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Transcript of Paul Prucnal, Ph.D.

Date: March 27, 2025

Case: Intel Corporation -v- Telefonaktiebolaget L M Ericsson (PTAB)

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WORLDWIDE COURT REPORTING & LITIGATION TECHNOLOGY

INTEL-1044
U.S. Patent 7,151,430

1 UNITED STATES PATENT AND TRADEMARK

2
3 BEFORE THE PATENT TRIAL AND APPEAL BOARD

4
5 INTEL CORPORATION,

6 Petitioner,

7 V.

8 TELEFONAKTIEBOLAGET LM ERICSSON,

9 Patent Owner.

10
11 IPR2024-00728

12 US PATENT 7,151,430

13
14
15 Videotaped Deposition of PAUL PRUCNAL, PhD

16 Conducted Virtually

17 Thursday, March 27, 2025

18 9:32 a.m. EST

19
20 Job No.: 576706

21 Pages: 1 - 144

22 Reported By: Karen Klerekoper, CSR-4250, RPR

1 Virtual Deposition of PAUL PRUCNAL, PhD,
2 conducted virtually:
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9 Pursuant to Notice, before Karen Klerekoper,
10 Notary Public in and for the State of
11 Massachusetts.
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A P P E A R A N C E S

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DOCUMENT TECH MILES TAG, PLANET DEPOS

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INDEX

WITNESS:	PAGE:
PAUL PRUCNAL PHD	
EXAMINATION BY MS. LAROCHELLE:	5
EXHIBIT:	PAGE:
(Exhibit 1 attached to transcript.)	
Exhibit 2002, expert rebuttal declaration of Paul R. Prucnal (previously marked)	10
Exhibit 1001, US Patent Number 7,151,430 (previously marked)	39
Exhibit 1020, 1300 ITC investigation (previously marked)	61
Exhibits 1007 and 1008, Miday and Raghavan (previously marked)	114
Exhibit 1, Dr. Prucnal's declaration	126
Exhibit 1010, excerpt of chapter 9 (previously marked)	130

P R O C E E D I N G S

(Oath stipulation read and agreed by
counsel and witness.)

09:32:06

PAUL PRUCNAL, PhD, having been duly sworn
testified as follows:

09:33:13

EXAMINATION

09:33:13

BY MS. LAROCHELLE:

09:33:14

Q Good morning, Dr. Prucnal.

09:33:14

A Good morning.

09:33:22

Q So, we didn't do introductions. I think

09:33:22

for the record, I will just state my name is

09:33:23

Christie Larochelle. I'm an attorney with Goodwin

09:33:26

Proctor, and I represent Intel in this inter

09:33:29

partes review proceeding. And with me today is

09:33:33

Lori Gordon, also from Goodwin Proctor.

09:33:34

So, this deposition is part of the

09:33:37

proceedings in IPR2024-00728, challenging US

09:33:39

Patent Number 7,151,430.

09:33:44

Is that your understanding?

09:33:48

A Yes.

09:33:49

Q Okay. And is it okay with you if we refer

09:33:50

to it as the '430 patent?

09:33:55

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1	A Yes.	09:33:56
2	Q Where are you physically located today?	09:33:56
3	A I am located in Princeton, New Jersey.	09:34:00
4	Q Is there anyone in the room with you?	09:34:03
5	A No.	09:34:06
6	Q Okay. And you have your laptop open. Do	09:34:06
7	you have any programs open aside from the Zoom	09:34:10
8	window?	09:34:14
9	A Let's see, I do have a couple of things.	09:34:14
10	I have my mail program open. I'll close it.	09:34:20
11	Q Thank you.	09:34:23
12	A I thought I had closed everything. And I	09:34:24
13	had my Safari application -- I don't know, does	09:34:32
14	Zoom require Safari to be open.	09:34:35
15	Q I don't think it does.	09:34:38
16	MR. WARR: Sometimes it does, depending on	09:34:40
17	which platform you're accessing it through.	09:34:42
18	A So, I'm not sure if I close Safari, I	09:34:44
19	don't know if I'm going to be cutting off the Zoom	09:34:48
20	call.	09:34:50
21	Q Okay. You agree you are not going to be	09:34:51
22	searching the web during this deposition?	09:34:53

1	A Of course not.	09:34:55
2	Q Okay. And you've set aside your cell	09:34:56
3	phone, put it on silent or turned it off?	09:34:58
4	A Yes, I have.	09:34:59
5	Q Thank you.	09:35:00
6	Have you ever been deposed before?	09:35:01
7	A Yes, I have.	09:35:02
8	Q How many times?	09:35:03
9	A A couple of dozen times.	09:35:05
10	Q Okay. So, you are pretty familiar with	09:35:07
11	how depositions go?	09:35:09
12	A Yes, I am.	09:35:10
13	Q So, just as a reminder, if you don't	09:35:11
14	understand a question that I ask you, please ask	09:35:16
15	for clarification. I'll try to restate to make it	09:35:19
16	clearer. Is that okay?	09:35:22
17	A Yes.	09:35:23
18	Q My typical practice is to take a break	09:35:24
19	about once every hour. If you need a break and I	09:35:26
20	haven't offered one, just ask. And I would just	09:35:29
21	ask that you answer any questions that are pending	09:35:32
22	at that time. Is that okay?	09:35:35

1	A Yes.	09:35:37
2	Q Is there any reason you cannot give	09:35:37
3	truthful and accurate testimony today?	09:35:43
4	A No.	09:35:44
5	Q What did you do to prepare for today's	09:35:44
6	deposition?	09:35:48
7	A I reviewed some of the documents in the	09:35:48
8	case, including my declaration and my supplemental	09:35:54
9	declaration, and many of the documents that's	09:35:59
10	cited, including prior art. And I met with the	09:36:04
11	attorneys I'm working with over -- over Teams on a	09:36:10
12	few occasions, and that's about it.	09:36:17
13	Q Okay. How many times did you meet with	09:36:19
14	the attorneys?	09:36:21
15	A Over a couple of weeks' period, three or	09:36:22
16	four times, I would say.	09:36:33
17	Q And how long were those meetings?	09:36:34
18	A They were -- they were two-hour meetings.	09:36:36
19	And sometimes they were broken up into one hour, a	09:36:42
20	break, and another hour.	09:36:46
21	Q So, in total, how many hours would you say	09:36:47
22	you spent preparing for the deposition?	09:36:50

1	A Oh, altogether, I don't know, 30, 35	09:36:53
2	hours, something like that.	09:37:03
3	Q And who attended these preparation	09:37:05
4	sessions you had with the attorneys?	09:37:08
5	A So, that was just Ali Warr, who is on this	09:37:10
6	call, and Brian Santarelli.	09:37:15
7	Q Anyone else?	09:37:18
8	A No. Oh, actually, one time there was	09:37:19
9	another attorney, Kevin Jablonski, from the same	09:37:23
10	firm.	09:37:27
11	Q So, you understand that you're here today	09:37:28
12	regarding your testimony provided in the two	09:37:42
13	declarations that you mentioned, your rebuttal and	09:37:44
14	supplemental declarations?	09:37:47
15	A Yes.	09:37:48
16	Q Okay. And I will enter those	09:37:48
17	declarations. I'm going to drop them in the chat	09:37:55
18	and enter them into the deposition.	09:37:59
19	MS. LAROCHELLE: Okay. So, I have added	09:38:07
20	into the chat Ericsson's Exhibit 2002, which is	09:38:08
21	the expert rebuttal declaration of Paul	09:38:14
22	R. Prucnal, regarding validity of US Patent Number	09:38:18

1 7,151,430.

09:38:22

2 And also Ericsson's Exhibit 2009,
3 supplemental expert declaration of Paul Prucnal,
4 PhD.

09:38:22

09:38:27

09:38:30

5 (Marked for identification Exhibit 2002,
6 expert rebuttal declaration of Paul R. Prucnal.)

09:38:31

09:38:14

7 (Previously marked for identification
8 Exhibit 2009, supplemental expert declaration of
9 Dr. Prucnal.)

09:38:32

10 Q You have -- I understand you have hard
11 copies of those with you today?

09:38:32

09:38:33

12 MR. WARR: Just a minute, Christie.

09:38:35

13 MS. LAROCHELLE: Sure.

09:38:37

14 MR. WARR: The box of exhibits that came
15 from your office to Paul yesterday contained 31
16 sealed envelopes, marked tab 1 through tab 31.

09:38:37

09:38:39

09:38:44

17 MS. LAROCHELLE: Right.

09:38:49

18 MR. WARR: Paul did not -- has not opened
19 those envelopes --

09:38:49

09:38:51

20 MS. LAROCHELLE: That's fine.

09:38:52

21 MR. WARR: -- yet. So, if you could refer
22 to them by tab, if they're in the binders --

09:38:53

09:38:54

1	MS. LAROCHELLE: If they're in the	09:38:57
2	binders, I will refer to them by tab if they are	09:38:57
3	in the box.	09:39:00
4	MR. WARR: Okay.	09:39:00
5	Q My understanding was that you already had	09:39:02
6	hard copies of your expert declarations; is that	09:39:04
7	correct?	09:39:06
8	A I do have them available. They are not in	09:39:06
9	the room with me. I have just to step out and get	09:39:09
10	them, because I didn't want to have anything here	09:39:12
11	in the room with me.	09:39:13
12	Q I see. I see. And maybe I misunderstood	09:39:14
13	the representation that you would have clean	09:39:17
14	copies.	09:39:19
15	Can you confirm that those physical copies	09:39:19
16	are clean copies with no marking or highlighting	09:39:21
17	in them?	09:39:24
18	A They are perfectly clean with no --	09:39:25
19	nothing written in them. I did put sticky tabs on	09:39:27
20	them, and I was planning to remove them if we were	09:39:32
21	going to use them.	09:39:35
22	Q Okay.	09:39:37

1 A Or we can leave them. We don't have many.

2 Q Yeah. I don't have a problem with you 09:39:38
3 keeping the stickies. So, let's pause and have 09:39:39
4 you retrieve those, because my understanding was 09:39:43
5 you were going to have those, so we didn't put 09:39:46
6 them in the box. 09:39:49

7 A Yes, I understand. It will just take me a 09:39:50
8 second to run into the next room. 09:39:52

9 MS. LAROCHELLE: Okay. Let's go off the 09:39:54
10 record just a minute until he comes back. 09:39:57

11 (Off the record.) 09:39:58

12 BY MS. LAROCHELLE: 09:41:56

13 Q So, just confirming to make sure the 09:41:59
14 record is clear, Dr. Prucnal, you have in front of 09:42:01
15 you clean hard copies of Ericsson's Exhibit 2002 09:42:04
16 and 2009, your rebuttal and supplemental 09:42:09
17 declarations that you've submitted in this IPR; is 09:42:13
18 that correct? 09:42:17

19 A Yes. 09:42:17

20 Q Did you review these declarations in 09:42:18
21 preparation for your deposition? 09:42:21

22 A Yes. 09:42:23

1	Q And are the opinions and analysis that you	09:42:25
2	present in these two declarations still the	09:42:28
3	opinions that you hold sitting here today?	09:42:31
4	A Yes.	09:42:34
5	Q You agree with all of the analysis and	09:42:34
6	opinions that you present in both declarations?	09:42:37
7	A Yes.	09:42:39
8	Q Is there anything in either declaration	09:42:40
9	that you would like to modify today?	09:42:44
10	A In reviewing them, there was a typo, and	09:42:48
11	I'm not quite sure I can remember where it is --	09:42:52
12	where it was, but I had accidentally duplicated	09:42:55
13	two paragraphs.	09:43:00
14	Q Okay.	09:43:01
15	A Identically duplicated. So, that's all.	09:43:02
16	Q Okay. I'm not worried about typos. So,	09:43:06
17	as to the substance of your opinions, you don't	09:43:09
18	want to modify anything?	09:43:11
19	A No.	09:43:13
20	Q Can we turn to paragraph 1 of	09:43:13
21	Exhibit 2002, your rebuttal declaration?	09:43:23
22	A Okay.	09:43:30

1 Q Okay. In this paragraph, you state: I've
2 been retained as an expert in this IPR by counsel
3 for Ericsson.

09:43:31

09:43:34

09:43:39

4 When were you retained by counsel for
5 Ericsson in connection with this IPR?

09:43:41

09:43:46

6 A Yes, and I'm actually not sure. It was --
7 I think sometime late last summer. It might have
8 been in the fall. I just -- I just don't recall
9 for sure. I'm thinking August, but that's kind of
10 a guess.

09:43:51

09:43:57

09:44:00

09:44:02

09:44:07

11 Q Who contacted you about acting as an
12 expert witness in this IPR?

09:44:09

09:44:14

13 A I believe one of the attorneys that I
14 mentioned earlier, Brian Santarelli.

09:44:16

09:44:19

15 Q And how do you know Brian Santarelli?

09:44:25

16 A Just through this case.

09:44:28

17 Q Did you draft both of your declarations?

09:44:37

18 A Yes, I did. I -- I work with the
19 attorneys to draft them.

09:44:40

09:44:43

20 Q Okay. Did you personally write all of the
21 words in both of your declarations?

09:44:46

09:44:49

22 A No, I did not.

09:44:52

1 Q About how -- percentage-wise how much of
2 the declaration did you personally write?

09:44:53

09:44:58

3 A Well, I don't recall that. I would say
4 the process was generally that we would discuss my
5 opinions, and then they would format and -- and
6 draft it, and then I would review it and we would
7 go back and forth.

09:45:00

09:45:04

09:45:08

09:45:11

09:45:14

8 Q How many hours did you spend preparing
9 your rebuttal declaration, Exhibit 2002?

09:45:16

09:45:20

10 A You know, I haven't -- I haven't looked
11 back at that. I would -- again, I know you don't
12 want me to guess, but I would say that it's my
13 best estimate would be -- my best estimate would
14 be over 50 hours. I'm not sure how much over 50
15 hours, but not less than 50.

09:45:30

09:45:32

09:45:36

09:45:39

09:45:43

09:45:51

16 Q Not more than 100, though?

09:45:57

17 A I don't think so. Again, I'm really --
18 I'm really guessing. I can't be accurate on that.
19 But probably not more than 100.

09:45:59

09:46:02

09:46:05

20 Q You're aware that your rebuttal
21 declaration, Exhibit 2002, was submitted as an
22 exhibit to patent owner's preliminary response in

09:46:07

09:46:11

09:46:14

1	this IPR?	09:46:17
2	A That sounds logical to me. I would have	09:46:21
3	to confirm that to give you an accurate answer.	09:46:25
4	Q Did you review patent owner's preliminary	09:46:29
5	response?	09:46:31
6	A I did.	09:46:32
7	Q Did you review the patent owner	09:46:32
8	preliminary response prior to preparing your	09:46:36
9	rebuttal declaration?	09:46:40
10	A I don't know.	09:46:43
11	Q About how many hours did you spend	09:46:49
12	preparing your supplemental declaration,	09:46:52
13	Ericsson's Exhibit 2009?	09:46:55
14	A A rough guess would be about the same, you	09:46:58
15	know, 50 hours, or more. I would say that I -- I	09:47:06
16	put a lot of time into both.	09:47:09
17	Q Okay. And are you aware that the	09:47:11
18	supplemental declaration, Exhibit 2009, is -- was	09:47:16
19	submitted in this IPR as an exhibit to the patent	09:47:20
20	owner response?	09:47:23
21	A That sounds about right to me, but, again,	09:47:28
22	I would have to confirm that to be sure.	09:47:31

1	Q Did you review the patent owner response?	09:47:34
2	A I have reviewed it at some point.	09:47:37
3	Q Did you review the patent owner response	09:47:38
4	prior to preparing your supplemental declaration,	09:47:41
5	Exhibit 2009?	09:47:45
6	A I don't know. I don't recall.	09:47:50
7	Q Can you turn to paragraph 5 of your	09:47:54
8	rebuttal declaration, Exhibit 2002?	09:48:18
9	A Okay.	09:48:24
10	Q So, in this paragraph, you state that you	09:48:26
11	reviewed certain materials and testimony in	09:48:33
12	preparing this declaration.	09:48:37
13	Do you see that?	09:48:39
14	A Yes.	09:48:40
15	Q And you list a number of documents that	09:48:45
16	you reviewed. You reviewed the '430 patent,	09:48:48
17	Intel's petition, all exhibits submitted	09:48:54
18	therewith, Dr. Tentzeris' declaration.	09:48:57
19	And then you say: Certain documents	09:48:59
20	produced in related proceedings such as those	09:49:02
21	produced by Ericsson, Intel and third parties?	09:49:04
22	Do you see that?	09:49:07

1	A Yes.	09:49:08
2	Q What documents are you referring to in	09:49:09
3	this sentence?	09:49:12
4	A Well, that I intended to be sort of a	09:49:14
5	catchall. I don't -- I don't know that I reviewed	09:49:19
6	any specific documents, but I wanted to take into	09:49:25
7	account that I was involved in a previous	09:49:30
8	proceeding some years ago. And so, some of that's	09:49:35
9	in my memory. Some of the opinions I -- I formed	09:49:40
10	may have been informed by those things, but I	09:49:43
11	don't have anything specific to...	09:49:46
12	Q So, when you say "related proceedings,"	09:49:49
13	what proceedings are you referring to?	09:49:52
14	A Well, I don't know the number, but there	09:49:55
15	was another case involving this patent with	09:49:56
16	Ericsson.	09:49:59
17	Q Okay. Was that an ITC investigation?	09:50:00
18	A I don't know. I just don't recall.	09:50:05
19	Q Okay. And so, did you review documents	09:50:09
20	from those proceedings when you prepared your	09:50:13
21	declaration for this matter?	09:50:16
22	A Not specifically. I didn't go back to any	09:50:21

1 of the material from those proceedings. I just
2 wanted to take into account that I have seen this
3 before. I have seen this patent before.

09:50:23

09:50:26

09:50:33

4 Q Okay. And so, any documents that you may
5 have had from those proceedings, who would have
6 provided those to you?

09:50:35

09:50:41

09:50:45

7 A That would have been provided by Fisher
8 Broyles when those proceedings occurred.

09:50:47

09:50:51

9 Q Do you still have those documents
10 available to you?

09:50:53

09:50:56

11 A I don't know, actually. I haven't gone
12 and looked back.

09:50:57

09:51:00

13 Q So, that sentence continues: The party's
14 Markman briefs, Markman hearing transcript,
15 deposition transcripts of numerous witnesses.

09:51:01

09:51:12

09:51:15

16 And, again, that's referring to the
17 related proceedings; is that correct?

09:51:17

09:51:19

18 A That's correct.

09:51:20

19 Q And you have those documents available to
20 you?

09:51:20

09:51:25

21 A I haven't looked at them. I don't know if
22 they are in a file somewhere, but I would have to

09:51:26

09:51:28

1 go look. You know, I think when I'm told to
2 destroy something when a case is done, I destroy
3 it, so...

4 Q Okay. So -- but you didn't specifically
5 review those documents when preparing this
6 declaration?

7 A I did not.

8 Q And that sentence continues: And
9 information obtained by interviews and discussions
10 with people knowledgeable about these issues.

11 When you say "knowledgeable about these
12 issues," what are these issues you're referring
13 to?

14 A I was referring to technical aspects of
15 the patent.

16 Q And who are those people knowledgeable
17 about those issues that you spoke to?

18 A Again, this goes back to the previous
19 case, which was several years back. And at that
20 time, I know I spoke with one or more engineers
21 from Ericsson at the time. That figured into my
22 opinion back then. So, I just -- I just wanted to

09:51:31

09:51:34

09:51:38

09:51:38

09:51:40

09:51:42

09:51:43

09:51:44

09:51:50

09:51:52

09:51:54

09:51:56

09:51:59

09:52:00

09:52:05

09:52:06

09:52:09

09:52:12

09:52:14

09:52:18

09:52:22

09:52:28

1 make reference to that fact.

09:52:31

2 Q Okay. And did those individuals at
3 Ericsson provide you with facts that informed your
4 analysis at the time?

09:52:34

09:52:37

09:52:40

5 A I'm not quite sure what the question
6 means. I guess I would say what we did was to
7 perform some simulations. He performed some
8 simulations. I performed some simulations. And
9 there was some technical analysis involved. And
10 that helped me to understand the patent.

09:52:43

09:52:51

09:52:54

09:52:59

09:53:01

09:53:04

11 Q And when you had those communications with
12 the people from Ericsson, were there attorneys on
13 those calls?

09:53:07

09:53:10

09:53:13

14 A Always.

09:53:15

15 Q You said that you performed some
16 simulations -- make sure I'm going to state what
17 you said correctly here. Let me pause and
18 withdraw that for a moment.

09:53:17

09:53:36

09:53:41

09:53:45

19 So, do I understand this correctly, that
20 it was the engineers at Ericsson that performed
21 simulations and not you?

09:54:00

09:54:04

09:54:06

22 A No, the -- we both did.

09:54:08

1 Q Okay. So, you worked on the simulations
2 together?

3 A Well, again, I'm having to recall as best
4 I can. As I understand -- as I -- as I recall,
5 and there may have been more than one engineer or
6 just one. As I recall, he may have had some
7 simulations that he did. And then we had a
8 conversation, and I said, why don't you go back
9 and run that with some different parameters, and
10 he did that for me.

11 And then as I recall, I ran my own
12 simulations without his help, to confirm or to
13 enhance my understanding.

14 Q And so, what types of simulations were
15 these? Like what tools were you using? And let's
16 take this separately, because you said Eric --
17 someone at Ericsson did simulations and you did
18 simulations. So, did you use the same tools?

19 A Now, that's -- that's stretching my memory
20 a little bit. Some of these were circuit-based
21 modeling, and others were electromagnetic-based
22 modeling tools. And right now, I just don't

09:54:10

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09:54:33

09:54:36

09:54:38

09:54:41

09:54:42

09:54:45

09:54:50

09:54:51

09:54:55

09:54:58

09:55:02

09:55:04

09:55:08

09:55:12

09:55:17

09:55:22

1 recall -- recall exactly who did what. I may have
2 done both. I don't recall.

3 Q And what were these simulations of? Was
4 this the patent you were simulating?

5 A It was -- they were simulations having to
6 do with the electromagnetic fields generated by
7 various configurations of inductors on
8 semiconductor substrates.

9 Q Did the simulations that you performed or
10 that Ericsson performed inform your opinions in
11 that case?

12 A Let's see, well, they informed -- they
13 informed me. I don't recall exactly what opinions
14 I offered, but certainly they informed my
15 understanding.

16 Q Of what, your understanding of what?

17 A Of, for example, how -- how inductors
18 might interact the electromagnetic fields that
19 were generated and how they might interact on a
20 shiv.

21 Q So -- I'm going back in the realtime
22 transcript. That's why I'm looking away. You

09:55:27

09:55:31

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09:55:52

09:55:55

09:55:58

09:56:01

09:56:07

09:56:17

09:56:19

09:56:21

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09:56:26

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09:56:38

09:56:44

09:56:46

1	said that some of these were circuit-based	09:56:48
2	modeling. Do you remember the name of the	09:56:52
3	circuit-based modeling tool that you used?	09:56:56
4	A I don't. And I'm really stretching my	09:56:58
5	memory at this point. And I think I'm giving you	09:57:01
6	answers that are sort of just guesses from my	09:57:05
7	recollection. So, I don't -- there are a number	09:57:08
8	of things I simulated. Some related to the '430	09:57:12
9	patent and some not.	09:57:18
10	So, I just don't -- I don't know the names	09:57:19
11	of the simulators.	09:57:22
12	Q Did you do any simulations related to this	09:57:25
13	matter in preparing your declaration and forming	09:57:51
14	your opinions here?	09:57:58
15	A May I just clarify that a bit? You're	09:58:01
16	asking me --	09:58:04
17	Q Sure.	
18	A -- have I done simulations for this	09:58:04
19	matter?	09:58:06
20	Q Right. The -- yes. In connection with	09:58:07
21	this inter partes review that you submitted two	09:58:09
22	declarations for, did you do any simulations to	09:58:14

1	inform your opinion?	09:58:16
2	A No, I did not.	09:58:17
3	Q So, in connection with preparing these	09:58:18
4	declarations for this IPR proceeding, did you	09:58:36
5	speak to anyone other than counsel for this	09:58:39
6	matter?	09:58:43
7	A No.	09:58:44
8	Q So, going back to paragraph 5, the next	09:58:45
9	sentence says: A list of the documents I've	09:58:56
10	reviewed in preparation for this -- of this	09:58:59
11	declaration and that I rely upon is attached in	09:59:03
12	appendix B.	09:59:05
13	Do you have an appendix B attached to your	09:59:06
14	declaration?	09:59:10
15	A No, I do not.	09:59:12
16	Q Okay. Did you prepare an appendix B?	09:59:13
17	A At this moment, I -- I don't recall. I	09:59:25
18	would say that -- I can say that the documents	09:59:29
19	that I reviewed in preparation of this declaration	09:59:34
20	are all cited in the declaration.	09:59:38
21	Q Okay. So, I want to make sure that's	09:59:41
22	clear for the record. Every document that you	09:59:45

1	reviewed in preparing your declaration is cited	09:59:47
2	somewhere within the declaration itself?	09:59:51
3	A To the best of my ability, I would say it	09:59:55
4	should -- they should be.	09:59:59
5	Q Okay. Attached to your declaration, your	10:00:00
6	first declaration, Exhibit 2002, is your CV.	10:00:30
7	Could you please turn to that?	10:00:35
8	MS. LAROCHELLE: And for anyone following	10:00:37
9	along in the electronic version, it's at page 57	10:00:39
10	of the PDF.	10:00:41
11	Q And just let me know when you're there.	10:00:44
12	A I'm there.	10:00:46
13	Q Okay. Did you review your CV in preparing	10:00:47
14	for this deposition?	10:00:53
15	A I just glanced through it. That's the	10:00:55
16	sort of review -- I -- I probably -- my CV is	10:00:59
17	continually updated over the years. And so, what	10:01:05
18	I probably did was to just flip through it to make	10:01:09
19	sure everything was there, and to check the end of	10:01:12
20	the list of publications where I'm usually adding	10:01:16
21	as we go along. So, that was my review.	10:01:20
22	Q Understood. And is your CV, as presented,	10:01:23

1	as attached here, your declaration here, is it	10:01:26
2	accurate?	10:01:29
3	A It is accurate. I'm not sure what the	10:01:32
4	latest update was, but it should be -- it should	10:01:42
5	be accurate. If there are any discrepancies as of	10:01:47
6	this moment, I'm constantly publishing stuff, so	10:01:52
7	there could be another publication or two that	10:01:55
8	would be added. But that's about all.	10:01:58
9	Q So, according to your CV, you have been a	10:02:00
10	professor at Princeton since 1988?	10:02:02
11	A Correct.	10:02:05
12	Q Okay. And before that, you were a	10:02:05
13	professor at Columbia University starting in 1979;	10:02:06
14	is that right?	10:02:11
15	A That's right.	10:02:11
16	Q Okay. And at Princeton, you were in the	10:02:11
17	department of electrical and computer engineering?	10:02:15
18	A Yes.	10:02:18
19	Q And at Columbia, what department were you	10:02:19
20	in?	10:02:24
21	A Electrical engineering.	10:02:24
22	Q Did you teach any undergraduate or	10:02:26

1 graduate level courses during these, what is that,
2 46 years now in academia?

10:02:27

10:02:31

3 A I have taught a lot of undergraduate and
4 graduate courses.

10:02:33

10:02:36

5 Q Okay. Are those listed anywhere on your
6 CV?

10:02:37

10:02:39

7 A I don't think so, no.

10:02:39

8 Q Okay. What are some of the undergraduate
9 level courses that you've taught over these
10 decades?

10:02:41

10:02:45

10:02:47

11 A Well, I've taught -- I've taught courses
12 in circuits, pretty extensively both at Columbia
13 and at Princeton.

10:02:48

10:02:52

10:02:56

14 And I have taught courses in signal
15 processing, digital signal processing.

10:02:59

10:03:05

16 And I have taught courses in something
17 called photonics, which is technology for the
18 internet.

10:03:08

10:03:13

10:03:16

19 And also in communications and optical
20 communications.

10:03:17

10:03:22

21 And I have also taught general
22 introductory courses to engineering.

10:03:24

10:03:29

1	Q	Have you ever taught a course on antenna	10:03:34
2		design?	10:03:39
3	A	I have taught courses involving antenna	10:03:39
4		design. The courses in communications have relied	10:03:43
5		on an understanding of antennas, and so have the	10:03:46
6		courses on circuits. But not a specific course on	10:03:52
7		antenna design.	10:03:55
8	Q	On the bottom of the first page of your	10:03:56
9		CV, you list your current research activities.	10:04:01
10		Is that statement accurate?	10:04:04
11	A	Accurate, yes.	10:04:14
12	Q	There is no mention of antenna design in	10:04:15
13		that list, is there?	10:04:19
14	A	Well, there is -- there is a mention of RF	10:04:20
15		photonics, which means radiofrequency photonics.	10:04:26
16		And since you're asking about it, I will just give	10:04:31
17		you an idea of the overlap, if that's okay.	10:04:33
18	Q	Yes.	10:04:35
19	A	All right. So, RF photonics is a field	10:04:36
20		which involves radio communications. And involves	10:04:41
21		using what I call photonic technology as part of	10:04:47
22		the radio receiver. So, the work that I do on RF	10:04:51

1 photonics involves over-the-air radio systems,
2 including various types of antennas that need to
3 be driven and that need to be understood.

4 In order to implement those systems, the
5 appropriate types of antennas have to be chosen.
6 They don't have to be designed per se, but they
7 have to be appropriate for the system.

8 Q As part of your research activities, have
9 you ever designed an inductor layout on a
10 semiconductor chip?

11 A Yes. A lot of the work I do, I'd say for
12 last ten years, is in a field called silicon
13 photonics, which is listed down here. And what
14 silicon photonics is, it's a technology that
15 utilizes silicon-integrated circuits to implement,
16 in addition to electronics, photonic technology.
17 And I won't get into that.

18 But just suffice it to say that we have to
19 put -- my students and I have to put inductors on
20 those chips. We have to design inductors to go on
21 those chips.

22 Q So, if we now turn to paragraph 24 in your

10:04:58

10:05:04

10:05:07

10:05:09

10:05:14

10:05:18

10:05:20

10:05:27

10:05:29

10:05:33

10:05:35

10:05:39

10:05:45

10:05:48

10:05:51

10:05:56

10:06:00

10:06:01

10:06:06

10:06:11

10:06:15

10:06:25

1 rebuttal declaration, Ericsson's Exhibit 2002, and
2 just let me know when you get there.

10:06:35

10:06:40

3 A Okay.

10:06:53

4 Q So, in paragraph 24, you provide your
5 opinion as to the level of ordinary skill in the
6 art; is that right?

10:06:53

10:06:58

10:07:02

7 A That's right.

10:07:10

8 Q Okay. Now, if could you turn to your
9 supplemental declaration, Ericsson's Exhibit 2009,
10 at paragraph 7, and let me know when you get
11 there.

10:07:10

10:07:13

10:07:17

10:07:24

12 A Okay. I'm at paragraph 7 of the
13 supplemental.

10:07:36

10:07:37

14 Q Okay. And in paragraph 7 of the
15 supplemental, you provide what you characterize as
16 a refined description of the level of skill in the
17 art; is that correct?

10:07:38

10:07:40

10:07:43

10:07:47

18 A Yes.

10:07:51

19 Q Why did you -- why did your opinion change
20 as to the level of skill in the art?

10:07:51

10:07:55

21 A Well, my -- my opinion was refined because
22 of subsequent things that happened after I -- I

10:08:01

10:08:06

1 provided my initial opinion, including --

10:08:11

2 including Intel providing its definition of a

10:08:17

3 person of ordinary skill -- ordinary skill in the

10:08:21

4 art.

10:08:24

5 And also the -- the court's comments on

10:08:25

6 what a person of ordinary skill in the art is.

10:08:31

7 That caused me to rethink my opinion, and

10:08:34

8 I decided that I needed to be a bit more detailed

10:08:39

9 than I had been before.

10:08:44

10 Q Okay. You said that your opinion was

10:08:47

11 refined, in part, because of Intel providing its

10:08:54

12 definition of a person of ordinary skill in the

10:08:57

13 art; is that what you said?

10:08:59

14 A I believe so.

10:09:02

15 Q Okay. When you prepared your rebuttal

10:09:03

16 declaration, Exhibit 2002, did you review Intel's

10:09:08

17 petition for inter partes review?

10:09:14

18 A I don't specifically recall the timing at

10:09:23

19 this moment.

10:09:28

20 Q In preparing your declaration,

10:09:29

21 Exhibit 2002, did you review Dr. Tentzeris'

10:09:33

22 expert declaration that was submitted as an

10:09:37

1	exhibit to Intel's petition for inter partes	10:09:40
2	review?	10:09:43
3	A I think I did.	10:09:46
4	Q Okay. And I can remind you, if you want	10:09:47
5	to flip back to paragraph 5 of Exhibit 2002.	10:09:50
6	Okay. And in paragraph 5, you say: In	10:10:06
7	preparing this declaration, I reviewed the '430	10:10:08
8	patent, Intel's petition, paper 1, including all	10:10:14
9	exhibits submitted therewith, Dr. Tentzeris'	10:10:17
10	declaration.	10:10:21
11	Does that refresh your recollection?	10:10:22
12	A Yes, it did. I -- I did review those. It	10:10:24
13	says it here. I did review those two things.	10:10:26
14	Q Okay. And -- too many pages here. So, if	10:10:29
15	we go back to the supplemental declaration, your	10:10:43
16	supplemental declaration, Ericsson's Exhibit 2009,	10:10:46
17	in paragraph 8, you say: My opinion is based in	10:10:50
18	part on the declaration of Manos Tentzeris,	10:10:54
19	Exhibit 1003.	10:10:58
20	Do you see that?	10:11:00
21	A Yes.	10:11:01
22	Q And that is the declaration that	10:11:01

1	Dr. Tentzeris submitted in connection with the	10:11:06
2	petition for inter partes review that you reviewed	10:11:10
3	prior to submitting your first declaration; is	10:11:14
4	that correct?	10:11:17
5	A That is correct.	10:11:17
6	Q So, the information that you based your	10:11:20
7	refined opinion on was available to you prior to	10:11:27
8	submitting your first declaration, Exhibit 2002;	10:11:30
9	is that correct?	10:11:34
10	MR. WARR: Objection, form.	10:11:34
11	You may answer the question.	10:11:36
12	A I just would like to have a look at this	10:11:48
13	to refresh my memory.	10:11:50
14	Q Take your time.	10:11:51
15	A These pages aren't in a notebook. They	10:13:53
16	are already getting out of order. I apologize.	10:13:56
17	Q That's okay.	10:13:59
18	A So, I'm trying to -- I'm trying to be	10:14:00
19	accurate in what documents I reviewed. And just	10:14:01
20	to say it again, paragraph 5 of my original	10:14:04
21	declaration --	10:14:12
22	Q So, paragraph 35 of your original	10:14:14

1 declaration.

10:14:17

2 A So, it says that I reviewed the '430
3 patent, Intel's petition, including all exhibits
4 submitted therewith Dr. Tentzeris' declaration.

10:14:17

10:14:19

10:14:26

5 Okay. That's the two things I was
6 focusing on, Intel's petition and Dr. Tentzeris'
7 declaration.

10:14:29

10:14:32

10:14:37

8 Then there in the supplemental
9 declaration, I say that I am considering Intel's
10 reply and the institution decision -- decision in
11 coming up with my new refined definition of
12 POSITA.

10:14:39

10:14:50

10:14:58

10:15:06

10:15:14

13 And then I go on to say it's based in part
14 on the declaration of Dr. Tentzeris, which --
15 which, as you pointed out, I had listed in my
16 original declaration and I had already reviewed.

10:15:15

10:15:19

10:15:22

10:15:25

17 Q Um-hmm.

18 A And so, maybe I misunderstood your
19 question, but what I believe I reviewed,
20 additionally, that was not in my first
21 declaration, was Intel's reply and the institution
22 decision.

10:15:30

10:15:33

10:15:40

10:15:44

10:15:50

1	Q	Okay. So, your opinion -- your refined	10:16:00
2		opinion -- I want to make sure that I have a clear	10:16:02
3		record here. So, your refined -- the reason	10:16:04
4		you -- the reason you determined you needed to	10:16:07
5		refine your opinion is because of information in	10:16:11
6		Intel's reply and the institution decision; is	10:16:14
7		that correct?	10:16:18
8	A	That -- that was -- that was what I	10:16:18
9		considered that caused me to rethink my definition	10:16:22
10		of POSITA. But my opinion was also based on,	10:16:28
11		again, looking back at the declaration of	10:16:34
12		Dr. Tentzeris, which I...	10:16:38
13	Q	Right. And to confirm, the declaration of	10:16:42
14		Manos Tentzeris you had available to you when you	10:16:48
15		formed your initial opinion as to the level of	10:16:50
16		skill in the art as presented in your first	10:16:53
17		declaration, 2002?	10:16:55
18	A	Yes.	10:16:56
19	Q	So, in your first declaration,	10:16:56
20		Exhibit 2002, in paragraph 25, you state that your	10:17:14
21		analysis is unchanged whether the board accepts	10:17:22
22		Dr. Tentzeris' opinion or yours regarding the	10:17:27

1	level of ordinary skill in the art.	10:17:30
2	Do you see that?	10:17:33
3	A Yes.	10:17:34
4	Q Now, you don't make a similar statement in	10:17:37
5	your supplemental declaration in connection with	10:17:40
6	your refined opinion about the level of skill in	10:17:43
7	the art; is that correct?	10:17:47
8	MR. WARR: Objection as to form.	10:17:56
9	You may answer the question.	10:18:49
10	A I believe the answer to your question is	10:18:49
11	no. I -- the -- the last statement I make in --	10:18:50
12	in this section, section D, paragraph 10, says	10:18:55
13	that I conclude that -- it says that: After	10:19:05
14	further evaluating the references relied on by	10:19:10
15	Intel and the board's institution decision, I	10:19:14
16	conclude that applications for printed circuit	10:19:17
17	boards differ from integrated circuits or	10:19:21
18	semiconductors.	10:19:24
19	And I go on to say that I believe that	10:19:26
20	Intel's definition is incorrect.	10:19:28
21	Q So, back to the definition of a POSITA,	10:19:41
22	sitting here today, is it still your position that	10:19:48

1 your analysis would be unchanged whether the board
2 accepts Dr. Tentzeris' definition of a POSITA
3 rather than your definition, your refined
4 definition?

10:19:52

10:19:56

10:19:59

10:20:01

5 A My -- yes, my analysis would remain the
6 same.

10:20:01

10:20:05

7 Q Are you a POSITA under your refined
8 definition?

10:20:05

10:20:10

9 A Yes.

10:20:10

10 Q Are you a POSITA under Dr. Tentzeris'
11 definition?

10:20:11

10:20:13

12 A Yes.

10:20:23

13 Q And I apologize, I went to patent
14 terminology and said POSITA, P-O-S-I-T-A. You
15 understand that I mean "person of ordinary skill
16 in the art" when I say that?

10:20:33

10:20:38

10:20:42

10:20:45

17 A Yes.

10:20:46

18 Q Thank you.

10:20:46

19 MS. LAROCHELLE: At this time, I would
20 like to enter into the deposition US Patent Number
21 7,151,430, which has been entered as Exhibit Intel
22 1001 to this inter partes review proceeding. And

10:20:53

10:20:54

10:20:58

10:21:02

1	this is tab 5 in your box of documents and I will	10:21:06
2	also add it to the chat.	10:21:08
3	(Previously marked for identification	10:21:12
4	Exhibit 1001, US Patent Number 7,151,430.)	10:21:13
5	Q And so, you can go ahead and pull that	10:21:16
6	out, and let me know when you have it.	10:21:19
7	A Can I assume that I should open this	10:21:50
8	envelope now?	10:21:53
9	Q Yes, please. Yeah, I think our office	10:21:53
10	services got a little overzealous. Go ahead and	10:21:55
11	please open up the envelope.	10:21:59
12	A They were taped on the back, so I didn't	10:22:01
13	know that I should...	10:22:02
14	Q Yeah, go ahead and -- you can open that	10:22:02
15	envelope now.	10:22:04
16	A Okay.	10:22:05
17	Q Okay. Did you review this document in	10:22:24
18	preparation for your deposition?	10:22:25
19	A Yes.	10:22:26
20	Q Okay. I would like you to turn to	10:22:26
21	figure 2.	10:22:28
22	Okay. And we agree that this is the '430	10:22:34

1	patent, just want to make sure the record is	10:22:36
2	clear; is that right?	10:22:38
3	A Yes.	10:22:38
4	Q What is shown in figure 2 of the '430	10:22:39
5	patent?	10:22:43
6	A This is what's referred to as an 8-shaped	10:22:45
7	inductor.	10:23:01
8	Q Okay. Can you walk me through how current	10:23:01
9	would flow through this 8-shaped inductor?	10:23:08
10	MR. WARR: Objection, form.	10:23:13
11	You may answer the question.	10:23:15
12	A Okay. So, I would have to make the	10:23:19
13	assumption that there is a current source located	10:23:27
14	somewhere that's connected to the inductor, or	10:23:32
15	that the inductor is connected to another part of	10:23:37
16	the circuit that's providing current to the	10:23:40
17	terminal that's labeled 204A.	10:23:43
18	And you can see that the arrows, the arrow	10:23:46
19	that's above that, shows the direction of the	10:23:54
20	current flow in this example. The current flows	10:23:58
21	to the left, in what I will call the lower loop,	10:24:04
22	in a clockwise direction.	10:24:09

1 And then it proceeds through a 10:24:11
2 cross-under, I would call it, to the upper loop. 10:24:20

3 The middle part of this layout shows how 10:24:27
4 this inductor would be laid out on a -- on a chip, 10:24:33
5 where the inductor from the lower loop goes under 10:24:37
6 the conductor from the upper loop. I guess I 10:24:44
7 could describe that as an underpass. Okay? 10:24:48

8 Q Um-hmm. 10:24:51

9 A And that underpass is separated from the 10:24:52
10 loop on the top. One would assume from knowledge 10:24:55
11 of integrated circuits, there would be a -- an 10:25:00
12 insulator between the two. Okay? 10:25:03

13 So, we have a current that's flowing 10:25:05
14 counter -- clockwise in the lower loop and 10:25:08
15 proceeds through the underpass and then emerges in 10:25:11
16 the upper loop. I guess I would describe it as 10:25:17
17 the lower right portion of the upper loop, there 10:25:21
18 is an arrow going to the right. And that's the 10:25:24
19 direction of the current. 10:25:30

20 And now, the current starts traveling in 10:25:31
21 the upper loop but in a counterclockwise 10:25:35
22 direction. So, it first passes that label 202 and 10:25:39

1	then goes to the top of the upper loop, proceeding	10:25:44
2	from right to left, which is a counterclockwise	10:25:48
3	direction.	10:25:51
4	It goes around the left side of the upper	10:25:52
5	loop, and then comes to the -- to the place where	10:25:55
6	there is another underpass. That could be	10:26:01
7	described by the arrow that's in the lower left	10:26:08
8	portion of the upper loop, that arrow that's	10:26:17
9	pointing to the right. Okay?	10:26:20
10	And that arrow that's pointing to the	10:26:21
11	right indicates that the current is continuing in	10:26:23
12	a counterclockwise direction and through the --	10:26:26
13	the cross under, and it merges at the lower loop,	10:26:30
14	the upper right portion of the lower loop, now	10:26:39
15	going again in a clockwise direction, to the point	10:26:43
16	where it gets to the arrow under the number 206B.	10:26:48
17	And at that point, it emerges from the terminal	10:26:54
18	204B.	10:26:58
19	Q Can you describe what the net magnetic	10:27:15
20	field that would be produced by current flow in	10:27:20
21	this inductor would look like in the vicinity of	10:27:24
22	the inductor?	10:27:27

1	A So, that really depends upon the details	10:27:34
2	of where the -- the field is being measured. At a	10:27:39
3	high level, we can see an indication of the	10:27:42
4	direction of the magnetic fields produced by the	10:27:47
5	upper and lower loop by the little circles that	10:27:49
6	are in the middle of the loop that either have a	10:27:54
7	dot or a crosshatch. Okay?	10:27:56
8	So, in the -- in the upper loop, where the	10:27:59
9	current is flowing in a counterclockwise	10:28:05
10	direction, the magnetic field is -- in the center	10:28:09
11	of the loop, the magnetic field is emerging coming	10:28:16
12	out of the page, if you will.	10:28:20
13	And in a lower loop where the current is	10:28:22
14	going in the clockwise direction, the magnetic	10:28:25
15	field in the center of the loop is going into the	10:28:30
16	page.	10:28:33
17	Now, the details about what the net field	10:28:33
18	looks like is a much more complicated question,	10:28:37
19	because, in fact, the -- the field lines -- for	10:28:40
20	example, in the -- in the top loop, the field	10:28:45
21	lines are coming out of the center of the loop,	10:28:48
22	but they are actually wrapping around the	10:28:52

1 conductors. They are wrapping around the outside
2 of that inductor, of that portion of the inductor.
3 So, they are coming out, they are going around and
4 back, and then coming back through. So, that's
5 what the field lines look like if you look outside
6 the inductor.

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7 And -- and similarly, in the bottom loop,
8 in the middle, as I said, the -- the field lines
9 are going into the page, but they -- they are
10 actually going into the page, coming around the
11 lower loop, and -- and coming back into the
12 center. So, the field lines are continuously
13 coming back around the outside and coming back
14 into the center.

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15 So, that's probably the best I can do
16 describing it in words.

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10:29:45

17 Q Sure. And what you just described, was
18 that the net field of both loops or the loops
19 individually, the upper and lower loops?

10:29:47

10:29:49

10:29:52

20 A That was the -- that was the -- the field
21 individually of the upper and lower loops.

10:29:55

10:29:58

22 Q Okay. And what would the net field look

10:30:01

1	like in these regions that you just talked about?	10:30:04
2	A Well, again, that -- that -- as I said at	10:30:08
3	the beginning of my answer, the net field depends	10:30:11
4	upon exactly where you're -- where you're	10:30:15
5	measuring it. The net field -- the sum of these	10:30:16
6	two fields -- the sum of these two fields would --	10:30:19
7	would be different depending upon the exact	10:30:23
8	position, and the shape of the field lines at that	10:30:26
9	point.	10:30:29
10	Q Okay. So, let's break it down. Is there	10:30:30
11	a place where the magnetic field is at a maximum?	10:30:33
12	The net magnetic field due to the upper and lower	10:30:37
13	loops, where would that be a maximum?	10:30:42
14	A I haven't thought about that. That would	10:30:45
15	take -- that would take some analysis that I don't	10:31:12
16	think I could do sitting here. And that's --	10:31:17
17	that's because we have these opposing field lines,	10:31:20
18	and the field lines aren't straight. They are	10:31:26
19	curving. And so, when you combine the two fields,	10:31:31
20	it really depends on exactly where you are and --	10:31:36
21	yeah, I don't -- I don't know for sure where the	10:31:49
22	maximum would be.	10:31:51

1 Q Okay. And would you be able to say where
2 the minimum magnetic field would be, net magnetic
3 field of both loops?

10:31:53

10:31:56

10:32:01

4 A Well, what the patent teaches us and what
5 I understand is that at points that are far enough
6 away from these two loops, such that you're seeing
7 equal contributions from both the upper and lower
8 loop, and, again, this is something that has to be
9 visualized. There can be the cancellation of the
10 two fields creating a minimum.

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11 And -- and so, that could basically be at
12 points that are equidistance from those two center
13 points that I just described, those two little
14 circles that are in the center. And if one draws
15 a line, say, out to the side from those two
16 points, if the lines are equidistant, and, again,
17 this has to be at some distance away, one could
18 get a minimum, one could get cancellation.

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19 One way of thinking about this might be to
20 draw a horizontal line through the figure 8, as
21 it's shown there. The figure 8 is sort of shown
22 being vertical. And if one took a horizontal line

10:33:10

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10:33:22

1 and drew it directly through the center of that,
2 out to the side, then -- then points in that
3 horizontal line would be equidistant from those
4 two center points that I just described.

5 But one wouldn't get a minimum -- if one
6 is too close, it's not going to at a point where
7 those two fields look identical and would sum
8 identically.

9 So, if you go out on that horizontal line
10 a sufficient distance away such that the two
11 fields look equal and opposite, that's where we
12 get the minimum.

13 Q Earlier today, you told me that, in
14 connection with the other proceeding that you were
15 involved in, you did some simulations.

16 Do you remember that?

17 A Yes.

18 Q Was the magnetic field near an 8-shaped
19 inductor that carries a current, was that one of
20 the simulations that you did?

21 A I looked at some -- so many simulations
22 that right now I just don't recall whether I did

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1 that simulation. I know that I did see -- I did
2 see papers in the field, subsequent to this
3 patent, that did this kind of electromagnetic
4 simulation with a figure 8. I believe I did them,
5 too.

10:34:37
10:34:43
10:34:48
10:34:53
10:34:56

6 The simulations I recall seeing used color
7 representations of the strength of the field. And
8 I don't think I did it that way. But that's my --
9 that's my recollection.

10:34:57
10:35:02
10:35:06
10:35:13

10 Q But you didn't do any simulations of the
11 magnetic field near a figure 8 shaped inductor
12 carrying a current in forming your opinions for
13 these declarations that you submitted in this
14 proceeding?

10:35:14
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10:35:28

15 A I did no simulations for this case.

10:35:29

16 Q Can you flip to figure 10 in the '430
17 patent, Intel Exhibit 1001?

10:35:40
10:35:47

18 (The court reporter asked for clarification.)

19 Q So, what's shown in figure 10 of the '430
20 patent?

10:36:12
10:36:15

21 A This is an inductor that's -- they say is
22 in the shape of a four-leaf clover. It has four

10:36:25
10:36:30

1	leaves -- it has four loops instead of two loops.	10:36:34
2	Q Okay. And assuming that there is a, you	10:36:38
3	know, current source connected to the terminals of	10:36:42
4	this four-leaf clover, could you walk me through	10:36:45
5	how current would flow in that inductor?	10:36:49
6	And to be clear, we are talking about	10:37:05
7	current -- you know, a current source coming in	10:37:07
8	from one of these legs, let's say current in	10:37:10
9	through the left-hand leg at the bottom of this	10:37:15
10	four-leaf clover. Is that clear?	10:37:19
11	A Yes, yes. So, this -- so, do you want me	10:37:22
12	to do it in the same level of detail I did in the	10:37:29
13	last one?	10:37:31
14	Q You can abbreviate a little bit and refer	10:37:32
15	back, if you would like, but...	10:37:35
16	A I know my answer took some time.	10:37:36
17	Q Yeah, that's fine.	10:37:38
18	A So, this -- this figure doesn't have	10:37:40
19	arrows to indicate the direction of current flow.	10:37:43
20	But one can -- there are four loops, as I said.	10:37:49
21	And one can -- where those four loops intersect,	10:37:54
22	see where the conductors -- the current conducting	10:37:59

1	paths, are going under and going over the	10:38:06
2	overpass.	10:38:14
3	And let's see, I'm going to -- I'm going	10:38:19
4	to try to trace it out myself before I describe	10:38:23
5	it.	10:38:25
6	Q Are you drawing on your copy of the	10:38:33
7	patent?	10:38:35
8	A With my finger.	10:38:35
9	Q Oh, okay, with your finger. Okay.	10:38:37
10	A I want to rehearse it before I use too	10:38:37
11	many words. It will help me.	10:38:40
12	Q That's fine, I just wanted to know if you	10:38:41
13	were drawing physically on your patent, because I	10:38:44
14	would want to have a copy of that.	10:38:46
15	A Anything I write, you will have, I	10:38:46
16	promise.	10:38:49
17	Q Okay. Thank you.	10:38:50
18	A Okay. I think I can do it in the	10:39:43
19	following way, and it may be a little harder to	10:39:47
20	describe because there are not arrows on this	10:39:52
21	figure.	10:39:54
22	But to sort of give you the answer to what	10:39:54

1	happens, there are four loops. There are two	10:39:58
2	terminals on the bottom loop. And the current	10:40:05
3	enters one of those terminals, let's say the one	10:40:09
4	that's labeled 1008.	10:40:12
5	Q Okay. The one on the right-hand side?	10:40:15
6	A Yes, yes.	10:40:17
7	Q Okay.	10:40:18
8	A And in traversing these loops, the sort of	10:40:18
9	the bottom line is that the current will traverse,	10:40:25
10	two of them in a clockwise direction and two of	10:40:27
11	them in a counterclockwise direction, similar to	10:40:30
12	the figure 4, where it was traversing one in a	10:40:34
13	clockwise and the other in a counterclockwise.	10:40:37
14	And so, the way -- the way we can see this	10:40:40
15	is to start at the terminal on the lower right and	10:40:44
16	have a current going upward through the right-hand	10:40:50
17	portion of the lower loop, the right-hand side of	10:40:56
18	the lower loop in a vertical and counterclockwise	10:40:59
19	direction.	10:41:05
20	And then when it reaches the intersection,	10:41:06
21	it appears to make a right turn and go into -- go	10:41:11
22	underneath and into the right-hand loop, which is	10:41:18

1	labeled 102, now in a clockwise direction.	10:41:20
2	And then from the upper loop, circling	10:41:27
3	around the -- I'm circling around the right-hand	10:41:30
4	loop, again, coming to the intersection, the	10:41:33
5	conducting path bends to the right.	10:41:36
6	And now it's going through loop 1004, in	10:41:39
7	the counterclockwise direction.	10:41:43
8	And then as it traverses loop 1004, and	10:41:46
9	comes in the counterclockwise direction back	10:41:51
10	towards the intersection of all the loops again,	10:41:55
11	it makes a turn to the -- I guess you would say to	10:41:58
12	the left, and now traverses the left hand loop,	10:42:03
13	1006, in a clockwise direction.	10:42:08
14	Comes back to the intersection, makes a	10:42:16
15	right-hand turn, and finishes the loop -- the	10:42:18
16	lower loop, going in a counterclockwise direction.	10:42:21
17	Q Are you done?	10:42:30
18	A (Indicating.)	10:42:33
19	Q Okay. In connection with the simulations	10:42:34
20	that you did for the previous proceeding, did you	10:42:37
21	simulate the magnetic field produced by a current	10:42:42
22	carrying four-leaf clover inductor like this one?	10:42:49

1	A I don't think I considered that there.	10:42:54
2	Again, I'm going through my recollection, and I	10:42:56
3	don't know for sure, but I don't recall	10:42:58
4	considering it.	10:43:00
5	MR. WARR: Christie, when it's convenient,	10:43:14
6	could we have a five-minute break, please?	10:43:16
7	MS. LAROCHELLE: Oh, absolutely. I just	10:43:18
8	have one more question on this. And so, we can	10:43:19
9	break now, or I can ask my last question.	10:43:22
10	MR. WARR: Just may as well finish up --	10:43:25
11	MS. LAROCHELLE: Right.	
12	MR. WARR: -- same subject matter, that's	10:43:28
13	fine.	10:43:29
14	Q Okay. So, I just want to be clear what is	10:43:29
15	going on in the center of this four-leaf clover	10:43:31
16	and what's connecting these loops. Can you	10:43:34
17	explain these what look to be solid pieces	10:43:37
18	connecting the loops?	10:43:41
19	A Yeah. Well, again, the bottom line here,	10:43:43
20	the significance of this inductor shape, is that	10:43:47
21	with the figure 8, the figure 8 has a -- has two	10:43:54
22	loops with counter-propagating currents, one	10:43:58

1 clockwise and the other counterclockwise. And I
2 have discussed, that creates magnetic fields in
3 opposite directions, ultimately which can cancel.

4 And this is same idea here, which is to
5 construct not two loops but four loops, such that
6 one gets counter-propagating currents in pairs of
7 those loops, so you have two that are clockwise
8 and two that are counterclockwise.

9 And as I interpret what's going on here is
10 that the loop 1008 has -- when it comes into the
11 intersection from the right-hand side, it makes a
12 right turn and goes under a conductor, and that
13 allows the current to loop around clockwise in
14 loop 1002. And then as it finishes loop 1002, it
15 comes back to the intersection, it now passes over
16 the other conductor and leads us to the right in
17 loop 1004, such that it goes counterclockwise.

18 And then similarly, as loop 1004 completes
19 this loop, and comes to the intersection, the
20 conductor bends, I guess you'd say, leftward and
21 downward going over the conductor underneath. And
22 that allows the current to go in a clockwise

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1	direction again.	10:45:42
2	When loop 1006 is completed and comes back	10:45:44
3	into the intersection, it now goes under and sort	10:45:47
4	of bends downward, I guess you could say, into	10:45:51
5	loop 1008, giving you counterclockwise.	10:45:55
6	So, I could summarize by saying the way	10:46:00
7	this looks to me is that loop 1008 as a	10:46:04
8	counterclockwise current. Loop 1002 has a	10:46:11
9	clockwise current. 1004 has a counterclockwise	10:46:29
10	current. And 1006 has a clockwise current. So,	10:46:18
11	it's two pairs of clockwise and counterclockwise.	10:46:22
12	MS. LAROCHELLE: Okay. Let's go ahead and	10:46:38
13	take a break. Go off the record.	10:46:39
14	(Off the record.)	10:46:43
15	BY MS. LAROCHELLE:	10:52:37
16	Q Dr. Prucnal, during the break, did you	10:52:41
17	speak to anyone about the substance of your	10:52:44
18	testimony?	10:52:46
19	A No.	10:52:46
20	Q So, I want to move on to a new topic. In	10:52:47
21	your rebuttal declaration, Exhibit 2002,	10:52:55
22	paragraph 6, you state: I understand that the	10:53:00

1	parties have proposed certain constructions for	10:53:08
2	the terms, which I have considered.	10:53:10
3	Are you there?	10:53:13
4	A Yes.	10:53:15
5	Q Where did you get that understanding?	10:53:18
6	A I don't recall. It may have been some of	10:53:49
7	the documents I read. I assume that's what it	10:53:54
8	was.	10:53:57
9	Q So, let's go to your supplemental	10:53:58
10	declaration, Ericsson Exhibit 2009, and starting	10:54:03
11	at paragraph 11, you have a section about claim	10:54:08
12	construction. Let me know when you get there.	10:54:11
13	A Okay.	10:54:16
14	Q Okay. In paragraph, 11 you provide an	10:54:21
15	opinion that the claim 11 requires that the	10:54:27
16	inductors be formed on a semiconductor die.	10:54:34
17	Do you see that?	10:54:38
18	A Yes.	10:54:39
19	Q Is that still your opinion sitting here	10:54:55
20	today, that both -- claim 11 requires the	10:54:57
21	inductors be formed on a semiconductor die?	10:55:00
22	A Yes.	10:55:13

1 Q And did you arrive at that opinion based
2 on your own analysis of the patent claims and
3 specification?

10:55:15

10:55:19

10:55:24

4 A Yes.

10:55:30

5 Q Is that an opinion that you developed in
6 connection with this case, this IPR, or is this an
7 opinion that you developed in connection with a
8 prior proceeding?

10:55:33

10:55:35

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10:55:41

9 A I developed the opinion here in this case.
10 I don't recall my opinions in the prior
11 proceeding.

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12 Q In paragraph 14, you state that the
13 language used in the other patent claims informs a
14 POSITA that the fabrication method of claim 11 is
15 limited to forming both inductors on a
16 semiconductor die.

10:55:54

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17 Do you see that?

10:56:23

18 A Yes.

10:56:24

19 Q You don't point to any specific language
20 in this paragraph, though, do you?

10:56:38

10:56:42

21 A I don't point to anything else in this
22 paragraph 14.

10:56:45

10:57:24

1 Q Is there anywhere in this declaration that
2 you point to language from other patent claims
3 that informs a POSITA that claim 11 is limited to
4 inductors on the semiconductor die?

5 (Witness reviewing documents.)

6 A Well, for one thing, in addition to
7 claim 11, there are several dependent claims,
8 which would include 12, 13, 14, 15, 16 and 17 that
9 all depend on claim 11. And the language of those
10 claims is consistent with having inductors on a
11 semiconductor die.

12 Q Do any of those claims mention
13 semiconductor die in them?

14 MR. WARR: Objection as to form.

15 You may answer the question.

16 A My understanding of all the claims is
17 informed by -- by reading the patent spec, my
18 understanding of the patent spec, which is that
19 this is directed toward inductors on a
20 semiconductor die. But in addition to that, all
21 these dependent claims are referring back to the
22 semiconductor die in claim 11, so they don't need

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1 to repeat the preamble because it's -- of claim 11
2 because it's referring to it.

3 Q Are you familiar with claim 1 of the '430
4 patent?

5 A Yes.

6 Q Does claim 1 of the '430 patent include
7 any limitation directed to a semiconductor die?

8 A There is no limitation that specifically
9 refers to semiconductor die but, again, my -- my
10 understanding of claim 1 is that it's -- it's
11 derived from the patent spec, which is only about
12 semiconductor dies.

13 Q So, is it your position that claim 1
14 requires the inductors be formed on a
15 semiconductor die?

16 MR. WARR: Objection.

17 You may answer the question.

18 A No, it's not required in claim 1. My
19 understanding of claim 1 is that it's referring to
20 the semiconductor die, the inductors in the spec,
21 but claim 1 does not require it that it be a
22 semiconductor die. It doesn't say semiconductor

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1 die.

11:02:04

2 Q In paragraph 15, you state that the term
3 "far field" has been construed to mean, and then
4 you give a construction.

11:02:06

11:02:26

11:02:29

5 When you say "has been construed," are you
6 referring to the previous proceeding that you were
7 involved in?

11:02:30

11:02:35

11:02:40

8 A I would have to look at the exhibits that
9 are cited there. I have citations immediately
10 following that statement.

11:02:40

11:02:43

11:02:46

11 Q Okay. If it would help you, we can go to
12 the -- so, you have two citations, Exhibit 1020
13 and Exhibit 1001. We have already looked at 1001,
14 which is the '430 patent, correct?

11:02:47

11:02:51

11:02:58

11:03:02

15 A Exhibit 1001?

11:03:04

16 Q Intel's Exhibit 1001.

11:03:10

17 A I think -- I'm sure you're right. That
18 was Exhibit 1001.

11:03:14

11:03:17

19 Q Okay. And then if you would like to, we
20 can introduce into the deposition, this document
21 will be at tab 12 in your box, and it's Intel's
22 Exhibit 1020, and that's the claim construction

11:03:19

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1 order from the 1300 ITC investigation. And I'm
2 putting that in the chat now.

3 (Marked for identification Exhibit 1020,
4 1300 ITC investigation.)

5 Q Again, that was tab 12, Intel's
6 Exhibit 1020.

7 And your reference in paragraph 15 of your
8 supplemental declaration, Exhibit 2009, is
9 Exhibit 1020, page 19.

10 Does this refresh your recollection at
11 all?

12 A Yes, the construction that I cite in my
13 paragraph 15 is the same as the construction --
14 Ericsson's proposed construction shown here.

15 Q Okay. Is it your position that this is
16 the construction the board should adopt in this
17 proceeding?

18 A Yes.

19 Q Now, you have not provided any other
20 proposed claim constructions for the '430 patent
21 in this section of your declaration, have you?

22 A Well, the term "far field" is the only one

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1 that I refer to in this section. There is some
2 other discussion in the claim construction
3 section, but this is only -- the only term I
4 believe that's -- that I refer to being construed.

5 Q If there were other claim terms that you
6 thought the board should construe, you would have
7 said so in one of your declarations, right?

8 A That's right.

9 Q Okay. I would like to turn now to your
10 opinions about Taniguchi, the Taniguchi reference.
11 And so, this is -- you can go to tab 6 in your
12 box. And this is Intel's Exhibit 105. And I just
13 put that in the chat, as well. Just let me know
14 when you have that.

15 A I have it.

16 Q Okay. Did you review this document in
17 preparation for your deposition?

18 A Yes.

19 Q So, if we go to your rebuttal declaration,
20 Exhibit 2002, paragraph 60.

21 A Okay.

22 Q Okay. In the -- about halfway through

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1 this paragraph, you say -- this is the second
2 sentence -- actually, I'm sorry. The third
3 sentence: For example, figure 4 shows a tag 211
4 that is relatively far away, quote, makes
5 interlinkage with many lines of magnetic flux from
6 antenna 1.

11:09:01

11:09:06

11:09:16

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11:09:29

7 And you cite paragraph 64 of Taniguchi.

11:09:30

8 Do you see that?

11:09:33

9 A Yes.

11:09:34

10 Q Okay. So, let's go to Taniguchi, which is
11 Intel's Exhibit 1005, and let's start with that
12 paragraph 64 that you cite.

11:09:34

11:09:40

11:09:44

13 A May I just have a moment to look at the
14 sentences around the one you just read to me?

11:09:49

11:09:52

15 Q Absolutely. You can read that entire
16 paragraph. Yeah. Anything you want.

11:09:54

11:09:56

17 A I have looked at that paragraph. Where
18 would you like me to look in Taniguchi?

11:10:48

11:10:51

19 Q Okay. Let's start -- your citation is to
20 paragraph 64. So, let's go to paragraph 64 of
21 Taniguchi. And just let me know when you're --
22 when you get there.

11:10:53

11:10:54

11:10:58

11:11:01

1	A Okay.	11:11:04
2	Q And can you point me to where in paragraph	11:11:05
3	64 the phrase that you quote in this paragraph	11:11:12
4	appears, and the quote is: Makes interlinkage	11:11:17
5	with many lines of magnetic flux.	11:11:21
6	And then you say from antenna 1.	11:11:24
7	(Witness reviewing document.)	11:12:02
8	A As far as I can tell, that doesn't appear	11:13:19
9	to be a -- a direct quote from paragraph 64,	11:13:22
10	although it does convey to me the sense of what	11:13:28
11	paragraph 64 is talking about, which is that	11:13:33
12	paragraph 64 is talking about which of the RFID	11:13:40
13	tags is intersecting lines of magnetic force and	11:13:45
14	which are not.	11:13:50
15	So -- so, to me, paragraph 64 is -- you	11:13:51
16	know, it's indicating that tag 213 only intersects	11:13:56
17	one line. It's not very strong coupling. But	11:13:58
18	paragraph -- but tag 211 has a stronger	11:14:02
19	interaction.	11:14:07
20	But to answer your question, I don't see	11:14:08
21	the direct quote from that paragraph.	11:14:10
22	Q Okay. So, let's actually look at	11:14:20

1 figure 4, because paragraph 64 is referring to
2 figure 4, correct?

11:14:28

11:14:32

3 A Yes.

11:14:34

4 Q Okay. So, let's go look at figure 4, and
5 then we'll come back to that paragraph in a
6 minute.

11:14:36

11:14:40

11:14:42

7 So, what is shown in figure 4 of
8 Taniguchi?

11:14:45

11:15:07

9 (Witness reviewing document.)

11:15:07

10 A Figure 4 is a representation of the -- the
11 inductor in figure 3, but also showing the lines
12 of magnetic flux that are coming from inductor 1,
13 inductor 1 in both figures.

11:15:34

11:15:42

11:15:47

11:15:57

14 Q So, when you say "showing the lines of
15 magnetic flux," are you referring to the solid
16 lines in the bottom half of the figure and the
17 dotted lines in the top half, the ones with the
18 arrows on them?

11:16:13

11:16:16

11:16:20

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11:16:27

19 A Yes.

11:16:30

20 Q Okay. And so, what do the solid lines
21 with the arrows on them represent?

11:16:31

11:16:35

22 A So, the -- the lines with arrows

11:17:04

1 corresponding to the solid lines represent the
2 magnetic flux from the -- the lower loop in
3 antenna 1.

4 Q Okay. And for clarity, antenna 1 is the
5 8-shaped antenna; is that correct?

6 A That's correct.

7 Q Okay. And what do the dotted lines with
8 arrows in the upper half of the figure represent?

9 A Those are the lines corresponding to the
10 magnetic field from the upper loop of antenna 1.

11 Q Okay. And paragraph 60 of your rebuttal
12 expert report, Exhibit 2002, you refer to tab 211.
13 So, you see tab 211 there?

14 A Yes.

15 Q And in your paragraph 60, you stated:
16 Figure 4 shows tab 211 relatively far away, quote,
17 makes interlinkage with many lines of magnetic
18 flux, end quote, from antenna 1.

19 A Yes.

20 Q So, is it your opinion that tab 211
21 couples with antenna 1? Or you use the word
22 "communicates with," I think in your...

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11:18:47
11:19:02

1	A There is coupling, yes -- yes, my opinion	11:19:42
2	is that there is coupling from -- there is	11:19:44
3	coupling from antenna 1 to tag 211. It's shown by	11:19:50
4	the lines. A magnetic force going through it.	11:19:57
5	The whole -- the whole point of figure 4	11:20:02
6	is that Taniguchi is trying to create a uniform	11:20:05
7	enough field so that these tags will be sensed by	11:20:12
8	the antenna, in other words, a field that doesn't	11:20:16
9	have any holes in it.	11:20:20
10	So, this -- this is -- this is Taniguchi	11:20:22
11	showing where you might have interlinkage to a tag	11:20:25
12	and where you might not have interlinkage to a tag	11:20:30
13	and where you might have holes in it.	11:20:35
14	The overall objective being that one gets	11:20:38
15	with Taniguchi very good coupling, very strong	11:20:40
16	coupling from the antenna to the RFID tag.	11:20:43
17	Q Let's go back to paragraph -- we were at	11:21:02
18	paragraph 64.	11:21:06
19	And just to be clear, we are talking about	11:21:06
20	the magnetic field from antenna 1?	11:21:08
21	A We were just talking about, in figure 4,	11:21:15
22	the magnetic field from antenna 1.	11:21:19

1	Q Okay. And, so if we go back to paragraph	11:21:23
2	64.	11:21:26
3	A We had been at paragraph 60, I thought.	11:21:31
4	Q 60 of your report, but 64 of Taniguchi.	11:21:34
5	A Oh, okay.	11:21:38
6	Q Right. So, that's the paragraph that you	11:21:38
7	cite in your paragraph 60. Sorry, apologies for	11:21:40
8	the confusion.	11:21:43
9	A I see what you mean.	11:21:44
10	Q Okay. And feel free to read that	11:21:45
11	paragraph again, which, again, is talking about	11:21:46
12	figure 4.	11:21:49
13	You would agree that this paragraph in	11:21:50
14	figure 4 are both directed to the magnetic field	11:21:53
15	due to antenna 1, the 8-shaped antenna?	11:22:01
16	(Witness reviewing document.)	11:22:25
17	A Yes, we are dealing with antenna 1 only,	11:22:50
18	in paragraph 64.	11:22:53
19	Q Okay. And so, paragraph 64, the second	11:22:54
20	sentence that starts: The lines of magnetic flux	11:22:59
21	indicated by solid lines and lines of magnetic	11:23:06
22	flux indicated by broken lines which are	11:23:10

1	substantially the same in number make interlinkage	11:23:12
2	with a tag 211. And the lines of magnetic flux	11:23:17
3	indicated by solid lines and the lines of magnetic	
4	flux indicated by broken lines which make such	11:23:22
5	interlinkage are equal in magnitude to each other	11:23:24
6	and directed opposite to each other all the time.	11:23:27
7	Do you see that?	11:23:29
8	A Yes.	11:23:30
9	Q And so, then it continues: The induced	11:23:31
10	electromotive force generated on tag 211 becomes	11:23:35
11	substantially zero.	11:23:40
12	Do you see that?	11:23:41
13	A Yes.	11:23:42
14	Q So, you would agree that Taniguchi in	11:23:42
15	paragraph 64, in figure 4, teaches that tag 211 is	11:23:47
16	not coupling with antenna 1. Do you agree with	11:23:53
17	that?	11:23:56
18	A Yes. It's -- it's saying that this is a	11:23:56
19	bad thing. It's saying that in this particular --	11:24:00
20	so, what Taniguchi is -- the problem Taniguchi is	11:24:04
21	trying to solve is to have an antenna	11:24:07
22	configuration that will allow all of the RFID tags	11:24:13

1 to be sensed wherever they are, whatever
2 orientation they are. And what he's pointing out
3 here is that with antenna 1 alone, there's some
4 places where there is strong coupling to the tag,
5 and there's some cases -- there's some positions
6 where there's poor coupling, either because the
7 fields may be canceling or because of the
8 orientation of the tag.

9 So, this is the problem that Taniguchi
10 wants to solve with his approach.

11 Q So, back to your paragraph 60, in your
12 Exhibit 2002, you stated that tag 211 makes
13 interlinkage with many lines of magnetic flux from
14 antenna 1. That statement is incorrect, isn't it?

15 A No -- let me read the paragraph again,
16 please.

17 This statement -- this statement by itself
18 is correct that figure 4 does show a tag 211 that
19 has the interlinkage with many lines of magnetic
20 flux for tag 11.

21 And also, I guess I don't refer to it, for
22 the tags 203 -- let's see...

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11:25:06
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11:25:57
11:26:08

1 I think -- I think there's a typo in the 11:26:40
2 paragraph, because I'm talking about the cases 11:26:43
3 where Taniguchi has a lot of -- a lot of lines of 11:26:48
4 magnetic flux going through the tags. And I point 11:26:53
5 to tags 201 -- I'm sorry, I'm not sure that the 11:26:57
6 tags are -- that the -- the coils and tags are 11:27:21
7 correctly numbered in paragraph 60. 11:27:25

8 But what I am saying, that you pointed 11:27:27
9 out, is that 211 has interlinkage with many lines 11:27:30
10 of magnetic flux, that's correct. 11:27:37

11 Q Let's go back to Taniguchi and look at 11:27:43
12 paragraph 65. Paragraph 65 references figure 5. 11:27:50
13 It says: Figure 5 shows a state in which many 11:28:02
14 lines of magnetic flux make interlinkage with tag 11:28:06
15 211 and tag 213, which have difficulty 11:28:10
16 communicating with the antenna 1 but favorably 11:28:13
17 communicate with antenna 2. 11:28:16

18 Do you see that? 11:28:19

19 A Yes. 11:28:20

20 Q So, that direct quote that you have in 11:28:27
21 paragraph 60, quote, makes interlinkage with many 11:28:29
22 lines of magnetic flux quote, that actually comes 11:28:32

1	from paragraph 65; is that right?	11:28:36
2	A Yes.	11:28:50
3	Q Okay. And paragraph 65 refers to tag 211	11:28:50
4	coupling with antenna 2, not antenna 1; is that	11:28:54
5	right?	11:29:07
6	A That's correct.	11:29:07
7	Q Okay. So, there is an error in your	11:29:08
8	paragraph 60 in your rebuttal report?	11:29:11
9	A It appears that I should have referred to	11:29:14
10	paragraph 65 in the patent, but I need to look at	11:29:18
11	paragraph 60 again to be sure of that.	11:29:25
12	Q Okay. Well, since we're talking about	11:29:28
13	figure 5 of Taniguchi, why don't we look at that,	11:29:30
14	the actual figure.	11:29:35
15	A Yes.	11:29:37
16	Q Okay. And once you're there, I'll ask you	11:29:38
17	again to tell me what figure 5 shows.	11:29:43
18	(Witness reviewing document.)	11:29:55
19	A These are the -- so, figure 5 shows the	11:30:10
20	field lines from antenna 2 and how they intersect	11:30:15
21	tags 211, 212 and 213.	11:30:22
22	Q Okay. And so, to be clear, tag 211	11:30:28

1	couples with antenna 2, correct?	11:30:33
2	A Yes, that's right.	11:30:54
3	Q But tag 211 does not couple with	11:30:55
4	antenna 1, correct?	11:31:01
5	A Yes, as -- as 211 is positioned in	11:31:14
6	figure 4, it has opposing field lines that are --	11:31:18
7	that paragraph 64 says are in opposite direction	11:31:22
8	and that -- I think it said reduce the field to	11:31:29
9	nearly zero, substantially zero. And that's the	11:31:39
10	problem that's pointed out -- that's the problem	11:31:44
11	that Taniguchi is trying to solve, this lack of	11:31:47
12	coupling of 211 within antenna 1. And that's why	11:31:49
13	antenna 2 -- antenna 2 is introduced	11:31:55
14	concentrically with antenna 1, because antenna 2	11:31:58
15	does couple with tag 211.	11:32:03
16	Q So, I would like to turn to your	11:32:20
17	supplemental declaration -- I'm sorry, no, I want	11:32:24
18	to stick with your rebuttal declaration. I	11:32:29
19	apologize.	11:32:32
20	And so, Exhibit 2002 -- sorry, I am	11:32:32
21	getting my declarations confused. Give me a	11:32:41
22	moment.	11:32:44

1 Okay. So, in Exhibit 2002, your first
2 declaration, let's look at paragraph 46.

3 A Okay.

4 Q Okay. Starting at the bottom of -- well,
5 so, in paragraph 46, near the bottom, you say: As
6 shown in Taniguchi's figure 21 -- which we will
7 look at in a minute -- RFID tags 201 and 202 pass
8 between antenna gates 208 and 209.

9 Do you see that?

10 A Yes.

11 Q And then in -- you have a parenthetical
12 here that says: A POSITA would have understood
13 that the antenna gates 208 and 209 each include a
14 radio guidance antenna.

15 Do you see that?

16 A Yes.

17 Q What is the basis for your understanding
18 in that parenthetical?

19 And if it helps, you can pull up
20 Taniguchi's figure 21.

21 (Witness reviewing document.)

22 A I believe this is what's described in the

11:33:25

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11:34:39

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11:36:34

1 text that talks about figure 21.

11:36:37

2 Q Okay. And what paragraph are you at?

11:36:40

3 A I haven't thoroughly read through the
4 patent, and I might have to, to fully --

11:36:42

11:36:45

5 Q Okay. Well, we can move on. That is your
6 understanding, that 208 and 209 each include a
7 radio guidance antenna as you state in paragraph
8 46 of your declaration, 2002?

11:36:48

11:36:54

11:36:58

11:37:01

9 A So -- so, my understanding is that, let's
10 see, look again. Let me say -- I can say without
11 rereading the patent that Taniguchi is about
12 creating this -- this antenna that has two
13 concentric antennas for the purpose of creating a
14 uniform and strong field that can sense an RFID
15 tag.

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11:38:00

11:38:04

11:38:08

16 And in an implementation of that, in
17 figure 21, I guess -- and I guess this is informed
18 by looking at his drawing in figure 14, where --
19 where Taniguchi is describing the coverage. The
20 point of Taniguchi is to create this antenna that
21 doesn't have holes in the magnetic field so that
22 one can sense -- sense RFID tags. And in

11:38:11

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1 figure 14, he is showing the magnetic field that
2 reaches from one antenna on the left, out toward
3 the middle, and another antenna on the right, out
4 toward the middle.

5 And plot below 14A is 14B that shows the
6 strength of the magnetic field. So, this -- this
7 happens because each of those antennas has the
8 type of antenna shown in figure 3 or figure 4.
9 That's how he is able to create a strong and
10 uniform magnetic field at a distance.

11 So, to me, figure 14 is sort of a
12 theoretical diagram of what's shown in a -- you
13 know, sort of a cartoon-ish fashion in figure 21.
14 And at the very least, I take it from that, that
15 208 has the two antennas that -- that are shown in
16 figure 3 and 4. And so does the antenna 209, the
17 figure 21.

18 So, that's my basis.

19 Q Okay. So, I want to make sure that I
20 understood you very clearly.

21 So, you're saying that each of the gates
22 has both an antenna 1 and an antenna 2?

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11:39:55
11:40:02
11:40:10
11:40:11
11:40:12
11:40:15
11:40:17
11:40:22

1	A Yes.	11:40:26
2	Q Okay. And so -- and you referred, I	11:40:27
3	think, to figure 13A and B; is that correct?	11:40:30
4	A Figure 14.	11:40:34
5	Q Okay, 14.	11:40:35
6	A Figure 14 shows in figure 14B how the	11:40:37
7	field would decline over distance from the	11:40:43
8	antennas on the right and the left.	11:40:48
9	The idea --	11:40:50
10	Q Okay.	
11	A -- that would -- may I just --	11:40:51
12	Q Absolutely. Finish, please.	11:40:54
13	A All right. The idea being that one wants	11:40:56
14	to create between these two -- between these two	11:40:59
15	sets of antennas, a field that can sense RFID	11:41:01
16	tags. And that's why they are doing this -- this	11:41:06
17	calculation.	11:41:08
18	And they want to be able to sense the RFID	11:41:09
19	tags, no matter what their orientation or	11:41:13
20	position. So, it stands to reason, for example,	11:41:15
21	in figure 21, where that crate is being wheeled	11:41:16
22	between these two gates, 208 and 209, the RFID	11:41:21

1 could be on one side or the other.

11:41:26

2 So, each of those antennas, 208 and 209,
3 needs to be able to sense the RFID tag. And,
4 therefore, each of those antennas should operate
5 like the antenna in figure 4.

11:41:28

11:41:32

11:41:36

11:41:38

6 Q So, you refer to figure 14. In your
7 expert declaration, you cite figure 14A
8 frequently. And then you just talked about 14B
9 here. And I want to clarify what these lines
10 represent. You talked about lines A and B.

11:42:09

11:42:14

11:42:17

11:42:19

11:42:23

11 So, I think you said line A is the
12 magnetic field; is that correct?

11:42:27

11:42:32

13 It's the magnetic field produced by what?

11:42:36

14 A So, I can be accurate. I was giving a
15 description off the top of my head. If I may --

11:42:39

11:42:54

16 Q Sure.

11:42:50

17 A -- look at figure 14.

11:42:51

18 So, figure 14 of -- is talking about the
19 reception distance from antennas 1 and 2. And the
20 lines that are shown in figure 14A represent the
21 magnetic field distribution.

11:43:05

11:43:12

11:43:23

11:43:30

22 So, for example, the magnetic field

11:43:31

1 distribution from antenna 1 is shown by the line
2 labeled A. And from antenna 2, it's the line
3 labeled B.

4 Q So, when you say "antenna 1," what are you
5 referring to?

6 A In figure 14A, on the left-hand side, 1 --
7 the number 1 is pointing to antenna 1.

8 Q Okay. But what does the antenna 1
9 structure look like?

10 MR. WARR: Objection as to form.

11 You may answer the question.

12 (Witness reviewing document.)

13 A The discussion of these antennas is
14 developed throughout the entire patent, referring
15 back to previous antennas as it goes along.

16 And so, you know, we -- Taniguchi makes
17 the argument in figure 3 in favor of using two
18 antennas on top of each other to create a more
19 uniform field.

20 He shows the field lines in figure 4 and
21 figure 5. And then shows a structure, for
22 example, in figure 6, where these antennas are --

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11:46:01

11:46:02

1 are placed parallel and concentric to one another.

11:46:09

2 And that's shown in various cross-sections,

11:46:15

3 figure 6A through -- through 6E.

11:46:20

4 And -- and similar things are shown in

11:46:23

5 the -- in the figures that follow, including

11:46:26

6 figures 7 and figure 8. And also in figure 12.

11:46:33

7 So, when figure 14, which is discussed in

11:46:41

8 paragraph 83 of Taniguchi, is talking about the

11:46:48

9 antennas and the reception distances, the point of

11:46:52

10 Taniguchi is Taniguchi is trying to generate the

11:46:57

11 strongest and most uniform field over the longest

11:47:01

12 distance in order to sense the ID tags.

11:47:04

13 And -- and that's why -- why figure 14

11:47:08

14 shows the field emanating from the left antenna 1

11:47:10

15 and the separate field emanating from the left --

11:47:12

16 from the right antenna 2 and calculates in figure

11:47:16

17 14B how far those fields extend and, therefore,

11:47:19

18 can detect a RFID tag.

11:47:24

19 And so, for example, in figure 14B, there

11:47:27

20 is a dashed line going across the figure that

11:47:30

21 shows the necessary field strength to be detected.

11:47:33

22 And -- and you can see in figure 14C,

11:47:38

1 the -- the antennas have been pushed a little
2 closer together so that now the entire field
3 overlaps that line, that dashed line.

4 So, you asked me about the structure of
5 the antenna, and everything described here is
6 intending to use these two concentric antennas to
7 create this stronger and more uniform field, which
8 is what we see in antenna 1 and antenna 2 in
9 figure 14.

10 Q Okay. So, in figure 14, the structure
11 that you're referring to as antenna 1, is that a
12 single antenna, or is that the structure that
13 Taniguchi -- you just described of the -- the pair
14 of antennas?

15 A That is the structure -- structure that
16 Taniguchi proposes to be the pair of antennas.

17 Q Okay. So, just to wrap this up a little
18 more cleanly, you refer to figure 21, and figure
19 21 has these gates, 208 and 209, we talked about,
20 right?

21 A Yes, that's right.

22 Q Okay. And then it might help to look at

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1	figure 13, which I think represents those gates.	11:48:54
2	Would you agree with that?	11:49:02
3	MR. WARR: Objection as to form.	11:49:06
4	You may answer the question.	11:49:08
5	A I -- I don't know what figure 13 -- I'd	11:49:11
6	have to go back and review -- review this.	11:49:14
7	Q Okay. Well, for now, let's go back to	11:49:18
8	figure 14, since that's the one that you refer to.	11:49:22
9	We agree that figure 14, the gate on the	11:49:25
10	left labeled 1, has two antennas in it, a figure 8	11:49:31
11	and a second antenna, based on one of Taniguchi's	11:49:38
12	embodiments; is that right?	11:49:43
13	A Yes, my understanding is that these are	11:49:45
14	Taniguchi's antennas that are being referred to as	11:49:48
15	number 1 and number 2.	11:49:51
16	Q Okay. And by "Taniguchi's antennas," you	11:49:52
17	mean a structure that is two antennas, for	11:49:54
18	example, something that looks like figure 4 or	11:49:59
19	figure 5, or even a better example might be	11:50:05
20	figure 8, right, where you've got the figure 8	11:50:10
21	antenna on one side and the loop on the other?	11:50:13
22	MR. WARR: Objection.	11:50:18

1 Q Actually, let me withdraw that question
2 and ask it a little more cleanly.

3 In figure 14A, the gate on the left, which
4 has a number 1 pointing to it, that gate contains
5 the antenna structure disclosed by Taniguchi,
6 which is two antennas; is that correct?

7 (Witness reviewing document.)

8 A May I explain?

9 Q You may explain.

10 A So, I'm now looking at -- I'm now looking
11 at the spec of the patent, which I hadn't looked
12 at previously very much. In paragraph 83, talks
13 about figures 14A through 14C, which we were just
14 discussing.

15 Q Um-hmm.

16 A And it talks about antennas 1 and 2 being
17 those shown in figure 13A and 13B, which I think
18 you just pointed out to me.

19 Q Right.

20 A And when I go back to figures 13A and 13B,
21 it -- it says that the gates on the respective
22 sides are the same in structure as shown in figure

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1 6A to 6E.

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2 Going back to figure 6A to E, this
3 structure is the one that I've been talking about
4 that Taniguchi proposes, which has two concentric
5 antennas, one which is a figure 8.

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11:55:04

6 So, from that structure in figure 6A
7 through E, it's used in figure 13 for each of the
8 antennas facing each other. That's the structure
9 used in figure 14, and that's what I was
10 describing.

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11 Q Okay. And so, to be clear, each of these
12 gates in figures 13 and 14 has two antennas, an
13 8-shaped antenna and a loop antenna?

11:55:28

11:55:36

11:55:43

14 A Well, in paragraph 81, when describing
15 figure 13A and 13B, it says that the antennas are
16 installed to face each other in a gate-like
17 manner. And gates on the respective sides are the
18 same in structure as shown in figure 6A through
19 6E, and figure 6 -- I'll look at figure 6, have
20 the two antennas back-to-back and concentric.
21 That's my understanding.

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22 Q Okay. And so, I just want to ask the

11:56:35

1	question one more time. Your understanding is	11:56:38
2	that there are two antennas in each of the gates,	11:56:41
3	a figure 8 and a loop?	11:56:44
4	A I think -- I think I said that. We're	11:56:48
5	talking about figure 14A.	11:56:54
6	Q Um-hmm.	
7	A And -- and the -- the spec says those are	11:56:57
8	the gates shown in figure 13. And in paragraph	11:57:01
9	81, it says each of those gates is the structure	11:57:05
10	in figure 6, which is a pair of antennas for each	11:57:09
11	gate.	11:57:12
12	Q Okay. So, your answer to my question is	11:57:13
13	yes?	11:57:15
14	A Yes, with the explanation I gave.	11:57:16
15	Q Okay. So, back to figure 14, these lines	11:57:21
16	labeled A and B, you said that A represents the	11:57:31
17	magnetic field from antenna 1. Is that -- am I	11:57:40
18	remembering correctly that's what you said?	11:57:46
19	A Yes.	11:57:47
20	Q Okay. And so, when you say "the magnetic	11:57:47
21	field from antenna 1," that's the net magnetic	11:57:51
22	field from the combined structure of the two	11:57:54

1	antennas in the gate on the left; is that correct?	11:57:57
2	A That is correct.	11:58:02
3	MS. LAROCHELLE: Okay. Is now a good time	11:58:05
4	for a break?	11:58:07
5	THE WITNESS: Sure, if you would like.	11:58:09
6	MS. LAROCHELLE: Okay. Ali, do you want	11:58:11
7	to take lunch now, or do you want to take a short	11:58:13
8	break and come back?	11:58:16
9	MR. WARR: I will defer to Paul. My	11:58:17
10	preference would be to take a lunch now because I	11:58:19
11	get up early and I don't eat breakfast.	11:58:21
12	(Luncheon recess.)	11:58:24
13	BY MS. LAROCHELLE:	12:45:00
14	Q Dr. Prucnal, during the break in the	12:45:06
15	deposition, did you speak to anyone about the	12:45:09
16	substance of your testimony?	12:45:11
17	A No.	12:45:12
18	Q I want to kind of close the loop and go	12:45:13
19	back to paragraph 60 of your rebuttal declaration,	12:45:21
20	Ericsson's Exhibit 2002, which is where we started	12:45:27
21	on all this Taniguchi discussion.	12:45:31
22	So, just let me know when you're back	12:45:34

1 there, paragraph 60, Exhibit 2002.

12:45:37

2 A Okay.

12:45:41

3 Q Okay. And in this paragraph, you refer to
4 antenna 1, I count four times. And I want to make
5 sure that I understand clearly what you were
6 referring to when you say antenna 1 in this
7 paragraph.

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8 And so, if we could walk through each of
9 the four usages of antenna 1 here and then just --
10 so I can get that clarity. Because we talked
11 about, in Taniguchi, there's -- if you look at
12 figure 4, there's antenna 1 antenna 2, right?

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13 The 8-shaped and then the loop; is that
14 right?

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15 A Yes.

12:46:18

16 Q And then we also talked about antenna 1
17 being the antenna -- you had a word for it, the --
18 kind of combined?

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19 A The gate. That was the gate.

12:46:29

20 Q Right. The gate has a -- the combined two
21 antennas, right?

12:46:31

12:46:34

22 A Yes.

12:46:36

1 Q Okay. And so, what I want to understand
2 is, in paragraph 60, when you say antenna 1, which
3 of those are you referring to? Is that antenna 1,
4 the 8-shaped inductor from, like, a figure 4, or
5 is that antenna 1 the gate on the left-hand side,
6 like in figure 13 or figure 14?

7 A Just have a quick look at paragraph 60 to
8 see how the --

9 Q Yes, take your time.

10 (Witness reviewing document.)

11 A Okay. I'm ready to discuss this.

12 Q Okay. And so, back to my question, there
13 are four usages of antenna 1 in paragraph 60, and
14 I want to clarify what you mean in each of these
15 four instances. So, let's take them one at a
16 time.

17 So, the first sentence of paragraph 60
18 says: Taniguchi fails to show cancellation of the
19 magnetic field emanating from the first antenna 1
20 at a predetermined distance away from the first
21 antenna.

22 What does "antenna 1" refer to in that

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1	sentence?	12:54:23
2	A Okay. I would like to refer back to	12:54:29
3	paragraph 55 right before that, where it says that	12:54:31
4	antenna 1 and antenna 2 are not inductors. Okay?	12:54:35
5	Q Um-hmm.	12:54:40
6	A Now, that -- that can mean antenna 1 and	12:54:41
7	antenna 2 as defined in figure 4. Figure 4 have	12:54:46
8	labels for antenna 1, the figure 8, and antenna 2,	12:54:51
9	the rectangle. They are not inductors. They are	12:54:57
10	not on a semiconductor die.	12:54:59
11	But then paragraph 55 says: The coupling	12:55:01
12	between each antenna and the coils 203 and 204 in	12:55:03
13	the tags 201 and 202 are not reduced.	12:55:08
14	So, I think the only place that those tags	12:55:13
15	201 and 202 are shown is in figure 21. Please	12:55:20
16	correct me if I'm wrong. I've looked through the	12:55:24
17	figures, and I think it's only figure 21.	12:55:26
18	Q Okay. So, figure 21 shows tags 201 and	12:55:35
19	202, which contain coils 203 and 204. That's --	12:55:41
20	A Yes.	12:55:46
21	Q -- that's what you're pointing to?	12:55:46
22	A Yes.	12:55:48

1 Q Okay. And so, what does that mean about
2 what antenna 1 refers to?

3 A Well, so, at this point -- at this point,
4 it's a little bit ambiguous as to whether the
5 gates contain both antenna -- antenna 1 and
6 antenna 2 as shown in figure 4.

7 But regardless of whether the gate 208 is
8 called antenna 1 or antenna 1 and antenna 2 are
9 both within the gate, the statement holds true
10 that antenna 1, antenna 2 are not on a
11 semiconductor die, and the coupling between each
12 antenna and the coils is not reduced.

13 So, in other words, if gate labeled as 208
14 contains antenna 1 and antenna 2 in figure 4, this
15 statement is correct, in paragraph 55, that those
16 two antennas comprising gate 208 do not -- neither
17 of them -- between each antenna, neither of them
18 has reduced coupling to the coils in the tags in
19 figure 21.

20 So, I can take antenna 1 and antenna 2
21 there as being the antennas within the gate, the
22 two antennas within the gate, as we discussed

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1 before.

12:57:29

2 And the same thing would hold true if I
3 called the gate antenna 1. But the coupling
4 between antenna 1 and the coils and the tags would
5 not be reduced.

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6 So, if I take that forward to paragraph 60
7 that you asked me about, where Taniguchi fails to
8 show cancellation of the magnetic field emanating
9 from antenna 1, at a predetermined distance away,
10 that -- that can refer to antenna 1 being the
11 figure 8 in figure 4.

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12 Q Can refer to, or it does refer to?

12:58:09

13 A To me -- to me, it does -- it does refer
14 to it because we are -- we are talking about the
15 figure 8 antenna, whether or not the figure 8
16 antenna has cancellation, and it doesn't have
17 cancellation at the tags.

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18 So, when -- when we're talking about
19 this -- let's see, this paragraph 60, reading on,
20 every embodiment of an antenna is able to provide
21 the magnetic field necessary for -- for mutual
22 inductance between the antenna 1 and the coils in

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1	the tags.	12:59:01
2	So, the gate has antenna 1 within it, and	12:59:02
3	antenna 1 from figure 4 does not have a reduction	12:59:08
4	of the field at a distance, because the field is	12:59:15
5	always strong enough to detect those -- those	12:59:19
6	tags.	12:59:25
7	So -- so, I take this antenna 1 to be the	12:59:26
8	to be the figure 8 antenna, even though we're	12:59:33
9	pointing to figure 14, which has a gate labeled	12:59:36
10	208. It's also called antenna 1 in the discussion	12:59:42
11	of figure 14.	12:59:46
12	And this sentence in 60 -- 60 -- in	12:59:48
13	paragraph 60, meaning the -- the long first	12:59:56
14	sentence, it's referring to figure 4, which has	13:00:03
15	antenna 1 labeled as the figure 8.	13:00:09
16	Q Okay. So, I want to unpack that. So, I	13:00:12
17	think where you just landed that is antenna 1 in	13:00:16
18	the first sentence of paragraph 60, Taniguchi	13:00:19
19	fails to show cancellation of the magnetic field	13:00:22
20	emanating from the first antenna 1 at a	13:00:25
21	predetermined distance away from the first	13:00:27
22	antenna.	13:00:30

1 Did I understand you correctly that that
2 usage of antenna 1 refers to the figure 8 antenna
3 of -- the figure 8-shaped antenna of figure 4 of
4 Taniguchi?

5 A Yes, because it's citing figure 4, and
6 figure 4 has the figure 8 as antenna 1.

7 Q Okay.

8 A Shall we go to the next?

9 Q Let's go to the next usage of antenna 1.
10 I thought I had a follow-up on something you said,
11 but I can circle back.

12 So, the next usage of antenna 1 is near
13 the end of the next sentence: Instead, every
14 embodiment of an antenna in the noncontact
15 identification apparatus in Taniguchi is able to
16 provide the magnetic field intensity necessary for
17 mutual inductance coupling between antenna 1 and
18 the coils 203, 204 and tags 201, 202.

19 And then referencing Taniguchi's figure 4.

20 So, which antenna 1 does that reference?
21 Does that reference the figure 8 antenna of
22 figure 4, or the antenna 1 of the gate on the

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13:01:51

1 left-hand side, which is the combination of the
2 two?

3 A This -- and this is -- so, this still
4 refers to the same figure 8 antenna 1. But it's
5 referring to now -- instead of referring to only
6 the figure 4, it's referring to the coils in the
7 tags that I think are only shown in figure 14, if
8 I'm correct -- I'm sorry, not figure 14,
9 figure 21.

10 Q Right. Understood.

11 A And the reason I say that is because of
12 these -- of these two antennas, we are not
13 showing -- Taniguchi is not showing that there is
14 coupling between the tags and either antenna being
15 reduced or -- or the -- the combination of the two
16 antennas being reduced.

17 So -- but it's the figure 8 where one
18 would expect -- one might expect, with hindsight
19 from looking at the '430, that the figure 8 could
20 have the reduction of the field at a distance.

21 But to the contrary, Taniguchi is showing
22 that -- that antenna 1, even though it's a figure

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1 8, is being designed in combination with figure 2,
2 such that the field isn't reduced at a distance.
3 It's actually strengthened.

4 So, I'm saying that I think -- I think
5 that this -- this paragraph -- as I recall,
6 this -- this paragraph is referring to the antenna
7 1 in figure 4, but it also holds true for the
8 combination of the two antennas and the gate.
9 Because in neither case is the field reduced at a
10 distance.

11 Q So, is it your testimony that the figure 8
12 antenna of Taniguchi alone, if you just take that
13 figure 8 antenna alone, that that does not have a
14 reduced field at a distance?

15 A No, no. The antenna 8 alone can have a
16 reduced field, as we saw, I think, in that
17 paragraph we were looking at earlier, where the
18 combination of the upper and lower loops at a
19 certain point can give cancellation.

20 But Taniguchi -- that's the physics of it.
21 But Taniguchi is trying to -- Taniguchi considers
22 that to be a problem that he is solving, because

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1 he doesn't want that antenna to have a hole at a
2 certain point. And so, he is using that in the
3 combination with antenna 2, so that together they
4 cover the entire field of sensing.

5 Q Okay. So, that covers the first and
6 second usages of antenna 1 in paragraph 60.

7 And then the next sentence we already
8 talked about, this is the one that has -- talks
9 about tag 211, which appears in figure -- figures
10 4 and 5, but is relatively far away. And this is
11 the sentence we talked about where the quote comes
12 not from paragraph 64, as you cite here, but
13 paragraph 65 in Taniguchi.

14 So, antenna 1 in this paragraph, 211
15 that -- tag 211 relatively far away makes
16 interlinkage with many lines of magnetic flux from
17 antenna 1.

18 Does that also refer to the figure 8
19 antenna of figure 4?

20 A I think as we -- we said earlier, there
21 may have been a typo in that this quote appears to
22 come from paragraph 65, which says figure 5 has

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1	many lines of magnetic flux interlinkage with	13:06:43
2	tag 211 and tag 13.	13:06:48
3	And those have difficulty communicating	13:06:50
4	with antenna 1, but favorable communication with	13:06:57
5	antenna 2.	13:07:00
6	So, this is distinguishing antenna 1 and	13:07:02
7	antenna 2 as they appear in figure 5, figure 1	13:07:06
8	being the figure 8 antenna.	13:07:11
9	Q Okay. And so, in this -- this sentence is	13:07:14
10	just an error; is that right?	13:07:17
11	A Well, I think that it's saying -- it's --	13:07:24
12	it appears to be referring to figure 5 and --	13:07:28
13	Q And that should say antenna 2, not	13:07:39
14	antenna 1, correct?	13:07:42
15	A That's correct. For that to work, it's	13:07:43
16	supposed to say figure -- antenna 2. So, there is	13:07:45
17	an error there, that's correct.	13:07:48
18	Q And then the last usage of antenna 1 is in	13:07:50
19	the last sentence: Similarly, figure 14 shows	13:07:53
20	that the electromagnetic field A emanating from	13:07:57
21	antenna 1 in the area between the two gates is	13:08:01
22	sufficiently strong to allow for communication	13:08:03

1 with tags containing coils.

13:08:05

2 And that references paragraph 83 of
3 Taniguchi that we have already talked about.

13:08:08

13:08:11

4 So, which -- what does "antenna 1" mean in
5 that sentence?

13:08:13

13:08:17

6 (Witness reviewing document.)

13:09:16

7 A Well, again, figure -- figure 14, the
8 antenna -- antennas 1 and 2 are indicated by the
9 structures on the left and the right respectively.
10 And paragraph 83 says antennas 1 and 2 are shown
11 in figures 13A and B.

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13:10:00

12 And figures 13A and B have what appear to
13 be two gates that are separated with -- that are
14 labeled antenna 1 and antenna 2. But the
15 description of figure 13 says the gates on the
16 respective sides of the same structure shown in
17 figure 6A to 6E.

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18 And when you look back earlier at figure
19 6A to 6E, each of the embodiments there has the
20 two antennas on top of each other.

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21 What we previously called antenna 1 and
22 antenna 2 in figure 4 will be shown physically on

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1 top of each other and concentric in figure 6A.

13:11:15

2 So, I think it creates a little bit of
3 confusion in Taniguchi, because clearly figure 6A
4 is showing antennas -- what we call the antenna 1
5 and antenna 2 stacked on top of each other.

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6 And figure 13 says that the antennas on
7 the left and the right are just those shown in
8 figure 6. In figure 13, they are not shown
9 perspective, but they are shown -- we may just be
10 looking at, you know, from -- from a different
11 perspective one of the antennas on one side of the
12 gate and the other antenna on the other side of
13 the gate.

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14 So, figure 13 refers to figure 6, but I
15 think figure 13 isn't quite clear in the picture
16 of where antennas 1 and antennas 2 fall in each of
17 those gates.

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18 So, I -- so, I take it at its word that
19 figure 13, that each of the antenna structures has
20 figure 6 in it. Each of those -- each of those
21 structures has two antennas, one on the right and
22 one on the -- two antennas on the right, two

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1	antennas on the left. And that's what being	13:12:47
2	carried over to 14A.	13:12:50
3	Q Okay. So, to close that loop, the usage	13:12:51
4	of antenna 1 in that final sentence, that means	13:12:55
5	that the combination of the two antennas in that	13:13:01
6	left-hand gate?	13:13:05
7	A That's my understanding.	13:13:05
8	Q Okay. I mean, Dr. Prucnal, this is your	13:13:07
9	declaration. You participated in the preparation	13:13:11
10	of this declaration, right? That's what you told	13:13:14
11	me earlier.	13:13:17
12	A These -- these are my opinions for sure.	13:13:18
13	Q Okay.	13:13:20
14	A And I'm saying that I think -- I think	13:13:22
15	that Taniguchi is a little bit unclear in that it	13:13:24
16	may not be labeling antenna 1 antenna 2 the same	13:13:30
17	in figure 14 as it did in figure 4 and in figure 6	13:13:35
18	and all of the other figures preceding it. But I	13:13:39
19	have an understanding of how figure 14 must work,	13:13:43
20	which leads me to this conclusion. It's not just	13:13:45
21	the words.	13:13:48
22	Q Sure. But I'm referring to your	13:13:49

1 paragraph 60, where you interpret Taniguchi and
2 trying to get clarity on what your conclusions are
3 in this paragraph.

4 A Yes. So, as I said earlier, my -- my
5 conclusions are that we are speaking about all the
6 way through the -- all the way through Taniguchi,
7 and antenna 1 and antenna 2 as they are described
8 in figure 4, figure 5, 6, 7, 8, et cetera,
9 figure -- figure 10.

10 In all of those cases, the field from
11 antenna -- antenna 1, which is the figure 8, is
12 not reduced. It's combined with figure 2 to
13 provide better coverage, but it's not reduced.

14 And so, that statement applies whether --
15 whether you consider antenna 1 alone or in
16 combination with antenna 2, which is how it's
17 presented.

18 I believe that the labeling changes when
19 we get to figure 14, where now we have the two
20 antennas on the left and the two antennas on the
21 right, and also in figure 21, where the gate
22 contains two antennas, antenna 1 antenna 2.

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13:15:06
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1	Q	So, I want to follow up on something you	13:15:35
2		just said. And I'm looking at the realtime, so	13:15:37
3		correct me if I say this wrong, but you said: The	13:15:39
4		field from antenna 1, which is the figure 8, is	13:15:44
5		not reduced.	13:15:48
6		And then you said: That statement applies	13:15:50
7		whether you consider antenna 1 alone or in	13:15:53
8		combination.	13:15:56
9		So, is it your testimony that you don't	13:15:56
10		get reduced field from the figure 8 antenna alone?	13:16:00
11	A	I misspoke there.	13:16:08
12	Q	Okay. Thank you.	13:16:09
13		So, just to finish up on Taniguchi --	13:16:19
14		well, at least on this piece of Taniguchi, in	13:16:23
15		figure 4, we talked about the 8-shaped antenna	13:16:28
16		loop. And you described how current flows through	13:16:34
17		that 8-shaped loop.	13:16:38
18	A	That would be figure 4.	13:16:41
19	Q	Figure 4, right.	13:16:43
20		So -- go ahead.	13:16:44
21	A	I'm sorry, figure 4 of which?	13:16:47
22	Q	Of Taniguchi.	13:16:50

1	A	Okay.	13:16:53
2	Q	Okay. And so, you agree that that figure	13:16:54
3		shows current carrying conducting loops; is that	13:16:57
4		right?	13:17:10
5	A	I agree. I don't think we actually talked	13:17:10
6		about the current flow in this figure 4, which is	13:17:13
7		why I hesitated.	13:17:16
8	Q	Oh, okay. I apologize if I misspoke	13:17:18
9		there. But you agree that that's what is going on	13:17:20
10		in Taniguchi, figure 4, you have current carrying	13:17:23
11		conducting loops; is that right?	13:17:27
12	A	Yes.	13:17:28
13	Q	Okay. And we already talked about the	13:17:29
14		'430 patent and we looked at the figure 2, the	13:17:34
15		figure 8-shaped inductor. And you agree that's	13:17:36
16		also a figure 8-shaped current carrying conductor	13:17:39
17		in the shape of figure 8, right?	13:17:44
18	A	Yes.	13:17:47
19	Q	Okay. Let's talk about far field. So, if	13:17:47
20		we can go to your supplemental declaration, which	13:17:59
21		is Exhibit 2009.	13:18:02
22	A	Okay.	13:18:16

1	Q Paragraph 18.	13:18:17
2	A I'm at -- I'm at paragraph 18.	13:18:35
3	Q Of Exhibit 2009.	13:18:37
4	Okay. So, paragraph 18 says: The	13:18:40
5	magnetic field needs to be at a far field distance	13:18:42
6	to be sure it is uniform, not because it needs to	13:18:45
7	be a propagating EM wave.	13:18:49
8	Do you see that?	13:18:51
9	A Yes.	13:18:53
10	Q What do you mean by that?	13:18:53
11	A Well, so, there is a definition of far	13:18:58
12	field that is conventionally used when thinking	13:19:06
13	about antennas. And when thinking about antennas,	13:19:09
14	the far field is -- I guess to put it simply, is a	13:19:14
15	distance that's much longer than a wavelength of	13:19:21
16	the radiation produced. So, it depends upon the	13:19:25
17	electromagnetics. You have an antenna of a	13:19:27
18	certain size.	13:19:30
19	Based on the size of the -- in geometry of	13:19:30
20	the antenna, it will generate radiation of a	13:19:34
21	certain wavelength. And the far field is more	13:19:37
22	than one wavelength, approximately, or multiple	13:19:40

1 wavelengths. That's what a far field is when
2 you're transmitting electromagnetic radiation.

3 That's not the definition of far field
4 that is adopted in the '430 when they're
5 describing how the field cancellation occurs.

6 The -- that definition in '430 is the
7 distance away from an inductor where the magnetic
8 field cancels -- an inductor in a figure 8, I
9 should say, where the magnetic field cancels.

10 So, that's not -- that's not the same as
11 the definition of a far field for an antenna which
12 has a propagating electromagnetic wave.

13 Q And just to confirm, you agree that the
14 construction that we talked about earlier that was
15 adopted in the prior proceeding is the one that
16 the broad should apply here, which was -- I'm
17 trying to find it -- the electromagnetic field
18 from a certain distance from the first inductor
19 where the second inductor is positioned.

20 That's the construction of far field that
21 you think should be adopted here?

22 A May I look at that again, please?

1	Q Absolutely. That is in your supplemental	13:21:21
2	declaration at paragraph 15.	13:21:24
3	A Yes.	13:21:36
4	Q Okay. So, you're saying yes, that is the	13:21:36
5	construction that you think should apply here?	13:21:39
6	A Yes, the term "far field" has been	13:21:41
7	construed to mean the electromagnetic field at a	13:21:44
8	certain distance from the first inductor where the	13:21:48
9	second inductor is positioned. I agree with that.	13:21:50
10	Q Okay. And so, the statement in your	13:21:53
11	paragraph 18 that we just talked about, the point	13:21:55
12	you were making there is that a more traditional	13:22:01
13	definition of far field --	13:22:05
14	A No.	13:22:09
15	Q -- is that right?	13:22:10
16	A No. The -- the far field, as construed,	13:22:10
17	is the definition of far field used in the '430	13:22:14
18	patent.	13:22:17
19	Q Right, but we were -- prior to that, we	13:22:19
20	were talking about your paragraph 18. And so, I	13:22:20
21	just want to confirm that what you say in	13:22:27
22	paragraph 18 is not the definition of far field	13:22:29

1	that you think should apply in this case?	13:22:35
2	A No, no, no. No. Paragraph 18 agrees with	13:22:37
3	the construction that I'm supporting, because --	13:22:42
4	Q Oh, okay. I'm -- I apologize. I got	13:22:45
5	ahead of myself.	13:22:47
6	Okay. So, paragraph 18 agrees with the	13:22:49
7	construction. What you were explaining in the	13:22:51
8	context of that is actually what you say in	13:22:56
9	paragraph 23, if you want to page forward, where	13:22:59
10	you talk about being much closer than a	13:23:03
11	wavelength. I apologize. I messed that up.	13:23:06
12	A So, in paragraph 23, I'm saying that the	13:23:25
13	second antenna is not in the far field, in the	13:23:28
14	traditional definition of far field, which is the	13:23:36
15	one that applies to Taniguchi, because Taniguchi's	13:23:40
16	talking about antennas. That definition is much	13:23:43
17	larger than a wavelength.	13:23:48
18	Q Okay. And so, back to paragraph 18, your	13:23:51
19	second sentence is: This is the distance -- we're	13:24:01
20	talking about far field. This is the distance	13:24:04
21	where the fields become equal and opposite.	13:24:06
22	Do you see that?	13:24:09

1	A Yes.	13:24:10
2	Q And this is your understanding of how the	13:24:10
3	'430 patent uses far field?	13:24:13
4	A It does, yes.	13:24:15
5	Q Okay. And so -- so, is there only one	13:24:16
6	place where the fields become equal and opposite	13:24:46
7	that you would call far field? Where is the far	13:24:50
8	field --	13:24:52
9	A Well --	13:24:54
10	Q -- based on your understanding of the	13:24:54
11	inductor in the '430 patent?	13:24:56
12	A Yes. So -- so, the far field -- so, the	13:24:58
13	'430 patent talks about using a figure 8 antenna,	13:25:03
14	such that when you place a second antenna in its	13:25:09
15	far field, the magnetic fields are canceled.	13:25:12
16	That -- that distance is such that if you	13:25:18
17	look at -- if you look at a horizontal axis going	13:25:22
18	right through the figure 8, the distance between	13:25:28
19	any point on that horizontal axis, once the fields	13:25:31
20	have become uniform and opposite, they will	13:25:35
21	cancel.	13:25:38
22	So, for positions that are close to	13:25:39

1 that -- close to that point that's equidistant
2 from the centers of the two loops, that's where
3 the best cancellation will occur.

13:25:42

13:25:48

13:25:50

4 That won't happen if it's near the center
5 8 and too close -- near the figure 8 and too close
6 to it, because the fields won't be equal and
7 opposite at that point.

13:25:52

13:25:55

13:25:58

13:26:00

8 But as you get further away and the fields
9 become more flat, for example, the way the fronts
10 become more flat, then the two fields will cancel.

13:26:01

13:26:04

13:26:07

11 And the figure 8 -- the '430 uses the term
12 "far field" to say, when we're far enough away
13 from the figure 8, such that these two fields sum
14 up and they are equal and opposite, at that
15 distance, if we put a second inductor there, we
16 will have cancellation.

13:26:12

13:26:15

13:26:18

13:26:21

13:26:24

13:26:26

17 Now, it's not only one distance. It's
18 just far enough way. And when you go beyond that
19 distance, generally the fields will still be equal
20 and opposite to one another and you will still get
21 cancellation.

13:26:29

13:26:32

13:26:34

13:26:38

13:26:41

22 And so -- and I think -- I think the '430

13:26:42

1 calculations show that.

13:26:46

2 Q So, since we're talking about the figure 8
3 inductor from the '430 patent, what is the
4 magnetic field produced by that figure 8 compared
5 to the magnetic field that would be produced by
6 the figure 8 from Taniguchi?

13:26:53

13:26:55

13:27:03

13:27:05

13:27:08

7 A Well, for one thing, the scale, the
8 size -- the size and the scales of these two
9 structures are vastly different from one another.
10 And so, the distances of -- the distances where
11 the fields might cancel are -- are completely
12 different.

13:27:15

13:27:20

13:27:23

13:27:28

13:27:34

13:27:38

13 The -- the antenna in Taniguchi is about
14 1,000 times larger than the inductors in -- in the
15 '430. So, they both have the same physics in that
16 there is a field produced. But the scale is such
17 that what happens after that with the fields
18 combining would be at much different distances.

13:27:38

13:27:45

13:27:49

13:27:58

13:28:03

13:28:09

19 And I guess I would add to that, that
20 Taniguchi is designed -- I mean, what Taniguchi is
21 all about is producing a strong field at a
22 distance away from it where the RFID tags are, not

13:28:14

13:28:19

13:28:22

13:28:28

1 at producing field cancellation.

13:28:33

2 Q And when you're talking about Taniguchi
3 and being designed to produce a strong field at a
4 distance, you're not referring to the magnetic
5 field produced solely by the figure 8 antenna,
6 though, are you?

13:28:56

13:29:02

13:29:05

13:29:09

13:29:13

7 A Taniguchi would like to have the figure 8
8 antenna -- Taniguchi would like to have the field
9 of each antenna be as strong as possible to detect
10 the RFID tag, as strong as possible where the RFID
11 tag is located.

13:29:15

13:29:25

13:29:33

13:29:38

13:29:42

12 Two antennas are used to allow covering
13 the entire field pattern to not allow there to be
14 holes. Taniguchi doesn't discuss how the -- you
15 know, the field of the -- Taniguchi discusses how
16 antenna 1 would interact with antenna 2 such that
17 antenna 1 and antenna 2 would reduce the strength
18 of each antenna. And by making one of them a
19 figure 8, in that effect, is to produce a stronger
20 field overall and a more uniform field overall.

13:29:44

13:30:01

13:29:57

13:30:04

13:30:16

13:30:21

13:30:25

13:30:29

13:30:33

21 Q Okay. And so -- strike that. We'll move
22 on.

13:30:44

13:30:51

1	Let's turn to paragraph 48.	13:31:02
2	MR. WARR: Are we still in Exhibit 2009,	13:31:03
3	Christie?	13:31:06
4	MS. LAROCHELLE: Correct.	13:31:07
5	A Okay.	13:31:11
6	Q So, in paragraph 48, you refer to	13:31:30
7	Taniguchi's antenna's magnetic field is not	13:31:32
8	canceled, as in the '430 patent, by having two	13:31:35
9	identical but opposite fields superimposed in the	13:31:39
10	far field.	13:31:44
11	And then Taniguchi's second antenna is not	13:31:44
12	located in the far field immediately adjacent.	13:31:47
13	And then the next sentence is where I want	13:31:49
14	to focus. You say: Taniguchi has no cancellation	13:31:52
15	of the magnetic field whatsoever.	13:31:57
16	What do you mean by that?	13:31:59
17	A So, we're talking about the interaction of	13:32:08
18	antenna 1 and antenna 2 here. That's what	13:32:12
19	Taniguchi is focused on.	13:32:14
20	And in the '430 patent, the two inductors	13:32:16
21	are deliberately separated at a distance where the	13:32:24
22	field from the figure 8 magnetic field cancels.	13:32:27

1 We've discussed that.

13:32:32

2 Taniguchi is the opposite. Taniguchi has,
3 not two inductors, but two antennas. They are
4 concentric and on top of each other. And that
5 configuration does not produce a cancellation of a
6 magnetic field at -- from antenna 1 at antenna 2.

13:32:33

13:32:37

13:32:40

13:32:47

13:32:52

7 In fact, the combination of the two
8 antennas are designed so that the magnetic field
9 is not canceled at a distance further away so that
10 the magnetic -- so that the RFID tags can be
11 sensed.

13:32:57

13:33:01

13:33:04

13:33:08

13:33:14

12 On the contrary, Taniguchi's first antenna
13 induces currents directly in the second antenna,
14 and the currents cancel. Not the magnetic field.

13:33:14

13:33:18

13:33:22

15 Q Okay. I want to move on and talk about
16 the Midya reference, and the Midya Raghavan
17 combination now. Let me go ahead and put those
18 two references into the chat. And so that you can
19 reference them, you will find Midya at tab 8. And
20 Raghavan you will find at tab 9. Those should be
21 coming through in the chat.

13:34:03

13:34:09

13:34:15

13:34:28

13:34:31

13:34:44

13:34:53

22 MS. LAROCHELLE: And for the record, Midya

13:35:08

1	is already entered as Exhibit Intel 1007. And	13:35:10
2	Raghavan is entered as Exhibit Intel 1008 in IPR	13:35:16
3	2024-00728.	
4	Q Just let me know when you have both of	13:35:26
5	those.	13:35:27
6	A I have them both.	13:35:28
7	(Previously marked for identification	13:35:29
8	Exhibits 1007 and 1008, Miday and Raghavan.)	13:35:30
9	Q Okay. And regarding Midya Exhibit Intel	13:35:30
10	1007, did you review this document in preparation	13:35:34
11	for your deposition?	13:35:37
12	A Yes.	13:35:38
13	Q And regarding Raghavan Intel 1008, did you	13:35:39
14	also review this document in preparation for your	13:35:44
15	deposition?	13:35:46
16	A Yes.	13:35:48
17	Q Okay. So, let's go to paragraph 39 of	13:35:48
18	your first declaration, so that would be	13:35:56
19	Exhibit 2002.	13:36:00
20	A Okay.	13:36:17
21	Q In paragraph 39, I want to look at the	13:36:18
22	second half of paragraph 39, which is at the top	13:36:30

1 of page 18. And you state: Generally, in
2 references alleged by Intel to teach an inductor
3 having two sections or loops, the terminals are
4 not closely spaced because the actual points of
5 contact on the loops to the two conductors that
6 supply electrical current are spaced apart.

13:36:33

13:36:39

13:36:42

13:36:45

13:36:48

13:36:51

7 And then you reference 1007, which is
8 Midya.

13:36:54

13:36:57

9 And then it says Exhibit 2008, but I think
10 that's typo and it should say 1008, figure 3,
11 which is Raghavan.

13:36:57

13:37:04

13:37:08

12 If you could confirm that. You've got the
13 reference in front of you, so you can confirm that
14 we're talking about figure 1 from Midya and figure
15 3 from Raghavan.

13:37:09

13:37:13

13:37:15

13:37:18

16 A Yes, I see that.

13:37:24

17 Q Okay. And so, what do you mean by "the
18 actual points of contact on the loops are spaced
19 apart"? What does that refer to?

13:37:24

13:37:27

13:37:32

20 A If I may, I would like to look at the
21 section where this is discussed.

13:37:37

13:37:43

22 Q And can you tell me what you're looking at

13:37:48

1	when you're there?	13:37:50
2	A Sure. I'm looking for where the	13:37:51
3	combination of Midya and Raghavan is discussed.	13:37:53
4	Q In your declaration?	13:37:59
5	A Yeah, maybe I should just read a little	13:38:00
6	further in my declaration.	13:38:02
7	I know this is one of the grounds. I'm	13:38:26
8	just not sure exactly where I discuss it in my	13:38:29
9	report.	13:38:32
10	Q Yeah. I'm going to try to help you out	13:38:32
11	here. I mean, you talk about it somewhat in this	13:38:34
12	paragraph. But if you go to --	13:38:43
13	MR. WARR: 84 is where it starts.	13:38:52
14	MS. LAROCHELLE: Where it starts, thank	13:38:54
15	you.	
16	MR. WARR: You're welcome.	13:38:55
17	THE WITNESS: Thank you.	13:38:56
18	(Witness reviewing documents.)	13:39:11
19	A Okay. So -- so, in looking at this, I	13:40:58
20	haven't -- I haven't read the whole section, but I	13:41:01
21	just read enough, I think, to answer your	13:41:03
22	question. And I think you're asking about the	13:41:05

1 sentence at the top of page 18, of my initial
2 report --

3 Q Okay.

4 A -- where I say that: The references
5 alleged by Intel, to teach an inductor having two
6 sections or loops, the terminals are not closely
7 spaced for the actual content on the, quote, loops
8 to the two conductors that supply electrical
9 current are spaced apart.

10 So, I think -- I think the key here is
11 that the references I'm talking about by Intel are
12 the ones that have an inductor with two sections
13 or loops, two loops in it.

14 And that would be Midya, which requires
15 several loops. I think he said at least three.

16 And in Midya, the -- the two points of
17 contact are not on the same -- are not on the same
18 loop. They are not connected to the same loop.
19 So, although Midya's terminal is 102 might appear
20 to be close together -- first of all, Midya
21 doesn't teach that there is any benefit, you know,
22 in terms of field canceling, having them close

13:41:12
13:41:17
13:41:18
13:41:19
13:41:23
13:41:32
13:41:38
13:41:43
13:41:45
13:41:47
13:41:49
13:41:56
13:42:02
13:42:04
13:42:10
13:42:12
13:42:25
13:42:30
13:42:34
13:42:40
13:42:44
13:42:47

1	together. So, they may or may not be close	13:42:52
2	together.	13:42:54
3	But I think, as importantly, those two	13:42:55
4	terminals are not on the same loop. They are not	13:42:57
5	connected to the same loop.	13:43:00
6	The reason I mentioned Exhibit 2008 is	13:43:02
7	that the attempt to combine Raghavan with Midya	13:43:13
8	would still not lead to the two terminals being	13:43:23
9	connected to the same -- the same loop. And they	13:43:27
10	wouldn't necessarily be spaced close together,	13:43:31
11	even if they were not.	13:43:34
12	Q Okay. So, let's take the next step from	13:43:40
13	there and go to your supplemental declaration,	13:43:43
14	Exhibit 2009. And I would like to look at	13:43:49
15	paragraph 57.	13:43:52
16	A Okay.	13:44:11
17	Q Okay. And in 57, this is under the	13:44:12
18	section ground 3 Midya and Raghavan, and you start	13:44:15
19	by saying: Intel's proposed combination of Midya	13:44:20
20	and Raghavan does not disclose or teach connecting	13:44:25
21	to two closely spaced terminals connected to the	13:44:28
22	first loop for supplying electrical current to the	13:44:31

1	first and second loops, while minimizing magnetic	13:44:35
2	field contributions from the terminals as required	13:44:35
3	by the '430 patent.	13:44:37
4	Do you see that?	13:44:38
5	A Yes.	13:44:39
6	Q So, the sentence I want to ask you about	13:44:40
7	is the next sentence: The additional loop	13:44:43
8	generates an EM field that is not reduced or	13:44:45
9	canceled by any structure in Midya.	13:44:48
10	What do you mean by that? What is the	13:44:51
11	additional loop, is I guess what I really want to	13:44:54
12	ask?	13:44:59
13	A Okay. So, to explain that clearly, it	13:44:59
14	probably would help for us to look at a figure --	13:45:02
15	figure from Midya.	13:45:05
16	Q Sure. So, which figure would you like to	13:45:06
17	look at?	13:45:08
18	A I'm thinking of the one with the four --	13:45:08
19	the four spirals.	13:45:13
20	Q I think that's figure 1.	13:45:14
21	A Yes, it is.	13:45:20
22	Q Okay. So, looking at figure 1 of Midya,	13:45:21

1 which is Intel's Exhibit's 1007.

13:45:24

2 A All right. So, what I'm saying is that
3 Midya attempts to have counter-propagating
4 currents in the various loops that -- in which
5 the -- the fields would cancel. But because Midya
6 is not using a figure 8, as required by the
7 patent, you cannot have two terminals coming off
8 of only one of the loops.

13:45:28

13:45:33

13:45:40

13:45:43

13:45:46

13:45:51

13:45:57

9 To traverse the entire current path, here,
10 unlike the figure 8, you have to -- if we looked
11 at this figure 1, let's say we had current going
12 in the right-hand terminal, there is two terminals
13 labeled 102, and -- okay?

13:45:58

13:46:03

13:46:08

13:46:11

13:46:15

14 Q Um-hmm, I see that.

13:46:20

15 A Okay. So, we go in the right-hand
16 terminal, and then because this is a spiral
17 inductor, that inductor spirals to the center and
18 ends at the middle.

13:46:21

13:46:23

13:46:27

13:46:30

19 So, any spiral has the problem that its
20 beginning point and its ending point are spaced
21 far apart, first of all. Okay?

13:46:32

13:46:36

13:46:39

22 But in Midya, what -- what is done is to

13:46:41

1	connect that center point of -- call it the lower	13:46:46
2	right-hand spiral -- underneath through the dashed	13:46:50
3	vertical line 104 to the next spiral, to the	13:46:55
4	center of the next spiral, which is on the upper	13:46:59
5	right.	13:47:02
6	And from there, the current loop spirals	13:47:02
7	outward, and it ends up, you know, somewhere sort	13:47:06
8	of in the middle, and we need another vertical	13:47:11
9	line that brings us up to the upper left spiral.	13:47:14
10	Thereupon spirals back in again to the center,	13:47:20
11	dashed vertical line to the inside of the last	13:47:24
12	spiral, which is the lower left. Spirals back	13:47:27
13	out, where it ends at the left-hand terminal 102.	13:47:30
14	So, the -- the design in the figure 8	13:47:33
15	inductors is such that there is a -- a symmetry,	13:47:38
16	and such that the fields cancel, and such that	13:47:41
17	there is no other loop produced by -- by	13:47:45
18	connecting the terminals directly to the -- to one	13:47:48
19	of the -- one of the loops.	13:47:51
20	The additional loop that's created here is	13:47:54
21	actually a current path that has to traverse	13:47:58
22	the -- the dashed vertical line for conductor 104,	13:48:05

1	and then the vertical line that is between the	13:48:11
2	upper right and lower -- upper right and upper	13:48:17
3	left spirals, and then the dashed line 114 that	13:48:22
4	comes down.	13:48:26
5	So, even if the spirals were having	13:48:26
6	counter-propagating currents that canceled, the	13:48:32
7	current that traverses this path going up 104,	13:48:35
8	across between the two inductors on the top, and	13:48:40
9	then down 114, in the direction that I've	13:48:44
10	discussed is an additional counterclockwise loop,	13:48:47
11	because the current is going up, across and down.	13:48:54
12	And that counterclockwise loop produced by these	13:48:58
13	additional interconnections between the spirals is	13:49:04
14	a large loop that's not compensated anywhere.	13:49:07
15	And that's -- that's what the -- that's	13:49:09
16	what the -- the patent is trying to prevent by	13:49:12
17	putting the two terminals connected to the same	13:49:21
18	loop.	13:49:24
19	Q So, just so that I understand, you're	13:49:32
20	pointing to these dotted lines that connect the	13:49:36
21	centers of the spirals. So, there is one dotted	13:49:39
22	line on the left-hand side connecting the	13:49:44

1 left-hand bottom and left-hand top center spirals,
2 and there's another dotted line connecting the
3 center of the bottom right and top right spirals,
4 correct?

13:49:47
13:49:51
13:49:54
13:49:58

5 A And in addition to that, the connection
6 that is made between the upper right and upper
7 left spirals, which is that solid line that comes
8 up between them. It's not labeled.

13:49:59
13:50:02
13:50:06
13:50:11

9 Q So, this additional loop that you just
10 described, this is a feature of Midya, right?

13:50:15
13:50:20

11 A Well, yes. We're talking about Midya.
12 And the fact that, you know, I think it's a
13 liability of Midya that each spiral begins either
14 on the inside or outside and goes to the inside or
15 outside. Your left -- each spiral leaves you at a
16 different point than it started. And, therefore,
17 these additional lines that we just agreed on are
18 necessary interconnections to hook the spirals
19 together. That's what forms the additional loop
20 in Midya.

13:50:24
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13:50:56
13:50:59

21 Q And it's your opinion that that additional
22 loop creates a magnetic -- or an electromagnetic

13:51:00
13:51:03

1 field that's not reduced or canceled by any other
2 structure in Midya; that's your testimony?

13:51:11

13:51:14

3 A Yes, this is -- this is an asymmetry that
4 creates -- creates an additional loop, an
5 additional magnetic field that's not compensated.

13:51:16

13:51:19

13:51:21

6 Q When you prepared your supplemental
7 declaration, you reviewed Intel's petition for
8 IPR, correct?

13:51:45

13:51:49

13:51:56

9 A At some point, I did, yes.

13:51:57

10 Q Okay. And you reviewed the declaration of
11 Dr. Tentzeris, correct?

13:51:59

13:52:05

12 A Yes.

13:52:05

13 Q And in the petition in the declaration,
14 Intel argues that it's the combination of Midya
15 and Raghavan that renders obvious the '430 patent
16 claims; is that your understanding?

13:52:06

13:52:12

13:52:16

13:52:20

17 A I -- I understand that there is a ground
18 that combine Midya and Raghavan, yes.

13:52:24

13:52:26

19 MS. LAROCHELLE: So, it's been a little
20 over an hour. Why don't we take a short break?

13:52:52

13:52:53

21 THE WITNESS: Okay.

13:52:58

22 (Off the record.)

13:52:59

1	BY MS. LAROCHELLE:	13:58:45
2	Q Okay. Welcome back. And just to confirm,	13:58:49
3	Mr. Prucnal, you did not speak to anybody about	13:58:52
4	the substance of your testimony during the break?	13:58:54
5	A That's correct.	13:58:56
6	Q Okay. I want to move on now to a new	13:58:57
7	topic. You previously provided an expert opinion	13:59:01
8	about the '430 patent at the International Trade	13:59:06
9	Commission and investigation 337-TA-1300; is that	13:59:12
10	right?	13:59:17
11	A I believe so.	13:59:17
12	Q Okay. Do you still agree with the	13:59:21
13	opinions that you provided in that case?	13:59:23
14	A I actually don't recall the opinions I	13:59:25
15	provided, but I'll stand by whatever opinions I	13:59:29
16	provided.	13:59:32
17	Q When did you last review your testimony	13:59:33
18	from the 1300 investigation?	13:59:37
19	A I don't even know what year that took	13:59:39
20	place, but it would have to be -- it would have to	13:59:41
21	be whenever, you know -- my testimony, you mean	13:59:44
22	for the trial? I probably never reviewed my	13:59:46

1 testimony from the trial. But we only looked at
2 the relevant documents before the trial and not
3 after.

13:59:48

13:59:52

13:59:55

4 Q Okay. Well, I'm going to put in the chat
5 here a document, and this is also in your box of
6 hard copy documents on tab 4. And tab 4 is your
7 declaration. Let's see, it's titled: Declaration
8 of Paul R. Prucnal, PhD, in support of
9 complainant's claim construction brief, submitted
10 in ITC investigation number 337TA1300.

13:59:55

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14:00:19

14:00:22

11 And as I said, this is tab 4 in your box
12 of documents?

14:00:26

14:00:29

13 MS. LAROCHELLE: And, Ali, this should be
14 at the file share that I sent you.

14:00:30

14:00:32

15 MR. WARR: It was.

16 MS. LAROCHELLE: And this is not in the
17 record at the -- at the -- at the P tab yet. So,
18 let's mark this as Prucnal Exhibit 1, attach --
19 and attach it to the transcript.

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14:00:46

20 (Marked for identification Exhibit 1, Dr.
21 Prucnal's declaration.)

14:00:48

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22 Q Would you let me know when you have that?

14:00:58

1	A I have it.	14:00:59
2	Q Okay. And so, does this refresh your	14:01:00
3	recollection about providing testimony in a	14:01:01
4	previous -- at least by declaration, in a previous	14:01:03
5	proceeding?	14:01:06
6	(Witness reviewing document.)	14:01:19
7	A It doesn't refresh my memory very much. I	14:01:22
8	guess this was three years ago. And it's in	14:01:26
9	support of complainant's claim construction brief.	14:01:32
10	And I signed it.	14:01:37
11	Q Okay. You provided an opinion about the	14:01:40
12	closely spaced terminals claim term in the '430	14:01:45
13	patent. If you turn to page 18, you will see	14:01:48
14	that.	14:01:53
15	A Okay. I see two closely spaced terminals.	14:02:02
16	Q Okay. And you said before, just to	14:02:05
17	confirm, that you stand by your testimony in this	14:02:09
18	previous investigation?	14:02:12
19	A Well, I do. I don't recall what my	14:02:17
20	testimony was here, but I...	14:02:20
21	Q Okay. Well, let's take a look at what	14:02:22
22	your testimony was. So, at the top, the heading	14:02:24

1 of this section, two closely spaced terminals, you
2 provide Ericsson's proposed construction, which is
3 plain and ordinary meaning, which is two terminals
4 in proximity to each other such that the
5 electromagnetic field at a certain distance from
6 the first inductor where the second inductor is
7 positioned is reduced.

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8 A Yes, I see is that.

14:02:54

9 Q Okay. Do you still agree with this
10 proposed construction for closely spaced
11 terminals?

14:02:56

14:02:59

14:03:02

12 A Well, I do, but I assume that there was a
13 lot of analysis of the patent, et cetera, that
14 goes into this.

14:03:02

14:03:04

14:03:11

15 THE WITNESS: Sorry if you heard my phone
16 ring my phone connected to my computer even though
17 it was muted.

14:03:33

14:03:22

14:03:25

18 MS. LAROCHELLE: That's fine.

14:03:26

19 A So what I was saying is that I -- I do
20 agree with it, but I also assume that there was a
21 lot of thought that went into the analysis that I
22 don't recall.

14:03:31

14:03:35

14:03:37

14:03:40

1	Q	Okay. That's fair. Let's look at	14:03:42
2		paragraph 63.	14:03:45
3	A	Okay.	14:03:51
4	Q	So, furthermore, as explained in the '430	14:03:52
5		patent, when there are multiple conductive coils	14:03:58
6		on a chip, the resulting magnetic field at a	14:04:01
7		particular location is the combination of the	14:04:03
8		magnetic field contributions from each of these	14:04:05
9		conductors. And if current is flowing in opposite	14:04:07
10		directions in the two different conductors, the	14:04:11
11		magnetic fields from the conductors will also be	14:04:12
12		in opposite directions and tend to cancel each	14:04:14
13		other out at locations away from those two	14:04:19
14		conductors.	14:04:21
15		Do you see that?	14:04:22
16	A	I do. I would just like to look at it	14:04:23
17		again, please.	14:04:26
18	Q	Take your time.	14:04:27
19	A	Yes, I see that, okay.	14:04:45
20	Q	Okay. Do you still agree with that	14:04:47
21		statement?	14:04:48
22	A	Yes, I do.	14:04:49

1 Q And I notice that you didn't cite any
2 references in this paragraph. Why is that?

3 A Well, again, this is -- this is a few
4 years ago and I don't recall -- I don't recall the
5 details of this. But this is -- this is general
6 knowledge that I would have that if you have two
7 conductors with currents in opposite directions,
8 they would generate opposite fields that would
9 tend to cancel. It's my general knowledge.

10 Q Okay. I'm entering into the chat the
11 document that you will find at tab 2, and this is
12 the Brooks reference, which is already entered as
13 Exhibit Intel 1010 to the IPR. Just for the sake
14 of convenience, I have provided just an excerpt of
15 chapter 9 for you at tab 2.

16 (Previously marked for identification
17 Exhibit 1010, excerpt of chapter 9.)

18 Q Let me know when you have you that.

19 A I have it.

20 Q Okay. And if you can go to page 157 in
21 Intel Exhibit 1010.

22 A Okay.

1 Q Now, figure 92 shows two conductors -- two
2 current carrying conductors having current in
3 opposite directions. And the text at the top of
4 page 157: The currents will be equal and
5 opposite. Therefore, the magnetic fields will
6 also be equal and opposite.

7 And then it goes on to discuss where you
8 will see cancellation.

9 And under the figure, it says: In the
10 limit, if the wires are very close together, EMI
11 radiations completely cancel and would not be
12 measurable.

13 So, is -- is this consistent with the
14 statement that you made in the ITC investigation?

15 MR. WARR: I'm going to object to the form
16 of the question.

17 A You know, there's -- it's -- it's a
18 difficult question to answer because there is so
19 much packed into the ITC report that I wrote that,
20 you know, I don't -- I don't recall. But my
21 position about the claim construction was that --
22 that if the two terminals are in proximity such

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14:07:01
14:07:03
14:07:03
14:07:04
14:07:16
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14:07:18
14:07:19
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14:07:26
14:07:31
14:07:38

1 that the electromagnetic field of a certain
2 distance from the first inductor is reduced,
3 the -- that statement about how the fields would
4 behave for two parallel conductors is consistent
5 with what happens in two parallel wires with
6 currents going in different directions.

14:07:56

14:07:54

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14:08:10

14:08:14

14:08:20

7 And I believe what Brooks is talking about
8 here is that those fields would tend to cancel.
9 And from an outside perspective away from these
10 two conductors, the closer the two conductors are
11 relative to the distance away that you're
12 observing, the greater the -- the cancellation.

14:08:25

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13 But -- but, again, Brooks is talking -- as
14 I recall, this whole book was on -- was on printed
15 circuit -- on PCBs, printed circuit boards. So,
16 it -- although this principle is the same, it does
17 not relate to integrated circuits or inductors on
18 integrated circuits in any way.

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14:08:54

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19 Q You just said the principle is the same?

14:09:21

20 A Well, the physics, the electromagnetics of
21 having -- having opposite fields coming from
22 currents in different directions is the same -- is

14:09:24

14:09:29

14:09:32

1 the same principle.

14:09:35

2 But -- but to the extent that there's a
3 desire to combine this with the other prior art we
4 have seen, this -- this is not a place certainly
5 that I would look, because this is a book on
6 printed circuit boards.

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14:09:55

7 In fact -- in fact, this book completely
8 teaches away from using inductors. You know, I
9 would not go to this book to learn about
10 inductors. You know, it teaches that -- if you
11 have a need for an inductor in a circuit on a
12 printed circuit board, find a way around it.

14:09:56

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13 So, I wouldn't -- I wouldn't go to this
14 for any kind of -- any kind of insight as to how
15 to design an integrated circuit. It's just --
16 it's just very, very different. The design rules
17 are entirely different.

14:10:17

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14:10:36

18 And, in fact, I would say one other thing,
19 and this is going back to my report, that one
20 understands how printed circuit boards are laid
21 out and integrated circuits are laid out. In
22 fact, the conductors have to be spaced at a

14:10:38

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1 certain distance so there is not crosstalk between
2 them. So, there is sort of conflicting --
3 conflicting needs here.

14:10:58

14:11:01

14:11:04

4 Where on an integrated circuit, you have
5 to space apart those lines to keep them from
6 interacting with one another.

14:11:07

14:11:09

14:11:12

7 I think -- if I may add just one more
8 thing.

14:11:30

14:11:33

9 Q Sure.

14:11:34

10 A I did recall that as I read further down
11 on this page, the real point of Brooks here was
12 to -- to motivate the concept of using twisted
13 pairs. And -- and twisted pairs are wires that
14 have insulation on them, ordinary wires with
15 insulation on them. And they're twist -- if they
16 have currents going in opposite directions, they
17 are twisted around each other. And what that does
18 is permit you to not space the conductors far
19 apart. You can actually space them pretty close
20 together, because there is an insulation between
21 them.

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14:12:01

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14:12:16

22 And the fact that it's twisted means that

14:12:16

1	sometimes -- if you are at given point away from	14:12:18
2	these wires, sometimes, say, the red wire is	14:12:21
3	closer. And when it's twisted around, sometimes	14:12:25
4	the green wire is closer. And so, sort of the	14:12:27
5	point of this page with my reading, was that, yes,	14:12:30
6	you can put conductors close together. But if you	14:12:34
7	use twisted pairs, you can actually bring them	14:12:40
8	close together and equalize the distances so that	14:12:44
9	the fields more readily cancel.	14:12:48
10	So, to me, this is about motivating	14:12:52
11	twisted pairs. I think that's described in the	14:12:54
12	last paragraph on page 157, the thing I was just	14:13:03
13	talking about.	14:13:06
14	Q Let's go back to what we've marked as	14:13:09
15	Exhibit 1 to this deposition, your declaration	14:13:12
16	from the 1300 investigation. And I want to ask	14:13:15
17	you about paragraph 64. And this was your tab 4.	14:13:19
18	A Tab 4, okay. The same -- the same report	14:13:30
19	we were just looking at a moment ago?	14:13:34
20	Q The same report we were just looking at,	14:13:35
21	so paragraph 64.	14:13:38
22	A Okay. I'm there.	14:13:39

1 Q Okay. In the first sentence here, you 14:13:41
2 say: These features of conductors and 14:13:44
3 electromagnetism inform a person of ordinary skill 14:13:48
4 that the closely spaced limitations in the claims 14:13:50
5 are related to the functional limitations. 14:13:53

6 And take your time and review whatever you 14:13:55
7 need, but my question is: What do you mean by 14:13:58
8 "functional limitations" here? 14:14:00

9 (Witness reviewing document.) 14:14:45

10 A I'm now talking about a report that I 14:15:28
11 wrote several years ago, and I think there's a lot 14:15:31
12 in here that leads to this discussion. So, I just 14:15:34
13 want to start by saying I'm a little hesitant to 14:15:37
14 shoot from the hip. 14:15:40

15 Q I mean, if you don't remember what you 14:15:41
16 meant by "functional limitations," I'm happy to 14:15:43
17 take that as your answer. That's... 14:15:46

18 A Well, I can -- I can try. I can try. I 14:15:49
19 think -- I think, to me -- to me, a functional -- 14:15:54
20 something that is functional means it's -- it's 14:15:56
21 described -- it's in terms of the -- the result of 14:16:00
22 what happens, the function of what happens. 14:16:05

1 And -- and here -- here, in the '430 patent, the
2 idea behind having two closely spaced terminals
3 connected to the same loop, okay, connected to the
4 same loop, there is two parts to it.

5 One is when it's done the way it's done in
6 the figure 8, no additional loop is produced
7 that's not -- as we talked about with Midya.
8 That's one very important thing, right? In Midya,
9 there was an additional loop created that wasn't
10 balanced.

11 And the other important -- and so, that
12 function is to not generate a magnetic field
13 that's not compensated. It's the same function
14 here. By physically putting the two terminals
15 close to one another, then the function will be
16 that the fields -- the currents go in and out, the
17 fields are counter to one another, and that the
18 function will be at some distance away that those
19 fields aren't -- those fields are canceled.

20 And I think what I'm discussing in this
21 section is contrasting my opinion with -- I guess
22 it was Apple's, where Apple said put those two

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14:16:38
14:16:40
14:16:47
14:16:50
14:16:54
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14:17:02
14:17:05
14:17:08
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14:17:15
14:17:17

1	terminals as close together as possible.	14:17:22
2	And I'm saying no, there are physical	14:17:24
3	limits. You -- you know, you don't put them as	14:17:26
4	close together as possible. Because if you did,	14:17:28
5	they would touch and short, or they would lead to	14:17:30
6	other problems.	14:17:34
7	And so my opinion was that the terminals	14:17:35
8	had to be in proximity, because they just had to	14:17:38
9	be -- by putting them in proximity, the function	14:17:41
10	of doing that would be to cause them to cancel --	14:17:45
11	cancel more readily than if the terminals were far	14:17:50
12	apart.	14:17:53
13	Q You can set that document aside. I want	14:18:15
14	to go back to your first declaration,	14:18:18
15	Exhibit 2002. And look at paragraph 70.	14:18:22
16	A Okay.	
17	Q Let me know when you're there.	14:18:49
18	A I'm there.	14:18:50
19	Q Okay. And paragraph 70 is under the	14:18:50
20	heading where I believe you're talking about	14:18:56
21	claim 3 here.	14:18:59
22	A Yes.	14:19:03

1	Q	And for the Taniguchi ground, ground 1.	14:19:04
2		And claim 3 is: The inductor layout according to	14:19:10
3		claim 1 wherein the same -- wherein said first	14:19:14
4		inductor and said second inductor are oriented in	14:19:16
5		the same direction.	14:19:20
6	And in paragraph 70, you say: The		14:19:22
7	orientation of coils 203 and 204 is variable		14:19:27
8	because these coils are contained in tags attached		14:19:31
9	to commodities that pass through the antenna gates		14:19:34
10	208 and 209.		14:19:37
11	Do you see that?		14:19:41
12	A (Indicating.)		14:19:43
13	Q So, is it your understanding that Intel is		14:19:44
14	pointing to the tags, the coils 203 and 204 in the		14:19:51
15	tags as the second inductor?		14:19:56
16	A I think that Intel has clarified that it's		14:20:02
17	referring to antennas 1 -- antennas 1 and 2 and		14:20:10
18	not the coils. But if it were -- if it were		14:20:15
19	referring to the coils, then those don't		14:20:18
20	necessarily have any particular orientation.		14:20:21
21	Q But where is it that Intel clarified that		14:20:25
22	for you that wasn't clear when you drafted this		14:20:28

1	declaration?	14:20:32
2	A I don't know where that was.	14:20:36
3	Q But under the understanding that what	14:20:38
4	Intel points to are antenna 1 and antenna 2 of	14:20:42
5	Taniguchi, your analysis and conclusions in	14:20:46
6	paragraph 70 are not applicable?	14:20:52
7	A You know, my -- my -- so, part of my	14:20:56
8	analysis is that antenna 1 antenna 2 are not	14:20:58
9	inductors, so that's applicable.	14:21:03
10	Q Okay. But the second sentence?	14:21:05
11	A The second sentence referring to the coils	14:21:07
12	and the RFID tags are not -- is not applicable to	14:21:11
13	antenna 1 and antenna 2.	14:21:20
14	Q And same thing for paragraph 71, which is	14:21:22
15	about claim 4, wherein said first inductor and	14:21:28
16	said second inductor are oriented in different	14:21:32
17	directions. Same question about the orientation	14:21:35
18	of the coils, you understand now that Intel is not	14:21:38
19	pointing to the coils as the second inductor?	14:21:42
20	A Provided Intel is not pointing to those	14:21:47
21	coils, and I think they are not, it is not -- then	14:21:50
22	the second sentence isn't necessary.	14:21:53

1	Q And then the same question for paragraph	14:21:56
2	72, regarding claim 5.	14:21:58
3	A The same answer.	14:22:13
4	Q And you have not provided any opinion in	14:22:15
5	either declaration that any of the dependent	14:22:40
6	claims are not rendered obvious by any of these	14:22:44
7	grounds, aside from your argument that the	14:22:47
8	independent claims are rendered obvious? Sorry,	14:22:54
9	was that unclear?	14:22:59
10	A Very much so.	14:22:59
11	Q Sorry. Let me rephrase that.	14:23:00
12	Have you provided an opinion anywhere that	14:23:02
13	any of the dependent claims are rendered obvious	14:23:05
14	for reasons independent of your reasoning for the	14:23:11
15	independent claims?	14:23:15
16	A I see. I do think there are in a couple	14:23:17
17	of places some additional comments about the	14:23:23
18	dependent claims that were not part of the	14:23:28
19	independent claims. I don't know where, but I	14:23:31
20	think -- I think there are a couple of places	14:23:38
21	where that occurs. But it's all in my report.	14:23:39
22	There's nothing else other than what's in my	14:23:41

1	report.	14:23:44
2	Q Okay. So, your report is the complete	14:23:44
3	statement of your opinions as of today?	14:23:47
4	A Yes.	14:23:50
5	MS. LAROCHELLE: Okay. Let's take a quick	14:23:54
6	break so I can go through my notes. And I think	14:23:55
7	I'm wrapping up very, very quickly here.	14:23:58
8	MR. WARR: Okay. Very good.	14:24:00
9	(Off the record.)	14:24:02
10	MS. LAROCHELLE: I have no further	14:31:38
11	questions. Thank you, Dr. Prucnal.	14:31:39
12	And I pass the witness.	14:31:40
13	THE WITNESS: Thank you.	14:31:43
14	MR. WARR: No questions.	14:31:44
15	We would ask to read and sign, though,	14:31:44
16	please.	14:31:46
17	MS. LAROCHELLE: Okay. I think we can go	14:31:49
18	off the record, then.	14:31:50
19	(Deposition concluded at 2:31 p.m. EST.)	
20	(Signature of the witness was requested.)	
21		
22		

VERIFICATION OF DEPONENT

I, PAUL PRUCNAL, PhD, having read the foregoing deposition consisting of my testimony at the aforementioned time and place, do hereby attest to the correctness and truthfulness of the transcript.

NAME: PAUL PRUCNAL, PhD

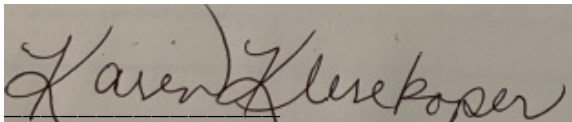
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I, Karen Klerekoper, the officer before whom
the foregoing proceedings were taken, do hereby
certify that the foregoing transcript is a true
and correct record of the proceedings; that said
proceedings were taken by me stenographically and
thereafter reduced to typewriting under my
supervision; that review was requested; and that I
am neither counsel for, related to, nor employed
by any of the parties to this case and have no
interest, financial or otherwise, in its outcome.

IN WITNESS WHEREOF, I have hereunto set my hand
and affixed my notarial seal this 1st day of
April 2025.

MY COMMISSION EXPIRES: DECEMBER 4, 2031

A rectangular box containing a handwritten signature in cursive script that reads "Karen Klerekoper".

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A**abbreviate**

49:14

ability

26:3

able

46:1, 76:9,

77:18, 78:3,

91:20, 93:15

about

7:19, 8:12,

13:16, 14:11,

15:1, 16:11,

16:14, 16:21,

20:10, 20:11,

20:17, 27:8,

29:16, 37:6,

43:17, 45:1,

45:14, 46:19,

49:6, 55:17,

56:11, 59:11,

62:10, 62:22,

64:11, 64:12,

67:19, 67:21,

68:11, 71:2,

72:12, 75:1,

75:11, 78:8,

78:10, 78:18,

80:8, 81:4,

81:19, 83:13,

83:16, 84:3,

85:5, 86:15,

87:11, 87:16,

90:1, 91:7,

91:14, 91:18,

96:8, 96:9,

96:11, 98:3,

101:5, 102:15,

103:6, 103:13,

103:19, 104:13,

105:14, 106:11,

106:20, 107:10,

107:16, 107:20,

108:13, 110:2,

110:13, 110:21,

111:2, 112:17,

113:15, 115:14,

116:11, 116:22,

117:11, 119:6,

123:11, 125:3,

125:8, 127:3,

127:11, 131:21,

132:3, 132:7,

133:9, 135:10,

135:13, 135:17,

136:10, 137:7,

138:20, 140:15,

140:17, 141:17

above

40:19

absolutely

53:7, 63:15,

77:12, 106:1

academia

28:2

accepts

36:21, 38:2

accessing

6:17

accidentally

13:12

according

27:9, 139:2

account

18:7, 19:2

accurate

8:3, 15:18,

16:3, 27:2,

27:3, 27:5,

29:10, 29:11,

34:19, 78:14

across

80:20, 122:8,

122:11

acting

14:11

activities

29:9, 30:8

actual

72:14, 115:4,

115:18, 117:7

actually

9:8, 14:6,

19:11, 43:22,

44:10, 63:2,

64:22, 71:22,

83:1, 95:3,

103:5, 107:8,

121:21, 125:14,

134:19, 135:7

add

39:2, 110:19,

134:7

added

9:19, 27:8

adding

26:20

addition

30:16, 58:6,

58:20, 123:5

additional

119:7, 119:11,

121:20, 122:10,

122:13, 123:9,

123:17, 123:19,

123:21, 124:4,

124:5, 137:6,

137:9, 141:17

additionally

35:20

adjacent

112:12

adopt

61:16

adopted

105:4, 105:15,

105:21

affixed

144:13

aforementioned

143:8

after

31:22, 37:13,

110:17, 126:3

again

15:11, 15:17,

16:21, 19:16,

20:18, 22:3,

34:20, 36:11,

42:15, 45:2,

46:8, 46:16,

52:4, 52:10,

53:2, 53:19,

55:1, 59:9,

61:5, 68:11,

70:15, 72:11,

72:17, 75:10,

98:7, 105:22,

121:10, 129:17,

130:3, 132:13

ago

18:8, 127:8,

130:4, 135:19,

136:11

agree

6:21, 13:5,

39:22, 68:13,

69:14, 69:16,

82:2, 82:9,

103:2, 103:5,

103:9, 103:15,

105:13, 106:9,

125:12, 128:9,

128:20, 129:20

agreed

5:2, 123:17

agrees

107:2, 107:6

ahead

39:5, 39:10,

39:14, 55:12,

102:20, 107:5,

113:17

alastair

3:12

ali

9:5, 86:6,

126:13

all

13:5, 13:15,

14:20, 17:17,

25:20, 27:8,

29:19, 33:8,

35:3, 52:10,

58:9, 58:16,

58:20, 61:11,

69:6, 69:22,

77:13, 86:21,

100:18, 101:5,

101:6, 101:10,

110:21, 117:20,

120:2, 120:21,
141:21
alleged
115:2, 117:5
allow
69:22, 97:22,
111:12, 111:13
allows
54:13, 54:22
alone
70:3, 95:12,
95:13, 95:15,
101:15, 102:7,
102:10
along
26:9, 26:21,
79:15
already
11:5, 34:16,
35:16, 60:13,
96:7, 98:3,
103:13, 114:1,
130:12
also
3:18, 5:15,
10:2, 28:19,
28:21, 32:5,
36:10, 39:2,
65:11, 70:21,
80:6, 87:16,
92:10, 95:7,
96:18, 101:21,
103:16, 114:14,
126:5, 128:20,
129:11, 131:6
although
64:10, 117:19,
132:16
altogether
9:1
always
21:14, 92:5
ambiguous
90:4
analysis
13:1, 13:5,
21:4, 21:9,
36:21, 38:1,

38:5, 45:15,
57:2, 128:13,
128:21, 140:5,
140:8
another
8:20, 9:9,
18:15, 27:7,
40:15, 42:6,
76:3, 80:1,
109:20, 110:9,
121:8, 123:2,
134:6, 137:15,
137:17
answer
7:21, 16:3,
34:11, 37:9,
37:10, 40:11,
45:3, 49:16,
50:22, 58:15,
59:17, 64:20,
79:11, 82:4,
85:12, 116:21,
131:18, 136:17,
141:3
answers
24:6
antenna's
112:7
antennas
29:5, 30:2,
30:5, 75:13,
76:7, 76:15,
77:8, 77:15,
78:2, 78:4,
78:19, 79:13,
79:15, 79:18,
79:22, 80:9,
81:1, 81:6,
81:14, 81:16,
82:10, 82:14,
82:16, 82:17,
83:6, 83:16,
84:5, 84:8,
84:12, 84:15,
84:20, 85:2,
85:10, 86:1,
87:21, 90:16,
90:21, 90:22,

94:12, 94:16,
95:8, 98:8,
98:10, 98:20,
99:4, 99:6,
99:11, 99:16,
99:21, 99:22,
100:1, 100:5,
101:20, 101:22,
104:13, 107:16,
111:12, 113:3,
113:8, 139:17
any
6:7, 7:21, 8:2,
18:6, 18:22,
19:4, 24:12,
24:22, 27:5,
27:22, 48:10,
57:19, 58:12,
59:7, 61:19,
67:9, 108:19,
117:21, 119:9,
120:19, 124:1,
130:1, 132:18,
133:14, 139:20,
141:4, 141:5,
141:6, 141:13,
144:10
anybody
125:3
anyone
6:4, 9:7, 25:5,
26:8, 55:17,
86:15
anything
11:10, 13:8,
13:18, 18:11,
50:15, 57:21,
63:16
anywhere
28:5, 58:1,
122:14, 141:12
apart
115:6, 115:19,
117:9, 120:21,
134:5, 134:19,
138:12
apologies
68:7

apologize
34:16, 38:13,
73:19, 103:8,
107:4, 107:11
apparatus
93:15
appeal
1:3
appear
64:8, 97:7,
98:12, 117:19
appears
51:21, 64:4,
72:9, 96:9,
96:21, 97:12
appendix
25:12, 25:13,
25:16
apple
137:22
apple's
137:22
applicable
140:6, 140:9,
140:12
application
6:13
applications
37:16
applies
101:14, 102:6,
107:15
apply
105:16, 106:5,
107:1
approach
70:10
appropriate
30:5, 30:7
approximately
104:22
april
144:14
area
97:21
aren't
34:15, 45:18,
137:19

argues	asymmetry	back	65:1, 70:6,
124:14	124:3	12:10, 15:7,	70:7, 71:2,
argument	attach	15:11, 18:22,	73:14, 76:7,
79:17, 141:7	126:18, 126:19	19:12, 20:18,	86:10, 87:10,
around	attached	20:19, 20:22,	91:14, 92:4,
42:4, 43:22,	4:10, 25:11,	22:8, 23:21,	93:5, 94:11,
44:1, 44:3,	25:13, 26:5,	25:8, 33:5,	95:9, 95:22,
44:10, 44:13,	27:1, 139:8	33:15, 36:11,	99:3, 104:6,
52:3, 54:13,	attempt	37:21, 39:12,	107:3, 107:15,
63:14, 133:12,	118:7	44:4, 44:11,	109:6, 115:4,
134:17, 135:3	attempts	44:13, 49:15,	120:5, 120:16,
arrive	120:3	52:9, 52:14,	122:11, 131:18,
57:1	attended	54:15, 55:2,	133:5, 134:20,
arrow	9:3	58:21, 65:5,	138:4, 138:8,
40:18, 41:18,	attest	67:17, 68:1,	139:8
42:7, 42:8,	143:8	70:11, 71:11,	become
42:10, 42:16	attorney	79:15, 82:6,	107:21, 108:6,
arrows	5:12, 9:9	82:7, 83:20,	108:20, 109:9,
40:18, 49:19,	attorneys	84:2, 85:15,	109:10
50:20, 65:18,	1:14, 8:11,	86:8, 86:19,	becomes
65:21, 65:22,	8:14, 9:4,	86:22, 88:12,	69:10
66:8	14:13, 14:19,	89:2, 93:11,	been
art	21:12	98:18, 107:18,	5:4, 7:6, 14:2,
8:10, 31:6,	august	121:10, 121:12,	14:8, 18:10,
31:17, 31:20,	14:9	125:2, 133:19,	19:7, 22:5,
32:4, 32:6,	available	135:14, 138:14	27:9, 32:9,
32:13, 36:16,	11:8, 19:10,	back-to-back	38:21, 56:6,
37:1, 37:7,	19:19, 34:7,	84:20	60:3, 60:5,
38:16, 133:3	36:14	bad	68:3, 81:1,
aside	avenue	69:19	84:3, 96:21,
6:7, 7:2,	3:7	balanced	106:6, 124:19
138:13, 141:7	aware	137:10	before
asked	15:20, 16:17	based	1:3, 2:9, 7:6,
48:18, 81:4,	away	33:17, 34:6,	19:3, 27:12,
91:7	23:22, 46:6,	35:13, 36:10,	32:9, 50:4,
asking	46:17, 47:10,	57:1, 82:11,	50:10, 89:3,
24:16, 29:16,	63:4, 66:16,	104:19, 108:10	91:1, 126:2,
116:22	88:20, 91:9,	basically	127:16, 144:2
aspects	92:21, 96:10,	46:11	beginning
20:14	96:15, 105:7,	basis	45:3, 120:20
assume	109:8, 109:12,	74:17, 76:18	begins
39:7, 41:10,	110:22, 113:9,	because	123:13
56:7, 128:12,	129:13, 132:9,	11:10, 12:4,	behalf
128:20	132:11, 133:8,	22:16, 31:21,	3:3, 3:11
assuming	135:1, 137:18	32:11, 36:5,	behave
49:2	axis	43:19, 45:17,	132:4
assumption	108:17, 108:19	50:13, 50:20,	behind
40:13	B	59:1, 59:2,	137:2
	b		
	77:3		

being	32:8, 49:14,	breakfast	109:10, 110:11,
43:2, 46:22,	90:4, 99:2,	86:11	113:14, 120:5,
62:4, 67:14,	100:15	brian	121:16, 129:12,
77:13, 77:21,	board	9:6, 14:14,	130:9, 131:11,
82:14, 83:16,	1:3, 36:21,	14:15	132:8, 135:9,
87:17, 90:21,	38:1, 61:16,	brief	138:10, 138:11
91:10, 94:14,	62:6, 133:12	126:9, 127:9	canceled
94:16, 95:1,	board's	briefs	108:15, 112:8,
97:8, 100:1,	37:15	19:14	113:9, 119:9,
107:10, 111:3,	boards	bring	122:6, 124:1,
118:8	37:17, 132:15,	135:7	137:19
believe	133:6, 133:20	brings	canceling
14:13, 32:14,	book	121:9	70:7, 117:22
35:19, 37:10,	132:14, 133:5,	broad	cancellation
37:19, 48:4,	133:7, 133:9	105:16	46:9, 46:18,
62:4, 74:22,	boston	broken	88:18, 91:8,
101:18, 125:11,	3:8	8:19, 68:22,	91:16, 91:17,
132:7, 138:20	both	69:4	92:19, 95:19,
below	13:6, 14:17,	brooks	105:5, 109:3,
76:5	14:21, 16:16,	130:12, 132:7,	109:16, 109:21,
bends	21:22, 23:2,	132:13, 134:11	111:1, 112:14,
52:5, 54:20,	28:12, 44:18,	broyles	113:5, 131:8,
55:4	46:3, 46:7,	3:13, 19:8	132:12
benefit	56:20, 57:15,	C	cancels
117:21	65:13, 68:14,	calculates	105:8, 105:9,
best	76:22, 90:5,	80:16	112:22
15:13, 22:3,	90:9, 110:15,	calculation	cannot
26:3, 44:15,	114:4, 114:6	77:17	8:2, 120:7
109:3	bottom	calculations	carried
better	29:8, 44:7,	110:1	100:2
82:19, 101:13	49:9, 51:2,	call	carries
between	51:9, 53:19,	6:20, 9:6,	47:19
41:12, 74:8,	65:16, 74:4,	29:21, 40:21,	carrying
77:14, 77:22,	74:5, 123:1,	41:2, 99:4,	48:12, 52:22,
89:12, 90:11,	123:3	108:7, 121:1	103:3, 103:10,
90:17, 91:4,	box	called	103:16, 131:2
91:22, 93:17,	10:14, 11:3,	28:17, 30:12,	cartoon-ish
94:14, 97:21,	12:6, 39:1,	90:8, 91:3,	76:13
108:18, 122:1,	60:21, 62:12,	92:10, 98:21	case
122:8, 122:13,	126:5, 126:11	calls	8:8, 14:16,
123:6, 123:8,	break	21:13	18:15, 20:2,
134:1, 134:20	7:18, 7:19,	came	20:19, 23:11,
beyond	8:20, 45:10,	10:14	48:15, 57:6,
109:18	53:6, 53:9,	can't	57:9, 95:9,
binders	55:13, 55:16,	15:18	107:1, 125:13,
10:22, 11:2	86:4, 86:8,	cancel	144:10
bit	86:14, 124:20,	54:3, 108:21,	cases
22:20, 24:15,	125:4, 142:6		70:5, 71:2,

101:10
catchall
 18:5
cause
 138:10
caused
 32:7, 36:9
cell
 7:2
center
 43:10, 43:15,
 43:21, 44:12,
 44:14, 46:12,
 46:14, 47:1,
 47:4, 53:15,
 109:4, 120:17,
 121:1, 121:4,
 121:10, 123:1,
 123:3
centers
 109:2, 122:21
certain
 17:11, 17:19,
 56:1, 95:19,
 96:2, 104:18,
 104:21, 105:18,
 106:8, 128:5,
 132:1, 134:1
certainly
 23:14, 133:4
certificate
 144:1
certify
 144:4
cetera
 101:8, 128:13
challenging
 5:17
change
 31:19
changes
 101:18
chapter
 4:20, 130:15,
 130:17
characterize
 31:15
chat
 9:17, 9:20,

39:2, 61:2,
 62:13, 113:18,
 113:21, 126:4,
 130:10
check
 26:19
chicago
 3:15
chip
 30:10, 41:4,
 129:6
chips
 30:20, 30:21
chosen
 30:5
christie
 3:4, 5:12,
 10:12, 53:5,
 112:3
circle
 93:11
circles
 43:5, 46:14
circling
 52:2, 52:3
circuit
 37:16, 40:16,
 132:15, 133:6,
 133:11, 133:12,
 133:15, 133:20,
 134:4
circuit-based
 22:20, 24:1,
 24:3
circuits
 28:12, 29:6,
 30:15, 37:17,
 41:11, 132:17,
 132:18, 133:21
citation
 63:19
citations
 60:9, 60:12
cite
 61:12, 63:7,
 63:12, 68:7,
 78:7, 96:12,
 130:1

cited
 8:10, 25:20,
 26:1, 60:9
citing
 93:5
claim
 56:11, 56:15,
 56:20, 57:14,
 58:3, 58:7,
 58:9, 58:22,
 59:1, 59:3,
 59:6, 59:10,
 59:13, 59:18,
 59:19, 59:21,
 60:22, 61:20,
 62:2, 62:5,
 126:9, 127:9,
 127:12, 131:21,
 138:21, 139:2,
 139:3, 140:15,
 141:2
claims
 57:2, 57:13,
 58:2, 58:7,
 58:10, 58:12,
 58:16, 58:21,
 124:16, 136:4,
 141:6, 141:8,
 141:13, 141:15,
 141:18, 141:19
clarification
 7:15, 48:18
clarified
 139:16, 139:21
clarify
 24:15, 78:9,
 88:14
clarity
 66:4, 87:10,
 101:2
clean
 11:13, 11:16,
 11:18, 12:15
cleanly
 81:18, 83:2
clear
 12:14, 25:22,
 36:2, 40:2,

49:6, 49:10,
 53:14, 67:19,
 72:22, 84:11,
 99:15, 139:22
clearer
 7:16
clearly
 76:20, 87:5,
 99:3, 119:13
clockwise
 40:22, 41:14,
 42:15, 43:14,
 51:10, 51:13,
 52:1, 52:13,
 54:1, 54:7,
 54:13, 54:22,
 55:9, 55:10,
 55:11
close
 6:10, 6:18,
 47:6, 86:18,
 100:3, 108:22,
 109:1, 109:5,
 117:20, 117:22,
 118:1, 118:10,
 131:10, 134:19,
 135:6, 135:8,
 137:15, 138:1,
 138:4
closed
 6:12
closely
 115:4, 117:6,
 118:21, 127:12,
 127:15, 128:1,
 128:10, 136:4,
 137:2
closer
 81:2, 107:10,
 132:10, 135:3,
 135:4
clover
 48:22, 49:4,
 49:10, 52:22,
 53:15
coils
 71:6, 89:12,
 89:19, 90:12,

90:18, 91:4,
91:22, 93:18,
94:6, 98:1,
129:5, 139:7,
139:8, 139:14,
139:18, 139:19,
140:11, 140:18,
140:19, 140:21
color
48:6
columbia
27:13, 27:19,
28:12
combination
94:1, 94:15,
95:1, 95:8,
95:18, 96:3,
100:5, 101:16,
102:8, 113:7,
113:17, 116:3,
118:19, 124:14,
129:7
combine
45:19, 118:7,
124:18, 133:3
combined
85:22, 87:18,
87:20, 101:12
combining
110:18
come
65:5, 86:8,
96:22
comes
12:10, 42:5,
52:9, 52:14,
54:10, 54:15,
54:19, 55:2,
71:22, 96:11,
122:4, 123:7
coming
35:11, 43:11,
43:21, 44:3,
44:4, 44:10,
44:11, 44:13,
49:7, 52:4,
65:12, 113:21,
120:7, 132:21

comments
32:5, 141:17
commission
125:9, 144:16
commodities
139:9
communicate
71:17
communicates
66:22
communicating
71:16, 97:3
communication
97:4, 97:22
communications
21:11, 28:19,
28:20, 29:4,
29:20
compared
110:4
compensated
122:14, 124:5,
137:13
complainant's
126:9, 127:9
complete
142:2
completed
55:2
completely
110:11, 131:11,
133:7
completes
54:18
complicated
43:18
comprising
90:16
computer
27:17, 128:16
concentric
75:13, 80:1,
81:6, 84:4,
84:20, 99:1,
113:4
concentrically
73:14
concept
134:12

conclude
37:13, 37:16
concluded
142:19
conclusion
100:20
conclusions
101:2, 101:5,
140:5
conducted
1:16, 2:2
conducting
49:22, 52:5,
103:3, 103:11
conductive
129:5
conductor
41:6, 54:12,
54:16, 54:20,
54:21, 103:16,
121:22
conductors
44:1, 49:22,
115:5, 117:8,
129:9, 129:10,
129:11, 129:14,
130:7, 131:1,
131:2, 132:4,
132:10, 133:22,
134:18, 135:6,
136:2
confidential
1:14
configuration
69:22, 113:5
configurations
23:7
confirm
11:15, 16:3,
16:22, 22:12,
36:13, 105:13,
106:21, 115:12,
115:13, 125:2,
127:17
confirming
12:13
conflicting
134:2, 134:3

confused
73:21
confusion
68:8, 99:3
connect
121:1, 122:20
connected
40:14, 40:15,
49:3, 117:18,
118:5, 118:9,
118:21, 122:17,
128:16, 137:3
connecting
53:16, 53:18,
118:20, 121:18,
122:22, 123:2
connection
14:5, 24:20,
25:3, 34:1,
37:5, 47:14,
52:19, 57:6,
57:7, 123:5
consider
101:15, 102:7
considered
36:9, 53:1,
56:2
considering
35:9, 53:4
considers
95:21
consistent
58:10, 131:13,
132:4
consisting
143:7
constantly
27:6
construct
54:5
construction
56:12, 60:4,
60:22, 61:12,
61:13, 61:14,
61:16, 62:2,
105:14, 105:20,
106:5, 107:3,
107:7, 126:9,

127:9, 128:2,
128:10, 131:21
constructions
56:1, 61:20
construe
62:6
construed
60:3, 60:5,
62:4, 106:7,
106:16
contact
115:5, 115:18,
117:17
contacted
14:11
contain
89:19, 90:5
contained
10:15, 139:8
containing
98:1
contains
83:4, 90:14,
101:22
content
117:7
context
107:8
continually
26:17
continues
19:13, 20:8,
69:9
continuing
42:11
continuously
44:12
contrary
94:21, 113:12
contrasting
137:21
contributions
46:7, 119:2,
129:8
convenience
130:14
convenient
53:5

conventionally
104:12
conversation
22:8
convey
64:10
copies
10:11, 11:6,
11:14, 11:15,
11:16, 12:15
copy
50:6, 50:14,
126:6
corporation
1:5
correct
11:7, 12:18,
19:17, 19:18,
27:11, 31:17,
34:4, 34:5,
34:9, 36:7,
37:7, 60:14,
65:2, 66:5,
66:6, 70:18,
71:10, 72:6,
73:1, 73:4,
77:3, 78:12,
83:6, 86:1,
86:2, 89:16,
90:15, 94:8,
97:14, 97:15,
97:17, 102:3,
112:4, 123:4,
124:8, 124:11,
125:5, 144:5
correctly
21:17, 21:19,
71:7, 85:18,
93:1
correctness
143:9
corresponding
66:1, 66:9
could
10:21, 26:7,
27:7, 31:8,
41:7, 42:6,
45:16, 46:11,

46:17, 46:18,
49:4, 53:6,
55:4, 55:6,
78:1, 87:8,
94:19, 115:12
counsel
5:3, 14:2,
14:4, 25:5,
144:9
count
87:4
counter
41:14, 137:17
**counter-propagat-
ing**
53:22, 54:6,
120:3, 122:6
counterclockwise
41:21, 42:2,
42:12, 43:9,
51:11, 51:13,
51:18, 52:7,
52:9, 52:16,
54:1, 54:8,
54:17, 55:5,
55:8, 55:9,
55:11, 122:10,
122:12
couple
6:9, 7:9, 8:15,
73:3, 73:15,
141:16, 141:20
couples
66:21, 73:1
coupling
64:17, 67:1,
67:2, 67:3,
67:15, 67:16,
69:16, 70:4,
70:6, 72:4,
73:12, 89:11,
90:11, 90:18,
91:3, 93:17,
94:14
course
7:1, 29:1, 29:6
courses
28:1, 28:4,

28:9, 28:11,
28:14, 28:16,
28:22, 29:3,
29:4, 29:6
court
48:18
court's
32:5
cover
96:4
coverage
75:19, 101:13
covering
111:12
covers
96:5
crate
77:21
create
67:6, 75:20,
76:9, 77:14,
79:18, 81:7
created
121:20, 137:9
creates
54:2, 99:2,
123:22, 124:4
creating
46:10, 75:12,
75:13
cross
42:13
cross-sections
80:2
cross-under
41:2
crosshatch
43:7
crosstalk
134:1
csr
1:22
current
29:9, 40:8,
40:13, 40:16,
40:20, 41:13,
41:19, 41:20,
42:11, 42:20,

43:9, 43:13,
47:19, 48:12,
49:3, 49:5,
49:7, 49:8,
49:19, 49:22,
51:2, 51:9,
51:16, 52:21,
54:13, 54:22,
55:8, 55:9,
55:10, 102:16,
103:3, 103:6,
103:10, 103:16,
115:6, 117:9,
118:22, 120:9,
120:11, 121:6,
121:21, 122:7,
122:11, 129:9,
131:2
currents
53:22, 54:6,
113:13, 113:14,
120:4, 122:6,
130:7, 131:4,
132:6, 132:22,
134:16, 137:16
curving
45:19
cutting
6:19
cv
26:6, 26:13,
26:16, 26:22,
27:9, 28:6, 29:9
D
dashed
80:20, 81:3,
121:2, 121:11,
121:22, 122:3
dated
143:14
day
144:13
dealing
68:17
decades
28:10
december
144:16

decided
32:8
decision
35:10, 35:22,
36:6, 37:15
declaration
4:11, 4:19,
8:8, 8:9, 9:21,
10:3, 10:6,
10:8, 13:8,
13:21, 15:2,
15:9, 15:21,
16:9, 16:12,
16:18, 17:4,
17:8, 17:12,
17:18, 18:21,
20:6, 24:13,
25:11, 25:14,
25:19, 25:20,
26:1, 26:2,
26:5, 26:6,
27:1, 31:1,
31:9, 32:16,
32:20, 32:22,
33:7, 33:10,
33:15, 33:16,
33:18, 33:22,
34:3, 34:8,
34:21, 35:1,
35:4, 35:7,
35:9, 35:14,
35:16, 35:21,
36:11, 36:13,
36:17, 36:19,
37:5, 55:21,
56:10, 58:1,
61:8, 61:21,
62:19, 73:17,
73:18, 74:2,
75:8, 78:7,
86:19, 100:9,
100:10, 103:20,
106:2, 114:18,
116:4, 116:6,
118:13, 124:7,
124:10, 124:13,
126:7, 126:21,
127:4, 135:15,
138:14, 140:1,
141:5
declarations
9:13, 9:14,
9:17, 11:6,
12:17, 12:20,
13:2, 13:6,
14:17, 14:21,
24:22, 25:4,
48:13, 62:7,
73:21
decline
77:7
defer
86:9
defined
89:7
definition
32:2, 32:12,
35:11, 36:9,
37:20, 37:21,
38:2, 38:3,
38:4, 38:8,
38:11, 104:11,
105:3, 105:6,
105:11, 106:13,
106:17, 106:22,
107:14, 107:16
deliberately
112:21
department
27:17, 27:19
depend
58:9
dependent
58:7, 58:21,
141:5, 141:13,
141:18
depending
6:16, 45:7
depends
43:1, 45:3,
45:20, 104:16
deponent
143:4
depos
3:19
deposed
7:6

deposition
1:15, 2:1,
5:16, 6:22, 8:6,
8:22, 9:18,
12:21, 19:15,
26:14, 38:20,
39:18, 60:20,
62:17, 86:15,
114:11, 114:15,
135:15, 142:19,
143:7
depositions
7:11
derived
59:11
describe
41:7, 41:16,
42:19, 50:4,
50:20
described
42:7, 44:17,
46:13, 47:4,
74:22, 81:5,
81:13, 101:7,
102:16, 123:10,
135:11, 136:21
describing
44:16, 75:19,
84:10, 84:14,
105:5
description
31:16, 78:15,
98:15
design
29:2, 29:4,
29:7, 29:12,
30:20, 121:14,
133:15, 133:16
designed
30:6, 30:9,
95:1, 110:20,
111:3, 113:8
desire
133:3
destroy
20:2
detail
49:12

detailed	68:14, 69:6	distance	126:2, 126:6,
32:8	direction	46:17, 47:10,	126:12
details	40:19, 40:22,	76:10, 77:7,	doing
43:1, 43:17,	41:19, 41:22,	78:19, 80:12,	77:16, 138:10
130:5	42:3, 42:12,	88:20, 91:9,	done
detect	42:15, 43:4,	92:4, 92:21,	20:2, 23:2,
80:18, 92:5,	43:10, 43:14,	94:20, 95:2,	24:18, 52:17,
111:9	49:19, 51:10,	95:10, 95:14,	120:22, 137:5
detected	51:11, 51:19,	104:5, 104:15,	dot
80:21	52:1, 52:7,	105:7, 105:18,	43:7
determined	52:9, 52:13,	106:8, 107:19,	dotted
36:4	52:16, 55:1,	107:20, 108:16,	65:17, 66:7,
developed	73:7, 122:9,	108:18, 109:15,	122:20, 122:21,
57:5, 57:7,	139:5	109:17, 109:19,	123:2
57:9, 79:14	directions	110:22, 111:4,	down
diagram	54:3, 129:10,	112:21, 113:9,	30:13, 45:10,
76:12	129:12, 130:7,	128:5, 132:2,	122:4, 122:9,
die	131:3, 132:6,	132:11, 134:1,	122:11, 134:10
56:16, 56:21,	132:22, 134:16,	137:18	downward
57:16, 58:4,	140:17	distances	54:21, 55:4
58:11, 58:13,	directly	80:9, 110:10,	dozen
58:20, 58:22,	47:1, 113:13,	110:18, 135:8	7:9
59:7, 59:9,	121:18	distinguishing	dr
59:15, 59:20,	disclose	97:6	4:19, 5:8,
59:22, 60:1,	118:20	distribution	10:9, 12:14,
89:10, 90:11	disclosed	78:21, 79:1	17:18, 32:21,
dies	83:5	document	33:9, 34:1,
59:12	discrepancies	3:19, 25:22,	35:4, 35:6,
differ	27:5	39:17, 60:20,	35:14, 36:12,
37:17	discuss	62:16, 64:7,	36:22, 38:2,
different	15:4, 88:11,	65:9, 68:16,	38:10, 55:16,
22:9, 45:7,	111:14, 116:8,	72:18, 74:21,	86:14, 100:8,
99:10, 110:9,	131:7	79:12, 83:7,	124:11, 126:20,
110:12, 110:18,	discussed	88:10, 98:6,	142:11
123:16, 129:10,	54:2, 80:7,	114:10, 114:14,	draft
132:6, 132:22,	90:22, 113:1,	126:5, 127:6,	14:17, 14:19,
133:16, 133:17,	115:21, 116:3,	130:11, 136:9,	15:6
140:16	122:10	138:13	drafted
difficult	discusses	documents	139:22
131:18	111:15	8:7, 8:9,	draw
difficulty	discussing	17:15, 17:19,	46:20
71:15, 97:3	83:14, 137:20	18:2, 18:6,	drawing
digital	discussion	18:19, 19:4,	50:6, 50:13,
28:15	62:2, 79:13,	19:9, 19:19,	75:18
direct	86:21, 92:10,	20:5, 25:9,	draws
64:9, 64:21,	136:12	25:18, 34:19,	46:14
71:20	discussions	39:1, 56:7,	drew
directed	20:9	58:5, 116:18,	47:1
58:19, 59:7,			

driven
30:3
drop
9:17
due
45:12, 68:15
duly
5:4
duplicated
13:12, 13:15
during
6:22, 28:1,
55:16, 86:14,
125:4

E

each
69:5, 69:6,
74:13, 75:6,
76:7, 76:21,
78:2, 78:4,
79:18, 84:7,
84:8, 84:11,
84:16, 85:2,
85:9, 85:10,
87:8, 88:14,
89:12, 90:11,
90:17, 98:19,
98:20, 99:1,
99:5, 99:16,
99:19, 99:20,
111:9, 111:18,
113:4, 123:13,
123:15, 128:4,
129:8, 129:12,
134:17
earlier
14:14, 47:13,
95:17, 96:20,
98:18, 100:11,
101:4, 105:14
early
86:11
eat
86:11
effect
111:19
either
13:8, 43:6,

70:6, 94:14,
123:13, 141:5
electrical
27:17, 27:21,
115:6, 117:8,
118:22
electromagnetic
23:6, 23:18,
48:3, 97:20,
105:2, 105:12,
105:17, 106:7,
123:22, 128:5,
132:1
electromagnetic--
based
22:21
electromagnetics
104:17, 132:20
electromagnetism
136:3
electromotive
69:10
electronic
26:9
electronics
30:16
else
9:7, 57:21,
141:22
em
104:7, 119:8
emanating
80:14, 80:15,
88:19, 91:8,
92:20, 97:20
embodiment
91:20, 93:14
embodiments
82:12, 98:19
emerges
41:15, 42:17
emerging
43:11
emi
131:10
employed
144:9
end
26:19, 66:18,

93:13
ending
120:20
ends
120:18, 121:7,
121:13
engineer
22:5
engineering
27:17, 27:21,
28:22
engineers
20:20, 21:20
enhance
22:13
enough
46:5, 67:7,
92:5, 109:12,
109:18, 116:21
enter
9:16, 9:18,
38:20
entered
38:21, 114:1,
114:2, 130:12
entering
130:10
enters
51:3
entire
63:15, 79:14,
81:2, 96:4,
111:13, 120:9
entirely
133:17
envelope
39:8, 39:11,
39:15
envelopes
10:16, 10:19
equal
46:7, 47:11,
69:5, 107:21,
108:6, 109:6,
109:14, 109:19,
131:4, 131:6
equalize
135:8

equidistance
46:12
equidistant
46:16, 47:3,
109:1
eric
22:16
ericsson
1:8, 14:3,
14:5, 17:21,
18:16, 20:21,
21:3, 21:12,
21:20, 22:17,
23:10, 56:10
ericsson's
9:20, 10:2,
12:15, 16:13,
31:1, 31:9,
33:16, 61:14,
86:20, 128:2
error
72:7, 97:10,
97:17
esquire
3:4, 3:5, 3:12
est
1:18, 142:19
estimate
15:13
et
101:8, 128:13
evaluating
37:14
even
82:19, 92:8,
94:22, 118:11,
122:5, 125:19,
128:16
ever
7:6, 29:1, 30:9
every
7:19, 25:22,
91:20, 93:13
everything
6:12, 26:19,
81:5
exact
45:7

exactly

23:1, 23:13,
45:4, 45:20,
116:8

examination

4:6, 5:6

example

23:17, 40:20,
43:20, 63:3,
77:20, 78:22,
79:22, 80:19,
82:18, 82:19,
109:9

excerpt

4:20, 130:14,
130:17

exhibit

4:8, 4:10,
4:11, 4:13,
4:15, 4:19,
4:20, 9:20,
10:2, 10:5,
10:8, 12:15,
13:21, 15:9,
15:21, 15:22,
16:13, 16:18,
16:19, 17:5,
17:8, 26:6,
31:1, 31:9,
32:16, 32:21,
33:1, 33:5,
33:16, 33:19,
34:8, 36:20,
38:21, 39:4,
48:17, 55:21,
56:10, 60:12,
60:13, 60:15,
60:16, 60:18,
60:22, 61:3,
61:6, 61:8,
61:9, 62:12,
62:20, 63:11,
66:12, 70:12,
73:20, 74:1,
86:20, 87:1,
103:21, 104:3,
112:2, 114:1,
114:2, 114:9,

114:19, 115:9,
118:6, 118:14,
126:18, 126:20,
130:13, 130:17,
130:21, 135:15,
138:15

exhibit's

120:1

exhibits

4:17, 10:14,
17:17, 33:9,
35:3, 60:8,
114:8

expect

94:18

expert

4:11, 9:21,
10:3, 10:6,
10:8, 11:6,
14:2, 14:12,
32:22, 66:12,
78:7, 125:7

expires

144:16

explain

53:17, 83:8,
83:9, 119:13

explained

129:4

explaining

107:7

explanation

85:14

extend

80:17

extensively

28:12

extent

133:2

eyes

1:14

F**fabrication**

57:14

face

84:16

facing

84:8

fact

21:1, 43:19,
113:7, 123:12,
133:7, 133:18,
133:22, 134:22

facts

21:3

fails

88:18, 91:7,
92:19

fair

129:1

fall

14:8, 99:16

familiar

7:10, 59:3

far

46:5, 60:3,
61:22, 63:4,
64:8, 66:16,
80:17, 96:10,
96:15, 103:19,
104:5, 104:11,
104:14, 104:21,
105:1, 105:3,
105:11, 105:20,
106:6, 106:13,
106:16, 106:17,
106:22, 107:13,
107:14, 107:20,
108:3, 108:7,
108:12, 108:15,
109:12, 109:18,
112:10, 112:12,
120:21, 134:18,
138:11

fashion

76:13

favor

79:17

favorable

97:4

favorably

71:16

feature

123:10

features

136:2

feel

68:10

few

8:12, 130:3

fields

23:6, 23:18,
43:4, 45:6,
45:19, 46:10,
47:7, 47:11,
54:2, 70:7,
80:17, 107:21,
108:6, 108:15,
108:19, 109:6,
109:8, 109:10,
109:13, 109:19,
110:11, 110:17,
112:9, 120:5,
121:16, 129:11,
130:8, 131:5,
132:3, 132:8,
132:21, 135:9,
137:16, 137:17,
137:19

figured

20:21

figures

65:13, 80:5,
80:6, 83:13,
83:20, 84:12,
89:17, 96:9,
98:11, 98:12,
100:18

file

19:22, 126:14

final

100:4

financial

144:11

find

105:17, 113:19,
113:20, 130:11,
133:12

fine

10:20, 49:17,
50:12, 53:13,
128:18

finger

50:8, 50:9

finish	70:13, 70:20,	49:21, 51:1,	gate-like
53:10, 77:12,	71:4, 71:10,	54:5, 87:4,	84:16
102:13	71:14, 71:22,	87:9, 88:13,	gates
finishes	96:16, 97:1	88:15, 119:18,	74:8, 74:13,
52:15, 54:14	focus	119:19	76:21, 77:22,
firm	112:14	four-leaf	81:19, 82:1,
9:10	focused	48:22, 49:4,	83:21, 84:12,
first	112:19	49:10, 52:22,	84:17, 85:2,
26:6, 29:8,	focusing	53:15	85:8, 85:9,
34:3, 34:8,	35:6	free	90:5, 97:21,
35:20, 36:16,	follow	68:10	98:13, 98:15,
36:19, 41:22,	80:5, 102:1	frequently	99:17, 139:9
74:1, 88:17,	follow-up	78:8	gave
88:19, 88:20,	93:10	front	85:14
92:13, 92:18,	following	12:14, 115:13	general
92:20, 92:21,	26:8, 50:19,	fronts	28:21, 130:5,
96:5, 105:18,	60:10	109:9	130:9
106:8, 113:12,	follows	fully	generally
114:18, 117:20,	5:5	75:4	15:4, 109:19,
118:22, 119:1,	force	function	115:1
120:21, 128:6,	64:13, 67:4,	136:22, 137:12,	generate
132:2, 136:1,	69:10	137:13, 137:15,	80:10, 104:20,
138:14, 139:3,	foregoing	137:18, 138:9	130:8, 137:12
140:15	143:6, 144:3,	functional	generated
fisher	144:4	136:5, 136:8,	23:6, 23:19,
3:13, 19:7	form	136:16, 136:19,	69:10
five-minute	34:10, 37:8,	136:20	generates
53:6	40:10, 58:14,	further	119:8
flat	79:10, 82:3,	37:14, 109:8,	geometry
109:9, 109:10	131:15	113:9, 116:6,	104:19
flip	format	134:10, 142:10	getting
26:18, 33:5,	15:5	furthermore	34:16, 73:21
48:16	formed	129:4	give
flow	18:9, 36:15,	G	8:2, 16:3,
40:9, 40:20,	56:16, 56:21,	gate	29:16, 50:22,
42:20, 49:5,	59:14	82:9, 83:3,	60:4, 73:21,
49:19, 103:6	forming	83:4, 85:11,	95:19
flowing	24:13, 48:12,	86:1, 87:19,	given
41:13, 43:9,	57:15	87:20, 88:5,	135:1
129:9	forms	90:7, 90:9,	giving
flows	123:19	90:13, 90:16,	24:5, 55:5,
40:20, 102:16	forth	90:21, 90:22,	78:14
flux	15:7	91:3, 92:2,	glanced
63:5, 64:5,	forward	92:9, 93:22,	26:15
65:12, 65:15,	91:6, 107:9	95:8, 99:12,	go
66:2, 66:18,	four	99:13, 100:6,	7:11, 12:9,
68:20, 68:22,	8:16, 48:22,	101:21	15:7, 18:22,
69:2, 69:4,	49:1, 49:20,		20:1, 22:8,

26:21, 30:20,
33:15, 35:13,
37:19, 39:5,
39:10, 39:14,
47:9, 51:21,
54:22, 55:12,
55:13, 56:9,
60:11, 62:11,
62:19, 63:10,
63:20, 65:4,
67:17, 68:1,
71:11, 82:6,
82:7, 83:20,
86:18, 93:8,
93:9, 102:20,
103:20, 109:18,
113:17, 114:17,
116:12, 118:13,
120:15, 130:20,
133:9, 133:13,
135:14, 137:16,
138:14, 142:6,
142:17
goes
20:18, 41:5,
42:1, 42:4,
54:12, 54:17,
55:3, 79:15,
123:14, 128:14,
131:7
going
6:19, 6:21,
9:17, 11:21,
12:5, 21:16,
23:21, 25:8,
41:18, 42:15,
43:14, 43:15,
44:3, 44:9,
44:10, 47:6,
50:1, 50:3,
51:16, 52:6,
52:16, 53:2,
53:15, 54:9,
54:21, 67:4,
71:4, 80:20,
84:2, 103:9,
108:17, 116:10,
120:11, 122:7,

122:11, 126:4,
131:15, 132:6,
133:19, 134:16
gone
19:11
good
5:8, 5:9,
67:15, 86:3,
142:8
goodwin
3:6, 5:12, 5:15
gordon
3:5, 5:15
graduate
28:1, 28:4
greater
132:12
green
135:4
ground
118:18, 124:17,
139:1
grounds
116:7, 141:7
guess
14:10, 15:12,
16:14, 21:6,
41:6, 41:16,
52:11, 54:20,
55:4, 70:21,
75:17, 104:14,
110:19, 119:11,
127:8, 137:21
guesses
24:6
guessing
15:18
guidance
74:14, 75:7
H
half
65:16, 65:17,
66:8, 114:22
halfway
62:22
hand
52:12, 144:12

happen
109:4
happened
31:22
happens
51:1, 76:7,
110:17, 132:5,
136:22
happy
136:16
hard
10:10, 11:6,
12:15, 126:6
harder
50:19
head
78:15
heading
127:22, 138:20
heard
128:15
hearing
19:14
help
22:12, 50:11,
60:11, 81:22,
116:10, 119:14
helped
21:10
helps
74:19
here
9:11, 11:10,
13:3, 21:17,
24:14, 27:1,
30:13, 33:13,
33:14, 36:3,
37:22, 45:16,
53:19, 54:4,
54:9, 56:19,
57:9, 61:14,
70:3, 74:12,
78:9, 81:5,
87:9, 96:12,
105:16, 105:21,
106:5, 112:18,
116:11, 117:10,
120:9, 121:20,

126:5, 127:20,
132:8, 134:3,
134:11, 136:1,
136:8, 136:12,
137:1, 137:14,
138:21, 142:7
hereby
143:8, 144:3
hereunto
144:12
hesitant
136:13
hesitated
103:7
high
43:3
highlighting
11:16
hindsight
94:18
hip
136:14
hold
13:3, 91:2
holds
90:9, 95:7
hole
96:1
holes
67:9, 67:13,
75:21, 111:14
hook
123:18
horizontal
46:20, 46:22,
47:3, 47:9,
108:17, 108:19
hour
7:19, 8:19,
8:20, 124:20
hours
8:21, 9:2,
15:8, 15:14,
15:15, 16:11,
16:15

I

id
80:12

idea
29:17, 54:4,
77:9, 77:13,
137:2
identical
47:7, 112:9
identically
13:15, 47:8
identification
10:5, 10:7,
39:3, 61:3,
93:15, 114:7,
126:20, 130:16
illinois
3:15
immediately
60:9, 112:12
implement
30:4, 30:15
implementation
75:16
important
137:8, 137:11
importantly
118:3
include
58:8, 59:6,
74:13, 75:6
including
8:8, 8:10,
30:2, 32:1,
32:2, 33:8,
35:3, 80:5
incorrect
37:20, 70:14
independent
141:8, 141:14,
141:15, 141:19
index
4:1
indicate
49:19
indicated
68:21, 68:22,
69:3, 69:4, 98:8
indicates
42:11
indicating
52:18, 64:16,

139:12
indication
43:3
individually
44:19, 44:21
individuals
21:2
induced
69:9
induces
113:13
inductance
91:22, 93:17
inductor
30:9, 40:7,
40:9, 40:14,
40:15, 41:4,
41:5, 42:21,
42:22, 44:2,
44:6, 47:19,
48:11, 48:21,
49:5, 52:22,
53:20, 65:11,
65:12, 65:13,
88:4, 103:15,
105:7, 105:8,
105:18, 105:19,
106:8, 106:9,
108:11, 109:15,
110:3, 115:2,
117:5, 117:12,
120:17, 128:6,
132:2, 133:11,
139:2, 139:4,
139:15, 140:15,
140:16, 140:19
inductors
23:7, 23:17,
30:19, 30:20,
56:16, 56:21,
57:15, 58:4,
58:10, 58:19,
59:14, 59:20,
89:4, 89:9,
110:14, 112:20,
113:3, 121:15,
122:8, 132:17,
133:8, 133:10,

140:9
inform
23:10, 25:1,
136:3
information
20:9, 34:6,
36:5
informed
18:10, 21:3,
23:12, 23:13,
23:14, 58:17,
75:17
informs
57:13, 58:3
initial
32:1, 36:15,
117:1
inside
121:11, 123:14
insight
133:14
installed
84:16
instances
88:15
instead
49:1, 93:13,
94:5
institution
35:10, 35:21,
36:6, 37:15
insulation
134:14, 134:15,
134:20
insulator
41:12
integrated
37:17, 41:11,
132:17, 132:18,
133:15, 133:21,
134:4
intel
1:5, 5:13,
17:21, 32:2,
32:11, 37:15,
38:21, 48:17,
114:1, 114:2,
114:9, 114:13,

115:2, 117:5,
117:11, 124:14,
130:13, 130:21,
139:13, 139:16,
139:21, 140:4,
140:18, 140:20
intel's
17:17, 32:16,
33:1, 33:8,
35:3, 35:6,
35:9, 35:21,
36:6, 37:20,
60:16, 60:21,
61:5, 62:12,
63:11, 118:19,
120:1, 124:7
intended
18:4
intending
81:6
intensity
93:16
inter
5:13, 24:21,
32:17, 33:1,
34:2, 38:22
interact
23:18, 23:19,
111:16
interacting
134:6
interaction
64:19, 112:17
interconnections
122:13, 123:18
interest
144:11
interlinkage
63:5, 64:4,
66:17, 67:11,
67:12, 69:1,
69:5, 70:13,
70:19, 71:9,
71:14, 71:21,
96:16, 97:1
international
125:8
internet
28:18

interpret	61:1, 61:4,	53:3, 56:12,	large
54:9, 101:1	126:10, 131:14,	62:13, 63:21,	122:14
intersect	131:19	64:16, 76:13,	larger
49:21, 72:20	itself	79:16, 82:5,	107:17, 110:14
intersecting	26:2, 70:17	86:22, 99:10,	larochelle
64:13	J	111:15, 114:4,	3:4, 4:6, 5:7,
intersection	jablonski	116:7, 117:21,	5:12, 9:19,
51:20, 52:4,	9:9	121:7, 123:12,	10:13, 10:17,
52:10, 52:14,	jersey	125:19, 125:21,	10:20, 11:1,
54:11, 54:15,	6:3	126:22, 130:18,	12:9, 12:12,
54:19, 55:3	job	131:17, 131:20,	26:8, 38:19,
intersects	1:20	133:8, 133:10,	53:7, 53:11,
64:16	K	138:3, 138:17,	55:12, 55:15,
interviews	karen	140:2, 140:7,	86:3, 86:6,
20:9	1:22, 2:9,	141:19	86:13, 112:4,
introduce	144:2	knowledge	113:22, 116:14,
60:20	keep	41:10, 130:6,	124:19, 125:1,
introduced	134:5	130:9	126:13, 126:16,
73:13	keeping	knowledgeable	128:18, 142:5,
introductions	12:3	20:10, 20:11,	142:10, 142:17
5:10	kevin	20:16	lasalle
introductory	9:9	L	3:14
28:22	key	label	last
investigation	117:10	41:22	14:7, 30:12,
4:15, 18:17,	kind	labeled	37:11, 49:13,
61:1, 61:4,	14:9, 48:3,	40:17, 51:4,	53:9, 97:18,
125:9, 125:18,	86:18, 87:18,	52:1, 79:2,	97:19, 121:11,
126:10, 127:18,	133:14	79:3, 82:10,	125:17, 135:12
131:14, 135:16	klerekoper	85:16, 90:13,	late
involved	1:22, 2:9,	92:9, 92:15,	14:7
18:7, 21:9,	144:2	98:14, 120:13,	latest
47:15, 60:7	know	123:8	27:4
involves	6:13, 6:19,	labeling	layout
29:20, 30:1	9:1, 14:15,	100:16, 101:18	30:9, 41:3,
involving	15:10, 15:11,	labels	139:2
18:15, 29:3	16:10, 16:15,	89:8	lead
ipr	17:6, 18:5,	lack	118:8, 138:5
1:11, 5:17,	18:14, 18:18,	73:11	leads
12:17, 14:2,	19:11, 19:21,	laid	54:16, 100:20,
14:5, 14:12,	20:1, 20:20,	41:4, 133:20,	136:12
16:1, 16:19,	24:10, 26:11,	133:21	learn
25:4, 57:6,	31:2, 31:10,	landed	133:9
114:2, 124:8,	39:6, 39:13,	92:17	least
130:13	45:21, 48:1,	language	76:14, 102:14,
issues	49:3, 49:7,	57:13, 57:19,	117:15, 127:4
20:10, 20:12,	49:16, 50:12,	58:2, 58:9	leave
20:17		laptop	12:1
itc		6:6	leaves
4:15, 18:17,			49:1, 123:15

left	31:20, 36:15,	78:10, 78:20,	74:2, 74:7,
40:21, 42:2,	37:1, 37:6,	79:20, 85:15,	75:10, 78:17,
42:4, 42:7,	43:3, 49:12	96:16, 97:1,	79:9, 81:22,
52:12, 76:2,	liability	122:20, 123:17,	84:19, 87:11,
77:8, 80:14,	123:13	134:5	88:7, 98:18,
80:15, 82:10,	limit	list	105:22, 108:17,
83:3, 86:1,	131:10	17:15, 25:9,	114:21, 115:20,
98:9, 99:7,	limitation	26:20, 29:9,	118:14, 119:14,
100:1, 101:20,	59:7, 59:8	29:13	119:17, 127:21,
121:9, 121:12,	limitations	listed	129:1, 129:16,
122:3, 123:7,	136:4, 136:5,	28:5, 30:13,	133:5, 138:15
123:15	136:8, 136:16	35:15	looked
left-hand	limited	little	15:10, 19:12,
49:9, 79:6,	57:15, 58:3	22:20, 39:10,	19:21, 47:21,
88:5, 94:1,	limits	43:5, 46:13,	60:13, 63:17,
100:6, 121:13,	138:3	49:14, 50:19,	83:11, 89:16,
122:22, 123:1	line	81:1, 81:17,	103:14, 120:10,
leftward	46:15, 46:20,	83:2, 90:4,	126:1
54:20	46:22, 47:3,	99:2, 100:15,	looking
leg	47:9, 51:9,	116:5, 124:19,	23:22, 36:11,
49:9	53:19, 64:17,	136:13	75:18, 83:10,
legs	78:11, 79:1,	lm	94:19, 95:17,
49:8	79:2, 80:20,	1:8	99:10, 102:2,
less	81:3, 121:3,	located	115:22, 116:2,
15:15	121:9, 121:11,	6:2, 6:3,	116:19, 119:22,
let's	121:22, 122:1,	40:13, 111:11,	135:19, 135:20
6:9, 12:3,	122:3, 122:22,	112:12	looks
12:9, 22:15,	123:2, 123:7	location	43:18, 55:7,
23:12, 45:10,	lines	129:7	82:18
49:8, 50:3,	43:19, 43:21,	locations	loop
51:3, 55:12,	44:5, 44:8,	129:13	40:21, 41:2,
56:9, 63:10,	44:12, 45:8,	logical	41:5, 41:6,
63:11, 63:19,	45:17, 45:18,	16:2	41:10, 41:14,
63:20, 64:22,	46:16, 63:5,	long	41:16, 41:17,
65:4, 67:17,	64:5, 64:13,	8:17, 92:13	41:21, 42:1,
70:22, 71:11,	65:11, 65:14,	longer	42:5, 42:8,
74:2, 75:9,	65:16, 65:17,	104:15	42:13, 42:14,
82:7, 88:15,	65:20, 65:22,	longest	43:5, 43:6,
91:19, 93:9,	66:1, 66:7,	80:11	43:8, 43:11,
103:19, 112:1,	66:9, 66:17,	look	43:13, 43:15,
114:17, 118:12,	67:4, 68:20,	20:1, 34:12,	43:20, 43:21,
120:11, 126:7,	68:21, 68:22,	42:21, 44:5,	44:7, 44:11,
126:18, 127:21,	69:2, 69:3,	44:22, 47:7,	46:8, 51:2,
129:1, 135:14,	69:4, 70:13,	47:11, 53:17,	51:17, 51:18,
142:5	70:19, 71:3,	60:8, 63:13,	51:22, 52:2,
level	71:9, 71:14,	63:18, 64:22,	52:4, 52:6,
28:1, 28:9,	71:22, 72:20,	65:4, 71:11,	52:8, 52:12,
31:5, 31:16,	73:6, 78:9,	72:10, 72:13,	52:15, 52:16,

54:10, 54:13,
54:14, 54:17,
54:18, 54:19,
55:2, 55:5,
55:7, 55:8,
66:2, 66:10,
82:21, 84:13,
85:3, 86:18,
87:13, 100:3,
102:16, 102:17,
117:18, 118:4,
118:5, 118:9,
118:22, 119:7,
119:11, 121:6,
121:17, 121:20,
122:10, 122:12,
122:14, 122:18,
123:9, 123:19,
123:22, 124:4,
137:3, 137:4,
137:6, 137:9

loops

44:18, 44:19,
44:21, 45:13,
46:3, 46:6,
49:1, 49:20,
49:21, 51:1,
51:8, 52:10,
53:16, 53:18,
53:22, 54:5,
54:7, 95:18,
103:3, 103:11,
109:2, 115:3,
115:5, 115:18,
117:6, 117:7,
117:13, 117:15,
119:1, 120:4,
120:8, 121:19

lori

3:5, 5:15

lot

16:16, 28:3,
30:11, 71:3,
128:13, 128:21,
136:11

lower

40:21, 41:5,
41:14, 41:17,

42:7, 42:13,
42:14, 43:5,
43:13, 44:11,
44:19, 44:21,
45:12, 46:7,
51:15, 51:17,
51:18, 52:16,
66:2, 95:18,
121:1, 121:12,
122:2

lunch

86:7, 86:10

luncheon

86:12

M**made**

123:6, 131:14

magnetic

42:19, 43:4,
43:10, 43:11,
43:14, 45:11,
45:12, 46:2,
47:18, 48:11,
52:21, 54:2,
63:5, 64:5,
64:13, 65:12,
65:15, 66:2,
66:10, 66:17,
67:4, 67:20,
67:22, 68:14,
68:20, 68:21,
69:2, 69:3,
70:13, 70:19,
71:4, 71:10,
71:14, 71:22,
75:21, 76:1,
76:6, 76:10,
78:12, 78:13,
78:21, 78:22,
85:17, 85:20,
85:21, 88:19,
91:8, 91:21,
92:19, 93:16,
96:16, 97:1,
104:5, 105:7,
105:9, 108:15,
110:4, 110:5,

111:4, 112:7,
112:15, 112:22,
113:6, 113:8,
113:10, 113:14,
119:1, 123:22,
124:5, 129:6,
129:8, 129:11,
131:5, 137:12

magnitude

69:5

mail

6:10

make

7:15, 12:13,
21:1, 21:16,
25:21, 26:18,
36:2, 37:4,
37:11, 40:1,
40:12, 51:21,
69:1, 69:4,
71:14, 76:19,
87:4

makes

52:11, 52:14,
54:11, 63:4,
64:4, 66:17,
70:12, 71:21,
79:16, 96:15

making

106:12, 111:18

manner

84:17

manos

33:18, 36:14

many

7:8, 8:9, 8:13,
8:21, 12:1,
15:8, 16:11,
33:14, 47:21,
50:11, 63:5,
64:5, 66:17,
70:13, 70:19,
71:9, 71:13,
71:21, 96:16,
97:1

march

1:17

mark

126:18

marked

4:12, 4:14,
4:16, 4:18,
4:21, 10:5,
10:7, 10:16,
39:3, 61:3,
114:7, 126:20,
130:16, 135:14

marking

11:16

markman

19:14

massachusetts

2:11, 3:8,
144:20

material

19:1

materials

17:11

matter

18:21, 24:13,
24:19, 25:6,
53:12, 77:19

maximum

45:11, 45:13,
45:22

maybe

11:12, 35:18,
116:5

mean

38:15, 60:3,
68:9, 82:17,
88:14, 89:6,
90:1, 98:4,
100:8, 104:10,
106:7, 110:20,
112:16, 115:17,
116:11, 119:10,
125:21, 136:7,
136:15

meaning

92:13, 128:3

means

21:6, 29:15,
100:4, 134:22,
136:20

meant

136:16

measurable	124:14, 124:18,	138:11	140:22
131:12	137:7, 137:8	morning	need
measured	midya's	5:8, 5:9	7:19, 30:2,
43:2	117:19	most	30:3, 58:22,
measuring	might	80:11	72:10, 121:8,
45:5	14:7, 23:18,	motivate	133:11, 136:7
meet	23:19, 46:19,	134:12	needed
8:13	67:11, 67:12,	motivating	32:8, 36:4
meetings	67:13, 75:4,	135:10	needs
8:17, 8:18	81:22, 82:19,	move	78:3, 104:5,
memory	94:18, 110:11,	55:20, 75:5,	104:6, 134:3
18:9, 22:19,	117:19	111:21, 113:15,	neither
24:5, 34:13,	miles	125:6	90:16, 90:17,
127:7	3:19	much	95:9, 144:9
mention	minimizing	15:1, 15:14,	net
29:12, 29:14,	119:1	43:18, 83:12,	42:19, 43:17,
58:12	minimum	104:15, 107:10,	44:18, 44:22,
mentioned	46:2, 46:10,	107:16, 110:18,	45:3, 45:5,
9:13, 14:14,	46:18, 47:5,	127:7, 131:19,	45:12, 46:2,
118:6	47:12	141:10	85:21
merges	minute	multiple	never
42:13	10:12, 12:10,	104:22, 129:5	125:22
messed	65:6, 74:7	must	new
107:11	misspoke	100:19	6:3, 35:11,
met	102:11, 103:8	muted	55:20, 125:6
8:10	misunderstood	128:17	next
method	11:12, 35:18	mutual	12:8, 25:8,
57:14	modeling	91:21, 93:17	93:8, 93:9,
miday	22:21, 22:22,	myself	93:12, 93:13,
4:17, 114:8	24:2, 24:3	50:4, 107:5	96:7, 112:13,
middle	modify	N	118:12, 119:7,
41:3, 43:6,	13:9, 13:18	name	121:3, 121:4
44:8, 76:3,	moment	5:11, 24:2,	noncontact
76:4, 120:18,	21:18, 25:17,	143:13	93:14
121:8	27:6, 32:19,	names	north
midya	63:13, 73:22,	24:10	3:14
113:16, 113:19,	135:19	near	northern
113:22, 114:9,	more	47:18, 48:11,	3:7
115:8, 115:14,	15:16, 15:19,	74:5, 93:12,	notarial
116:3, 117:14,	16:15, 20:20,	109:4, 109:5	144:13
117:16, 117:20,	22:5, 32:8,	nearly	notary
118:7, 118:18,	43:18, 53:8,	73:9	2:10, 144:1,
118:19, 119:9,	79:18, 81:7,	necessarily	144:19
119:15, 119:22,	81:18, 83:2,	118:10, 139:20	notebook
120:3, 120:5,	85:1, 104:21,	necessary	34:15
120:22, 123:10,	106:12, 109:9,	80:21, 91:21,	notes
123:11, 123:13,	109:10, 111:20,	93:16, 123:18,	142:6
123:20, 124:2,	134:7, 135:9,		nothing
			11:19, 141:22

notice 2:9, 130:1 number 4:13, 5:18, 9:22, 17:15, 18:14, 24:7, 38:20, 39:4, 42:16, 69:1, 79:7, 82:15, 83:4, 126:10 numbered 71:7 numerous 19:15 O oath 5:2 object 131:15 objection 34:10, 37:8, 40:10, 58:14, 59:16, 79:10, 82:3, 82:22 objective 67:14 observing 132:12 obtained 20:9 obvious 124:15, 141:6, 141:8, 141:13 occasions 8:12 occur 109:3 occurred 19:8 occurs 105:5, 141:21 offered 7:20, 23:14 office 10:15, 39:9 officer 144:2	oh 9:1, 9:8, 50:9, 53:7, 68:5, 103:8, 107:4 once 7:19, 72:16, 108:19 one 7:20, 8:19, 9:8, 14:13, 20:20, 22:5, 22:6, 41:10, 46:14, 46:17, 46:18, 46:19, 46:22, 47:5, 47:19, 49:8, 49:13, 49:20, 49:21, 51:3, 51:5, 51:12, 52:22, 53:8, 53:22, 54:6, 58:6, 61:22, 62:7, 63:14, 64:17, 67:14, 75:22, 76:2, 77:13, 78:1, 80:1, 82:8, 82:11, 82:21, 84:3, 84:5, 85:1, 88:15, 94:17, 94:18, 96:8, 99:11, 99:21, 99:22, 104:22, 105:15, 107:15, 108:5, 109:17, 109:20, 110:7, 110:9, 111:18, 116:7, 119:18, 120:8, 121:18, 121:19, 122:21, 133:18, 133:19, 134:6, 134:7, 137:5, 137:8, 137:15, 137:17 ones 65:17, 117:12 only 1:14, 59:11,	61:22, 62:3, 64:16, 68:17, 89:14, 89:17, 94:5, 94:7, 108:5, 109:17, 120:8, 126:1 open 6:6, 6:7, 6:10, 6:14, 39:7, 39:11, 39:14 opened 10:18 operate 78:4 opinion 20:22, 25:1, 31:5, 31:19, 31:21, 32:1, 32:7, 32:10, 33:17, 34:7, 36:1, 36:2, 36:5, 36:10, 36:15, 36:22, 37:6, 56:15, 56:19, 57:1, 57:5, 57:7, 57:9, 66:20, 67:1, 123:21, 125:7, 127:11, 137:21, 138:7, 141:4, 141:12 opinions 13:1, 13:3, 13:6, 13:17, 15:5, 18:9, 23:10, 23:13, 24:14, 48:12, 57:10, 62:10, 100:12, 125:13, 125:14, 125:15, 142:3 opposing 45:17, 73:6 opposite 47:11, 54:3, 69:6, 73:7, 107:21, 108:6, 108:20, 109:7,	109:14, 109:20, 112:9, 113:2, 129:9, 129:12, 130:7, 130:8, 131:3, 131:5, 131:6, 132:21, 134:16 optical 28:19 order 30:4, 34:16, 61:1, 80:12 ordinary 31:5, 32:3, 32:6, 32:12, 37:1, 38:15, 128:3, 134:14, 136:3 orientation 70:2, 70:8, 77:19, 139:7, 139:20, 140:17 oriented 139:4, 140:16 original 34:20, 34:22, 35:16 other 25:5, 47:14, 51:13, 54:1, 54:16, 57:13, 58:2, 61:19, 62:2, 62:5, 67:8, 69:5, 69:6, 78:1, 79:18, 82:21, 84:8, 84:16, 90:13, 98:20, 99:1, 99:5, 99:12, 100:18, 113:4, 121:17, 124:1, 128:4, 129:13, 133:3, 133:18, 134:17, 137:11, 138:6, 141:22 others 22:21
--	---	---	---

otherwise	owner's	32:17, 33:1,	112:20, 119:3,
144:11	15:22, 16:4	34:2, 38:22	120:7, 122:16,
out	p	participated	124:15, 125:8,
11:9, 34:16,	p-o-s-i-t-a	100:9	127:13, 128:13,
35:15, 39:6,	38:14	particular	129:5, 137:1
41:4, 43:12,	packed	69:19, 129:7,	path
43:21, 44:3,	131:19	139:20	52:5, 120:9,
46:15, 47:2,	page	parties	121:21, 122:7
47:9, 50:4,	4:3, 4:8, 26:9,	17:21, 56:1,	paths
70:2, 71:9,	29:8, 43:12,	144:10	50:1
73:10, 76:2,	43:16, 44:9,	parts	pattern
76:3, 83:18,	44:10, 61:9,	137:4	111:13
116:10, 121:13,	107:9, 115:1,	party's	paul
129:13, 133:21,	117:1, 127:13,	19:13	1:15, 2:1, 4:5,
137:16	130:20, 131:4,	pass	4:11, 5:4, 9:21,
outcome	134:11, 135:5,	74:7, 139:9,	10:3, 10:6,
144:11	135:12	142:12	10:15, 10:18,
outside	pages	passes	86:9, 126:8,
44:1, 44:5,	1:21, 33:14,	41:22, 54:15	143:6, 143:13
44:13, 123:14,	34:15	patent	pause
123:15, 132:9	pair	1:1, 1:3, 1:9,	12:3, 21:17
outward	81:13, 81:16,	1:12, 3:11,	pcbs
121:7	85:10	4:13, 5:18,	132:15
over	pairs	5:22, 9:22,	pdf
8:11, 8:15,	54:6, 55:11,	15:22, 16:4,	26:10
15:14, 26:17,	134:13, 135:7,	16:7, 16:19,	pending
28:9, 50:1,	135:11	17:1, 17:3,	7:21
54:15, 54:21,	paper	17:16, 18:15,	people
77:7, 80:11,	33:8	19:3, 20:15,	20:10, 20:16,
100:2, 124:20	papers	21:10, 23:4,	21:12
over-the-air	48:2	24:9, 33:8,	percentage-wise
30:1	paragraphs	35:3, 38:13,	15:1
overall	13:13	38:20, 39:4,	perfectly
67:14, 111:20	parallel	40:1, 40:5,	11:18
overlap	80:1, 132:4,	46:4, 48:3,	perform
29:17	132:5	48:17, 48:20,	21:7
overlaps	parameters	50:7, 50:13,	performed
81:3	22:9	57:2, 57:13,	21:7, 21:8,
overpass	parenthetical	58:2, 58:17,	21:15, 21:20,
50:2	74:11, 74:18	58:18, 59:4,	23:9, 23:10
overzealous	part	59:6, 59:11,	period
39:10	5:16, 29:21,	60:14, 61:20,	8:15
own	30:8, 32:11,	72:10, 75:4,	permit
22:11, 57:2	33:18, 35:13,	75:11, 79:14,	134:18
owner	40:15, 41:3,	83:11, 103:14,	person
1:9, 3:11,	140:7, 141:18	106:18, 108:3,	32:3, 32:6,
16:7, 16:20,	partes	108:11, 108:13,	32:12, 38:15,
17:1, 17:3	5:14, 24:21,	110:3, 112:8,	136:3

personally 14:20, 15:2	placed 80:1	46:13, 46:16, 47:2, 47:4,	prepare 8:5, 25:16
perspective 99:9, 99:11, 132:9	places 70:4, 141:17, 141:20	115:4, 115:18, 117:16, 140:4	prepared 18:20, 32:15, 124:6
petition 17:17, 32:17, 33:1, 33:8, 34:2, 35:3, 35:6, 124:7, 124:13	plain 128:3	poor 70:6	preparing 8:22, 15:8, 16:8, 16:12, 17:4, 17:12, 20:5, 24:13, 25:3, 26:1, 26:13, 32:20, 33:7
petitioner 1:6, 3:3	planet 3:19	portion 41:17, 42:8, 42:14, 44:2, 51:17	present 3:18, 13:2, 13:6
phd 1:15, 2:1, 3:4, 4:5, 5:4, 10:4, 126:8, 143:6, 143:13	planning 11:20	posita 35:12, 36:10, 37:21, 38:2, 38:7, 38:10, 38:14, 57:14, 58:3, 74:12	presented 26:22, 36:16, 101:17
phone 7:3, 128:15, 128:16	platform 6:17	position 37:22, 45:8, 59:13, 61:15, 77:20, 131:21	pretty 7:10, 28:12, 134:19
photonic 29:21, 30:16	please 7:14, 26:7, 39:9, 39:11, 53:6, 70:16, 77:12, 89:15, 105:22, 129:17, 142:16	positioned 73:5, 105:19, 106:9, 128:7	prevent 122:16
photonics 28:17, 29:15, 29:19, 30:1, 30:13, 30:14	plot 76:5	positions 70:5, 108:22	previous 18:7, 20:18, 52:20, 60:6, 79:15, 127:4, 127:18
phrase 64:3	point 17:2, 24:5, 42:15, 42:17, 45:9, 47:6, 57:19, 57:21, 58:2, 64:2, 67:5, 71:4, 75:20, 80:9, 90:3, 95:19, 96:2, 106:11, 108:19, 109:1, 109:7, 120:20, 121:1, 123:16, 124:9, 134:11, 135:1, 135:5	possible 111:9, 111:10, 138:1, 138:4	previously 4:12, 4:13, 4:15, 4:18, 4:20, 10:7, 39:3, 83:12, 98:21, 114:7, 125:7, 130:16
physical 11:15, 138:2	pointed 35:15, 71:8, 73:10, 83:18	practice 7:18	princeton 6:3, 27:10, 27:16, 28:13
physically 6:2, 50:13, 98:22, 137:14	pointing 42:9, 42:10, 70:2, 79:7, 83:4, 89:21, 92:9, 122:20, 139:14, 140:19, 140:20	preamble 59:1	principle 132:16, 132:19, 133:1
physics 95:20, 110:15, 132:20	points 46:5, 46:12,	preceding 100:18	printed 37:16, 132:14, 132:15, 133:6, 133:12, 133:20
picture 99:15		predetermined 88:20, 91:9, 92:21	prior 8:10, 16:8,
piece 102:14		preference 86:10	
pieces 53:17		preliminary 15:22, 16:4, 16:8	
place 42:5, 45:11, 89:14, 108:6, 108:14, 125:20, 133:4, 143:8		preparation 9:3, 12:21, 25:10, 25:19, 39:18, 62:17, 100:9, 114:10, 114:14	

17:4, 34:3,
34:7, 57:8,
57:10, 105:15,
106:19, 133:3
probably
15:19, 26:16,
26:18, 44:15,
119:14, 125:22
problem
12:2, 69:20,
70:9, 73:10,
95:22, 120:19
problems
138:6
proceeding
5:14, 18:8,
25:4, 38:22,
42:1, 47:14,
48:14, 52:20,
57:8, 57:11,
60:6, 61:17,
105:15, 127:5
proceedings
5:17, 17:20,
18:12, 18:13,
18:20, 19:1,
19:5, 19:8,
19:17, 144:3,
144:5, 144:6
proceeds
41:1, 41:15
process
15:4
processing
28:15
proctor
3:6, 5:13, 5:15
produce
111:3, 111:19,
113:5
produced
17:20, 17:21,
42:20, 43:4,
52:21, 78:13,
104:16, 110:4,
110:5, 110:16,
111:5, 121:17,
122:12, 137:6

producing
110:21, 111:1
professor
27:10, 27:13
program
6:10
programs
6:7
promise
50:16
propagating
104:7, 105:12
proposed
56:1, 61:14,
61:20, 118:19,
128:2, 128:10
proposes
81:16, 84:4
provide
21:3, 31:4,
31:15, 56:14,
91:20, 93:16,
101:13, 128:2
provided
9:12, 19:6,
19:7, 32:1,
61:19, 125:7,
125:13, 125:15,
125:16, 127:11,
130:14, 140:20,
141:4, 141:12
providing
32:2, 32:11,
40:16, 127:3
proximity
128:4, 131:22,
138:8, 138:9
prucnal
1:15, 2:1, 4:5,
4:12, 5:4, 5:8,
9:22, 10:3,
10:6, 10:9,
12:14, 55:16,
86:14, 100:8,
125:3, 126:8,
126:18, 142:11,
143:6, 143:13
prucnal's
4:19, 126:21

public
2:10, 144:1,
144:19
publication
27:7
publications
26:20
publishing
27:6
pull
39:5, 74:19
purpose
75:13
pursuant
2:9
pushed
81:1
put
7:3, 11:19,
12:5, 16:16,
30:19, 62:13,
104:14, 109:15,
113:17, 126:4,
135:6, 137:22,
138:3
putting
61:2, 122:17,
137:14, 138:9
Q
question
7:14, 21:5,
34:11, 35:19,
37:9, 37:10,
40:11, 43:18,
53:8, 53:9,
58:15, 59:17,
64:20, 79:11,
82:4, 83:1,
85:1, 85:12,
88:12, 116:22,
131:16, 131:18,
136:7, 140:17,
141:1
questions
7:21, 142:11,
142:14
quick
88:7, 142:5

quickly
142:7
quite
13:11, 21:5,
99:15
quote
63:4, 64:3,
64:4, 64:9,
64:21, 66:16,
66:18, 71:20,
71:21, 71:22,
96:11, 96:21,
117:7

R

radiation
104:16, 104:20,
105:2
radiations
131:11
radio
29:20, 29:22,
30:1, 74:14,
75:7
radiofrequency
29:15
raghavan
4:17, 113:16,
113:20, 114:2,
114:8, 114:13,
115:11, 115:15,
116:3, 118:7,
118:18, 118:20,
124:15, 124:18
ran
22:11
rather
38:3
reaches
51:20, 76:2
read
5:2, 56:7,
63:14, 63:15,
68:10, 70:15,
75:3, 116:5,
116:20, 116:21,
134:10, 142:15,
143:6

readily 135:9, 138:11	reception 78:19, 80:9	62:10, 93:20, 93:21, 113:16,	regardless 90:7
reading 58:17, 91:19, 135:5	recess 86:12	113:19, 115:7, 115:13, 130:12	regions 45:1
ready 88:11	recollection 24:7, 33:11, 48:9, 53:2, 61:10, 127:3	references 37:14, 71:12, 98:2, 113:18, 115:2, 117:4, 117:11, 130:2	rehearse 50:10
real 134:11	record 5:11, 12:10, 12:11, 12:14, 25:22, 36:3, 40:1, 55:13, 55:14, 113:22, 124:22, 126:17, 142:9, 142:18, 144:5	referencing 93:19	relate 132:17
really 15:17, 15:18, 24:4, 43:1, 45:20, 119:11	rectangle 89:9	referred 40:6, 72:9, 77:2, 82:14	related 17:20, 18:12, 19:17, 24:8, 24:12, 136:5, 144:9
realtime 23:21, 102:2	red 135:2	referring 18:2, 18:13, 19:16, 20:12, 20:14, 58:21, 59:2, 59:19, 60:6, 65:1, 65:15, 79:5, 79:14, 81:11, 87:6, 88:3, 92:14, 94:5, 94:6, 95:6, 97:12, 100:22, 111:4, 139:17, 139:19, 140:11	relative 132:11
reason 8:2, 36:3, 36:4, 77:20, 94:11, 118:6	reduce 73:8, 111:17	refers 59:9, 72:3, 90:2, 93:2, 94:4, 99:14	relatively 63:4, 66:16, 96:10, 96:15
reasoning 141:14	reduced 89:13, 90:12, 90:18, 91:5, 94:15, 94:16, 95:2, 95:9, 95:14, 95:16, 101:12, 101:13, 102:5, 102:10, 119:8, 124:1, 128:7, 132:2, 144:7	refine 36:5	relevant 126:2
reasons 141:14	reduction 92:3, 94:20	refined 31:16, 31:21, 32:11, 34:7, 35:11, 36:1, 36:3, 37:6, 38:3, 38:7	relied 29:4, 37:14
rebuttal 4:11, 9:13, 9:21, 10:6, 12:16, 13:21, 15:9, 15:20, 16:9, 17:8, 31:1, 32:15, 55:21, 62:19, 66:11, 72:8, 73:18, 86:19	refer 5:21, 10:21, 11:2, 49:14, 62:1, 62:4, 66:12, 70:21, 78:6, 81:18, 82:8, 87:3, 88:22, 89:2, 91:10, 91:12, 91:13, 96:18, 112:6, 115:19	refresh 33:11, 34:13, 61:10, 127:2, 127:7	rely 25:11
recall 14:8, 15:3, 17:6, 18:18, 22:3, 22:4, 22:6, 22:11, 23:1, 23:2, 23:13, 25:17, 32:18, 47:22, 48:6, 53:3, 56:6, 57:10, 95:5, 125:14, 127:19, 128:22, 130:4, 131:20, 132:14, 134:10	reference 21:1, 61:7,	regarding 9:12, 9:22, 36:22, 114:9, 114:13, 141:2	remain 38:5
receiver 29:22			remember 13:11, 24:2, 47:16, 136:15
			remembering 85:18
			remind 33:4
			reminder 7:13
			remove 11:20
			rendered 141:6, 141:8, 141:13
			renders 124:15
			repeat 59:1
			rephrase 141:11
			reply 35:10, 35:21,

36:6
report
 66:12, 68:4,
 72:8, 116:9,
 117:2, 131:19,
 133:19, 135:18,
 135:20, 136:10,
 141:21, 142:1,
 142:2
reported
 1:22
reporter
 48:18, 144:1
represent
 5:13, 65:21,
 66:1, 66:8,
 78:10, 78:20
representation
 11:13, 65:10
representations
 48:7
represents
 82:1, 85:16
requested
 142:20, 144:8
require
 6:14, 59:21
required
 59:18, 119:2,
 120:6
requires
 56:15, 56:20,
 59:14, 117:14
rereading
 75:11
research
 29:9, 30:8
respective
 83:21, 84:17,
 98:16
respectively
 98:9
response
 15:22, 16:5,
 16:8, 16:20,
 17:1, 17:3
restate
 7:15

result
 136:21
resulting
 129:6
retained
 14:2, 14:4
rethink
 32:7, 36:9
retrieve
 12:4
review
 5:14, 12:20,
 15:6, 16:4,
 16:7, 17:1,
 17:3, 18:19,
 20:5, 24:21,
 26:13, 26:16,
 26:21, 32:16,
 32:17, 32:21,
 33:2, 33:12,
 33:13, 34:2,
 38:22, 39:17,
 62:16, 82:6,
 114:10, 114:14,
 125:17, 136:6,
 144:8
reviewed
 8:7, 17:2,
 17:11, 17:16,
 18:5, 25:10,
 25:19, 26:1,
 33:7, 34:2,
 34:19, 35:2,
 35:16, 35:19,
 124:7, 124:10,
 125:22
reviewing
 13:10, 58:5,
 64:7, 65:9,
 68:16, 72:18,
 74:21, 79:12,
 83:7, 88:10,
 98:6, 116:18,
 127:6, 136:9
rf
 29:14, 29:19,
 29:22
rfid
 64:12, 67:16,

69:22, 74:7,
 75:14, 75:22,
 77:15, 77:18,
 77:22, 78:3,
 80:18, 110:22,
 111:10, 113:10,
 140:12
right
 10:17, 16:21,
 22:22, 24:20,
 27:14, 27:15,
 29:19, 31:6,
 31:7, 36:13,
 40:2, 41:17,
 41:18, 42:2,
 42:9, 42:11,
 42:14, 47:22,
 51:15, 51:21,
 52:5, 53:11,
 54:12, 54:16,
 60:17, 62:7,
 62:8, 68:6,
 72:1, 72:5,
 73:2, 76:3,
 77:8, 77:13,
 80:16, 81:20,
 81:21, 82:12,
 82:20, 83:19,
 87:12, 87:14,
 87:20, 87:21,
 89:3, 94:10,
 97:10, 98:9,
 99:7, 99:21,
 99:22, 100:10,
 101:21, 102:19,
 103:4, 103:11,
 103:17, 106:15,
 106:19, 108:18,
 120:2, 121:5,
 122:2, 123:3,
 123:6, 123:10,
 125:10, 137:8
right-hand
 51:5, 51:16,
 51:17, 51:22,
 52:3, 52:15,
 54:11, 120:12,
 120:15, 121:2

ring
 128:16
room
 6:4, 11:9,
 11:11, 12:8
rough
 16:14
rpr
 1:22
rules
 133:16
run
 12:8, 22:9

S

safari
 6:13, 6:14,
 6:18
said
 21:15, 21:17,
 22:8, 22:16,
 24:1, 32:10,
 32:13, 38:14,
 44:8, 45:2,
 49:20, 62:7,
 73:8, 78:11,
 85:4, 85:16,
 85:18, 93:10,
 96:20, 101:4,
 102:2, 102:3,
 102:6, 117:15,
 126:11, 127:16,
 132:19, 137:22,
 139:3, 139:4,
 140:15, 140:16,
 144:5
sake
 130:13
same
 9:9, 16:14,
 22:18, 38:6,
 49:12, 53:12,
 54:4, 61:13,
 69:1, 83:22,
 84:18, 91:2,
 94:4, 98:16,
 100:16, 105:10,
 110:15, 117:17,

117:18, 118:4,
118:5, 118:9,
122:17, 132:16,
132:19, 132:22,
133:1, 135:18,
135:20, 137:3,
137:4, 137:13,
139:3, 139:5,
140:14, 140:17,
141:1, 141:3

santarelli

9:6, 14:14,
14:15

saw

95:16

say

8:16, 8:21,
15:3, 15:12,
16:15, 17:19,
18:12, 20:11,
21:6, 25:18,
26:3, 30:11,
30:18, 33:6,
33:17, 34:20,
35:9, 35:13,
37:19, 38:16,
46:1, 46:15,
48:21, 49:8,
51:3, 52:11,
54:20, 55:4,
59:22, 60:5,
63:1, 64:6,
65:14, 74:5,
75:10, 79:4,
85:20, 87:6,
88:2, 94:11,
97:13, 97:16,
102:3, 105:9,
106:21, 107:8,
109:12, 112:14,
115:10, 117:4,
120:11, 133:18,
135:2, 136:2,
139:6
saying
55:6, 69:18,
69:19, 71:8,
76:21, 95:4,

97:11, 100:14,
106:4, 107:12,
118:19, 120:2,
128:19, 136:13,
138:2

says

25:9, 33:13,
35:2, 37:12,
37:13, 71:13,
73:7, 74:12,
83:21, 84:15,
85:7, 85:9,
88:18, 89:3,
89:11, 96:22,
98:10, 98:15,
99:6, 104:4,
115:9, 131:9

scale

110:7, 110:16

scales

110:8

se

30:6

seal

144:13

sealed

10:16

searching

6:22

second

12:8, 63:1,
68:19, 82:11,
96:6, 105:19,
106:9, 107:13,
107:19, 108:14,
109:15, 112:11,
113:13, 114:22,
119:1, 128:6,
139:4, 139:15,
140:10, 140:11,
140:16, 140:19,
140:22

section

37:12, 56:11,
61:21, 62:1,
62:3, 115:21,
116:20, 118:18,
128:1, 137:21

sections

115:3, 117:6,
117:12

see

6:9, 11:12,
17:13, 17:22,
23:12, 33:20,
37:2, 40:18,
43:3, 48:1,
48:2, 49:22,
50:3, 51:14,
56:17, 57:17,
63:8, 64:20,
66:13, 68:9,
69:7, 69:12,
70:22, 71:18,
74:9, 74:15,
75:10, 80:22,
81:8, 88:8,
91:19, 104:8,
107:22, 115:16,
119:4, 120:14,
126:7, 127:13,
127:15, 128:8,
129:15, 129:19,
131:8, 139:11,
141:16

seeing

46:6, 48:6

seen

19:2, 19:3,
133:4

semiconductor

23:8, 30:10,
56:16, 56:21,
57:16, 58:4,
58:11, 58:13,
58:20, 58:22,
59:7, 59:9,
59:12, 59:15,
59:20, 59:22,
89:10, 90:11

semiconductors

37:18

sense

64:10, 75:14,
75:22, 77:15,
77:18, 78:3,

80:12

sensed

67:7, 70:1,
113:11

sensing

96:4

sent

126:14

sentence

18:3, 19:13,
20:8, 25:9,
63:2, 63:3,
68:20, 88:17,
89:1, 92:12,
92:14, 92:18,
93:13, 96:7,
96:11, 97:9,
97:19, 98:5,
100:4, 107:19,
112:13, 117:1,
119:6, 119:7,
136:1, 140:10,
140:11, 140:22

sentences

63:14

separate

80:15

separated

41:9, 98:13,
112:21

separately

22:16

services

39:10

sessions

9:4

set

7:2, 138:13,
144:12

sets

77:15

several

20:19, 58:7,
117:15, 136:11

shall

93:8

shape

45:8, 48:22,

53:20, 103:17	63:3, 66:16,	simulated	73:11
shaped	71:13, 72:17,	24:8	solving
48:11	72:19, 76:5,	simulating	95:22
share	77:6, 79:20,	23:4	some
126:14	79:21, 80:14,	simulation	8:7, 17:2,
shiv	80:21, 89:18,	48:1, 48:4	18:8, 18:9,
23:20	97:19, 103:3,	simulations	21:7, 21:8,
shoot	131:1	21:7, 21:8,	21:9, 21:15,
136:14	side	21:16, 21:21,	22:6, 22:9,
short	42:4, 46:15,	22:1, 22:7,	22:20, 24:1,
86:7, 124:20,	47:2, 51:5,	22:12, 22:14,	24:8, 24:9,
138:5	51:17, 54:11,	22:17, 22:18,	28:8, 45:15,
shorthand	78:1, 79:6,	23:3, 23:5,	46:17, 47:15,
144:1	82:21, 88:5,	23:9, 24:12,	47:21, 49:16,
should	94:1, 99:11,	24:18, 24:22,	56:6, 62:1,
26:4, 27:4,	99:12, 122:22	47:15, 47:20,	70:3, 70:5,
39:7, 39:13,	sides	47:21, 48:6,	124:9, 137:18,
61:16, 62:6,	83:22, 84:17,	48:10, 48:15,	141:17
72:9, 78:4,	98:16	52:19	someone
97:13, 105:9,	sign	simulators	22:17
105:16, 105:21,	142:15	24:11	something
106:5, 107:1,	signal	since	9:2, 20:2,
113:20, 115:10,	28:14, 28:15	27:10, 29:16,	28:16, 46:8,
116:5, 126:13	signature	72:12, 82:8,	82:18, 93:10,
show	142:20	110:2	102:1, 136:20
70:18, 88:18,	signature-plkal	single	sometime
91:8, 92:19,	144:17	81:12	14:7
110:1	signed	sitting	sometimes
showing	127:10	13:3, 37:22,	6:16, 8:19,
65:11, 65:14,	significance	45:16, 56:19	135:1, 135:2,
67:11, 76:1,	53:20	size	135:3
94:13, 94:21,	silent	104:18, 104:19,	somewhat
99:4	7:3	110:8	116:11
shown	silicon	skill	somewhere
40:4, 46:21,	30:12, 30:14	31:5, 31:16,	19:22, 26:2,
48:19, 61:14,	silicon-integrat-	31:20, 32:3,	40:14, 121:7
65:7, 67:3,	ed	32:6, 32:12,	sorry
74:6, 76:8,	30:15	36:16, 37:1,	63:2, 68:7,
76:12, 76:15,	similar	37:6, 38:15,	71:5, 73:17,
78:20, 79:1,	37:4, 51:11,	136:3	73:20, 94:8,
80:2, 80:4,	80:4	solely	102:21, 128:15,
83:17, 83:22,	similarly	111:5	141:8, 141:11
84:18, 85:8,	44:7, 54:18,	solid	sort
89:15, 90:6,	97:19	53:17, 65:15,	18:4, 24:6,
94:7, 98:10,	simply	65:20, 66:1,	26:16, 46:21,
98:16, 98:22,	104:14	68:21, 69:3,	50:22, 51:8,
99:7, 99:8, 99:9	simulate	123:7	55:3, 76:11,
shows	52:21	solve	76:13, 121:7,
40:19, 41:3,		69:21, 70:10,	

134:2, 135:4
sounds
16:2, 16:21
source
40:13, 49:3,
49:7
space
134:5, 134:18,
134:19
spaced
115:4, 115:6,
115:18, 117:7,
117:9, 118:10,
118:21, 120:20,
127:12, 127:15,
128:1, 128:10,
133:22, 136:4,
137:2
speak
25:5, 55:17,
86:15, 125:3
speaking
101:5
spec
58:17, 58:18,
59:11, 59:20,
83:11, 85:7
specific
18:6, 18:11,
29:6, 57:19
specifically
18:22, 20:4,
32:18, 59:8
specification
57:3
spend
15:8, 16:11
spent
8:22
spiral
120:16, 120:19,
121:2, 121:3,
121:4, 121:9,
121:12, 123:13,
123:15
spirals
119:19, 120:17,
121:6, 121:10,

121:12, 122:3,
122:5, 122:13,
122:21, 123:1,
123:3, 123:7,
123:18
spoke
20:17, 20:20
stacked
99:5
stand
125:15, 127:17
stands
77:20
start
51:15, 63:11,
63:19, 118:18,
136:13
started
86:20, 123:16
starting
27:13, 56:10,
74:4
starts
41:20, 68:20,
116:13, 116:14
state
2:10, 5:11,
14:1, 17:10,
21:16, 36:20,
55:22, 57:12,
60:2, 71:13,
75:7, 115:1,
144:19
stated
66:15, 70:12
statement
29:10, 37:4,
37:11, 60:10,
70:14, 70:17,
90:9, 90:15,
101:14, 102:6,
106:10, 129:21,
131:14, 132:3,
142:3
states
1:1
stenographically
144:6

step
11:9, 118:12
stick
73:18
stickies
12:3
sticky
11:19
still
13:2, 19:9,
37:22, 56:19,
94:3, 109:19,
109:20, 112:2,
118:8, 125:12,
128:9, 129:20
stipulation
5:2
straight
45:18
street
3:14
strength
48:7, 76:6,
80:21, 111:17
strengthened
95:3
stretching
22:19, 24:4
strike
111:21
strong
64:17, 67:15,
70:4, 75:14,
76:9, 92:5,
97:22, 110:21,
111:3, 111:9,
111:10
stronger
64:18, 81:7,
111:19
strongest
80:11
structure
79:9, 79:21,
81:4, 81:10,
81:12, 81:15,
82:17, 83:5,
83:22, 84:3,

84:6, 84:8,
84:18, 85:9,
85:22, 98:16,
119:9, 124:2
structures
98:9, 99:19,
99:21, 110:9
students
30:19
stuff
27:6
subject
53:12
submitted
12:17, 15:21,
16:19, 17:17,
24:21, 32:22,
33:9, 34:1,
35:4, 48:13,
126:9
submitting
34:3, 34:8
subsequent
31:22, 48:2
substance
13:17, 55:17,
86:16, 125:4
substantially
69:1, 69:11,
73:9
substrates
23:8
suffice
30:18
sufficient
47:10
sufficiently
97:22
suite
3:14
sum
45:5, 45:6,
47:7, 109:13
summarize
55:6
summer
14:7
superimposed
112:9

supervision	systems	92:6, 93:18,	136:10, 138:20
144:8	30:1, 30:4	94:7, 94:14,	talks
supplemental	T	98:1, 110:22,	75:1, 83:12,
8:8, 9:14,	ta	113:10, 139:8,	83:16, 96:8,
10:3, 10:8,	126:10	139:14, 139:15,	108:13
12:16, 16:12,	ta-	140:12	taniguchi
16:18, 17:4,	125:9	take	62:10, 63:7,
31:9, 31:13,	tab	7:18, 12:7,	63:10, 63:18,
31:15, 33:15,	10:16, 10:22,	18:6, 19:2,	63:21, 65:8,
33:16, 35:8,	11:2, 39:1,	22:16, 34:14,	67:6, 67:10,
37:5, 56:9,	60:21, 61:5,	45:15, 55:13,	67:15, 68:4,
61:8, 73:17,	62:11, 66:12,	76:14, 86:7,	69:14, 69:20,
103:20, 106:1,	66:13, 66:16,	86:10, 88:9,	70:9, 71:3,
118:13, 124:6	66:20, 113:19,	88:15, 90:20,	71:11, 72:13,
supply	113:20, 126:6,	91:6, 92:7,	73:11, 75:11,
115:6, 117:8	126:11, 126:17,	95:12, 99:18,	75:19, 75:20,
supplying	130:11, 130:15,	118:12, 124:20,	79:16, 80:8,
118:22	135:17, 135:18	127:21, 129:18,	80:10, 81:13,
support	tabs	136:6, 136:17,	81:16, 83:5,
126:8, 127:9	11:19	142:5	84:4, 86:21,
supporting	tag	taken	87:11, 88:18,
107:3	3:19, 63:3,	144:3, 144:6	91:7, 92:18,
supposed	64:16, 64:18,	talk	93:4, 93:15,
97:16	67:3, 67:11,	103:19, 107:10,	94:13, 94:21,
sure	67:12, 67:16,	113:15, 116:11	95:12, 95:20,
6:18, 10:13,	69:2, 69:10,	talked	95:21, 96:13,
12:13, 13:11,	69:15, 70:4,	45:1, 78:8,	98:3, 99:3,
14:6, 14:9,	70:8, 70:12,	78:10, 81:19,	100:15, 101:1,
15:14, 16:22,	70:18, 70:20,	87:10, 87:16,	101:6, 102:13,
21:5, 21:16,	71:14, 71:15,	96:8, 96:11,	102:14, 102:22,
24:17, 25:21,	72:3, 72:22,	98:3, 102:15,	103:10, 107:15,
26:19, 27:3,	73:3, 73:15,	103:5, 103:13,	110:6, 110:13,
36:2, 40:1,	75:15, 78:3,	105:14, 106:11,	110:20, 111:2,
44:17, 45:21,	80:18, 96:9,	137:7	111:7, 111:8,
53:3, 60:17,	96:15, 97:2,	talking	111:14, 111:15,
71:5, 72:11,	111:10, 111:11	49:6, 64:11,	112:14, 112:19,
76:19, 78:16,	tags	64:12, 67:19,	113:2, 139:1,
86:5, 87:5,	64:13, 67:7,	67:21, 68:11,	140:5
100:12, 100:22,	69:22, 70:22,	71:2, 72:12,	taniguchi's
104:6, 116:2,	71:4, 71:5,	78:18, 80:8,	74:6, 74:20,
116:8, 119:16,	71:6, 72:21,	84:3, 85:5,	82:11, 82:14,
134:9	74:7, 75:22,	91:14, 91:18,	82:16, 93:19,
sworn	77:16, 77:19,	106:20, 107:16,	107:15, 112:7,
5:4	80:12, 89:13,	107:20, 110:2,	112:11, 113:12
symmetry	89:14, 89:18,	111:2, 112:17,	taped
121:15	90:18, 91:4,	115:14, 117:11,	39:12
system	91:17, 92:1,	123:11, 132:7,	taught
30:7		132:13, 135:13,	28:3, 28:9,

28:11, 28:14,
28:16, 28:21,
29:1, 29:3
teach
27:22, 115:2,
117:5, 117:21,
118:20
teaches
46:4, 69:15,
133:8, 133:10
teams
8:11
tech
3:19
technical
20:14, 21:9
technology
28:17, 29:21,
30:14, 30:16
telefonaktiebola-
get
1:8
tell
64:8, 72:17,
115:22
ten
30:12
tend
129:12, 130:9,
132:8
tentzeris
17:18, 32:21,
33:9, 33:18,
34:1, 35:4,
35:6, 35:14,
36:12, 36:14,
36:22, 38:2,
38:10, 124:11
term
60:2, 61:22,
62:3, 106:6,
109:11, 127:12
terminal
40:17, 42:17,
51:15, 117:19,
120:12, 120:16,
121:13
terminals
49:3, 51:2,

51:3, 115:3,
117:6, 118:4,
118:8, 118:21,
119:2, 120:7,
120:12, 121:18,
122:17, 127:12,
127:15, 128:1,
128:3, 128:11,
131:22, 137:2,
137:14, 138:1,
138:7, 138:11
terminology
38:14
terms
56:2, 62:5,
117:22, 136:21
testified
5:5
testimony
8:3, 9:12,
17:11, 55:18,
86:16, 95:11,
102:9, 124:2,
125:4, 125:17,
125:21, 126:1,
127:3, 127:17,
127:20, 127:22,
143:7
text
75:1, 131:3
thank
6:11, 7:5,
38:18, 50:17,
102:12, 116:14,
116:17, 142:11,
142:13
theoretical
76:12
thereafter
144:7
therefore
78:4, 80:17,
123:16, 131:5
thereupon
121:10
therewith
17:18, 33:9,
35:4

thing
58:6, 69:19,
91:2, 110:7,
133:18, 134:8,
135:12, 137:8,
140:14
things
6:9, 18:10,
24:8, 31:22,
33:13, 35:5,
80:4
think
5:10, 6:15,
14:7, 15:17,
20:1, 24:5,
28:7, 33:3,
39:9, 45:16,
48:8, 50:18,
53:1, 60:17,
66:22, 71:1,
73:8, 77:3,
78:11, 82:1,
83:17, 85:4,
89:14, 89:17,
92:17, 94:7,
95:4, 95:16,
96:20, 97:11,
99:2, 99:15,
100:14, 103:5,
105:21, 106:5,
107:1, 109:22,
115:9, 116:21,
116:22, 117:10,
117:15, 118:3,
119:20, 123:12,
134:7, 135:11,
136:11, 136:19,
137:20, 139:16,
140:21, 141:16,
141:20, 142:6,
142:17
thinking
14:9, 46:19,
104:12, 104:13,
119:18
third
17:21, 63:2
thoroughly
75:3

thought
6:12, 45:14,
62:6, 68:3,
93:10, 128:21
three
8:15, 117:15,
127:8
through
6:17, 10:16,
14:16, 26:15,
26:18, 40:8,
40:9, 41:1,
41:15, 42:12,
44:4, 46:20,
47:1, 49:4,
49:9, 51:16,
52:6, 53:2,
62:22, 67:4,
71:4, 75:3,
80:3, 83:13,
84:7, 84:18,
87:8, 89:16,
101:6, 102:16,
108:18, 113:21,
121:2, 139:9,
142:6
throughout
79:14
thursday
1:17
time
7:22, 9:8,
16:16, 20:20,
20:21, 21:4,
34:14, 38:19,
49:16, 69:6,
85:1, 86:3,
88:9, 88:16,
129:18, 136:6,
143:8
times
7:8, 7:9, 8:13,
8:16, 87:4,
110:14
timing
32:18
titled
126:7

today
5:14, 6:2, 8:3,
9:11, 10:11,
13:3, 13:9,
37:22, 47:13,
56:20, 142:3
today's
8:5
together
22:2, 81:2,
96:3, 117:20,
118:1, 118:2,
118:10, 123:19,
131:10, 134:20,
135:6, 135:8,
138:1, 138:4
told
20:1, 47:13,
100:10
took
46:22, 49:16,
125:19
tool
24:3
tools
22:15, 22:18,
22:22
top
41:10, 42:1,
43:20, 65:17,
78:15, 79:18,
98:20, 99:1,
99:5, 113:4,
114:22, 117:1,
122:8, 123:1,
123:3, 127:22,
131:3
topic
55:20, 125:7
total
8:21
touch
138:5
toward
58:19, 76:2,
76:4
towards
52:10

trace
50:4
trade
125:8
trademark
1:1
traditional
106:12, 107:14
transcript
4:10, 19:14,
23:22, 126:19,
143:10, 144:4
transcripts
19:15
transmitting
105:2
traveling
41:20
traverse
51:9, 120:9,
121:21
traverses
52:8, 52:12,
122:7
traversing
51:8, 51:12
trial
1:3, 125:22,
126:1, 126:2
true
90:9, 91:2,
95:7, 144:4
truthful
8:3
truthfulness
143:9
try
7:15, 50:4,
116:10, 136:18
trying
34:18, 67:6,
69:21, 73:11,
80:10, 95:21,
101:2, 105:17,
122:16
turn
13:20, 17:7,
26:7, 30:22,

31:8, 39:20,
51:21, 52:11,
52:15, 54:12,
62:9, 73:16,
112:1, 127:13
turned
7:3
twist
134:15
twisted
134:12, 134:13,
134:17, 134:22,
135:3, 135:7,
135:11
two
9:12, 13:2,
13:13, 24:21,
27:7, 33:13,
35:5, 41:12,
45:6, 45:19,
46:6, 46:10,
46:12, 46:13,
46:15, 47:4,
47:7, 47:10,
49:1, 51:1,
51:10, 53:21,
54:5, 54:7,
54:8, 55:11,
60:12, 75:12,
76:15, 77:14,
77:22, 79:17,
81:6, 82:10,
82:17, 83:6,
84:4, 84:12,
84:20, 85:2,
85:22, 87:20,
90:16, 90:22,
94:2, 94:12,
94:15, 95:8,
97:21, 98:13,
98:20, 99:21,
99:22, 100:5,
101:19, 101:20,
101:22, 109:2,
109:10, 109:13,
110:8, 111:12,
112:8, 112:20,
113:3, 113:7,

113:18, 115:3,
115:5, 117:5,
117:8, 117:12,
117:13, 117:16,
118:3, 118:8,
118:21, 120:7,
120:12, 122:8,
122:17, 127:15,
128:1, 128:3,
129:10, 129:13,
130:6, 131:1,
131:22, 132:4,
132:5, 132:10,
137:2, 137:4,
137:14, 137:22
two-hour
8:18
type
76:8
types
22:14, 30:2,
30:5
typewriting
144:7
typical
7:18
typo
13:10, 71:1,
96:21, 115:10
typos
13:16

U

ultimately
54:3
um-hmm
35:17, 41:8,
83:15, 85:6,
89:5, 120:14
unchanged
36:21, 38:1
unclear
100:15, 141:9
under
38:7, 38:10,
41:5, 42:13,
42:16, 50:1,
54:12, 55:3,

118:17, 131:9,
138:19, 140:3,
144:7
undergraduate
27:22, 28:3,
28:8
underneath
51:22, 54:21,
121:2
underpass
41:7, 41:9,
41:15, 42:6
understand
7:14, 9:11,
10:10, 12:7,
21:10, 21:19,
22:4, 38:15,
46:5, 55:22,
87:5, 88:1,
93:1, 122:19,
124:17, 140:18
understanding
5:19, 11:5,
12:4, 22:13,
23:15, 23:16,
29:5, 56:5,
58:16, 58:18,
59:10, 59:19,
74:17, 75:6,
75:9, 82:13,
84:21, 85:1,
100:7, 100:19,
108:2, 108:10,
124:16, 139:13,
140:3
understands
133:20
understood
26:22, 30:3,
74:12, 76:20,
94:10
uniform
67:6, 75:14,
76:10, 79:19,
80:11, 81:7,
104:6, 108:20,
111:20
united
1:1

university
27:13
unlike
120:10
unpack
92:16
until
12:10
update
27:4
updated
26:17
upper
41:2, 41:6,
41:16, 41:17,
41:21, 42:1,
42:4, 42:8,
42:14, 43:5,
43:8, 44:19,
44:21, 45:12,
46:7, 52:2,
66:8, 66:10,
95:18, 121:4,
121:9, 122:2,
123:6
upward
51:16
usage
93:2, 93:9,
93:12, 97:18,
100:3
usages
87:9, 88:13,
96:6
use
11:21, 22:18,
50:10, 66:21,
81:6, 135:7
uses
108:3, 109:11
using
22:15, 29:21,
79:17, 96:2,
108:13, 120:6,
133:8, 134:12
usually
26:20
utilizes
30:15

v
validity
9:22
variable
139:7
various
23:7, 30:2,
80:2, 120:4
vastly
110:9
verification
143:4
version
26:9
vertical
46:22, 51:18,
121:3, 121:8,
121:11, 121:22,
122:1
vicinity
42:21
videotaped
1:15
virtual
2:1
virtually
1:16, 2:2
visualized
46:9

W
walk
40:8, 49:4,
87:8
want
11:10, 13:18,
15:12, 25:21,
33:4, 36:2,
40:1, 49:11,
50:10, 50:14,
53:14, 55:20,
63:16, 73:17,
76:19, 77:18,
78:9, 84:22,
86:6, 86:7,
86:18, 87:4,
88:1, 88:14,

92:16, 96:1,
102:1, 106:21,
107:9, 112:13,
113:15, 114:21,
119:6, 119:11,
125:6, 135:16,
136:13, 138:13
wanted
18:6, 19:2,
20:22, 50:12
wants
70:10, 77:13
warr
3:12, 6:16,
9:5, 10:12,
10:14, 10:18,
10:21, 11:4,
34:10, 37:8,
40:10, 53:5,
53:10, 53:12,
58:14, 59:16,
79:10, 82:3,
82:22, 86:9,
112:2, 116:13,
116:16, 126:15,
131:15, 142:8,
142:14
wave
104:7, 105:12
wavelength
104:15, 104:21,
104:22, 107:11,
107:17
wavelengths
105:1
way
46:19, 48:8,
50:19, 51:14,
55:6, 101:6,
109:9, 109:18,
132:18, 133:12,
137:5
we'll
65:5, 111:21
we're
72:12, 85:4,
91:18, 92:8,
107:19, 109:12,

110:2, 112:17,
115:14, 123:11
we've
113:1, 135:14
web
6:22
weeks
8:15
welcome
116:16, 125:2
went
38:13, 128:21
whatever
70:1, 125:15,
136:6
whatsoever
112:15
wheeled
77:21
whenever
125:21
wherein
139:3, 140:15
whereof
144:12
wherever
70:1
whether
36:21, 38:1,
47:22, 90:4,
90:7, 91:15,
101:14, 101:15,
102:7
whole
67:5, 116:20,
132:14
window
6:8
wire
135:2, 135:4
wires
131:10, 132:5,
134:13, 134:14,
135:2
withdraw
21:18, 83:1
within
26:2, 73:12,

90:9, 90:21,
90:22, 92:2
without
22:12, 75:10
witness
4:3, 5:3,
14:12, 58:5,
64:7, 65:9,
68:16, 72:18,
74:21, 79:12,
83:7, 86:5,
88:10, 98:6,
116:17, 116:18,
124:21, 127:6,
128:15, 136:9,
142:12, 142:13,
142:20, 144:12
witnesses
19:15
word
66:21, 87:17,
99:18
words
14:21, 44:16,
50:11, 67:8,
90:13, 100:21
work
14:18, 29:22,
30:11, 97:15,
100:19
worked
22:1
working
8:11
worried
13:16
wouldn't
47:5, 118:10,
133:13
wrap
81:17
wrapping
43:22, 44:1,
142:7
write
14:20, 15:2,
50:15
written
11:19

wrong
89:16, 102:3
wrote
131:19, 136:11
y
yeah
12:2, 39:9,
39:14, 45:21,
49:17, 53:19,
63:16, 116:5,
116:10
year
125:19
years
18:8, 20:19,
26:17, 28:2,
30:12, 127:8,
130:4, 136:11
yesterday
10:15
z
zero
69:11, 73:9
zoom
6:7, 6:14, 6:19
.0102
3:16
.1000
3:9
0
00728
1:11, 5:17,
114:3
02210
3:8
1
1
72:4, 88:22,
98:4
1,000
110:14
10
4:11, 37:12,

48:16, 48:19,
101:9
100
3:7, 15:16,
15:19
1001
4:13, 38:22,
39:4, 48:17,
60:13, 60:15,
60:16, 60:18
1002
54:14, 55:8
1003
33:19
1004
52:6, 52:8,
54:17, 54:18,
55:9
1005
63:11
1006
52:13, 55:2,
55:10
1007
4:17, 114:1,
114:8, 114:10,
115:7, 120:1
1008
4:17, 51:4,
54:10, 55:5,
55:7, 114:2,
114:8, 114:13,
115:10
1010
4:20, 130:13,
130:17, 130:21
102
52:1, 117:19,
120:13, 121:13
1020
4:15, 60:12,
60:22, 61:3,
61:6, 61:9
104
121:3, 121:22,
122:7
105
62:12

11
56:11, 56:14,
56:15, 56:20,
57:14, 58:3,
58:7, 58:9,
58:22, 59:1,
70:20
114
4:17, 122:3,
122:9
12
58:8, 60:21,
61:5, 80:6
126
4:19
13
58:8, 77:3,
82:1, 82:5,
83:17, 83:20,
84:7, 84:12,
84:15, 85:8,
88:6, 97:2,
98:11, 98:12,
98:15, 99:6,
99:8, 99:14,
99:15, 99:19
130
4:20
1300
4:15, 61:1,
61:4, 125:9,
125:18, 126:10,
135:16
14
57:12, 57:22,
58:8, 75:18,
76:1, 76:5,
76:11, 77:4,
77:5, 77:6,
78:6, 78:7,
78:8, 78:17,
78:18, 78:20,
79:6, 80:7,
80:13, 80:17,
80:19, 80:22,
81:9, 81:10,
82:8, 82:9,
83:3, 83:13,

84:9, 84:12,
85:5, 85:15,
88:6, 92:9,
92:11, 94:7,
94:8, 97:19,
98:7, 100:2,
100:17, 100:19,
101:19
144
1:21
15
58:8, 60:2,
61:7, 61:13,
106:2
157
130:20, 131:4,
135:12
16
58:8
17
58:8
18
104:1, 104:2,
104:4, 106:11,
106:20, 106:22,
107:2, 107:6,
107:18, 115:1,
117:1, 127:13
19
61:9
1979
27:13
1988
27:10
1st
144:13

2

2
142:19
2002
4:11, 9:20,
10:5, 12:15,
13:21, 15:9,
15:21, 17:8,
26:6, 31:1,
32:16, 32:21,
33:5, 34:8,

2

36:17, 36:20,
55:21, 62:20,
66:12, 70:12,
73:20, 74:1,
75:8, 86:20,
87:1, 114:19,
138:15
2008
115:9, 118:6
2009
10:2, 10:8,
12:16, 16:13,
16:18, 17:5,
31:9, 33:16,
56:10, 61:8,
103:21, 104:3,
112:2, 118:14
201
71:5, 74:7,
89:13, 89:15,
89:18, 93:18
202
41:22, 74:7,
89:13, 89:15,
89:19, 93:18
2024
1:11, 5:17,
114:3
2025
1:17, 144:14
203
3:14, 70:22,
89:12, 89:19,
93:18, 139:7,
139:14
2031
144:16
204
40:17, 42:18,
89:12, 89:19,
93:18, 139:7,
139:14
206
42:16
208
74:8, 74:13,
75:6, 76:15,
77:22, 78:2,

81:19, 90:7,
90:13, 90:16,
92:10, 139:10
209
74:8, 74:13,
75:6, 76:16,
77:22, 78:2,
81:19, 139:10
21
74:6, 74:20,
75:1, 75:17,
76:13, 76:17,
77:21, 81:18,
81:19, 89:15,
89:17, 89:18,
90:19, 94:9,
101:21
2100
3:14
211
63:3, 64:18,
66:12, 66:13,
66:16, 66:20,
67:3, 69:2,
69:10, 69:15,
70:12, 70:18,
71:9, 71:15,
72:3, 72:21,
72:22, 73:3,
73:5, 73:12,
73:15, 96:9,
96:14, 96:15,
97:2
212
72:21
213
64:16, 71:15,
72:21
23
107:9, 107:12
24
30:22, 31:4
25
36:20
27
1:17

3

30
9:1

31	90:15	98:19, 99:1,
10:15, 10:16,	57	99:3
142:19	26:9, 118:15,	6e
312.607	118:17	80:3, 84:1,
3:16	576706	84:19, 98:17,
32	1:20	98:19
1:18	6	7
337	60	7,151,430
125:9, 126:10	62:20, 66:11,	1:12, 4:13,
35	66:15, 68:3,	5:18, 10:1,
9:1, 34:22	68:4, 68:7,	38:21, 39:4
39	70:11, 71:7,	70
4:13, 114:17,	71:21, 72:8,	138:15, 138:19,
114:21, 114:22	72:11, 86:19,	139:6, 140:6
4	87:1, 88:2,	71
4250	88:7, 88:13,	140:14
1:22	88:17, 91:6,	72
430	91:19, 92:12,	141:2
5:22, 17:16,	92:13, 92:18,	8
24:8, 33:7,	96:6, 101:1	8-shaped
35:2, 39:22,	60601	40:6, 40:9,
40:4, 48:16,	3:15	47:18, 66:5,
48:19, 59:3,	61	68:15, 84:13,
59:6, 60:14,	4:15	87:13, 88:4,
61:20, 94:19,	617.570	93:3, 102:15,
103:14, 105:4,	3:9	102:17, 103:15,
105:6, 106:17,	63	103:16
108:3, 108:11,	129:2	81
108:13, 109:11,	64	84:14, 85:9
109:22, 110:3,	63:7, 63:12,	83
110:15, 112:8,	63:20, 64:3,	80:8, 83:12,
112:20, 119:3,	64:9, 64:11,	98:2, 98:10
124:15, 125:8,	64:12, 64:15,	84
127:12, 129:4,	65:1, 67:18,	116:13
137:1	68:2, 68:4,	9
46	68:18, 68:19,	9
28:2, 74:2,	69:15, 73:7,	1:18
74:5, 75:8	96:12, 135:17,	92
48	135:21	131:1
112:1, 112:6	65	
5	71:12, 72:1,	
50	72:3, 72:10,	
15:14, 15:15,	96:13, 96:22	
16:15	6a	
55	80:3, 84:1,	
89:3, 89:11,	84:2, 84:6,	
	84:18, 98:17,	