22 understand your question, maybe.

23 The example that we had in mind when we wrote
24 this would be that you would log in into your bank, and
25 at your bank, of course, once you logged in, you know

1 that you could perform various actions. You could look
2 at your accounts. You could look at transaction
3 history. But that is orthogonal to what is described in
4 '585.

5 Q Okay. You -- if I understand you right, the
6 authentication system described in the '585 reference
7 can be used to gain access to any service online or
8 offline, for that matter, correct?

9 A So let me qualify that. The services we're
10 speaking of is -- that it gains access to is in -- in
11 the same way that a password would gain you access to
12 it. So if you think about a service that would have a
13 user name and a password being verified, '585 describes
14 that instead of that, you could use a user name and a
15 code as described in here, the authentication code.

16 Q Okay. Let's see if we can -- let me just ask
17 you whether you agree or disagree with some things.

18 A credit card transaction is a type of
19 financial service, correct?

20 A It's not the kind of financial service that we
21 had in mind here. You don't log in to a credit card
22 transaction. So this is for logging in.

23 Q You have never logged in to perform a credit
24 card transaction?

25 MR. KAERICHER: Objection; form.

1 A Are you asking me if I log in to a site and at
2 that site, I perform a credit card transaction?

3 Q That would be an example.

4 A But that would be -- the logging in would be
5 an independent step. It would not be part of the
6 performing the transaction there. It's just like you
7 wouldn't say you've never used a password to perform a
8 transaction. You -- you give the password in order to
9 be verified, and, later, whatever functionality is
10 given, you might use.

11 Q Is it your opinion that a person of ordinary
12 skill in the art in 2000 -- let me ask it this way.

13 In 2006, a person of ordinary skill in the art
14 would understand that a financial service could include
15 a financial transaction, correct?

16 A Not in this context. So, here, it speaks of
17 logging in to a financial service, such as your bank.

18 Q But my question is not directed to the
19 reference --

20 A Okay.

21 Q -- the '585 reference. I'm just asking you
22 right now about what a person of ordinary skill in the
23 art would know in 2006. Do you have that in mind?

24 A Please ask your question again, and I'll think
25 about it generally and not in context of '585.

1 Q A person of ordinary skill in the art in 2006
2 would understand that a financial service could include
3 a financial transaction, correct?

4 A Some financial services would involve
5 financial transactions. But the same person would also
6 recognize that those were not the ones that were
7 described in the context of paragraph 39.

8 Q A person of ordinary skill in the art in 2006
9 would understand that an ATM transaction is a kind of
10 financial service, correct?

11 A Likewise, they would understand that whereas
12 it is a financial service, it's not the kind of
13 financial service that we're describing here.

14 Q A person of ordinary skill in the art in 2006
15 would understand that a credit card transaction is a
16 kind of financial service, correct?

17 A They would understand that a credit card
18 transaction is part of a financial service, but they
19 would not understand that in the context given in
20 paragraph 39.

21 Q Before 2006, there were financial
22 institutions, like banks, whose websites allowed a user
23 to access the user's account information, correct?

24 A I believe that to be true.

25 Q The website of a financial institution before

1 2006 -- strike that.

2 There were financial institutions before 2006
3 whose websites allowed users to perform financial
4 transactions, correct?

5 A Yes.

6 Q A person of ordinary skill in the art reading
7 the '585 reference in 2006 would understand how you
8 could apply the disclosed authentication system to a
9 credit card transaction, correct?

10 MR. KAERICHER: Objection; form.

11 A I haven't thought about that. The reason is
12 that this speaks of access rather than the action of
13 performing a credit card transaction.

14 Q So you haven't thought one way or the other
15 about whether a person of ordinary skill in the art
16 reading the '585 reference in 2006 would understand how
17 to apply the disclosed authentication system to a credit
18 card transaction, correct?

19 A I -- of course, I know some ways in which a
20 person of skill in the art would interpret this. It
21 would -- the person of skill in the art would understand
22 that the -- the authentication here is in place of a
23 user name and password. That's the context of the
24 application. So the person of skill in the art would
25 recognize that wherever you normally log in by giving a

1 user name and password, this would be relevant. And
2 it's relevant in the sense that it replaces the use of a
3 password. Instead, a user would input this code that is
4 given on the device.

5 Q Okay. So can we agree that a person of
6 ordinary skill in the art in 2006 reading the
7 '585 reference would understand how the authentication
8 system that's described in the reference could be
9 applied to a credit card transaction?

10 MR. KAERICHER: Objection; form.

11 A This does not describe credit card
12 transactions. It describes access. So the access is,
13 for example, like logging into your bank. If they had
14 in mind that you would go in and look at a credit card
15 transaction at your bank, is that what you're asking?

16 Q I don't think so. My question is a little bit
17 different. My question is a person of ordinary skill in
18 the art in 2006, reading and understanding the
19 '585 reference, would understand how the authentication
20 system that's described in the reference could be
21 applied to a credit card transaction, correct?

22 MR. KAERICHER: Objection to form.

23 A Maybe I misunderstand your question, because
24 I'm thinking that a credit card transaction, as a person
25 of skill in the art would understand it in the time

1 frame, would be that you present a merchant with your
2 credit card.

3 But this is different. This is, instead,
4 presenting a user name and some information instead of a
5 password to a website, for example, in order for that
6 entity to verify that it likely corresponds to you.

7 Q So is it your view that a person of ordinary
8 skill in the art reading the '585 reference in 2006
9 would have no understanding of how to apply the
10 disclosed authentication system to a credit card
11 transaction?

12 A I haven't given this any thought before. It's
13 an interesting question. I -- I think that the person
14 of skill in the art would primarily think of a credit
15 card transaction in the traditional sense. And the
16 traditional sense of thinking about a credit card
17 transaction would be to perform the transaction whereas
18 this is to gain access.

19 So if you were to ask could I log in and look
20 at my bank statement, that would be a natural thing.
21 But the application here in front of us describes the
22 logging in part, not the looking at the statement.

23 Q Let me direct your attention back to
24 paragraph 39. Do you see in the second sentence it says
25 "access includes without limitation"?

1 A Yes, I do.

2 Q Can you explain your understanding of the
3 words "without limitation"?

4 A So it means that the access one is granted or
5 not granted here could be to a physical location or --
6 and there's an -- a list of examples here. The examples
7 here correspond to things that you either would or not
8 would get access to in a system that were to use a user
9 name and password, for example.

10 Q You use the words "without limitation" in
11 paragraph 39 to indicate to one of ordinary skill in the
12 art that the examples that are listed are not intended
13 to be limiting, correct?

14 A In the context of the application, of course.

15 MR. SELWYN: Why don't we take our lunch
16 break.

17 THE WITNESS: Okay.

18 (A recess ensued from 12:11 p.m. to
19 12:51 p.m.)

20 (Mr. Guledjian is not present.)

21 BY MR. SELWYN:

22 Q Good afternoon, Dr. Jakobsson.

23 A Good afternoon.

24 Q Dr. Jakobsson, systems existed before 2006 to
25 protect against fraudulent transactions using a stolen

1 device, correct?

2 A Are you saying that the fraudulent
3 transactions used stolen device?

4 Q Yes.

5 A Yes.

6 Q Systems existed before 2006 that used
7 time-varying codes to protect against fraudulent
8 transactions, correct?

9 MR. KAERICHER: Objection.

10 A In general, yes.

11 Q Systems existed before 2006 that enabled a
12 local device to authenticate using both biometric
13 information and secret information from the user,
14 correct?

15 A When you say "local device," what do you mean?

16 Q The device that a user has.

17 A Okay. Yes.

18 Q Systems existed before 2006 that involved
19 handheld devices that wirelessly communicated with a
20 second device, correct?

21 A In general?

22 Q Yes.

23 A Yes.

24 Q Systems existed before 2006 that authenticated
25 users using just a handheld device, correct?

1 MR. KAERICHER: Objection to form.

2 A What's the question again?

3 Q Systems existed before 2006 that authenticated
4 users using just a handheld device, correct?

5 A When you say using just a handheld device,
6 what do you mean? Nothing else?

7 Q Yes.

8 A No, I wouldn't agree with that
9 characterization.

10 Q Systems existed before 2006 that authenticated
11 users using just the handheld device and secret
12 information of the user, correct?

13 MR. KAERICHER: Objection; form.

14 A There would be much more things needed than
15 just a handheld device and a secret of the user.

16 Q Systems existed before 2006 that authenticated
17 users using a handheld device and a second device,
18 correct?

19 A When you say "and a second device," what's the
20 role of the second device?

21 Q Could be just a second device.

22 A So the user has both a first and a second
23 device? Or --

24 Q No. Somebody else has a second device.

25 A Okay. And where is the -- where are the

1 various actions taking place in your question?

2 Q Remote from the user.

3 A Okay. So there is an authentication. Would
4 you ask the question again.

5 Q Sure. Sure. Systems existed before 2006 that
6 authenticated users using a handheld device and a second
7 device, correct?

8 A Yes.

9 Q And systems existed before 2006 that
10 authenticated users on a second device, correct?

11 MR. KAERICHER: Objection to form.

12 A When you say "authenticated users on a second
13 device," do you mean that the user somehow used the
14 second device or that the verification took place on the
15 second device?

16 Q The latter.

17 A Would you ask -- I'm sorry. Would you ask the
18 question again to make sure --

19 Q Yes. Systems existed before 2006 that
20 authenticated users on a second device, correct?

21 A The reason I am hesitant with this question is
22 that it's easy to misunderstand. Would you paraphrase
23 it so that there's no risk for misunderstanding.

24 Q I'll try. Systems existed before 2006 that
25 authenticated users who were using a local device on a

1 second device?

2 MR. KAERICHER: Objection to form.

3 A What I have a hard time with is on a second
4 device, what does that relate to? I mean there are many
5 portions of your sentence that it could potentially
6 relate to.

7 Q Can you turn to what's been previously been
8 marked as USR Exhibit 210 [sic].

9 A I don't think I have that. I'm sorry.

10 Q It should be in your --

11 MR. KAERICHER: It's in there somewhere.

12 A Is it 2010? No.

13 Q 2010. Yes.

14 A Then I have it. Yes. Yes.

15 Q Okay. You have Exhibit USR 2010 in front of
16 you?

17 A I do.

18 Q Can you turn, please, to paragraph 89.

19 A Just a moment, please.

20 Yes.

21 Q Exhibit 2010 is your declaration submitted in
22 connection with an IPR for the '137 patent, correct?

23 A Yes.

24 Q And then paragraph 89 of your declaration, you
25 testify, quote, In my opinion, the commercial success of

1 the claimed inventions was directly tied to the -- was
2 directly tied to the benefits of the claimed inventions,
3 parentheses, e.g., increased security and ease of
4 deployment. Correct?

5 A Yes.

6 Q Your declaration, Exhibit 2010, does not cite
7 any technical documents that show how Apple Pay works,
8 correct?

9 A That's correct.

10 Q None of your declarations cite any technical
11 documents that show how Apple Pay works, correct?

12 A Are you speaking of the documents in front of
13 me today?

14 Q Yes.

15 A None of them describe how Apple works.

16 Q Your declaration, Exhibit 2010, does not cite
17 any statement by Apple about how Apple Pay works,
18 correct?

19 A That's correct.

20 Q And none of the declarations that you have
21 prepared in connection with the '137 or '826 patents
22 cite any statement by Apple about how Apple Pay works,
23 correct?

24 A By Apple?

25 Q Yes.

1 A I'm not -- would you break down the question.
2 I'm sorry.

3 Q You have in front of you --

4 A Uh-huh.

5 Q -- six declarations that you submitted in
6 connection with the '137 and '826 IPRs, correct?

7 A Yes.

8 Q None of those declarations cite any statement
9 of Apple about how Apple Pay works, correct?

10 A That's my understanding.

11 Q Your declaration that we've marked as
12 Exhibit -- strike that.

13 Your declaration marked as Exhibit 2010 does
14 not explain how Apple Pay works, correct?

15 A Right.

16 Q None of the declarations that you have
17 submitted for the '137 or '826 patents explain how Apple
18 Pay works, correct?

19 A Right.

20 Q Your declaration, Exhibit 2010, does not
21 compare any claims of the '137 or '826 patents to any
22 Apple product or service, correct?

23 A That is correct.

24 Q None of the declarations that you have
25 submitted in connection with the '826 or '137 IPRs

1 compare any claims of the '137 or '826 patents to any
2 Apple product or service, correct?

3 A That is correct.

4 Q Exhibit 2010, your declaration does not map
5 any claim terms from the '137 or '826 patent to any
6 Apple Pay features, correct?

7 A Correct.

8 Q None of the declarations that you have
9 submitted in connection with the '137 or '826 IPRs maps
10 any claim terms to Apple Pay features, correct?

11 A I was not asked to do that.

12 Q Exhibit 210, your declaration does not compare
13 any claims of the '137 or '826 patents to any Visa
14 product or service, correct?

15 A Again, I wasn't asked to do that.

16 Q You have submitted no declarations in
17 connection with the IPRs for the '137 or '826 patents
18 that compare claims of the '137 or '826 patents to any
19 Visa product or service, correct?

20 A The IPRs probably do not need to do that,
21 right?

22 Q Is the answer, correct?

23 A I have not, yes.

24 Q Your declaration marked as Exhibit 2010 does
25 not cite any technical documents that show how Visa

1 Checkout works, correct?

2 A That is correct.

3 Q None of the declarations that you have
4 submitted in connection with the '826 or '137 IPRs cites
5 any technical documents that show how Visa Checkout
6 works, correct?

7 A I was not asked to do that.

8 Q Your declaration marked as Exhibit 2010 does
9 not explain how Visa Checkout works, correct?

10 A Again, I was not asked to do that.

11 Q And your declaration does not explain how Visa
12 Checkout works, correct?

13 A Again, I was not asked to do that either.

14 Q And therefore your declaration doesn't explain
15 it?

16 A I was not asked to do it, so I didn't do it.

17 Q None of the declarations that you have
18 submitted in connection with the '826 or '137 IPRs
19 explains how Visa Checkout works, correct?

20 A Again, I was not asked to do that; so there
21 was absolutely no reason to do it.

22 Q Your declaration, Exhibit 2010, does not
23 compare any claims of the '137 or '826 patents to any
24 Visa product or service, correct?

25 A Since I wasn't asked to do it, correct, I was

1 not doing it.

2 Q And you have submitted no declaration in
3 connection with any IPR for the '137 or '826 patents
4 that compares any claims of the '137 or '826 patents to
5 any Visa product or service, correct?

6 A There was no request to do that.

7 Q And therefore the declarations do not?

8 A I did not write about things that I was not
9 asked to write about.

10 Q Okay. Your declaration, Exhibit 2010, does
11 not identify any USR products or services that practice
12 the '137 or '826 patents, correct?

13 A Again. I wasn't asked to do that.

14 Q So is the answer, correct?

15 A That is correct.

16 Q And your declaration, Exhibit 2010, doesn't
17 identify any USR products or services, correct?

18 A I do not believe I do for the simple reason
19 that I was not asked to do that.

20 Q None of the declarations that you have
21 prepared in connection with the '137 or '826 patents
22 identify any USR products or services, correct?

23 A For the simple reason that I was not asked to
24 do that.

25 Q And the answer to my question is correct?

1 A It -- what you're saying is correct. I did
2 not do that because I was not asked to.

3 Q None of the declarations that you submitted in
4 connection with the '826 or '137 IPRs identify any
5 evidence that USR has ever made any money from the '137
6 or '826 patents, correct?

7 MR. KAERICHER: Objection to form.

8 A I have not been asked to look into this and
9 haven't considered it. Therefore, it's not in the
10 declaration.

11 Q None of the declarations that you submitted in
12 connection with the '826 or '137 IPRs identifies any
13 evidence that USR has ever licensed the '137 or '826
14 patents, correct?

15 A I do not know whether they have or not, and I
16 was not asked to consider that.

17 Q None of the declarations that you submitted in
18 connection with the '826 or '137 IPRs evaluate or
19 analyze the features or functionality of Apple Pay or
20 Visa Checkout, correct?

21 A They did not, as I was not asked to do that.

22 Q Would you put in front of you the
23 '585 reference.

24 A '585. Yes. I got it.

25 Q Did you ever ask to speak with Ken Weiss in

1 connection with your engagement on the IPRs for the '826
2 or '137 patents?

3 MR. KAERICHER: Caution you not to reveal any
4 communications with counsel. But I think you can answer
5 this one 'cause I know the answer.

6 A So I -- I have not.

7 Q So you never asked Mr. Weiss whether USR has
8 ever made any money in connection with the '137 or '826
9 patents?

10 A I've never met or spoken with Kenneth Weiss,
11 as far as I know.

12 Q You've never asked Mr. Weiss whether USR ever
13 practiced the '137 or '826 patents in any product or
14 service, correct?

15 A Could not have done that, because I have not
16 spoken with him.

17 Q And you don't know whether USR ever practiced
18 the '137 or '826 patents in any product or service,
19 correct?

20 A I --

21 MR. KAERICHER: Same caution.

22 A -- I haven't seen any information about this,
23 and I haven't been asked to consider it or try to find
24 it.

25 Q Okay. You have in front of you the

1 '585 reference?

2 A Yes, I do.

3 Q Would you agree that the '585 reference
4 discloses authentication codes?

5 A Yes, it does, one particular kind of
6 authentication codes.

7 Q The '585 reference discloses that the
8 combination function 230 is used to generate
9 authentication codes, correct?

10 A Let me ask you what paragraph you have in mind
11 here?

12 Q Paragraph 60 would be one example.

13 A Let me take a moment just to review that.
14 Please remind me of your question.

15 Q The '585 reference discloses that the
16 combination function 230 is used to generate
17 authentication codes, correct?

18 A Yes.

19 Q The '585 reference discloses that the
20 combination function can be implemented using more than
21 one different combining algorithm, correct?

22 MR. KAERICHER: Objection to form.

23 A To report on things that there's a one-way
24 function associated with it.

25 Q Is the answer to my question correct?

1 A Your answer -- the answer is that is correct,
2 but not any kind of function.

3 Q Well, let's look at paragraph 77.

4 A Just a moment, please.

5 Yes.

6 Q Paragraph 77 tells us that the combination
7 function can combine values, quote, in various ways and
8 in any order. Correct?

9 A That is correct.

10 Q And when it says "various ways," it means
11 there's more than one way to combine the values,
12 correct?

13 A One could implement this in various ways, and,
14 of course, different ways may have different benefits.
15 But there are many ways in which to do this. And it's
16 not specific to the order, although, again, there might
17 be some orderings that are less beneficial.

18 Q One way to combine the inputs would be to just
19 concatenate all of them, right?

20 A No, that's a misunderstanding. That would not
21 be what the combination function would do. The
22 combination function implicitly would involve something
23 that is not invertible.

24 Q Paragraph 77 of the '585 reference indicates
25 that, quote, Before being combined by the combination

1 function 230, these values can be processed by one or
2 more other functions.

3 Correct?

4 A That is correct.

5 Q Would you agree that the '585 reference
6 teaches that you can process the input values before
7 combining them?

8 MR. KAERICHER: Objection to form.

9 A The disclosures here describe ways of
10 combining things before you apply the combination
11 function, rather than what you're saying. I'm sorry.
12 They're -- in the combination function, there is a
13 one-way function step. And the processing using the
14 one-way function step would not -- I'm sorry. I don't
15 think I'm answering your question particularly.

16 Q I don't think you are.

17 A No.

18 Q Let me try it again.

19 Would you agree that the '585 reference
20 teaches that you can process the input values before
21 combining them?

22 MR. KAERICHER: Same objection.

23 A What is said here that you can process them
24 before you combine them, but, of course, also you'd have
25 to process them after you combine them. So there might

1 be multiple steps of processing involved.

2 Q The '585 reference teaches that you can
3 process the input values before combining them or after
4 combining them, correct?

5 A No. That's a misunderstanding.

6 Q Okay. The '585 patent -- strike that.
7 The '585 reference teaches that you can
8 process the input values before combining them, correct?

9 A As long as you also process them after. So
10 let me give you an example of processing before. You
11 may have an input such as a biometric reading, which is
12 not going to -- necessarily all of the bits of
13 information are going to be sent or used. And so what
14 you might do is to process them and keeping some of
15 these bits and then input that to a combination function
16 along with other information and then apply one other
17 function. That would be one way of doing it. The
18 one-way function is a critical aspect of this, and
19 that's part of the processing, and that would not be
20 performed solely before the combining.

21 Q Would it have been within the technical
22 ability of a person of skill in the art reading the
23 '585 reference in 2006 to concatenate the input values?

24 A To concatenate them, but that would not be it.
25 You would have to concatenate and then perform, for

1 example, the one-way function.

2 Q Okay. My -- my question is, simply, would it
3 have been within the technical ability of a person of
4 skill in the art reading a '585 reference in 2006 to
5 concatenate the input values?

6 A You know, I haven't given this much thought,
7 because it's not necessarily making sense in the context
8 of the application here. The -- this -- this patent
9 publication describes how to process it. And there are
10 various ways of doing that. Concatenation is not a
11 critical aspect.

12 Q So is it your opinion that it would not have
13 been within the technical ability of a person of
14 ordinary skill in the art, reading the '585 reference in
15 2006, to concatenate the input values?

16 A What I'm saying --

17 MR. KAERICHER: Objection to form.

18 A What I'm saying is that it would not have been
19 necessarily something a person of skill in the art would
20 have considered when reading this, whether they would
21 concatenate or not. The -- the authentication function
22 here uses a one-way function for combining purposes.
23 The inputs to that, it doesn't matter whether they're
24 concatenated or not.

25 Q Let me ask a different question then. Would

1 it have been within the technical ability of a person of
2 skill in the art in 2006 to concatenate the input
3 values?

4 MR. KAERICHER: Objection to form.

5 A In what context would they concatenate?

6 Q In the context of trying to develop an
7 authentication system.

8 A So what I'm explaining is that it -- the
9 concatenation is -- does not have a meaning in that
10 context. The one-way function that is used for the
11 combination function takes inputs, and it doesn't matter
12 whether those inputs have been concatenated or not. So
13 it's -- it's not something that a person of skill in the
14 art would consider, because it's not something, I'd say,
15 useful in the context.

16 Q Let me ask you to look at paragraph 73.

17 A Just a moment.

18 Yes.

19 Q Paragraph 73 says that a PIN (P) can be
20 combined with A (K, T, E), quote, by prepending or
21 appending the P -- PIN (P), correct?

22 A Let me see. Where did you read from? I
23 think -- I think I see it. Yes.

24 Q This sentence indicates that prepending or
25 appending is a function performed by the combination

1 function 230, correct?

2 A In this particular context, it doesn't
3 actually call out that it's the combination function
4 that does it, but it clarifies that the PIN, which is
5 the value P, can be combined by prepending or appending.
6 In many instances here, the combination function
7 corresponds to the function A.

8 Q So is the answer to my question correct?

9 A I have a hard time understanding your
10 question; so I'm trying to answer as best as I can.

11 Q A person of ordinary skill in the art reading
12 that sentence would understand the reference to be
13 disclosing that prepending or appending is a function
14 performed by the combination function 230, correct?

15 MR. KAERICHER: Objection to form.

16 A The combination function here is the
17 function A. That -- it doesn't describe anything about
18 prepending or appending by that function. You take --
19 you prepend or append a PIN to the output of that
20 function.

21 Q Paragraph 73 says, quote, The combination
22 function 230 then combines the generated authentication
23 code 291 with a PIN (P) to generate an authentication
24 code 292 that is a function of (K, T, E, P). Correct?

25 A Yes. And I apologize. I was being unclear

1 about the previous use of the word "authentication
2 code."

3 Q The combination function 230 combines the
4 code 291 with the PIN (P), correct?

5 A Yes.

6 Q And then the next sentence says, quote, The
7 PIN (P) can be combined with A (K, T, E) by prepending
8 or appending the PIN (P) to A (K, T, E) by
9 arithmetically adding the PIN (P) to A (K, T, E) or
10 using a block cipher or other one-way function or other
11 algorithm or a combination of these and other techniques
12 that combine two or more input values together.

13 Correct?

14 A Yes.

15 Q So would you agree that the act of combining
16 performed by the combination function 230 to combine
17 PIN (P) includes prepending or appending?

18 MR. KAERICHER: Objection to form.

19 A So it -- it prepends or appends the PIN (P) to
20 A (K, T, E), which is a value that has been computed
21 from (K, T, E).

22 Q The combination function 230 can prepend or
23 append, correct?

24 A The PIN to that value. So I just want to make
25 sure that I understand what you're saying it's

1 prepending or appending to. It's the function result of
2 the function A taking input (K, T, E).

3 Q Okay. My first question, though, is the
4 combination function 230 is capable of prepending or
5 appending, correct?

6 A It's not the authentication function that is
7 doing that.

8 Q The combination function?

9 A Combination function, yes. The combination
10 function -- one way it could do is to combine the
11 PIN (P) with A (K, T, E) by prepending or appending the
12 PIN to A (K, T, E) where A (K, T, E) is a value.

13 Q The '585 reference doesn't limit what the
14 combination function can be, correct?

15 A There are many things it could be, and there
16 are examples given here to describe a -- a few ways of
17 doing it.

18 Q Okay. So the '585 reference doesn't limit
19 what the combination function can be, correct?

20 A It does in a sense that it outlines the
21 expected functionality. So --

22 Q Please finish.

23 A So -- so if you did something that would
24 counteract the goals stated here, of course that would
25 not be desirable.

1 Q So you're saying that there is something that
2 you disclosed in the '585 reference that limits what the
3 combination function can be?

4 A No. What I'm saying is that there are
5 examples given here in the spirit of the goals that the
6 '585 publication aims to achieve, and there may be other
7 ways of applying other functions that simply would not
8 reach these goals.

9 Q Are there any words in the '585 reference that
10 limit what the combination function can be?

11 A It would be limited --

12 MR. KAERICHER: Objection to form.

13 A -- by the understanding of a person of skill
14 in the art of the goals and the functionality of the
15 components used in here.

16 Q Are there any words in the '585 reference that
17 I can look at that limit what the combination function
18 can be?

19 A I have not considered that question. But I
20 know that it can't just be anything.

21 Q The '585 reference doesn't require that the
22 combination function be a one-way function, correct?

23 A It says that it -- the only examples it gives
24 of the authentication function and the combination
25 function in unison would involve a one-way function.

1 Q That's not my question. There is nothing in
2 the '585 reference that requires the combination
3 function be a one-way function, correct?

4 A Whether it's stated? The -- all the examples
5 given and the motivation of this requires that it's a
6 one-way function. Remember, one of these things is --
7 for example, the value K, that's a secret key. If you
8 were not to apply a one-way function to that and you
9 were to, as a result, expose that to an eavesdropper,
10 that would not be beneficial.

11 So the spirit of the '585 application
12 described -- corresponds to a set of techniques that one
13 would use in order to achieve these goals.

14 Q Is there -- is there anything that says in the
15 '585 reference that the combination function must be a
16 one-way function, yes or no?

17 A I have not considered that question. I'm
18 sorry.

19 Q Is there anything in the '585 reference that
20 says the combination function is limited in some way?

21 A The --

22 MR. KAERICHER: Objection to form.

23 A -- '585 application describes both the
24 combination function and the authentication function A
25 and describes what the goals are. And it's -- would be

1 a -- clear to a person of skill in the art reading this
2 that there has to be a one-way function. There are
3 examples given of one-way functions, and a person of
4 skill in the art knowing from the description what the
5 goals of the application was would have understood that
6 not applying a one-way function would have been contrary
7 to the goals of the inventors.

8 Q Is there any statement, are there any words in
9 the '585 reference that says the combination function is
10 limited?

11 A I have not considered that question. We can
12 go through it in more detail if you have something in
13 particular in mind.

14 Q The '585 reference says in paragraph 73 in the
15 fourth sentence that the PIN can be combined using a
16 one-way function, quote, or other algorithm. Do you see
17 that?

18 A So --

19 MR. KAERICHER: Objection to form.

20 A -- if the -- you have to remember that A (K,
21 T, E), which is also combining things, is a one-way
22 function. And so that's why I'm collectively describing
23 the combination function in A because together they have
24 a purpose. The purpose is shared by these two. It is
25 to take the inputs and create the value from all of them

1 in a way that secures the communication and which
2 doesn't expose, for example, the key K.

3 Q Do you see the words "or other algorithm"?

4 A Yes.

5 Q And it says other one-way function or other
6 algorithm, correct?

7 A Yes, it does.

8 Q Which is disclosing that you could be using an
9 algorithm that is not a one-way function, correct?

10 MR. KAERICHER: Objection to form.

11 A So for one thing, there are functions that you
12 don't know to be one-way function but you believe to be
13 one-way function. Many of the algorithms that people
14 call one-way functions may not be one-way functions.
15 They're just believed to be one-way function. There are
16 even studies whether they exist, one-way functions.

17 So as a shortcut here, when you use a one-way
18 function or a function with suitable functionality --
19 which would be very hard to invert. But in addition,
20 you have to remember that the authentication function,
21 which is part of the combining function -- it's part of
22 the combining of the inputs, is a one-way function.

23 Q Prepending or appending is not a one-way
24 function, correct?

25 MR. KAERICHER: Objection to form.

1 A There are parts of the processing that do not
2 need to be a one-way function.

3 Q Can you answer my question. Prepending or
4 appending is not a one-way function, correct?

5 MR. KAERICHER: Same objection.

6 A Neither prepending nor appending is a one-way
7 function, but that is not what is important. Because
8 what you prepend or append to is A (K, T, E), which has
9 a one-way function.

10 Q If we prepended or appended an input value
11 such as PIN (P) to an authentication code, it would be
12 the same as concatenation, correct?

13 A Concatenation is the same as prepending or
14 appending based on where you put it.

15 Q If we prepended or appended an input value to
16 form an authentication code, the input values would form
17 separable fields, correct?

18 MR. KAERICHER: Objection to form.

19 A But only those that you do that to.

20 Q But the answer to my question is correct,
21 right?

22 A It's correct for those that you would do it
23 to, but it's very clear from the description here that
24 you would not do that to some of the fields. And a
25 person of skill in the art reading this would understand

1 that.

2 Q Okay. But if we prepended or appended an
3 input value to form an authentication code, the input
4 values would form separable fields, correct?

5 MR. KAERICHER: Objection to form.

6 A Only the portion that we prepend or append
7 would be a separable field.

8 Q The -- the '585 reference refers to reporting
9 the occurrence of certain events, correct?

10 A That is true.

11 Q And those events are called event states?

12 A Yes.

13 Q The event state is represented by the E value,
14 correct?

15 A That is correct.

16 Q And E can be an input into the combination
17 function, correct?

18 A Yes, it can.

19 Q Can you turn to paragraph 15, please, of the
20 '585 reference.

21 A Give me a moment, please.

22 Yes.

23 Q Paragraph 15 indicates that one or more bits
24 of the authentication code are dedicated to the event
25 state, correct?

1 A Yes.

2 Q So, for example, the last two bits of the
3 authentication code could be dedicated to the event
4 state, correct?

5 A Only for explicitly and separable portions of
6 the event state. For example, your battery level,
7 that's not considered sensitive in most situations.
8 That could be communicated in a separable field whereas
9 another thing like the device has been popped open or
10 the user has conveyed an alert in some way, an
11 emergency, that of course would not be communicated
12 explicitly.

13 Q Okay. But you agree that the last two bits of
14 the authentication code could be dedicated to the event
15 state, correct?

16 A I don't think it says so.

17 Q Do you see where it says "One or more bits
18 included in the authentication code can be dedicated to
19 reporting the occurrence of an event"?

20 A Yes.

21 Q And that is -- that example -- strike that.
22 That sentence is consistent with the example
23 of the last two bits of the authentication code being
24 dedicated to the event state, correct?

25 MR. KAERICHER: Objection to form.

1 A And if you understood my example of the event
2 codes being either sensitive or not, you would see that
3 one could communicate in such a way the -- an event that
4 is not sensitive; so, for example, the battery is dead.

5 Q Okay. But the last two bits of the
6 authentication code could be dedicated to the event
7 state, correct?

8 A It doesn't say that it's the last two bits.
9 But it does -- also does not say that it wouldn't be the
10 last two bits.

11 Q If the two bits are used to represent the
12 event state, then one or more bits included in the
13 authentication would be dedicated to the reporting of
14 the occurrence of an event, correct?

15 MR. KAERICHER: Objection to form.

16 A I'm so sorry. Would you say that again.

17 Q Sure. If two bits are used to represent the
18 event state, then one or more bits included in the
19 authentication would be dedicated to the reporting the
20 occurrence of an event, correct?

21 A No, it's not that easy. You are assuming that
22 the event is communicated explicitly in a separable way.

23 Q Let me ask -- go ahead.

24 A And in the main embodiment which corresponds
25 to not conveying event state, which is the goal of

1 Jakobsson, the event would be part of the input to A,
2 and one could not identify any one bit that is used to
3 convey the event state.

4 Q The '585 reference discloses using a separable
5 field to represent the event state in an authentication
6 code, correct?

7 MR. KAERICHER: Objection to form.

8 A Only in context where the event state is --
9 it's not -- where it's not undesirable for the event
10 state to be learned by an eavesdropper. And the goal of
11 the publication is to hide, to communicate covertly an
12 event state.

13 Q The event state is an in-click to the
14 combination function disclosed in the '585 reference,
15 correct?

16 A Yes, it is.

17 Q And the combination function in the
18 '585 reference is used to generate the authentication
19 code, correct?

20 A Yes, it is.

21 Q The '585 reference indicates to one of
22 ordinary skill in the art the use of a separable field
23 to represent inputs into the combination function,
24 correct?

25 A But only some of those inputs.

1 Q But that is correct, right?

2 A A person of skill in the art would have
3 understood that it would be absolutely against the
4 principles of the invention to do so in a careless
5 manner. There would be event states such as the battery
6 state that could be conveyed, but the focus of the
7 invention is to convey in a way that isn't separable
8 events of critical importance covertly.

9 Q Does the '585 reference disclose the
10 occurrence of an event communicated explicitly in
11 authentication code?

12 A It says that an occurrence to an event, it --
13 communicated explicitly in the authentication code in
14 one embodiment. And a person reading this would
15 understand that that is only for some event codes, and
16 there would be events that would not be communicated in
17 this way. And it's critical that those are not
18 separable and that they are part of the input to the
19 authentication function because they need to be
20 communicated covertly.

21 Q Can we agree that the '585 reference discloses
22 using a separable field to represent inputs to the
23 combination function, yes or no?

24 A Some of the inputs could be communicated in a
25 separable field.

1 Q And the '585 reference discloses using a
2 separable field to represent at least one input to the
3 combination function, correct?

4 A There are instances where one instance could
5 be conveyed in a separable field.

6 Q And the '585 reference discloses instances in
7 which separable fields are in the authentication code,
8 correct?

9 A Yes. However, a person of skill in the art
10 reading this would know that it's critical for the
11 functionality described in here that there are event
12 states that are not conveyed explicitly and which have
13 to be input into the authentication code production.

14 Q Can you tell me, Dr. Jakobsson, whether
15 systems existed before 2006 that authenticated users
16 using a handheld device and a second device that
17 provides the verification for authenticating a user?

18 MR. KAERICHER: Objection to form.

19 A Yes, there were.

20 Q Does the '585 reference disclose credit card
21 devices?

22 MR. KAERICHER: Objection to form.

23 A I don't recall that.

24 Q Does it disclose credit cards?

25 A I -- I don't recall this. Do you have a

1 particular segment of it in mind?

2 Q Does the '585 reference disclose a user
3 authentication device that is a credit card?

4 A That is a credit card?

5 Q Yeah.

6 A I don't remember.

7 Q Would it surprise you if the '585 reference
8 includes a user authentication device that is a credit
9 card?

10 A I would have to see the portion that you're
11 describing. I know that many of these devices are
12 credit card shaped, which is a general description of
13 the form factor. But I don't know what you have in
14 mind. Do you have a particular segment in mind?

15 Q Do you agree that the '585 reference discloses
16 a credit card that includes a magnetic strip?

17 A Maybe in the background it would do that.
18 That would make sense. I don't see it as being relevant
19 to the technical disclosure in the patent application.
20 It does not quite have anything to do with payments.

21 Q Doesn't the '585 reference disclose the use of
22 credit cards for financial transactions?

23 A You'd have to remind me where it says. The
24 '585 publication describes and discloses authentication
25 techniques. It's not at all centered on financial

1 transactions. It mentions in one paragraph that the use
2 of this could be to log in to any kind of service.

3 Q As part of your preparation of your
4 declarations for the '137 and '826 IPRs, did you
5 investigate or analyze whether the '585 reference
6 discloses a credit card?

7 A I understand what it does disclose, because I
8 understand as a co-inventor of this, the goal.

9 Q Can you answer my question, sir. Part of your
10 preparation for your declaration, did you investigate
11 whether the '585 reference discloses the credit cards?
12 Yes or no?

13 A Let me refresh my recollection by reading the
14 background of the invention, because that's where I
15 could see that it could have been mentioned.

16 You know, I'd have to ask you to either direct
17 me to a paragraph in one of my declarations or a
18 particular paragraph in '585, because as much as I'm
19 co-inventor of this, this was written in 2004, and I
20 don't remember by heart the descriptions in there. What
21 I could say, though, is that this is not about financial
22 transactions or credit card purchases.

23 Q As you sit here, you do not recall a
24 disclosure of credit card in the '585 reference,
25 correct?

1 A You'd have to give me more context. There are
2 devices that are credit card shaped. Of course, that
3 makes them -- doesn't make them credit cards. And there
4 are disclosures that just describes, you know, one could
5 use the credit card to buy this thing. But that's not
6 what the invention is.

7 Q I'm not asking you about a credit card shaped.
8 I'm asking you, as you sit here, whether you recall a
9 description of a credit card in the '585 reference? Yes
10 or no?

11 A I do not recall a description of a credit
12 card, because the '585 application is not about credit
13 cards. It's about generation of what you might think of
14 as password substitutes.

15 Q Can we agree that credit cards are used to
16 conduct financial transactions?

17 A That is for sure. There are some financial
18 transactions that involve credit cards. Those are not
19 the ones that would be the focus of this. The focus of
20 this would be not financial transactions at all, but
21 access to resources.

22 Q Would you turn to paragraph 59 of the
23 '585 reference.

24 A Just a moment.

25 Yes.

1 Q So can we walk through paragraph 59 together?

2 A Sure.

3 Q The first sentence of paragraph 59 tells us
4 that a first authentication is performed based on
5 information supplied by the user 110, correct?

6 A Yes.

7 Q Then the next sentence says that this
8 information supplied by the user can be a, quote, PIN,
9 password, or biometric information. Correct?

10 A Yes.

11 Q The '585 reference discloses a first
12 authentication based on a PIN, correct?

13 A You mean in general or in this sentence?

14 Q Well, in this sentence.

15 A It just says that the information supplied
16 by -- may include a PIN.

17 Q So the '585 reference in paragraph 59
18 discloses a first authentication based on a PIN,
19 correct?

20 MR. KAERICHER: Objection to form.

21 A Again, this sentence does not say so. Do you
22 want to speak about '585 in general or here?

23 Q So I'm directing you to paragraph 59.

24 A Yes.

25 Q Paragraph 59 of the '585 reference discloses a

1 first authentication, correct?

2 A Of the user.

3 Q And it discloses a first authentication based
4 on a PIN, correct?

5 A As far as we read together, it does not. It
6 says that there's a first authentication of the user
7 that is performed, and then it speaks about what
8 information is supplied by the user, but it doesn't
9 say -- up till here -- that there's any processing at
10 all of this.

11 Q Do you agree that the '585 reference discloses
12 a first authentication based on a PIN?

13 A Yes.

14 Q Do you agree that the '585 reference discloses
15 a first authentication based on a password?

16 A Yes.

17 Q Do you agree that the '585 reference discloses
18 a first authentication based on biometric information?

19 A Wait a minute. Let me back up here and
20 correct. When you're saying a first authentication, do
21 you refer to the one performed by the user
22 authentication device?

23 Q I'm referring to a first authentication of
24 user 110.

25 A So then you mean it in the context of

1 paragraph 59? This only says -- this speaks of what is
2 performed by the authentication device 120.

3 Q Okay. Let me not limit it to paragraph 59
4 then, okay?

5 A Okay.

6 Q The '585 reference discloses a first
7 authentication based on a PIN, correct?

8 A Can we drop the word "first," because I have
9 it here, and I want to make sure that we don't mess --
10 mix it up with this sentence. So is it okay if we say
11 discloses authentication?

12 Q Well, let's -- first to my question.

13 A Sure.

14 Q The '585 reference discloses a first
15 authentication based on a PIN. Correct or not correct?

16 A I would have to look for that.

17 Q Okay. The '585 reference discloses
18 authentication based on a PIN, correct?

19 A Again, in this sentence it does not, but, of
20 course, I know the '585, that the PIN is of relevance
21 for the verification.

22 Q The '585 reference discloses authentication
23 based on a password, correct?

24 A In general, yes.

25 Q The '585 reference discloses authentication

1 based on biometric information, correct?

2 A That is also correct.

3 Q And paragraph 59 says that the device may
4 perform the authentication alone, correct?

5 A It says that it could perform alone or in
6 combination with another device. So let me give you an
7 example. It could be that your PIN is input and the
8 device determines if it's correct.

9 Q Would you --

10 A It could also be that the PIN is determined
11 to -- to be correct by another device or in conjunction
12 with another device and the -- the present -- the
13 publication is actually silent on how it's done.

14 Q Would you agree that a person of ordinary
15 skill in the art reading paragraph 59 would understand
16 it to disclose a first authentication based on a PIN?

17 A No, because the first authentication is
18 performed by the user authentication device 120, and it
19 doesn't say that, that is -- can be performed by the
20 user authentication device alone.

21 Q So --

22 A It says, "Perform the first authentication
23 alone or in combination with another device."

24 Q So your opinion is that a person of ordinary
25 skill in the art reading paragraph 59 would not think

1 that the first authentication could be based on a PIN?

2 MR. KAERICHER: Objection to form.

3 A It would know that the first authentication is
4 performed by the user authentication device. And it
5 also would know that the first authentication could be
6 done alone or in combination with another device. So
7 this person of skill in the art would not come to the
8 conclusion that you're describing based on this sentence
9 alone.

10 Q Okay. Does the '585 reference disclose a
11 first authentication performed by the user
12 authentication device based on a PIN?

13 A You'll have to point me to the place where it
14 does; I'm not keenly aware of any such.

15 Q Does the '585 reference disclose a first
16 authentication of a user performed by the user
17 authentication device based upon biometric information?

18 A So what we know is that the first
19 authentication of a user is performed by the user device
20 120. But we also know that it's alone or in combination
21 with another device. '585 doesn't specify where this is
22 done. Let me give you an example. There's one field of
23 research that is distributed, password verification.
24 That is when you take a password and there's not one
25 entity that verifies it, but multiple entities. There

1 are clear benefits of doing that. Now the '585
2 application doesn't speak of what entity performs what
3 actions in this context that we're speaking.

4 MR. SELWYN: I move to strike as
5 nonresponsive.

6 Q Would you agree with me that one way to
7 perform the first authentication, described in
8 paragraph 59, is to compare a received value with a
9 stored value?

10 A Again, it doesn't say so, but that would be
11 one way of doing it. Now, there are other ways of doing
12 it, as well, as I clarified before.

13 Q In the system that's described in
14 paragraph 59, if the user enters a PIN, a password, or a
15 biometric, then the device could compare the entered
16 value with a stored value, correct?

17 A What it says, that the -- the device may
18 perform this first authentication alone or in
19 combination with another device. So it's silent on
20 whether it could do it alone.

21 Q Well, sir, you know that a person of skill in
22 the art has some background and education in computer
23 security, right?

24 A Right.

25 Q So would you agree with me that it would have

1 been within the technical skill of a person of skill in
2 the art reading the '585 reference, to design a system
3 for comparing a stored value and a received value?

4 A What I'm saying is that this is not what the
5 paragraph is speaking of.

6 Q Can you answer my question, please?

7 A I -- I think I need to think about it for a
8 while. Whether a person of skill in the art would
9 have -- that's not a question I have been asked to
10 consider before. And as simple as it might seem to you,
11 that would require some thinking for me.

12 Q Okay. So let me just make sure that the
13 record is clear. You do not know whether it would be
14 within the technical ability of a person of ordinary
15 skill in the art, reading a '585 reference in 2006, to
16 design a system for comparing a stored value and a
17 received value. Correct?

18 A Are you saying --

19 MR. KAERICHER: Objection to form.

20 A -- any stored value and any received value?

21 Q Yes.

22 A The application here does not speak of any
23 values. You're asking about a particular value, I
24 think. And there are very clear pros and cons of
25 different approaches. So, as I mentioned to you before,

1 in a distributive password verification setting, there
2 are great benefits associated with that. For example,
3 if there's a data compromise, that would not affect
4 adversely a system based on such -- such a technique.
5 So it really comes down to weighing the pros and the
6 cons, and a person of skill in the art would have to do
7 that.

8 MR. SELWYN: I move to strike as
9 nonresponsive.

10 Q In 2006, a person of ordinary skill in the art
11 would have understood how to store a biometric value in
12 memory, correct?

13 A By biometric value, what do you mean? Is it a
14 template, you mean?

15 Q A value indicative of a biometric.

16 A So it's not the input necessarily.

17 Q Not necessarily.

18 A So a person of skill in the art would not have
19 stored the biometric value in memory but would have
20 stored a template in memory.

21 Q In 2006, a person of ordinary skill in the art
22 would have understood how to store a template for a
23 biometric in memory, correct?

24 A Yes.

25 Q In 2006, a person of ordinary skill in the art

1 would have understood how to compare a stored biometric
2 with another biometric value, correct?

3 MR. KAERICHER: Objection to form.

4 A This other biometric value, is that also a
5 template?

6 Q Yes.

7 A That person would not be motivated to do so.

8 Q Would a person of ordinary skill in the art
9 have understood how to do -- design a system that
10 compared a template for a biometric with another
11 template for a biometric?

12 A That's a nonsensical question. I don't see
13 the person ever being motivated to do so.

14 Q In 2006, would a person of ordinary skill in
15 the art have understood how to compare a stored
16 biometric value with another biometric value?

17 A So is a stored biometric value a template?

18 Q Yes.

19 A And is the biometric value a template?

20 Q Yes.

21 A That person would not understand why to do
22 that. There's no meaning to compare on such sets of
23 values.

24 Q In 2006, would a person of ordinary skill in
25 the art have known how to program a computer to compare

1 a template for a biometric with a stored biometric?

2 A Is the stored biometric a template?

3 Q Yes.

4 A That person would not know why that should be
5 done. So you could write a program for it, but what
6 would the program do? It's very unclear what this would
7 achieve.

8 Q And are you as confident in that opinion as
9 all the other opinions you've given today?

10 MR. KAERICHER: Objection to form.

11 A I have not rated my confidence, but based on
12 my understanding of your question, I think I understand
13 that it would not make sense to compare two templates.

14 Q Okay. Let's go back to paragraph 59.

15 MR. KAERICHER: We've been going for about an
16 hour. Whenever we get to a good spot --

17 MR. SELWYN: Sure. Let me just finish this.

18 Q Do you see towards the bottom of paragraph 59
19 reads, "In one embodiment, the strength of the first
20 authentication is communicated as event state in the
21 authentication code that is verified by the
22 verifier 105. For example, the event state can reflect
23 the degree of the match of a biometric element."

24 A That's the example I gave you before, I think,
25 where I said there are certain events that you would not

1 convey explicitly but which would by necessity and
2 according to the spirit of this publication be conveyed
3 as part of the computation of the authentication code.

4 Q All I asked is whether you saw those two
5 sentences.

6 A Yes, I did.

7 Q That passage says that there is a match of a
8 biometric element, correct?

9 A It says speaks of the degree of the match.

10 Q Of a biometric element, correct?

11 A Yes.

12 Q And this match could be performed by the
13 device, correct?

14 A It doesn't say so. It, in fact, speaks about
15 performing the authentication alone or in combination
16 with another device. So it's silent on what device
17 performs it.

18 Q Okay. If the match is performed by the device
19 alone, then there must be a stored value, correct?

20 A The stored value would be the template.

21 Q The first sentence of paragraph 5 describes
22 biological characteristics such as fingerprints, right?

23 A Yes.

24 Q And the second-to-last sentence in paragraph 5
25 says that, quote, A verifier typically can observe the

1 characteristic and compare the characteristic to records
2 that associate the characteristic with the entity.

3 Correct?

4 A Those are the templates we've been speaking
5 of.

6 Q So that sentence, the second-to-last sentence
7 in paragraph 5 is describing a comparison of biometric
8 information to a stored record, correct?

9 A What it's doing is comparing the biometric
10 input to a template that's been stored.

11 Q And that comparison is being used to verify
12 the biometric, correct?

13 MR. KAERICHER: Objection to form.

14 A The biometric input, yes.

15 Q And in paragraph 5, the '585 reference is
16 disclosing a comparison of a biometric value to a stored
17 value, correct?

18 A With a stored value would be something like a
19 biometric template, of course. This now -- let me point
20 out, this is the background of the invention; so this
21 does not describe the invention as such but the
22 background only.

23 Q I'm just asking you what paragraph 5
24 discloses. Paragraph 5 discloses comparing a biometric
25 value to a stored value, correct?

1 A Yes. And one would understand that the stored
2 value would be the biometric template.

3 Q And going back to paragraph 59, would you
4 agree that it's not possible to perform the first
5 authentication described in that paragraph on one device
6 without some stored value?

7 A I haven't been given that much thought.

8 Q Would you agree that it's not possible to
9 perform the first authentication described in the first
10 sentence of paragraph 59 on one device without a
11 comparison?

12 A So this doesn't speak about doing it on the
13 device. It says that it's one or more devices. Now,
14 something has to be stored somewhere. I agree with
15 that. But it doesn't have to be stored on the device.

16 Q Has to be stored somewhere.

17 A Somewhere. It could be another device.
18 That's why it says that the device -- 120 may perform
19 this first authentication alone or in combination with
20 another device.

21 Q So you'd agree that it's not possible to
22 perform the first authentication described in
23 paragraph 59 on one device without a comparison to a
24 stored value somewhere, correct?

25 A But this -- we said about -- the first

1 authentication would be done alone or in combination
2 with another device. You're speaking of a
3 combination -- of a -- of a comparison where?

4 Q I'll re-ask the question.

5 A Okay.

6 Q It's not possible to perform the first
7 authentication described in paragraph 59 on one device
8 without a comparison to a stored value, correct?

9 A Where that stored value could be elsewhere and
10 the comparison likewise.

11 Q So the answer is correct?

12 A There has to be stored value somewhere, but it
13 doesn't have to be on the first device.

14 MR. SELWYN: Let's take our break.

15 THE WITNESS: Okay.

16 (A recess ensued from 1:59 p.m. to 2:06 p.m.)

17 BY MR. SELWYN:

18 Q Dr. Jakobsson, can you put back in front of
19 you the '137 patent.

20 A Yes. Yes.

21 Q And could you please turn to column 46,
22 claim 6.

23 A If I could just take a moment to look up my
24 corresponding opinion, since I know that it's probably
25 going to be relevant.

1 I'm sorry. I have lost one document, the one
2 I brought that had the index. Has either of you seen
3 that? Oh. This is it. Sorry.

4 Yes.

5 Q Okay. Do you have claim 6 in front of you of
6 the '137 patent?

7 A I do.

8 Q Claim 6 is a dependent claim, correct?

9 A That's correct.

10 Q Claim 6 in the '137 patent says "the system of
11 claim 1 wherein the first processor is configured to
12 encrypt the first authentication information," correct?

13 A Yes.

14 Q Claim 6 doesn't require any specific kind of
15 encryption, correct?

16 A It doesn't specify.

17 Q Any known algorithms would meet that
18 limitation, correct?

19 A I believe so.

20 Q The '137 and '826 patents don't propose any
21 new encryption algorithm, correct?

22 MR. KAERICHER: Objection to form.

23 A That is correct.

24 Q The '137 and '826 patents don't disclose any
25 new computer or computer components to perform

1 encryption, correct?

2 MR. KAERICHER: Objection to form.

3 A That's also true.

4 Q The '137 and '826 patents don't disclose any
5 new software to perform encryption, correct?

6 A That is correct.

7 MR. KAERICHER: Objection; form.

8 A Sorry. That's correct.

9 Q The '137 and '826 patents don't disclose any
10 new arrangement of components to perform encryption,
11 correct?

12 MR. KAERICHER: Objection to form.

13 A That is correct.

14 Q Encrypting communications transmitted over the
15 Internet was known before the '137 and '826 patents,
16 correct?

17 A In general, yes.

18 Q Encrypting communications transmitted over an
19 insecure channel was known before the '137 and '826
20 patents, correct?

21 MR. KAERICHER: Objection to form.

22 A That's correct.

23 Q In 2006, a person -- strike that.

24 Before 2006, a person of ordinary skill in the
25 art would have known how to program a computer to

1 perform an encryption or a decryption, correct?

2 A Yes.

3 Q Before 2006, a person of ordinary skill in the
4 art would have known how to configure a processor to
5 encrypt or decrypt information, correct?

6 A By that, do you mean providing input software?

7 Q Yes.

8 A Yes.

9 Q Before 2006, a person of ordinary skill in the
10 art would have known how to configure an electronic
11 device to encrypt or decrypt information, correct?

12 A Yes.

13 Q Before 2006, a person of ordinary skill in the
14 art would have understood that encrypted communications
15 are more secure than unencrypted communications,
16 correct?

17 A Yes. Now, there are, of course, instances
18 where encryption is not meaningful. I'm thinking of the
19 '585, which the authentication code there, as it's being
20 transmitted, there's no point to encrypting it because
21 its encryption is to hide contents, and one does not
22 need to hide the contents of the authentication code as
23 it already has made it unseparable.

24 Q I move to strike everything after the answer,
25 yes.

1 In -- strike that.

2 Before 2006, a person of ordinary skill in the
3 art would have understood what symmetric-key encryption
4 was, correct?

5 A Yes.

6 Q Before 2006, a person of ordinary skill in the
7 art would have understood what asymmetric encryption
8 was, correct?

9 A Yes.

10 Q And before 2006, a person of ordinary skill in
11 the art would have understood what public key encryption
12 was, correct?

13 A Yes.

14 Q Would you turn, please, in the '137 patent to
15 column 4, line 11?

16 A Just a moment, please.

17 Yes.

18 Q Okay. So directing your attention to
19 column 13, lines 4 through 11, do you see it reads,
20 quote, To enhance security, especially where
21 communication takes place over a publicly accessible
22 network such as the Internet, communications
23 facilitating or relating to transmission of data from/to
24 the USR database 24 or the computer system 10 may be
25 encrypted using an encryption algorithm such as PGP,

1 DES, or conventional symmetric or -- or asymmetric
2 algorithms?

3 A Yes. But I apologize. I thought you were
4 asking me to look up another paragraph before. Give me
5 a moment to just read this again.

6 Q Okay.

7 A Yes.

8 Q And when it refers to "conventional," you
9 understand that to mean that there were known encryption
10 algorithms, correct?

11 A In fact, people mostly want to use the known
12 encryption algorithms, because they have some assurance
13 that they would work as promised.

14 Q And the '137 and '826 patents don't disclose
15 any new encryption algorithms, correct?

16 A To their credit, I would say --

17 Q And --

18 A -- they use what is known to be working.

19 Q And the '137 and '826 patents don't disclose
20 any new arrangement of components to perform
21 conventional symmetric or asymmetric encryption
22 algorithms, correct?

23 MR. KAERICHER: Objection to form.

24 A This is true. Most use of cryptography in
25 this -- of this type is done as building blocks.

1 Q The '137 and '826 patents don't disclose any
2 new arrangement of components to perform any encryption
3 algorithms, correct?

4 MR. KAERICHER: Objection; form.

5 A That's correct.

6 Q Are you familiar with the term "ciphertext"?

7 A Yes, I am.

8 Q Ciphertext can be used to refer to encrypted
9 information, correct?

10 A Yes.

11 Q And would you agree that the '137 and '826
12 patents don't disclose any new types of hardware to
13 perform encryption or cryptography?

14 A Yes.

15 Q And the '137 and '826 patents don't disclose
16 any new type of software to perform encryption or
17 cryptography, correct?

18 A They describe new uses of the encryption,
19 which would probably be in software -- at least, in part
20 of software.

21 Q The '137 and '826 patents don't disclose any
22 software, correct?

23 A They describe --

24 MR. KAERICHER: Objection to form.

25 A Sorry.

1 MR. KAERICHER: Go ahead.

2 A They describe the method, of course. That
3 would guide the development of the software.

4 Q But they don't purport to disclose any new
5 software, correct?

6 MR. KAERICHER: Objection to form.

7 A They describe the new method, whether they're
8 going to be implemented in software or hardware or a
9 combination thereof. They don't give particular
10 descriptions of this hardware or software.

11 Q And, in fact, they say that conventional uses
12 of software can be applied, correct?

13 A So what I think they mean is that the
14 conventional hardware and conventional types of
15 programming -- languages, for example, could be used.
16 The software itself, of course, implements the
17 functionality. And to implement the functionality, they
18 would implement what is described here and claimed, for
19 example, which would be novel and which would be
20 different from just the plain encryption.

21 Q The '137 and '826 patents don't disclose any
22 examples of software for performing any of the methods
23 claimed in the patents, correct?

24 MR. KAERICHER: Objection to form.

25 A If by "software," you mean the code for doing

1 it, they do not.

2 Q Okay. Plaintext can be used to refer to
3 unencrypted information, correct?

4 A Yes.

5 Q And if I wanted to encrypt plaintext, one way
6 is to use a key, right?

7 A Among other things.

8 Q If I XOR plaintext with a key, the results
9 would be ciphertext, correct?

10 A That's not how you would do it. One would
11 have an -- an algorithm for encryption, and, for
12 example, in the case of DES, the key would not be
13 encrypted -- the key would not be XOR'd. Now, there are
14 particular instances -- and you may think of stream
15 ciphers where there is an XOR involved, but... I don't
16 see that that's what you're asking me.

17 Q Well, let me break it down. The XOR function
18 is a type of encryption function, correct?

19 A Definitely not.

20 Q If I were to XOR the same key with the
21 encrypted ciphertext, I would effectively decrypt the
22 ciphertext, correct?

23 MR. KAERICHER: Objection to form.

24 A I'm sorry. Would you say that again?

25 Q Sure. If I were to XOR the same key with the

1 encrypted ciphertext, I would, effectively, decipher the
2 ciphertext, correct?

3 MR. KAERICHER: Objection to form.

4 A So I think what you're describing is a stream
5 cipher, and one would not refer to the stream as a key.
6 The key, for example, would be the input -- one of the
7 inputs to DES, as described in these applications. And
8 there you do not XOR. And the decryption would not
9 involve XORing, either, except that the DES function may
10 have XORs, but it's not an XOR with the plaintext or the
11 ciphertext.

12 Q Is XORing a form of encryption?

13 A No, it's not seen as such. XOR is useful in
14 some encryption schemes, but it's, by itself, is not an
15 encryption scheme. Now --

16 Q Now can XORing be used as a form of
17 decryption?

18 A So the only context for this makes sense is
19 the stream cipher context where the -- the XOR is not
20 with a key, but it's with a stream. The -- using an XOR
21 with a key in a ciphertext, that would not be thought of
22 as decryption or encryption for that matter.

23 Q Can you turn, please, to the '585 reference.

24 A Yes.

25 Q Can you turn, please, to paragraph 58.

1 A Yes. Let me just refresh my recollection of
2 this paragraph.

3 Q Okay.

4 A Yes.

5 Q The fourth sentence of paragraph 58 reads,
6 quote, Verifier 105 reverses the combination function --
7 I'm sorry -- reverses the combination operation, e.g.,
8 by subtracting and/or XOR the user's PIN from the
9 received authentication code. Correct?

10 A That's correct.

11 Q That sentence discloses a decryption operation
12 that's performed on the system's authentication code,
13 correct?

14 A Not in the --

15 MR. KAERICHER: Objection to form.

16 A -- traditional sense.

17 Q Wasn't -- that sentence discloses a decryption
18 operation, correct?

19 A The -- the reason it uses the term "reverses"
20 is that this would not be seen as decryption. The
21 publication uses encrypting and decrypting in other
22 places, but this is -- the reason that it uses reversing
23 here is that it's hard to call this encryption and
24 decryption.

25 Q Okay. I want to make sure that the record is

1 clear about what you're saying. That sentence, the
2 fourth sentence of paragraph 1 -- paragraph 58 in your
3 view, does not disclose a decryption operation, correct?

4 A It -- it calls it for reversing it by
5 subtracting or XORing, so it extracts the -- the PIN
6 from the received code. Now, it's not a traditional
7 decryption as such. But I did bring up the stream
8 cipher before. It has similarities to stream cipher
9 technology, but for a stream cipher, you have a suit of
10 random code, and here, it's not the same. So I -- the
11 -- the reason it uses the reverses is that it's not
12 quite the same.

13 Q Okay. So, in your opinion, the fourth
14 sentence of paragraph 58 does not disclose a decryption
15 operation, correct?

16 A It -- the reason it uses reverses is to
17 specify that it does obtain information from it. But
18 we're not talking about traditional encryption
19 decryption here. Some people might flinch if you call
20 this decryption. It is extracting information by
21 reversing.

22 Q You understand what a decryption operation is,
23 correct?

24 A Yes, I do.

25 Q Does the fourth sentence of paragraph 58

1 disclose a decryption operation? Yes or no.

2 A It describes the reversing. It's very similar
3 to what you'd call a decryption, but it's not a
4 traditional decryption. It's not, for example, a stream
5 cipher. It's certainly not DES. There are other places
6 where encryption and decryption is disclosed. The
7 reason it uses reverses is that it is not the same.
8 It -- it has hidden the information, the PIN in the
9 information that is being sent and it's being extracted.

10 Q The reversing that's described in the fourth
11 sentence of paragraph 58 is being performed on the
12 system's authentication code, correct?

13 A Yes.

14 Q And that sentence discloses that the verifier
15 is configured to decrypt an authentication code,
16 correct?

17 MR. KAERICHER: Objection to form.

18 A That's -- if you're referring to the "in some
19 embodiments, the verifier 105 decrypts a value." Is
20 that it?

21 Q Yes.

22 A That is not necessarily describing the same
23 thing.

24 Q Does the fourth sentence -- strike that.

25 Do you see the sentence in paragraph 58 that

1 says that the verifier 105 reverses the combination
2 operation?

3 A Yes.

4 Q That sentence is referring to a combination
5 operation performed by the user authentication device,
6 correct?

7 MR. KAERICHER: Objection to form.

8 A It doesn't explicitly say so, but I -- I would
9 imagine that's likely.

10 Q Paragraph 58 also reads, quote, In a
11 simplistic example, the user authentication device 120
12 generates an authentication code by arithmetically
13 combining a secret stored by the user authentication
14 device 120 and a user-supplied PIN.

15 Did I read that right?

16 A Yes. I think why it's called an simplistic --
17 simplistic example is to convey that this is, of course,
18 not exactly what you would do, but here's some of the
19 intuition.

20 Q The arithmetic combination disclosed in
21 paragraph 58 is the combination operation that's later
22 reversed in the fourth sentence of paragraph 58,
23 correct?

24 A I cannot be sure from this description,
25 because it says that it's combines a secret stored by

1 the user or authentication device and the user-supplied
2 PIN, and I don't know the received authentication code
3 to be stored by the user device.

4 Q And XOR could be the arithmetic combination,
5 correct?

6 A XOR is an arithmetic combination.

7 Q In the embodiment disclosed in paragraph 58,
8 an authentication code is not generated at the verifier,
9 correct?

10 MR. KAERICHER: Objection to form.

11 A I don't understand why you would say that.
12 How else would the verifier know the identification
13 code?

14 Q So you think in the embodiment disclosed
15 paragraph 58, an authentication code is generated at the
16 verifier, correct?

17 A That's what all these -- that's the principle
18 of -- of 858.

19 Q Okay.

20 A So the -- the basic structure of 858 is that
21 an authentication code is generated on the first device.
22 And then it's also generated -- another one is generated
23 on a second device. And the second device receives the
24 first one and compares it to the second one. So -- and
25 you could not perform this reversing without having --

1 well, I'm sorry. So if you're reversing it and you
2 get -- from the received authentication code and
3 reversing out the PIN, then you're getting something
4 else, which would match what you have computed.

5 I think I'm not answering your question. I'm
6 sorry.

7 Q I don't think you are.

8 The embodiment described in paragraph 58
9 doesn't involve a hash function, correct?

10 A It doesn't say so. But hash functions are
11 used in the authentication codes, or at, least, a hash
12 function is one of the functions that being -- one-way
13 functions could be used to generate the authentication
14 code.

15 Q The system disclosed in paragraph 58 does not
16 require a hash function, correct?

17 A You could have any authentication code
18 described in 858, and this would still work.

19 Q So is the answer to my question correct?

20 A So a hash function is not necessary in order
21 to perform the function here. One could, for example,
22 use another one-way function.

23 Q The '585 reference does not require the use of
24 a hash function, correct?

25 A That is true.

1 Q The '137 and '826 patents do not disclose any
2 new form of biometric sensor, correct?

3 A Not that I know of.

4 Q And the '137 and '826 patents don't disclose
5 any new form of user interface, correct?

6 A I don't think they do it that either.

7 Q Turning back to the '585 reference, the
8 authentication codes disclosed in the '585 reference can
9 have a number of inputs, correct?

10 A Yes.

11 Q And one of those inputs is an E value,
12 correct?

13 A Yes.

14 Q The E value represents an event state,
15 correct?

16 A Yes.

17 Q And that event state is communicated to the
18 verifier as part of the authentication code, right?

19 A That's not the right way of putting it. It's
20 an input to the generation of the authentication code.

21 Q Can you turn, please, to paragraph 59.

22 A Yes, let me take a look at it first.

23 Yes.

24 Q This paragraph says that, quote, if the first
25 authentication is successfully verified by the

1 authentication device 120, the device 120 generates an
2 identity authentication code, correct?

3 A Yes.

4 Q This sentence indicates that the device
5 generates an authentication code if the first
6 authentication is successful, correct?

7 A Yes.

8 Q And if the first authentication fails, then
9 the device does not generate an identity authentication
10 code, correct?

11 A It doesn't say that.

12 Q Well, that's true, isn't it?

13 MR. KAERICHER: Objection to form.

14 A I don't know.

15 Q If no authentication code is generated by the
16 device, then no authentication code is sent, correct?

17 A So, actually, let me back up with your
18 question before. There are, actually, good examples of
19 instances where you would have an identity
20 authentication code that is generated, in spite of a
21 first authentication not being successfully verified,
22 because the goal of the publication is to not convey the
23 situation that has been detected to potentially
24 malicious user.

25 So let me give you an example. Say that you

1 have one of these 858 authentication devices, and it can
2 determine when you have correctly biometrically
3 authenticated to it. And then it sends or generates --
4 it generates an authentication code which you can input
5 somewhere. Assume that somebody were to attack you or
6 force you to use it and you used this with the wrong
7 finger because you don't want to convey something to the
8 back end that allows this user to get full access to
9 your information or account. If the device were not to
10 generate the authentication code in response to this,
11 the attacker, of course, would know that something is
12 up. So there are very good examples where in order to
13 hide the state -- we refer to it sometimes as event
14 state -- the device would continue operating in a way
15 that is indistinguishable to this malicious user from
16 normal operation in which nothing is detected.

17 Q Have you described just now an example that
18 appears in the '585 reference?

19 A This particular example? Or the principle of
20 the example?

21 Q No. This particular example that you just
22 described, is that anywhere in the '585 reference, sir?

23 A Word by word, it's not. I explained this in
24 order to convey to you why it's important.

25 Now, the '585 patent application speaks a lot

1 about the importance of this. And a person of skill in
2 the art would recognize that there are obvious things
3 that you wouldn't do, such as alerting an attacker to
4 the fact that they've been noticed.

5 Q I move to strike. The answer is
6 nonresponsive.

7 Sir, did you speak with your counsel, attorney
8 at the break about the substance of any of your
9 testimony?

10 A No. I'm not allowed to, right?

11 Q Would you agree with me that, according to the
12 '585 reference, if no authentication code is generated
13 by the device, then no authentication is sent? Yes or
14 no.

15 A It's not possible to send what is not
16 generated because the authentication codes aren't stored
17 there.

18 Q And if no authentication code is sent, then no
19 event state is sent, correct?

20 A That is also true.

21 Q Can you turn to paragraph 52, please. Still
22 on the '585 reference.

23 A Let me take a quick look at this.

24 Q Sure.

25 MR. SELWYN: How long have we been going since

1 the last break?

2 MR. KAERICHER: Half an hour.

3 MR. SELWYN: Oh. Seems like longer.

4 A Yes.

5 Q Do you see in the middle of paragraph 52 where
6 it reads "other examples of reportable events can
7 include" and then it continues?

8 A Yes.

9 Q That sentence describes event states that can
10 be sent in an authentication code, correct?

11 A They're not sent in authentication codes.
12 They're inputs to the generation of the authentication
13 code.

14 Q One of the examples listed there is, quote,
15 authentication quality, e.g., a number of PIN errors
16 prior to a successful authentication. Do you see that?

17 A Yes.

18 Q And a PIN error is a kind of failed
19 authentication attempt, correct?

20 A Yes.

21 Q So that sentence indicates that the event
22 state can store information about the failed
23 authentication, correct?

24 A That could be an event state.

25 Q An event state wouldn't need to be reported

1 for every authentication attempt, correct?

2 A Would you say that question again?

3 Q Sure. An event state wouldn't need to be
4 reported for every authentication attempt, correct?

5 A No. That's a misunderstanding. Event states
6 are also -- always reported, but the event might be
7 everything is fine.

8 Q Turn to paragraph 59, please.

9 A This is actually what we spoke of before,
10 which you asked me if I knew whether it was -- I
11 understood it.

12 Q I haven't asked you a question yet.

13 Do you see the sentence that reads "In some
14 embodiments, the device operates differently upon
15 occurrence of an event such that the occurrence of the
16 event is communicated in identity authentication codes
17 output by the device subsequent to the occurrence of the
18 reportable event"?

19 A Yes.

20 Q Paragraph 15 discloses that the occurrence of
21 an event can be communicated in an authentication code
22 sometime after the occurrence of the event, correct?

23 A Yes.

24 Q Paragraph 15 discloses that a reportable event
25 need not be reported right away, correct?

1 A Why do you say that?

2 Q Is that correct or not?

3 A What this means is that one could report
4 events multiple times. So -- for example, say that a
5 device is being physically opened and there's a sensor
6 or circuit that detects that it's being popped open.
7 Now, the first time that the device -- the device is
8 generating an authentication code, this, of course,
9 would be an event that is valuable to convey and, of
10 course, in a way that is not extractible by a potential
11 attacker.

12 But if it were only the first time an
13 authentication code were generated that it were
14 conveyed, then an attacker who breaks open the device
15 would simply throw away the first authentication code
16 and then wait for the next one. So there are some
17 events that maintain -- for example, if you have ever
18 had your device popped open, then the event could always
19 indicate that the device has popped open, even though it
20 was a long time ago.

21 Q Move to strike as nonresponsive.

22 A failed authentication is a reportable event,
23 correct?

24 A That is one example.

25 Q And the '585 reference discloses that a failed

1 authentication need not be immediately reported,
2 correct?

3 A That's not what it says.

4 Q Okay. Could you turn, please, to paragraph 3
5 of the '585 reference.

6 A Give me a moment, please.

7 Q Sure.

8 A Yes.

9 Q Paragraph 3 describes access as including
10 electronic access to a computer system or data, correct?

11 A Yes.

12 Q And it discloses that, quote, one goal of such
13 security systems is to accurately determine identity so
14 that an unauthorized party cannot gain access, correct?

15 A Yes.

16 Q And one way to determine identity is to
17 perform a user authentication, correct?

18 A Yes.

19 Q When paragraph 3 says, quote, so that an
20 unauthorized party cannot gain access, it's referring to
21 a denial of access, correct?

22 A Well, if you take the example of a person
23 accessing an e-mail account, for example, and you don't
24 have a user name and a password but instead you have a
25 user name and the -- the code generated here, the goal

1 here is to convey to the back end -- in this case, the
2 mail server or mail system -- that an attack has taken
3 place. So, first of all, the device wishes to know
4 whether it was you who properly used the device, and, if
5 so, you will gain access to your e-mail.

6 Now, if an attacker were to use your device or
7 force you to use the device and an event will be
8 conveyed in the form of being an input to the
9 authentication code and it detected therefore on the
10 back end, then it would be foolish of the system to have
11 a big alert saying you cannot gain access. But,
12 instead, in this particular example, one might give
13 access to something that looks like your mailbox but is
14 not. This, of course, is just a simplistic example to
15 explain the subtleties of this.

16 Q And the simplistic example that you just gave
17 me is not in the '585 reference, correct?

18 A So this is to clarify since, you're asking me,
19 the '585 publication relates to covertly conveying event
20 information by including it in the generation of the
21 authentication code.

22 Q Let's go back to paragraph 3.

23 A Yes.

24 Q Paragraph 3 describes denying access based on
25 a failed user authentication, correct?

1 MR. KAERICHER: Objection to form.

2 A So this is the background of the invention.

3 Q I'm just asking you, sir, whether paragraph 3
4 describes denying access based on a failed user
5 authentication.

6 A Yes. Now, in this case, of course, this
7 describes the prior art relative to the 858. So that is
8 not necessarily a desirable thing to do this, but that
9 is something that has been done in the prior art.

10 Q If an unauthorized party cannot gain access
11 the unauthorized party is being denied access, correct?

12 A So in the context of the 858 patent, you wish
13 for this not to be knowable of the unauthorized party.
14 You wish for the information to be conveyed in such a
15 way and the responses to be made in such a way that this
16 unauthorized person is not necessarily aware of it.
17 There could be cases where it is desirable. But the
18 main goal is to convey things covertly.

19 Q I don't think you answered my question. I'm
20 going to ask it again.

21 A Yes, please.

22 Q If an unauthorized party cannot gain access,
23 the unauthorized party is being denied access, correct?

24 A Well, if you cannot gain access but you didn't
25 try, it wasn't because you're denied access. So in

1 general I think that statement doesn't hold.

2 Q Okay. Let's look at paragraph 3. Paragraph 3
3 discloses what was known, correct?

4 A Yes.

5 Q Paragraph 3 tells one of ordinary skill in the
6 art that if an unauthorized party cannot gain access,
7 the unauthorized party is being denied access, correct?

8 MR. KAERICHER: Objection to form.

9 A It speaks of the allowed access, but it
10 doesn't speak of the denying of access.

11 Q Do you know what a one-way hash function is?

12 A Yes, I do.

13 Q If you were to input value through a one-way
14 hash function, the output can't be used to derive the
15 input, correct?

16 A That depends on the size of input. But in
17 general, for -- if used properly, then that is true.

18 Q If you only had the output from a one-way
19 hash, you can't derive the input, correct?

20 A Provided that the distribution of inputs is
21 not marginal.

22 Let me give you an example of how one would
23 not use such a system or such a function. Say that
24 there are only two things that you might want to say,
25 yes or no, and you could input either one of them but

1 nothing else into the hash function, then of course I
2 can determine what you said, even if I don't see your
3 message, just looking at the hash function for the
4 simple reason that I could try both yes and no as the
5 inputs to the hash function. So that's a simplistic
6 case that doesn't correspond to how the hash function
7 would be used.

8 Q You understand, sir, don't you, that one of
9 ordinary skill in the art in 2006 would understand that
10 the purpose of a one-way hash function is to ensure that
11 an input value sent through a one-way hash can't be --
12 strike that.

13 You understand that one of ordinary skill in
14 the art in 2006 would use a one-way hash function in
15 order to ensure that the output can't be used to derive
16 the input, correct?

17 A One does -- would not have to do that. One
18 could use a one-way function in general in order to make
19 the input not derivable from the output.

20 Q One of ordinary skill in the art in 2006 would
21 understand that one function of a one-way hash is to
22 ensure that the output can't be used to derive the
23 input, correct?

24 A Provided that the distribution is large
25 enough. Then that is one common use. There are other

1 common uses. For example, a cryptographic hash
2 function, which was what we were speaking of, has the
3 benefit of providing an output of uniform size. No
4 matter what the size of the input is.

5 Q If the input value to a one-way hash function
6 were biometric information, the hashed output value
7 would not reveal the original biometric information,
8 correct?

9 MR. KAERICHER: Objection to form.

10 A That is also not necessarily true. It depends
11 on the input value and its size. Now, if you were to
12 apply a one-way hash function to a substantially long
13 biometric value such as a fingerprint, that is not a
14 meaningful thing to do in the context of this patent.
15 And the reason is that one would never be able to verify
16 in any sense what it was.

17 Q Did my question ask you about the '585 patent?

18 MR. KAERICHER: Objection to form.

19 A I'm sorry. I misunderstood. I thought you
20 were still on the '585.

21 Q Listen to my question. If the input value to
22 a one-way hash function were a biometric information
23 such as a fingerprint, the hashed output value would not
24 reveal the original biometric information, correct?

25 A In fact, it would be meaningless because it

1 would not be able to be matched on the other side.

2 Q If the input value to a one-way hashed
3 function were biometric information such as a
4 fingerprint, an attacker could not derive the original
5 biometric information from the hashed biometric
6 information, correct?

7 MR. KAERICHER: Objection.

8 A But nobody would ever do this because it's a
9 pointless thing to apply this and transmit it, which I
10 presume is what you're saying.

11 Q Can you answer my question, correct or
12 incorrect?

13 A Would you say it again, please.

14 Q If the input value to a one-way hash function
15 were biometric information such as a fingerprint, an
16 attacker could not derive the original biometric
17 information from the hashed biometric information,
18 correct?

19 A Nor would anybody else, and it would be a
20 pointless thing to do. So it would -- it's a question
21 that I'm having a little bit of a hard time with because
22 it's very hypothetical.

23 Q Are you able to answer my question, correct or
24 incorrect?

25 A It -- I think I'm doing that. I'm just trying

1 to qualify it so that it's not misunderstood.

2 Q If the input value to a one-way hash function
3 were biometric information such as a fingerprint, an
4 attacker could not identify the user just using the
5 hashed biometric information, correct?

6 MR. KAERICHER: Objection to form.

7 A Nobody could do that.

8 Q Okay. Turn now to the '585 reference,
9 paragraph 72.

10 A And give me a moment, please.

11 Q Take your time.

12 A Yes.

13 Q Have you had an opportunity to read
14 paragraph 72?

15 A Yes, I did.

16 Q Do you see towards the middle of paragraph 72
17 where it says "The user data P can be mapped to another
18 value with a one-way function such as a hash function or
19 a key derivation function," and then it continues?

20 A Yes.

21 Q That sentence tells us that you can protect
22 user data P with a one-way function, correct?

23 A Sometimes, yes.

24 Q User data P can be a biometric, correct?

25 A Not in this context.

1 Q You're sure of that?

2 A So the user data P, if it's a fingerprint, for
3 example -- well, it could be protected, but it's useless
4 when it's done, because the problem is -- let me explain
5 the problem with the biometrics.

6 Q Before you do that, let me direct you, please,
7 to the third sentence of the paragraph.

8 A Yes.

9 Q Pardon me. The fourth sentence. You see, it
10 says "The user data P can also be obtained by biometric
11 measurement or observation"?

12 A Yes, I see that.

13 Q So that tells us that user data P can be a
14 biometric, correct?

15 A But then it says in one embodiment, it
16 continues from there and on, and then it describes
17 something that applies a one-way function. Now --

18 Q Sir, does the sentence that reads "The user
19 data P can also be obtained by biometric measurement or
20 observation" tell one of ordinary skill in the art that
21 user data P can be a biometric?

22 A It -- it says that it can be obtained by
23 biometric measurement observation. Maybe I'm not
24 understanding your question.

25 Q User data P can be a biometric, according to

1 the fourth sentence --

2 A It can be obtained by biometric measurement
3 observation. It doesn't say that it's a biometric.

4 Q One of ordinary skill in the art reading the
5 fourth sentence of paragraph 72 would know user data P
6 can be a biometric, correct or incorrect?

7 A So if we were to consider what's saying --
8 said afterwards to apply one-way function to it, that
9 would not make sense. It would make sense if the user
10 data P that is obtained by biometric measurement or
11 observation is a statement about the biometric input.
12 So, for example, it could be the count or the failure or
13 something like that because that, you can apply a hash
14 function or another one-way function to.

15 Q Let me make sure that the record is very clear
16 here so that when the judges read this --

17 A Yes.

18 Q -- it's clear what you're saying. You're
19 saying that one of ordinary skill in the art reading the
20 sentence "The user data P can also be obtained by a
21 biometric measurement or observation" would not
22 understand that user data P could be a biometric?

23 A So let me qualify this. If you later were to
24 apply a one-way function to it in order to perform a
25 comparison, that cannot happen. It's not meaningful.

1 You cannot compare if the, say, fingerprint is input to
2 a one-way function. However, if the biometric is
3 processed in some way, it could be the failure count,
4 something like that. That could be the value P. That
5 is a meaningful thing to apply the one-way function to.

6 So all I'm saying is in the context of the
7 next portion of this paragraph, P cannot be a biometric
8 reading such as a fingerprint if you're considering
9 applying a one-way function to it.

10 Q I'm just asking you about the sentence that
11 reads "The user data P can also be obtained by a
12 biometric measurement or observation." Do you have that
13 in mind?

14 A Yes.

15 Q And my question is would one of ordinary skill
16 in the art reading that sentence understand that user
17 data P can be a biometric?

18 A Not in the context of applying a one-way
19 function to it because that would not be helpful. So if
20 it's another measurement related to this, it could be
21 helpful.

22 Q Now, when you wrote in paragraph 72 that the
23 user data P can also be obtained by a biometric
24 measurement, you were referring to a measurement of a
25 biometric, correct?

1 A I do not recall what I had in mind. But
2 looking at the rest here, I know that it cannot be
3 biometric fingerprint, for example, or it would make no
4 sense to apply a one-way function to it.

5 Q In the fourth sentence when you use the term
6 "biometric measurement," you're referring to measuring a
7 biometric, correct?

8 A This is -- it says the user data can be
9 obtained by biometric measurement or observation. It
10 doesn't say what the user -- what the data P is. I gave
11 you an example of something that would make sense in the
12 context of applying the one-way function, which is some
13 kind of error or count or something like that.

14 The reason why that's a problem is the
15 fingerprint, if you think about you could turn your
16 finger in so many ways and slide it in so ways, applying
17 a hash function would make it impossible to match it to
18 anything later.

19 Q Okay. Let me ask you this. Would one of
20 ordinary skill in the art reading paragraph 72
21 understand that user data P can be biometric data, yes
22 or no?

23 A By "biometric data," what do you mean?

24 Q Can you answer my question?

25 A Not without a little bit better understanding

1 what you mean by biometric data.

2 Q Okay. Let's look, sir, at the sentence in
3 paragraph 72 that says "The user data P can be the
4 actual PIN password, biometric data, et cetera." Do you
5 see that?

6 A Yes, I do.

7 Q Now, my question to you is would one of
8 ordinary skill in the art reading that sentence
9 understand that the user data P can be biometric data?

10 A So if you finish reading the sentence, it
11 would say "Or the user data value P can be the result of
12 processing the user data by one or more functions."

13 Coming back to my example of the count, it
14 would not make sense to apply one-way function to a
15 fingerprint if you wish to match it later. If you want
16 to perform any kind of match later, you do not want to
17 apply a one-way function to it. And the reason is
18 simple. It just simply will never match.

19 Q Okay. So I want to make sure we're very clear
20 here for the judges who read this transcript. Your view
21 is that one of ordinary skill in the art reading
22 paragraph 72 would not interpret user data P to include
23 biometric data, correct?

24 MR. KAERICHER: Objection to form.

25 A What do you mean by biometric data?

1 Q Is that the best answer to your -- to my
2 question?

3 A It's not an answer to your question. It's a
4 wish for clarification. I know you want me to -- to
5 answer in a way that is helpful; so I need to know what
6 the question is.

7 Q Well, you used the term "biometric data" in
8 paragraph 72. Did you not?

9 A Yes, I did. And I'm asking you what do you
10 mean by biometric data? For example, biometric data is
11 data about biometric use, and it's also the biometric
12 fingerprint. But in this context, it cannot be the
13 latter because one would not apply a one-way function to
14 that.

15 Q And you're as confident in that answer as you
16 are in all the other answers you've given today?

17 MR. KAERICHER: Objection to form.

18 A So what I can tell you is that it's a
19 long-studied research problem to take a biometric or
20 another value that varies over time and extract from it
21 a string that doesn't vary over time. That would be a
22 very helpful thing. I have studied it. I have made
23 partial progress on this. But there is no perfect
24 solution developed so far.

25 Q Do you know what a fingerprint sensor is?

1 A Yes.

2 Q Fingerprint sensors existed before 2006,
3 correct?

4 A Yes.

5 Q The '137 and '826 patents don't describe any
6 new form of fingerprint sensors, correct?

7 A Not that I know of.

8 Q And the '137 and '826 patents don't describe
9 any new form of processor, correct?

10 A That's correct.

11 Q The '137 and '826 patents don't describe any
12 new form of communication interface, correct?

13 A Not that I know of.

14 Q Fingerprint sensors are electronic devices,
15 correct?

16 A Well, they are hardware, and they're -- do I
17 understand your questions, correctly? As opposed to
18 what? I would qualify them as electronic components.

19 Q Okay. Fingerprint sensors are electronic
20 components, correct?

21 A Yes.

22 Q They typically read fingerprints?

23 A That's what they're built to do.

24 Q Fingerprint sensors capture some biometric
25 observation, correct?

1 A They do.

2 Q Fingerprint sensors that captured a biometric
3 observation existed before 2006, correct?

4 A Yes.

5 Q And in the case of a fingerprint sensor, the
6 biometric observation is a fingerprint, correct?

7 A In the case of what?

8 Q In the case of fingerprint sensors, the
9 biometric observation is a fingerprint, correct?

10 A Well, it could be. There could be other
11 things too, of course. For example, it's commonly
12 undesirable to transmit the full fingerprint, say, from
13 a secure area to elsewhere. And so a fingerprint sensor
14 might have a processor that makes a determination and
15 processes what it gets. It might have a template or
16 more than one template stored and transmit biometric
17 information that related to this. So the output of this
18 component might not be a fingerprint as such but an
19 assessment related to it.

20 Q My question wasn't about the output. My
21 question is in the case of fingerprint sensors, the
22 biometric observation is of a fingerprint, correct?

23 A So to be very precise, you'd have to look at
24 how the -- this component works. It would be of, for
25 example, electric charges or something like that. That

1 is, of course, if you apply a fingerprint to it, that
2 would -- the meaning would be a fingerprint. But if you
3 apply something else, it would be -- the output would be
4 something else.

5 Q A fingerprint sensor makes a biometric
6 observation, correct?

7 A That's correct.

8 Q And the observation it is making is of a
9 fingerprint, correct?

10 A Yes.

11 Q Computers or processors use the information
12 from a fingerprint sensor in order to authenticate the
13 user, correct?

14 MR. KAERICHER: Objection to form.

15 A The fingerprint sensor sometimes has a
16 processor. Are you considering that? Or you're saying
17 in general?

18 Q The processor could be in the fingerprint
19 sensor.

20 A Okay. And that processor -- would you ask
21 your question again about it.

22 Q Computers or processors use the information
23 from a fingerprint sensor to authenticate the user,
24 correct?

25 MR. KAERICHER: Objection to form.

1 A That would be one of the goals.

2 Q And in order for a computer or a processor to
3 use the information from a fingerprint sensor, the
4 information must be in the form of bits, correct?

5 A Yes.

6 Q And the bits are a data representation from
7 the fingerprint, correct?

8 A Right.

9 Q Fingerprint sensors don't collect an actual
10 physical sample, correct?

11 A That's correct.

12 Q Fingerprint sensors collect a data
13 representation of the fingerprint, correct?

14 A Correct.

15 Q And to perform an authentication based on a
16 fingerprint sensor, a processor must use data that is
17 derived from the biometric observation, correct?

18 A That's what it would do.

19 MR. SELWYN: Why don't we take a break.

20 (A recess ensued from 3:06 p.m. to 3:15 p.m.)

21 BY MR. SELWYN:

22 Q Welcome back, Dr. Jakobsson. Let me hand you
23 what has been previously marked as Apple Exhibit 1105.

24 A Thank you.

25 Q Do you recognize that exhibit?

1 A Yes, I do.

2 Q What do you recognize it to be?

3 A Beg your pardon?

4 Q What do you recognize it to be?

5 A Oh, it's a patent that I referred to as
6 Maritzen in my declaration -- or my declarations.

7 Q And you'll understand me if I refer this
8 afternoon to Exhibit 1105 as the Maritzen reference?

9 A Yes, I will.

10 Q Maritzen -- strike that.

11 The Maritzen reference discloses a biometric
12 key and a transaction key, correct?

13 A Let me familiarize myself with the section you
14 have in mind here to get -- make sure that I get the
15 terminology right. Would you point me to one section
16 where it uses this?

17 Q Well, I don't have a particular section in
18 mind yet. Would you please tell me whether the Maritzen
19 reference discloses a biometric key and a transaction
20 key?

21 A I remember the biometric key. I don't
22 remember the other one called the transaction key. Let
23 me just take a look at it.

24 Yes, I see the transaction key too.

25 Q Okay. So we can agree that the Maritzen

1 reference discloses both a biometric key and a
2 transaction key, correct?

3 A Yes.

4 Q And Maritzen discloses that the transaction
5 key can be the biometric key, correct?

6 A Yes, I believe that. Or at the very at least
7 comprise it. I don't remember the exact sentence that
8 said that they would be the same.

9 Do you have a particular paragraph in mind?

10 Q Sure. Let's look at paragraph 45.

11 A Okay.

12 Q You've read paragraph 45 before today,
13 correct?

14 A Definitely.

15 Q And paragraph 45 discloses that the
16 transaction key can be the biometric key, correct?

17 A Well, it says the transaction key may include
18 the biometric key and the PTD identifier. So I'm
19 familiar with that setting. I thought you asked if it
20 could be the same, and I don't remember that.

21 Q You don't. Do you see the sentence that says
22 "In an alternate embodiment, the transaction key
23 includes only the biometric key"?

24 A Yes, I see that.

25 Q And it tells us that the transaction key can

1 be the biometric key, correct?

2 A You bet.

3 Q The transaction key is used as part of the
4 authentication in the Maritzen reference, correct?

5 MR. KAERICHER: Objection to form.

6 A Need to ask you to turn me to a particular
7 paragraph where it speaks of this.

8 Q That's not something you remember?

9 A I know that the biometric key likely is what
10 some people refer to as a database key. It's a way of
11 finding a record. And I don't remember to what extent
12 that is the transaction key is used for authentication.

13 Q In the Maritzen reference, the transaction key
14 is used as a form of authentication information,
15 correct?

16 MR. KAERICHER: Objection to form.

17 A Again, it -- it's getting late in the day, and
18 I just wanted to either -- if you have a particular line
19 in my -- in one of my declarations or a particular
20 paragraph here for me to review first, that would be
21 great.

22 Q So let's turn to paragraph 48.

23 Are you at 48?

24 A Yes. Just give me a moment. I just want to
25 review it.

1 Yes, I see this paragraph.

2 Q Do you see the paragraph says
3 "Clearinghouse 130 compares the transaction key against
4 a list of keys." Then it goes on, "If a match is found,
5 then the transaction key is valid."

6 A Yes.

7 Q And then if you look at paragraph 49, do you
8 see that the Maritzen reference indicates, quote, Once
9 clearinghouse 130 determines that the transaction type
10 and transaction key are valid, clearinghouse 130 selects
11 a preexisting account from a number of user accounts
12 associated with the PTD100 and the user to process the
13 financial transaction.

14 Did I read that right?

15 A Yes, I think so.

16 Q So can we agree that the transaction key is
17 used as part of the authentication?

18 A I don't see authentication being described
19 here.

20 Q One of ordinary skill in the art would
21 understand paragraphs 48 and 49 to indicate that the
22 transaction key is used as part of the authentication,
23 correct?

24 A It seems like it's used --

25 MR. KAERICHER: Objection to form.

1 A -- to -- for lookup. So if you have other
2 context in mind, I'd be very happy to look at that.
3 Here, I don't see it being used for authentication.

4 Q The transaction key is used as a form of
5 authentication information, is it not?

6 MR. KAERICHER: Objection to form.

7 A I need to ask to -- if you mean in the context
8 of 48 and the portion of 49 that you read, that's not
9 what it says.

10 Q Okay. The biometric key is used in the
11 Maritzen reference as part of the authentication,
12 correct?

13 MR. KAERICHER: Objection to form.

14 A So, again, I would really appreciate it if you
15 drew my attention either to a particular paragraph here
16 or in one of my declarations, because it is getting late
17 in the day.

18 Q Well, let's look at what you just reviewed,
19 paragraph 48?

20 A Yes.

21 Q Paragraph 48 says "Clearinghouse 130 also
22 verifies that the biometric key is valid by comparison
23 of the biometric key transmitted to clearinghouse 130
24 with a known biometric key contained within
25 clearinghouse 130."

1 Did I read that right?

2 A Yes.

3 Q The biometric key is used in Maritzen as part
4 of authentication, correct?

5 A Again, that's not what it says.

6 Q Okay.

7 A Valid key is one which has a corresponding
8 stored element in the database that is described here.
9 So there's a lookup.

10 But this does not describe authentication.

11 Q So you do not think that one of ordinary skill
12 in the art would read paragraph 48 to suggest a form of
13 authentication; is that right?

14 MR. KAERICHER: Objection to form.

15 A No. This is not authentication. They
16 determine validity based on whether it is in the record,
17 and then they know what account to select.

18 Q In paragraph 48, it indicates -- strike that.
19 In paragraph 45, it indicates that the
20 biometric key is encrypted, correct?

21 A Let me take a look at this.

22 Yes, it does.

23 Q The Maritzen reference discloses encrypting a
24 biometric key, correct?

25 A Yes.

1 Q And at the bottom of paragraph 45, the last
2 sentence indicates that the transaction key is encrypted
3 prior to transmission, correct?

4 A Yes.

5 Q So Maritzen discloses encrypting a transaction
6 key, correct?

7 A Yes.

8 Q It discloses encryption, correct?

9 A Yes.

10 Q And it discloses encrypting authentication
11 information, correct?

12 MR. KAERICHER: Objection to form.

13 A Where do you see that?

14 Q Do you agree or disagree?

15 A I -- I -- just from what you read, I don't see
16 what you mean.

17 Q Are you familiar with the device disclosed in
18 Maritzen referred to as the PTD?

19 A Yes.

20 Q What is the PTD?

21 A Let me look up what it's short for. It's the
22 personal transaction device. So it's a device that a
23 user would have in his or her car or other vehicle.

24 Q Let's look at paragraph 69. Paragraph 69
25 discloses something called a privacy card 110, right?

1 A Just -- just a moment, please.

2 Yes. I'm done. What did you say?

3 Q Paragraph 69 discloses something called a
4 privacy card 110, correct?

5 A Yes.

6 Q And it tells us that the privacy card is the
7 size of a credit card, correct?

8 A In one embodiment, yes.

9 Q Well, the Maritzen reference doesn't suggest
10 that the privacy card is of any size other than that of
11 a credit card, correct?

12 MR. KAERICHER: Objection to form.

13 A Don't remember that, but I see what you mean
14 that it could be a credit-card-sized device -- credit
15 card. I'm sorry.

16 Q And you'd agree with me that credit cards are
17 handheld, right?

18 A Not as a person of skill in the art would use
19 the term "handheld."

20 Q You don't regard a credit card as something
21 that is handheld, correct?

22 A Handheld relates to, for example, a phone as a
23 handheld device. Nobody would say, "What kind of
24 handheld devices do you have?"

25 "Oh, I have a credit card."

1 Q That's not what I asked, sir. I didn't call a
2 credit card a handheld device, did I?

3 A I'm not sure.

4 Q My question to you is credit cards are
5 handheld, correct?

6 A Are you saying they could be held in one's
7 hand?

8 Q Let's start with that.

9 A Yes, a credit card could be held in your hand.

10 Q Okay. Would you ever hold a credit card
11 anywhere other than in your hand?

12 A I could hold it in my wallet.

13 Q Would you ever hold a credit card anyplace on
14 your body other than your hand?

15 A I cannot think of any instance where I would.

16 Q Okay. The privacy card can be integrated into
17 the PTD in the Maritzen reference, correct?

18 A Yes.

19 Q And would you turn, please, to paragraph 16.

20 A To what? I'm sorry.

21 Q Paragraph 16.

22 A 60?

23 Q 16, 1-6.

24 A Oh, thank you.

25 Yes.

1 Q Paragraph 16 tells us that figure 6A and 6B
2 are examples of a personal transaction device with
3 integrated privacy card. Do you see that?

4 A Yes, I do.

5 Q And if you would, please, now turn to
6 figure 6A.

7 A Ooh, I wish you had a better copy than this.
8 This is the copy I've seen too.

9 Q Are you at figure 6A?

10 A Yes.

11 Q Figure 6A, the patent tells us, is the PTD
12 with an integrated privacy card 110, correct?

13 A Yes.

14 Q Element 620 is a display, correct?

15 A Yes.

16 Q Element 630 is a biometric sensor, correct?

17 A Yes.

18 Q Element 630 is designed for a finger, correct?

19 A Where does it say, by the way? I don't
20 remember that part.

21 Q I'm just asking, sir, is figure -- is
22 element 630 designed for a finger?

23 A Please jog my memory. Where is -- can I look
24 this up? This is such a difficult figure. That's why
25 I'm looking for the guidance on what it means. Would

1 you happen to know the paragraph?

2 Q I -- I don't. And you can look at whatever
3 you'd like, but my question to you, sir, is would one of
4 ordinary skill in the art understand that the biometric
5 sensor that is element 630 is designed for a finger?

6 A I cannot tell either from the description
7 here. It says "illustrates biometric input 630." And
8 this is such a poor image. It could be a fingerprint
9 sensor. But, you know, it really could be something
10 else too.

11 Q So you think one of ordinary skill in the art,
12 looking at figure 6A and knowing that element 630 is a
13 biometric sensor, that that person of ordinary skill in
14 the art would think that something other than a person's
15 finger should be placed on that element?

16 MR. KAERICHER: Objection to form.

17 A For example, it could potentially be a
18 microphone, right?

19 Q A biometric sensor has a microphone?

20 A A microphone could be used for biometric
21 purposes. I don't know for sure, but we could go along
22 with the assumption that it's a biometric sensor.

23 Q Well, it's not an assumption, sir. The patent
24 tells us that, doesn't it?

25 A It says that it has biometric input 630. It

1 doesn't quite describe what kind of biometric input.

2 Are you referring to another paragraph?

3 Q Can a person hold the device in figure 6A in
4 his or her hand?

5 A Given the context here, I don't think this is
6 a handheld device.

7 Q You don't think that the device in figure 6A
8 is a cell phone?

9 A No, I don't. I think this is dash mounted
10 because that would in the context of this application
11 makes sense. If you're going to do this without having
12 to be distracted from driving, you probably would not
13 want to pull out your phone.

14 Q Well, would you agree with me that figure 6A
15 is in the shape of cell phones that existed as of 2001?

16 MR. KAERICHER: Objection to form.

17 A It's in the general shape that matches some
18 cell phones, but I don't believe that it would be a cell
19 phone.

20 Q Could a person hold a cell phone in his or her
21 hand in 2001?

22 A Yes.

23 Q Does the Maritzen reference anywhere disclose
24 a mounting bracket for the PTD?

25 A It does not, but that would make sense if you

1 don't want to be distracted when you're driving.

2 Q Sir, yes or no, does the Maritzen reference
3 disclose a mounting bracket for the PTD?

4 A I would have to look for that. I'm not aware
5 of it.

6 Q Does Maritzen disclose an adhesive for
7 mounting the PTD?

8 A I'm not aware of that, but I haven't been
9 looking for that.

10 Q None of the figures in the Maritzen reference
11 show that the PTD can be mounted to anything, correct?

12 A Are you referring to the figures 6A and 6B?

13 Q Any of the figures anywhere in the Maritzen
14 reference.

15 A I cannot tell what 6A and 6B refers to. This
16 could be mounts as far as -- or include mounts, as far
17 as I'm concerned. They're very poor images.

18 But irrespective of whether they're mounted or
19 not in this figure, I wouldn't believe Maritzen would
20 disclose a cell phone without saying that it's a cell
21 phone.

22 Q Do you see anywhere in the Maritzen reference
23 a figure that shows the PTD mounted to anything?

24 A So if you're looking at figure 6A, it's
25 unfortunately of such a poor quality that it's hard to

1 know what it is. We're speculating on what it is. We
2 can't even know whether it's floating in the air or
3 mounted on the dashboard.

4 Q Well, you know that that figure 6A shows a
5 PTD, correct?

6 A That's what it says, yes.

7 Q And nothing in figure 6A shows the PTD mounted
8 on anything, correct?

9 A That is where I'm stating that the figure is
10 so weak in itself, you cannot tell whether this -- you
11 know, I don't see a hand there. That's for sure. I
12 cannot tell whether it's mounted or not.

13 Q Okay. Can you tell from any other figure
14 whether the PTD is mounted? Is there anything that
15 shows it being mounted?

16 A I can neither say that it's handheld nor
17 mounted. These are awful pictures when it comes to
18 describing things like that.

19 Q Is there anything in the text of the Maritzen
20 reference that indicates that the PTD is mounted to
21 something?

22 A It does not say, as far as I know.

23 Q Had you heard of a personal transaction device
24 before you read the Maritzen reference?

25 A I don't think this is a term that is common in

1 the art. I was not aware of, at the very least. I
2 cannot remember having seen it. If I saw it in a
3 context where it would make sense, I would not recall
4 that at this point.

5 Q Have you read the Maritzen reference from
6 cover to cover?

7 A Yes, I have.

8 Q How many times?

9 A I would not know. I have read it several
10 times.

11 Q As part of the preparation of your
12 declarations, did you do any research into how the term
13 "personal transaction device" is understood in the art?

14 A I did not. I was not asked to do that.

15 Q Personal devices are typically tied to a
16 person, correct?

17 A But you're asking about personal transaction
18 device now.

19 Q Sir, my question is personal devices are
20 typically tied to a person, correct?

21 MR. KAERICHER: Objection; form.

22 A Like a personal computer?

23 Q For example.

24 A Okay. So, for example, what is commonly
25 referred to as a PC, say, a desktop computer, it's a

1 personal device by naming. Of course one could share
2 it.

3 Q The phrase "personal" refers to a relationship
4 with a person, correct?

5 A Not necessarily. I share my PC with my son
6 and my wife.

7 Q And you are all people, correct?

8 A We're all people.

9 Q Okay. Good.

10 Turn to paragraph 30, please.

11 A Sorry. I misunderstood your question. It
12 does not have a relationship with one person. That's
13 not what you asked, right? Could I just ask for
14 clarification what you're asking?

15 Q I'm happy to, but what question do you want me
16 to clarify?

17 A The last one. I'm just --

18 Q My last question was, And you are all people,
19 correct?

20 A No, no, no. The previous one. Sorry.

21 Q The phrase "personal" refers to a relationship
22 with a person.

23 A With one or more. Is that what you asked or
24 with only one?

25 Q Either way.

1 A So if it's with only one, then I'm not so sure
2 that's true in many cases. And if it's one or more,
3 I -- it at least works for my PC example.

4 Nevertheless, did I answer you in a way that
5 made sense?

6 Q You own a smartphone, correct?

7 A Yes, I do.

8 Q Do you regard that as a personal device?

9 A Unfortunately not. I -- I often lend it to my
10 son. So I use it much of the time, but it's not only
11 used by me.

12 Q All right. Can you turn, please, to
13 paragraph 30.

14 A Yes.

15 Q You've read paragraph 30 before today?

16 A Yes.

17 Q That paragraph describes a pre-funded cash
18 account that is loaded onto the PTD, correct?

19 A Yes.

20 Q And a cash account would be one way to
21 identify a specific user, correct?

22 MR. KAERICHER: Objection to form.

23 A When you say "identify user," what do you
24 mean?

25 Q What's confusing to you about that?

1 A The goal of a cash account is not to identify
2 a user but, rather, to perform financial transactions.
3 So I'm trying to understand your question.

4 Q The user of the PTD would be associated with
5 the pre-funded cash account, correct?

6 MR. KAERICHER: Objection; form.

7 A So one or more users would be associated with
8 it.

9 Q And if I wanted to fund my pre-funded account,
10 I would need to identify my account before I funded it,
11 correct?

12 MR. KAERICHER: Objection; form.

13 A You're not referring to the paragraph you drew
14 my attention to now, right?

15 Q I am.

16 A Okay. So is it the loading of the
17 pre-funded -- the loading of it?

18 Q One of ordinary skill in the art would
19 understand that if you wanted to fund the pre-funded
20 account, you need to identify the account prior to
21 funding it, correct?

22 A No. For example, if you are taking subway
23 rides in the New York Metro and you have a stored value
24 card, you just stick it in the machine, you don't have
25 to identify an account. You could transfer money. You

1 could, for example, put a bill in, and that would add to
2 the balance associated with the account.

3 Q Okay. Well, paragraph 30 is talking about a
4 pre-funded cash account, right?

5 A That's what I used in the example. When I pay
6 money in order to build up my MTA card, that's a cash
7 account.

8 Q Your -- your MTA card is a cash account?

9 A It's a stored value.

10 Q Is your MTA card a cash account?

11 A It's not a credit account. It's a stored
12 value. That's how I read the cash here, that it's a
13 noncredit, but it's a stored value.

14 Q Would you agree that a pre-funded cash account
15 needs to have a account identifier that identifies the
16 account?

17 MR. KAERICHER: Objection to form.

18 A So the biometric key here, as we discussed, is
19 used to locate the record associated with the device.
20 And to that extent, that key could -- is a record
21 locator -- is that what you're asking about?

22 Q You've read paragraph 30 in its entirety,
23 correct?

24 A Yes, I did.

25 Q And you know, then, that paragraph 30

1 describes an embodiment in which the funds are uniquely
2 identified with the owner of the PTD, correct?

3 MR. KAERICHER: Objection to form.

4 A So I read the owner of the PTD as the user of
5 the PTD. I know it says the owner of it, but I
6 understand it to mean the user of it.

7 Q And you understand that this indicates that
8 the PTD is associated with a single owner, correct?

9 A Here, it doesn't clarify. For example, the
10 owner could be an organization. And that's not a single
11 user.

12 Q You think that paragraph 30, when it says the
13 owner of the PTD, that one of ordinary skill in the art
14 would interpret that as an organization; is that right?

15 A No, I'm not saying one way or the other. I'm
16 saying it says here that it's identified the owner. For
17 example, say that you have a bus company, and every bus
18 driver would be able to pay the tolls using the PTD
19 here. Now, of course the bus driver is not going to
20 have to pay for the toll. But it goes to the bus
21 company. Here, the owner of the device is not the user
22 of the device. The user of the device is the bus
23 driver, and the account owner is the device owner.

24 So I'm -- all I'm saying is that it's not very
25 clear on this account at all.

1 Q You read the owner of the PTD to mean that the
2 PTD could have multiple owners; is that right?

3 A No. I'm saying I'm not reading it as it's a
4 single user.

5 Q When it says the owner of the PTD, it means a
6 single owner, correct?

7 A But if the single owner is a corporate entity,
8 that corresponds to multiple people.

9 Q Can you answer my question. When it says the
10 owner of the PTD, it means a single owner, correct?

11 A It means a single entity, as I read it here.

12 Q So you think that the owner in paragraph 30 is
13 not a person but an entity?

14 A I am just -- since it doesn't specify, I am
15 being as clear as I can without overgeneralizing.

16 Q So when it says personal transaction device,
17 you are interpreting "personal" to mean "entity"?

18 A No. Personal transaction device as such is
19 not a term that I'm familiar with in the prior art. We
20 spoke about personal devices like a PC, which, as I gave
21 the example, could be associated with multiple people.

22 Q Okay. Let's go to paragraph 45.

23 A Just give me one moment, please.

24 Yes.

25 Q In paragraph 35, the third sentence says that

1 the transaction key can include a PTD identifier,
2 correct?

3 A Yes.

4 Q And then the next sentence says that the --
5 the next -- strike that. The next sentence says that
6 the identifier identifies the particular PTD being used,
7 correct?

8 A Yes.

9 Q The transaction key is sent to the
10 clearinghouse as part of the authentication, correct?

11 A It doesn't actually say authentication. If we
12 call it the operation, I agree.

13 Q If the transaction key includes the PTD
14 identifier, that means that the PTD identifier is also
15 sent to the clearinghouse, correct?

16 A Yes, that's how I understand it.

17 Q And paragraph 48 tells us that the
18 clearinghouse 130 compares the transaction key against a
19 list of keys associated with a particular user, correct?

20 A Let me just read this again. It says it
21 validates it against preexisting user keys. Is that the
22 sentence you have in mind?

23 Q Yes.

24 A Yes. So the clearinghouse may validate the
25 transaction key against preexisting user keys.

1 Q The clearinghouse could use the PTD identifier
2 to identify the user, correct?

3 A Where does it say that?

4 Q You don't think one of ordinary skill in the
5 art would understand from paragraph 48 that the
6 clearinghouse could use the PTD identifier to identify
7 the user?

8 A The PTD identifier identifies the PTD, which
9 is a device. Now, the device, if it's used by multiple
10 people, the identifier is going to remain the same.

11 Q If the PTD has a single owner, the
12 clearinghouse could use the PTD identifier to identify
13 the user, correct?

14 A But how would the clearinghouse know whether
15 it has one or many?

16 Q Sir, if the PTD has a single owner, then the
17 clearinghouse could use the PTD identifier to identify
18 the user, correct?

19 A Again, we're back at the owner. The owner
20 might be multiple users. So in -- and it's important
21 here to say that the clearinghouse would have to know
22 that there's only one user associated with it.

23 Q Do you understand I'm asking you to assume
24 that the PTD has a single owner? Can you do that?

25 A Single owner. Can you use another word than

1 "owner"?

2 Q No.

3 A Okay. So the owner might be an entity such as
4 a bus company.

5 Q If the PTD has a single personal owner, a
6 human being, the clearinghouse could use the PTD
7 identifier to identify the user, correct?

8 A No, it didn't. That's the device. It doesn't
9 know whether the wrong person uses it from seeing the
10 PTD identifier. In other words, the PTD identifier
11 doesn't convey your identity or parts thereof. In fact,
12 this patent is very clear on that user information is
13 not transmitted. So if you were to identify user, you
14 would have to transmit user information.

15 Q Just tracking down exhibit numbers.

16 A There's a bunch to select from.

17 Q What's that?

18 A There's a bunch to select from.

19 Q That's true.

20 All right.

21 A Thank you.

22 Q Dr. Jakobsson, I'm handing you what had been
23 previously been marked as Exhibit 1117 from the '809
24 IPR. Do you recognize that as a U.S. patent to Niwa?

25 A Yes, I do.

1 Q And will you understand me if I refer to
2 Exhibit 1117 as the Niwa reference?

3 A Yes, I will.

4 Q Could you turn, please, to column 4, line 27.

5 A Just a moment.

6 Yes.

7 Q Do you see the sentence that reads the
8 fingerprint identification device 50 includes a
9 microprocessor memory and fingerprint sensor 51 which
10 are interconnected and programmed in order to compare a
11 fingerprint of the customer 52 with a stored fingerprint
12 of that customer 52?

13 A Yes.

14 Q The microprocessor mentioned here is a
15 processor within the fingerprint identification device,
16 correct?

17 A I would understand that to be so.

18 Q This microprocessor is a first processor,
19 correct?

20 MR. KAERICHER: Objection; form.

21 A I'm not sure what you mean by that. Do you
22 mean in the context of the claim language in the Niwa
23 patent?

24 Q Let me ask you this. The fingerprint of the
25 customer is authentication information, correct?

1 MR. KAERICHER: Objection; form.

2 A I'm sorry. Would you say that again.

3 Q The fingerprint of the customer is
4 authentication information, correct?

5 A So do you mean authentication information in
6 the context of the patents at stake here? Then I'm not
7 so sure. We have to look at that.

8 Q Well, I'm using authentication information in
9 the same way that it's used in the '137 and '826
10 patents.

11 A So there, it depends on other claim
12 limitations to interpret what it means. Authentication
13 information has a relationship to other limitations.

14 Q Well, do you understand the way the term
15 "authentication information" is used in the '137 and
16 '826 patents?

17 A Yes. But I have a hard time applying it to
18 Niwa. Would you -- can we switch to the '137 and look
19 at authentication information?

20 Q No, not yet.

21 A Okay.

22 Q Would you agree with me that the fingerprint
23 of the customer as described in column 4 of the Niwa
24 reference is authentication information as the term
25 "authentication information" is used in the '137 and

1 '826 patents?

2 A I would have to look at either my declarations
3 or the patent to determine that. I cannot recall the
4 exact description related to this.

5 Q Your declarations do not say whether the
6 fingerprint of the customer in the Niwa reference is
7 authentication information, correct?

8 A I would have to look this up.

9 Q Go ahead.

10 A Let me...

11 So I know that Niwa produces an authentication
12 code, and I'm reading from the abstract.

13 Q Do you recall my question?

14 A Yes, I think I do.

15 So Niwa produces an authentication code when
16 the fingerprint of a customer matches a stored
17 fingerprint.

18 Now, in the context of '8 -- the '826 patent,
19 claim 21, the first authentication information is
20 transmitted, and it's received by the second device.
21 Now, I don't think Niwa transmits this, so I don't see
22 how it could be first authentication information.

23 Q Okay. The question that I asked you is the
24 following. Your declarations do not say whether the
25 fingerprint of the customer in the Niwa reference is

1 authentication information, correct?

2 A I -- in the context of the patent owner's
3 response, I'm the rebuttal expert. So for -- for that
4 purpose, I've only commented on things that Dr. Shoup
5 has described. He probably did not make an assertion
6 earlier to this, and, therefore, I -- I would not
7 include anything in my declaration.

8 Q When Niwa says that the microprocessor memory
9 and fingerprint sensor 51 are interconnected and
10 programmed in order to compare a fingerprint, you
11 understand that to mean the microprocessor is performing
12 the comparison, correct?

13 A Let me take a look at this sentence again. I
14 forgot where we were.

15 Q We were at column 4 beginning at line 27.

16 A So it says that the fingerprint sensor in 51
17 are interconnected and programmed -- I'm sorry --
18 includes a microprocessor memory and fingerprint sensor
19 which are interconnected and programmed in order to
20 compare fingerprint of the customer 52 with a stored
21 fingerprint of that customer 52. So are you -- would
22 you -- in light of that, would you ask your question
23 again?

24 Q One of ordinary skill in the art would
25 understand the sentence that you just read to mean that

1 the microprocessor is performing the comparison,
2 correct?

3 A Yes.

4 Q The comparison here is done by the fingerprint
5 identification device 50, correct?

6 A That is one way to do it. As we talked about
7 before, there are lots of cases where one would want a
8 determination to be made elsewhere, but what you're
9 describing is one possibility.

10 Q And it's the possibility that Niwa discloses,
11 correct?

12 MR. KAERICHER: Objection; form.

13 A Well, they're programmed in order to compare
14 the fingerprint of the customer. That might be to send
15 something elsewhere and receive something. That would
16 be in order to do it. It doesn't specifically say where
17 it's done. One good place would be to do it on this
18 device.

19 Q Niwa discloses a processor that's configured
20 to compare stored biometric information with the
21 biometric information of the user, correct?

22 A You know, let me backtrack to my previous
23 answer and -- and clarify. I think you're right that
24 this microprocessor would do the comparison. Give me a
25 moment and figure this out. It's getting late in the

1 day, and I want to make sure I don't mix these up.

2 I can't find any evidence one way or another,
3 and I'm not sure. I'm sorry. I don't remember anything
4 about whether it would be done there or elsewhere.
5 Either is possible.

6 Q Would you agree with me that one of ordinary
7 skill in the art would know that the system described in
8 the Maritzen reference could be -- could be combined
9 with the system described in the Niwa reference?

10 MR. KAERICHER: Objection to form.

11 A Do you mean in general?

12 Q That the two systems could be combined?

13 MR. KAERICHER: Same objection.

14 A Just a moment. I know I've addressed this,
15 and I want to make sure that I'm not making a
16 misstatement.

17 So I know I have addressed the motivation to
18 combine and described why a person of skill in the art
19 would not have combined the Maritzen and Jakobsson.

20 Q My question, sir, is about combining Maritzen
21 and Niwa?

22 A I understand. I do not recall where I
23 addressed this in my declaration.

24 Do you know the place where that has been
25 discussed.

1 Q I -- I don't. You're welcome to look at
2 anything you want in your declarations, but my question
3 to you, simply, sir, is that would you agree that one of
4 ordinary skill in the art would know that the system
5 described in the Maritzen reference could be combined
6 with the Niwa reference?

7 A So --

8 MR. KAERICHER: Objection to form.

9 A -- I'm looking for what I've already written,
10 because I want -- don't want to wing this. If I haven't
11 made an assertion about it in any of the declarations, I
12 have not expressed an opinion about it, and I would need
13 some time to consider that.

14 Q Have you considered, at all, whether the
15 Maritzen reference incorporates the Niwa reference?

16 A I know that it incorporates it for certain
17 purposes. So I -- I know that the Maritzen reference
18 relies on aspects of Niwa by incorporating by reference.
19 But I need to understand your question. I'm sorry.

20 Q Does the Maritzen reference incorporate by
21 reference the Niwa reference?

22 A Yes, it does.

23 Q And do you have any understanding of what the
24 legal significance is of one reference incorporated by
25 reference in another?

1 A Yes. Unless they state otherwise, then they
2 use all of the portions of the incorporated. So I need
3 to go back and look where they incorporate the reference
4 to see whether it was all or not.

5 Q Okay. Can you put the Schutzer reference back
6 in front of you.

7 Is it buried in there, someplace?

8 A Yeah, I'm not sure where. That's it. Yes.

9 Q Okay. Do you have the Schutzer reference now
10 in front of you?

11 A I do.

12 Q Could you turn, please, to figure 5. I'd like
13 to ask some questions about that.

14 A Can we look at where this is cited? Do you
15 know the paragraph where it's referenced offhand?

16 Q Paragraph 35.

17 A Okay.

18 Yes.

19 Q In figure 5 of the Schutzer reference, the
20 user enters information into the device 34, correct?

21 A Yes.

22 Q And paragraph 35 of Schutzer discloses that
23 for this input, quote, the user 2 enters a password onto
24 the input device 34, such as the keypad, or,
25 alternatively, the user 2 enters a biometric, such as a

1 fingerprint. Onto the input device 34, such as a
2 biometric input device. Correct?

3 A Yes.

4 Q And then after receiving the correct
5 information, the input device 34 provides an anonymous
6 card number to the merchant point-of-sale card
7 device 42, correct?

8 A I -- I'll read it. Upon entering the correct
9 password or biometric on to the input device 34, the
10 anonymous card number is displayed on the LCD 36 as the
11 card number, and when the card 32 is dipped in the card
12 device 42, the magnetic strip 38 outputs the anonymous
13 card number.

14 Q So do you agree with me that after receiving
15 the correct information, the input device 34 provides an
16 anonymous card number to the merchant point-of-sale card
17 device 42?

18 A It doesn't say so. It just says that the
19 magnetic strip outputs the anonymous card number. Seems
20 plausible that this would be read by the card device 42,
21 even though it's not explicitly stated.

22 Q One of ordinary skill in the art reading
23 paragraph 35, would understand that after receiving the
24 correct information, the input device 34 provides an
25 anonymous card number to the merchant point-of-sale

1 device 42, correct?

2 A It allows it to be provided. So the magnetic
3 strip is being written with the anonymous card number
4 and the user swipes or dips, and then, as a result of
5 that, this information is being read.

6 Q And then in paragraph 37, the anonymous card
7 number could be a one-time-use anonymous card number,
8 correct?

9 A Did you say 37?

10 Q I did.

11 A I haven't read that paragraph. I apologize.
12 Sorry. Paragraph 37 or line 37.

13 Q Paragraph 37?

14 A Paragraph. Thank you.

15 Would you state your question again, please.

16 Q In paragraph 37, the anonymous card number can
17 be a one-time-use anonymous card number, correct?

18 A Yes.

19 Q This anonymous card number is eventually
20 provided to the issuing bank 8, correct?

21 A Yes.

22 Q Could you look at paragraph 32, please.

23 A Give me a moment, please.

24 Yes, I've read that.

25 Q In paragraph 32, Schutzer explains that the

1 issuing bank server receives the anonymous card number
2 and sends the card holder's actual card number to the
3 card issuer's authorization processor 26 before
4 authorizing the transaction, right?

5 A So the alternate -- the issuer's alternate
6 card number generator receives the request and transmits
7 the actual card number. But that is not the entity that
8 sends the authorization, I believe. That's the card
9 issuer's authorization processor 26. So it's the
10 receiving party.

11 Q In paragraph 32, Schutzer explains that the
12 issuing bank server receives the anonymous card number,
13 correct?

14 A Yes.

15 Q And in paragraph 32, Schutzer explains that
16 the issuing bank server sends the card holder's actual
17 card number to the card issuer's authorization
18 processor 26, correct?

19 A That is correct.

20 Q And that happens before authorizing the
21 transaction, correct?

22 A That happens before the transaction is
23 authorized.

24 Q The issuing bank server identifies the actual
25 card number based on the anonymous card number, correct?

1 A So it doesn't use exactly those terms. But I
2 would understand there to be a lookup of some form.

3 Q One of ordinary skill in the art, reading
4 paragraph 32 would understand that the issuing bank's
5 server identifies the actual card number based on the
6 anonymous card number. Correct?

7 A Because it has stored it before. We know that
8 it generates the next number in the sequence. So I
9 would presume that it stores that number.

10 Q So is the answer correct?

11 A I -- so I understand that if you used the
12 pre-stored number and look that up and use it.

13 Q So would you agree with me that a person of
14 ordinary skill in the art reading paragraph 32 would
15 understand that the issuing bank server identifies the
16 actual card number based on the anonymous card number?

17 A Yes.

18 Q The issuing bank server maps the anonymous
19 card number to the actual card number, correct?

20 MR. KAERICHER: Objection to form.

21 A I'm not sure there's a mapping. It doesn't
22 say one way or the other.

23 Q One --

24 A It says that it links the other card number to
25 the card holder, actual number. So it could just be a

1 lookup, as it suggests here.

2 Q One of ordinary skill in the art would
3 understand that paragraph 32 indicates that the issuing
4 bank server compares the anonymous card number to the
5 actual card number, correct?

6 A Would you say that again? It compares to
7 what?

8 Q One of ordinary skill in the art would
9 understand paragraph 32 to indicate that the issuing
10 bank server compares the anonymous card number to the
11 actual card number.

12 A I don't understand that at all. They would
13 not be the same, I think, and there would be no meaning
14 to compare them.

15 Q What would one of ordinary skill in the art
16 understand paragraph 32 to indicate that the issuing
17 bank server does with the anonymous card number?

18 MR. KAERICHER: Objection to form.

19 A It doesn't say, but it says before that it has
20 linked the alternate card number to the card holder's
21 actual number. So I don't think there's -- there's a
22 comparison to the anonymous card number and the actual
23 card number. That would make very little sense. You
24 know, I haven't studied this reference with this
25 question in mind. I can be pretty sure that it doesn't

1 perform the comparison that you perform, but I don't
2 know what it does do, because I haven't been asked to
3 figure that out in this context.

4 Q Can you look back at the '585 reference,
5 please?

6 MR. KAERICHER: We've been going over an hour.

7 MR. SELWYN: Okay. Just give me about five
8 minutes. Might be less. Could be a little bit more.

9 A Yes. I'm at the '585.

10 Q Okay. And if you'd turn, please, to
11 paragraph 41 of the '585 reference?

12 A Yes. Give me a moment to read this.

13 Yes.

14 Q Did you draft paragraph 41?

15 A I cannot remember that.

16 Q Among you, Dr. Juels, and Dr. Kaliski, whose
17 idea was paragraph 41?

18 MR. KAERICHER: Objection to form.

19 A There's no way for me to know.

20 Q You don't know, as you sit here, whether it
21 was your idea?

22 A I -- you know, I need to read this patent
23 application carefully. It was filed, as I said, in
24 2004. I don't remember the details of it right now. By
25 studying records, I might be able to find the answer to

1 your question, although I doubt it since I don't believe
2 I kept any such records.

3 Q Okay. So you don't know, correct?

4 A Sitting here right now, I cannot remember.

5 Q Do you see on page 14 beginning at line 9 of
6 paragraph 41 the sentence that reads, quote, In still
7 other embodiments, a credit-card-sized device 120 is a
8 card such as a credit card including a magnetic strip or
9 other data store" --

10 A I'm sorry. I don't see that. You said
11 line 9?

12 Q So I'm -- I'm on page 14.

13 A Yes.

14 MR. KAERICHER: And it's line 8.

15 A I'm sorry?

16 Q Line 8.

17 A Line 8? I'm sorry. Line 8. Yes. Now I see
18 it.

19 Q It reads, "In still other embodiments, a
20 credit card-sized device 120 is a card such as a credit
21 card including a magnetic strip or other data store on
22 one of its sides."

23 A Yes.

24 Q Did you author that sentence?

25 A I cannot recall.

1 Q Do you recall if that was your idea or
2 Dr. Juels' or Dr. Kaliski's?

3 A I have no idea at this point.

4 Q Do you remember seeing that sentence before
5 today?

6 A I'm sure I saw it when we submitted this
7 publication. Now, this actually speaks about the
8 question you asked me before --

9 Q Sir, I haven't asked a question yet.

10 A I'm sorry?

11 Q I haven't asked a new question yet.

12 A Okay.

13 Q Do you have a memory of reading that sentence
14 before today?

15 A You know, I know I read the whole publication
16 multiple times when I was first starting to study this
17 reference. But I don't have a specific memory of
18 specifically reading this line.

19 Q Okay. Let me just ask you about this line.
20 I'm going to focus your attention just on this line that
21 begins "In still other embodiments," okay?

22 A Yes.

23 Q It says in this sentence that the user
24 authentication device 120 is a card such as a credit
25 card, correct?

1 A No. I'm sorry. It says it's a
2 credit-card-sized device. "In still other embodiments,
3 a credit-card-sized device, 120, is a card such as a
4 credit card." So it describes the form factor. It has
5 the form factor of a credit card. That's what it means.
6 So it is -- it is not saying that it's a credit card.
7 It's a credit-card-sized device.

8 Q And then it goes on and says, "Including a
9 magnetic strip or other data store on one of its sides."
10 Do you see those words?

11 A Right.

12 Q And a magnetic strip is something physical,
13 correct?

14 A Yes.

15 Q And "other data store on one of its sides" is
16 also describing something physical, correct?

17 A Yes.

18 Q Do you agree that the credit-card-sized device
19 disclosed in this sentence can be the user
20 authentication device 120?

21 A It says that the credit-card-sized device 120,
22 so it describes 120, and it says that it can have the
23 form factor of a credit card, and in addition to the
24 form factor, it could have the storage. That is
25 correct.

1 Q Do you agree that the credit-card-sized device
2 disclosed in the sentence can be the user authentication
3 device 120?

4 A I'm a little bit puzzled by your question,
5 because I'm just reading back to make sure I get it
6 right. It says it's a credit-card-sized device 120. So
7 we know that it speaks of 120, and it now describes the
8 form factor of it, that it's credit card sized.

9 Q Well, it says a credit-card-sized device is a
10 card such as a credit card, does it not?

11 A What it means here, it's a card -- let me give
12 the perspective here. It doesn't say that it has an
13 account number and -- that you use for purchases. It's
14 a credit-card-sized device. What -- a user seeing it in
15 my wallet would recognize it as being similar to a
16 credit card. For example, you might have more
17 credit-card-sized devices than actual credit cards. You
18 might have a credit-card-sized device with a mag stripe
19 that allows you into the building.

20 So it describes a general device with this
21 form factor, but it does not describe something that is
22 used in order to make a purchase.

23 Q So your -- you don't believe that that
24 sentence discloses an actual credit card, correct?

25 A It describes something that is such as a

1 credit card in its form factor.

2 Q Does that sentence describe an actual credit
3 card?

4 A It describes it -- it's saying that the
5 credit-card-sized device 120 is as such as a credit
6 card. It doesn't say that it is a credit card. It
7 describes the form factor and the fact that it has a
8 magnetic strip and/or other data store on its side. It
9 would not be used for purchases. This is an
10 authentication device.

11 Q Are you as confident in that testimony as you
12 are in all the other testimony you've given today?

13 MR. KAERICHER: Objection to form.

14 A Like I said before, I -- I don't rate my
15 confidence, but I feel confident in that this describes
16 the form factor of the device.

17 Q So your testimony is that one of ordinary
18 skill in the art reading the '585 reference would not
19 interpret a credit-card-sized device 120 is a card such
20 as a credit card to mean a credit card that could
21 perform a credit card transaction?

22 A A person who reads this of course would read
23 it in the context of the patent application. And it
24 would know that this is not a credit-card-related
25 application. This is about authentication devices, and

1 it speaks here about it's a credit-card-sized device.
2 And it describes further that it has the -- such as a
3 credit card including a magnetic strip or other data
4 store on the side. But is not a credit card. And a
5 person of skill in the art would not be mistaken reading
6 this reference as such to think that this sentence
7 describes a credit card.

8 Q So your testimony under oath today is that one
9 of ordinary skill in the art reading that sentence would
10 not view the credit card reference there to be a credit
11 card that could perform a credit card transaction,
12 correct or incorrect?

13 A The person of skill in the art that you're
14 asking about would probably not only be asked to read
15 this sentence but would read it in the context of the
16 patent.

17 Q Can you answer my question?

18 A I need to qualify it. I don't believe you're
19 asking about this sentence alone. I believe you're
20 asking about the sentence --

21 Q No, sir. I'm asking about the sentence alone.

22 A This sentence alone has no meaning. It has
23 meaning in the context of the patent application.

24 Q This sentence has no meaning?

25 A By itself. It needs to be construed in the

1 context here. In the context here, we know this is not
2 about credit card transactions. This is about
3 authentication.

4 Q Now, tell us, please, like when you said in
5 that sentence, "in still other embodiments," what do you
6 understand "still other embodiments" to mean?

7 A So, before, it has described an embodiment
8 where there's a keypad or button for PIN entry. So that
9 is one embodiment. There are several embodiments given
10 here.

11 Q What is a key fob?

12 A A key fob is a small device that you typically
13 can carry on a key chain.

14 Q So is a key fob a credit-card-sized device?

15 A It doesn't have the form factor of a credit
16 card normally, but people would understand a key fob --
17 it's possible that a key fob has that functionality, but
18 many of them do not.

19 MR. KAERICHER: We've been going for way over
20 an hour now.

21 MR. SELWYN: Yeah, let's take our break.

22 (A recess ensued from 4:30 p.m. to 4:37 p.m.)

23 MR. SELWYN: I don't have any further
24 questions at this time.

25 MR. KAERICHER: Okay. Can I have just a

1 minute? I'll be right back. But I'm probably done too.

2 (A recess ensued from 4:38 p.m. to 4:39 p.m.)

3 MR. KAERICHER: No questions.

4 (The deposition concluded at 4:39 p.m.)

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CERTIFICATE OF SHORTHAND REPORTER

I, Charlotte Lacey, Certified Reporter within
and for the State of California do hereby certify:

That BJORN MARKUS JAKOBSSON, Ph.D., the
witness whose deposition is hereinbefore set forth, was
duly sworn by me before the commencement of such
deposition and that such deposition was taken before me
and is a true record of the testimony given by such
witness.

I further certify that the adverse party,
UNIVERSAL SECURE REGISTRY LLC, was represented by
counsel at the deposition.

I further certify that the deposition of BJORN
MARKUS JAKOBSSON, Ph.D. occurred at the offices of QUINN
EMANUEL URQUHART & SULLIVAN, LLP, 555 Twin Dolphin
Drive, 5th Floor, Redwood Shores, California, on
Wednesday, March 20, 2019, commencing at 9:00 a.m. to
4:39 p.m..

I further certify that I am not related to any
of the parties to this action by blood or marriage, that

1 I am not employed by or an attorney to any of the
2 parties to this action, and that I am in no way
3 interested, financially or otherwise, in the outcome of
4 this matter.

5

6 IN WITNESS WHEREOF, I have hereunto set my
7 hand this 24th of March, 2019.

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Charlotte Lacey, RPR, CSR #14224

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