1 UNITED STATES PATENT AND TRADEMARK OFFICE

2 BEFORE THE PATENT TRIAL AND APPEAL BOARD

3 - - - - - - - - - - - - x

4 NEURENT MEDICAL INC. &: IPR2024-00277

5 NEURENT MEDICAL LTD., : U.S. Patent No. 11,241,271

6 Petitioner, : IPR2024-00278

7 v. : U.S. Patent No. 11,033,318

8 AERIN MEDICAL, INC., : IPR2024-00282

9 Patent Owner. : U.S. Patent No. 11,766,286

10 - - - - - - - - - - - - x

11 NEURENT MEDICAL INC. &:

12 NEURENT MEDICAL LTD., :

13 Petitioner, : IPR2024-00669

14 v. : U.S. Patent No. 11,679,077

15 THE FOUNDRY, LLC, :

16 Patent Owner. :

17 - - - - - - - - - - - - x

18 Deposition of GREGORY T. MARTIN, Ph.D.

19 Washington, DC

20 Thursday, February 20 2025 - 9:13 a.m.

21 Job Nos. 570093 and 570095

22 Pages: 1 - 231

1 Deposition of GREGORY T. MARTIN, Ph.D.,
2 held at the office of:
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14 Pursuant to Notice, before Janet A.
15 Hamilton, Registered Diplomate Reporter and Notary
16 Public in and for the District of Columbia.
17
18
19
20
21
22

The Foundry, LLC Exhibit 2012: IPR2024-00669
Neurent Medical Inc. & Neurent Medical Ltd. v. The Foundry, LLC

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C O N T E N T S

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By Ms. Cohen 206

E X H I B I T S

(Attached to the transcript)

MARTIN DEPOSITION
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EXHIBITS PREVIOUSLY MARKED
NEURENT EXHIBIT
Exhibit 1083
Exhibit 2001
Exhibit 1001
Exhibit 1004
Exhibit 1084
Exhibit 1087

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1 - - - - -
2 MR. GILFORD: I guess let's go ahead and
3 do appearances for the record. I'm Ben Gilford of
4 Greenberg Traurig, LLP, appearing on behalf of the
5 patent owners, Aerin Medical Inc. and The Foundry,
6 LLC.
7 MS. COHEN: I'm Alexis Cohen from
8 WilmerHale, and with me is my colleague, Sarah
9 Murphy, and we are appearing for the petitioners,
10 Neurent Medical, and we are defending the
11 deposition of Dr. Gregory Martin.
12 MR. GILFORD: Great. So before we get
13 started, just wanted to clarify the record that
14 Dr. Martin is here to testify regarding
15 declarations he submitted in four IPR proceedings.
16 I'm going to just list the four really
17 quickly. It's IPR2024-00277, IPR2024-00278,
18 IPR2024-00282 and IPR2024-00669, and the
19 transcript of today's deposition will be submitted
20 in all four proceedings.
21 P R O C E E D I N G S
22 -----

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1 GREGORY T. MARTIN, Ph.D.,
2 a witness herein, being duly sworn, testified as
3 follows:
4 EXAMINATION BY COUNSEL FOR THE PATENT OWNERS
5 BY MR. GILFORD:
6 Q So with that said, Dr. Martin, did you do
7 anything to prepare for today's deposition?
8 MS. COHEN: And I'll just caution the
9 witness not to reveal the contents of any
10 privileged communications with counsel.
11 A Yes.
12 Q What did you do?
13 A I met with the legal team.
14 Q When you say the legal team, who are you
15 referring to?
16 A Alexis, Sarah and Josh.
17 Q And do you happen to remember Josh's last
18 name?
19 A I do not. I apologize.
20 Q It's okay if you don't remember.
21 Now, did you meet with Alexis, Sarah and
22 Josh all at the same time?

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1 A On occasion.
2 Q Okay. Well, I guess let's go back in
3 time. So going back in time for when you started
4 preparing for today's deposition, when was the
5 first time you met with the legal team?
6 A It would have been on Zoom last week. Was
7 that Thursday?
8 Q You think it was Thursday?
9 A Yes.
10 Q Okay. And again going forward in time,
11 did you meet with any of the legal team again
12 after that day to prepare for today's deposition?
13 A Yes. Yesterday and two days ago.
14 Q So just to clarify, it sounds like you met
15 with the legal team three times to prepare for
16 today's deposition; is that right?
17 A Correct. Yes.
18 Q And you met with the legal team last week
19 you believe, on Thursday?
20 A I believe it was on Thursday on Zoom, or
21 Friday. Thursday, I think. I apologize.
22 Q Okay. And you met with the legal team two

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1 days ago?
2 A Correct.
3 Q And you met with the legal team yesterday?
4 A Yes.
5 Q Okay.
6 A And I neglected to also include Alex
7 Nemtzow who was on Zoom but not in person in the
8 meeting.
9 Q Okay. So I know we've been talking about
10 your meetings with the legal team.
11 Did you meet with anybody else to prepare
12 for today's deposition?
13 A No.
14 Q Okay. Let's start with your Zoom meeting
15 last week. I believe you said it was on Thursday.
16 It could have been Friday.
17 A Right.
18 Q Who -- who was on that Zoom meeting?
19 A Let's see. That was Alexis, Sarah and I.
20 I don't think Alex was there.
21 Q Okay. And approximately how long did you
22 meet with the legal team on that Zoom call last

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1 week?
2 A It was about two hours.
3 Q And did you -- sorry. So let's talk about
4 the meeting you had two days ago.
5 A Okay.
6 Q Was that in person?
7 A Yes.
8 Q And how long did you meet with the legal
9 team during that meeting?
10 A That was about seven and a half hours.
11 Q And you said you met with the legal team
12 yesterday too; right?
13 A Yes.
14 Q Approximately how long was that meeting?
15 A That was about eight hours.
16 Q Is it fair to say you spent roughly 18
17 hours preparing for today's deposition?
18 A I'd say that sounds about right.
19 Q Did you review any documents in
20 preparation for today's deposition?
21 MS. COHEN: And I'll just caution the
22 witness not to reveal the contents of any

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1 privileged communication.
2 A Yes.
3 Q What kind of documents did you review to
4 prepare for today's deposition?
5 A I reviewed my reply declarations, my
6 original declarations and some of the reference
7 material.
8 Q When you say the reference material, what
9 do you mean by that?
10 A Each reply declaration contains in the
11 appendix a list of references that are referred to
12 in each declaration. In the last few days, I did
13 not reread every single one of them, but I did
14 look over some of the items.
15 Q Okay. So when you say you reviewed the
16 reply declarations, I believe there's four reply
17 declarations; right?
18 A Correct.
19 Q Did you review all four?
20 A Yes.
21 Q And you had four original declarations;
22 right?

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1 A Yes.
2 Q Did you review all four of those original
3 declarations?
4 A Yes.
5 Q And we were talking about some other
6 materials you believe you reviewed; correct?
7 A Yes.
8 Q Do you recall specifically what other
9 material you reviewed?
10 A That would have been, let's see, the '318
11 patent, '286 patent, some of the other patents,
12 '535 Edwards, '720 Stern, '788 Baker, the
13 transcript from Dr. Bikson, Dr. Bikson's
14 declaration, The Foundry patent, '271 patent. I
15 don't know if I said that. I may have missed a
16 couple, but that's -- that's -- you get the
17 picture.
18 Q So other than those things you just
19 mentioned, your four reply declarations and your
20 four original declarations, were there any other
21 types of documents that you reviewed to prepare
22 for today's deposition?

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1 MS. COHEN: Objection to form.
2 A I don't think so.
3 Q You mentioned Dr. Bikson's declaration.
4 Do you recall that?
5 A Yes.
6 Q Are you aware that he submitted several
7 declarations in these proceedings?
8 A Yes, I am.
9 Q And which of his declarations did you
10 review?
11 A I reviewed them all.
12 Q Okay. Have you spoken to anyone about
13 today's deposition other than Neurent's attorneys?
14 A No.
15 Q Have you spoken to anyone about these IPR
16 proceedings other than Neurent's attorneys?
17 A No.
18 Q Have you spoken to anyone about the
19 subject patents other than Neurent's attorneys?
20 A No.
21 Q Did you speak with anybody at Neurent
22 about today's deposition?

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1 A No.
2 Q Have you ever spoken with anyone at
3 Neurent?
4 A No.
5 Q Did you speak with anyone at Aerin
6 Medical Inc. about today's deposition?
7 A No.
8 Q Have you ever spoken with anybody at Aerin
9 Medical Inc.?
10 A No.
11 Q Did you speak with anyone at The
12 Foundry, LLC about today's deposition?
13 A No.
14 Q Have you ever spoken with anyone at The
15 Foundry, LLC?
16 A No.
17 Q You're familiar with an individual named
18 Dr. DelGuadio; is that right?
19 A Yes.
20 Q And have you spoken with Dr. DelGuadio
21 since you submitted your original declarations in
22 these proceedings?

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1 A No.
2 Q So if I understand correctly, you spoke to
3 Dr. DelGuadio before you submitted your
4 declarations, your original ones?
5 A I don't -- I -- let's see.
6 Yeah, I don't recall if it was before or
7 immediately after. I did not speak with him with
8 regard to these -- these reply declarations. That
9 I do recall.
10 Q Got it. Understood.
11 So just to be clear, you have four
12 things -- four bound things in front of you;
13 right?
14 A Yes.
15 Q And what -- what are those?
16 A So these here are my four reply
17 declarations for each of the IPRs.
18 Q And then are there any handwritten notes
19 or anything like that in those declarations?
20 A I don't think so.
21 Q So to your understanding, they're clean
22 copies of what --

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1 A Correct, yeah.
2 Q Okay. We're going to talk about the '318
3 reply declaration first. You're free to use the
4 copy I brought for you or to use your copy.
5 Assuming you're, you know, representing to me that
6 that's a true and accurate copy of what you
7 submitted. Is that fair?
8 A It is, yes.
9 Q Okay. So let's go ahead and talk about
10 what was previously marked in the '318 patent
11 proceeding as Neurent Exhibit 1083.
12 And I'll represent to you that what I
13 handed you is a copy of your reply declaration
14 that you submitted in IPR2024-00278.
15 This declaration relates to the '318 or
16 '318 patent; correct?
17 A Correct.
18 Q So let's go ahead and flip to page 8.
19 A Okay.
20 Q And I'm looking at paragraph 17.
21 Let me know when you're there.
22 A I'm here.

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1 Q And I'm looking at the first sentence.
2 Do you see where you wrote, Dr. Bikson
3 opines that Stern does not teach multiple pairs of
4 bipolar radiofrequency electrodes as claimed by
5 the '318 patent because, in his view, limitation
6 1D requires bipolar electrode pairs that are
7 active "at the same time."
8 Do you see that?
9 A Yes.
10 Q And do you see here you cite to
11 Dr. Bikson's declaration at paragraphs 57 to 65?
12 Do you see that?
13 A Yes.
14 Q So I'm going to go ahead and hand you what
15 was previously marked as Exhibit 2001 in the
16 '318 patent proceeding.
17 Go ahead and take a quick look at that
18 document.
19 You've seen this document before; correct?
20 A Yes.
21 Q And this is Dr. Bikson's declaration for
22 the '318 patent; correct?

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1 A Correct.
2 Q Would you mind showing me where in this
3 declaration Dr. Bikson opines that limitation 1D
4 requires bipolar electrode pairs that are active
5 at the same time?
6 A If you look on paragraph 64 of
7 Dr. Bikson's reply deposition he says, "To form
8 multiple pairs of bipolar radiofrequency
9 electrodes in Stern figure 15, three or four of
10 figure 15's switches must be closed at the same
11 time."
12 Q Okay. And that's where you understood
13 Dr. Bikson to be opining that limitation 1D
14 requires bipolar electrode pairs that are active
15 at the same time?
16 A That's -- that's one place, yes.
17 Q Any other places you can recall?
18 A Let's see.
19 I think for this reference that's it for
20 now.
21 Q Okay. So going back to that first
22 sentence in paragraph 64 of Dr. Bikson's

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1 '318 patent declaration.
2 Is it fair to say that when Dr. Bikson
3 said three or more of figure 15's switches must be
4 closed at the same time, that you interpreted that
5 to mean that Dr. Bikson was saying the electrodes
6 have to be active at the same time?
7 MS. COHEN: Objection. Form.
8 A Correct.
9 Q Okay. Did you ever ask Dr. Bikson what he
10 meant in the sentence?
11 MS. COHEN: Objection. Form.
12 A I did not have the opportunity to talk to
13 Dr. Bikson directly.
14 Q Okay. Go ahead and put this to the side.
15 Let's go back to your '318 patent reply
16 declaration. And let's flip to page 15. And I'm
17 looking at the very bottom right portion where it
18 says, A person.
19 A Yes.
20 Q And it's going to go onto page 16.
21 So just for the record, you can follow
22 along with me, but do you see where you wrote, "A

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1 person of ordinary skill in the art would have
2 understood that the desired outcomes of even
3 heating and destruction over an entire area of
4 tissue are accomplished by activating multiple
5 pairs at the same time."
6 Do you see that?
7 A Yes.
8 Q Activating multiple pairs at the same time
9 is not the only way to destroy tissue across an
10 entire surface; right?
11 A Correct.
12 MS. COHEN: Objection. Form.
13 A Correct.
14 Q You could destroy tissue across a entire
15 surface by activating different pairs
16 sequentially; right?
17 MS. COHEN: Objection. Form.
18 A Correct.
19 Q Let's go to page 17 of your declaration.
20 And I'm looking at the annotated figure, kind of
21 in the middle of the page here.
22 Do you see that?

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1 A Yes.
2 Q So are these annotations that you created?
3 A Correct.
4 Q Okay. So in this annotated figure, are
5 the two electrodes in green supposed to be a pair?
6 A In this case -- so we -- I just want to
7 clarify something.
8 Pairing, per se, can be done mechanically,
9 right. I mean, this shows that these -- that the
10 green electrodes could be paired, but in the
11 bipolar sense pairing also requires both
12 electrodes to have a certain proximity to each
13 other. A certain, if you will, mechanical
14 relationship.
15 Q Okay. I think I understand what you're
16 saying. I guess let's talk a little bit about
17 what you were trying to represent with these
18 annotations.
19 So, again, with the two green circles that
20 you added to this figure, were you -- were you
21 using the green circles to represent a pair of
22 electrodes?

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1 A So what this represents is that when the
2 switches are closed, current will flow, right,
3 from electrode 220 to 222.
4 Q And your understanding is those two
5 electrodes would be a pair of electrodes?
6 A They could form a pair of electrodes, yes.
7 Q Okay. So I guess let me just ask a more
8 open-ended question.
9 What did you intend to represent with the
10 two green circles in this annotated figure?
11 A Well, if you look at paragraph 28 in the
12 declaration it says, "I offer the following
13 additional annotation to show how closing of the
14 switches would result in the activation of
15 multiple pairs of electrodes at once."
16 That's how a combination of pairs that are
17 utilized together, as disclosed by Stern.
18 Q Right.
19 So specifically about the two green
20 circles, that -- to my understanding, you're using
21 the two green circles to represent what could be a
22 pair of electrodes; correct?

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1 A They could be, yes.
2 Q Okay. And I -- if I understand you
3 correctly, you're also using the purple circles to
4 represent what could also be another pair of
5 electrodes; right?
6 A Correct.
7 Q Okay. And just for the record, the
8 electrodes circled in green are electrodes 220 and
9 222; correct?
10 A Correct.
11 Q And the electrodes circled in purple are
12 electrodes 224 and 226; correct?
13 A Correct.
14 Q And if I understand you correctly, what
15 you're trying to show in this annotated figure is
16 that all four of the electrodes you circled are --
17 would be active at the same time. Is that
18 accurate?
19 A That is correct.
20 Q So if I understand this figure correctly,
21 all four electrodes share the radiofrequency
22 energy from voltage source 228?

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1 A Correct.
2 Q And the four electrodes don't necessarily
3 share the radiofrequency energy equally, do they?
4 MS. COHEN: Objection. Form.
5 A We don't know that from looking at this
6 diagram.
7 Q Okay. You know, I'm not an expert in
8 this, but my understanding is the amount of energy
9 that flows from one electrode to another in this
10 figure would depend on multiple factors. Is
11 that -- is that an accurate understanding?
12 A Yes.
13 MS. COHEN: Objection. Form.
14 A That's correct. And I just want to amend
15 that thought and say that there are four
16 electrodes here, and so if they're all active at
17 the same time, you don't know in advance where the
18 current is flowing. It's not going to necessarily
19 flow between 220 and 222. It could flow from the
20 green to the purple or the purple to the green,
21 depending on a lot of other factors as well.
22 Q Okay. I guess when you say you don't know

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1 in advance where the current is flowing, what do
2 you mean by that?
3 A Well, this is just a schematic diagram;
4 right? And -- and so what we're missing is the --
5 that -- what is between the electrodes; right?
6 The tissue, per se.
7 Q Okay. So if I understand you correctly,
8 you know, I understand that this is just a
9 schematic, and it's not showing an actual thing in
10 use; right?
11 A It is a schematic, yes.
12 Q So when you were -- if you were to
13 implement this in an actual patient, there would
14 be a number of variables that would factor into
15 how the current flows between the electrodes;
16 right?
17 MS. COHEN: Objection. Form.
18 A Correct. Those factors would include the
19 geometry, the anatomy and the tissue electrical
20 properties.
21 Q Got you. And to kind of tie in to what
22 you said a minute ago, it's fair to say that, you

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1 know, when you put this device into an actual
2 patient, you don't know in advance how the
3 current's going to flow between those electrodes;
4 right?
5 A Well, keep in mind this is not an actual
6 device, right. This is just a schematic. So, but
7 if you were to implement a device in part based on
8 the schematic for most devices in advance, you
9 don't know exactly where the current's going to
10 flow.
11 Q Okay. So it's fair to say that if this
12 schematic of figure 15 were to be implemented in
13 an actual device, it's fair to say you wouldn't
14 know in advance where the current's going to flow
15 if all four electrodes were activated at the same
16 time?
17 A I just --
18 MS. COHEN: Objection. Form.
19 A I should amend that to say you don't know
20 where the current's going to flow. You just don't
21 know the relative amounts.
22 Q I think we'll get into that a little bit

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1 more, so let's kind of take a step back. So I
2 think I asked you this, but I just want to maybe
3 circle back and ask it one more time.
4 So, again, what you're representing in
5 this figure is four electrodes that are active at
6 the same time; right?
7 A Correct.
8 Q And the four electrodes don't necessarily
9 share the radiofrequency energy equally; correct?
10 MS. COHEN: Objection. Form.
11 A Correct.
12 Q And the amount of energy that flows from
13 one electrode to another depends on, I think you
14 said, several factors; right?
15 A Correct.
16 Q And is it fair to say that the impedance
17 of the medium between the electrodes would be one
18 of those factors?
19 A Correct.
20 Q What are some other factors that would
21 impact how much energy flows from one electrode to
22 another?

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1 A Well, I think -- so you have the impedance
2 of the tissue is probably one of the most
3 important factors. There could be, for instance,
4 contact resistance, right, between the electrode
5 and the tissue itself. If you look at the trace
6 lines that run all the way back to the voltage
7 source, we don't know what the relative electrical
8 resistance is, impedance in each of those lines,
9 and so, therefore, you know, just looking at this
10 diagram, you can't say what -- what the
11 distribution of energy would be.
12 Q Any other factors you can think of?
13 A The switches would have potentially
14 electrical resistance or impedance. I mean, those
15 are the major factors. There are other, if you
16 will, nonlinear factors. For instance, as you
17 heat the tissue, you can change the impedance of
18 the tissue. If you heat it up too much, you're
19 decreasing the water content, maybe even boiling
20 off some of the water. That will decrease the
21 electrical conductivity of the tissue.
22 Q Anything else you can think of as we sit

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1 here today?
2 A I mean, there's also things like if this
3 were in a device in a patient, you know, factors
4 like patient movement, for instance, could disrupt
5 things. Even blood flow as well inside the tissue
6 that's being heated.
7 Q So I guess the amount of energy that flows
8 from one electrode to another, it's fair to say
9 that could depend on the patient itself?
10 MS. COHEN: Objection. Form.
11 A Correct.
12 Q So I guess just to clarify, it's fair to
13 say the amount of energy that flows between the
14 electrodes you've circled in green here might be
15 different than the amount of energy that flows
16 between the electrodes you've circled in purple;
17 correct?
18 MS. COHEN: Objection. Form.
19 A Yes, and I just want to highlight the fact
20 that energy, if, when these switches are off --
21 they're activated at the same time -- energy may
22 flow from purple to green and green to purple

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1 depending on the polarity and the position of each
2 of the electrodes.
3 Q I think you're getting a little ahead of
4 me, but we will circle back to that point you just
5 raised, but just to kind of clarify for the
6 record, is it fair to say that the amount of
7 energy flowing between the green electrodes might
8 be different than the amount of energy flowing
9 between the purple electrodes?
10 MS. COHEN: Objection. Form.
11 A Yes.
12 Q Okay. And the difference in the amount of
13 energy that flows between the green electrodes and
14 the purple electrodes can vary based on, I think
15 you said, the impedance of the medium between the
16 electrodes; is that right?
17 A And the geometry, the size of the
18 electrodes, the surface area, the material of the
19 electrodes, the internal resistance in the
20 circuitry.
21 Q So it's --
22 A Among other -- among the other factors I

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1 mentioned, yes.
2 Q So it's fair to say the difference in the
3 amount of energy that flows between the green
4 electrodes and between the purple electrodes can
5 vary based off of a number of factors. Is that
6 fair to say?
7 A Correct.
8 MS. COHEN: Objection. Form.
9 A Yes.
10 Q And how -- how difficult is it to control
11 those factors?
12 A It depends on the application. In some
13 applications you can control the energy deposition
14 very precisely. In other applications it can be
15 more difficult.
16 Q Is it difficult to control the impedance
17 of the patient's tissue?
18 A Well, you don't control the impedance of
19 the patient's tissue. It's inherent in the
20 properties of the tissue, primarily based on the
21 water content, the proportion of protein content
22 and the fat content.

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1 Q So I think we're going to talk a little
2 bit about what you had mentioned before about how
3 energy can go from a green to a purple. So if we
4 look back at your figure here on page 17, if all
5 four of the electrodes are activated at the same
6 time, it's fair to say that radiofrequency energy
7 can also flow between a purple electrode and a
8 green electrode; correct?
9 A Correct.
10 Q Okay. So it's fair to say that, for
11 example, radiofrequency energy can flow between
12 electrode 224 and electrode 222; correct?
13 MS. COHEN: Objection. Form.
14 A 224 and 222, yes, correct.
15 Q And radiofrequency energy can flow between
16 electrode 220 and electrode 226; right?
17 A Yes, and that will, of course, depend on,
18 like, physically how close they are relative to
19 each other, yes.
20 Q Okay. And the amount of energy that flows
21 between the purple electrodes and the green
22 electrodes, I think it's fair to say that would

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1 vary based off of several factors; right?
2 MS. COHEN: Objection. Form.
3 A Yes.
4 Q And the impedance of the medium between
5 the electrodes would be one factor; right?
6 A Correct.
7 Q And I think you said the physical distance
8 between the electrodes would be another factor?
9 A Correct.
10 Q And, you know, those factors you mentioned
11 a little while ago about contact resistance and
12 the impedance of the wires and switches itself,
13 would those be other factors?
14 A Correct.
15 Q Okay. So I guess just to clarify, so if
16 you were to turn all four of these switches on at
17 the same time, is it fair to say that some energy
18 would flow between the green electrodes, some
19 energy would flow between the purple electrodes
20 and also some energy would flow between the green
21 and the purple electrodes?
22 A Well, that was going -- that's going to

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1 depend on the exact configuration and how this is
2 implemented. Again, this is just a schematic. So
3 what you just mentioned, that's all possible,
4 right, but we don't know if it's actually going to
5 happen until we look at the particular
6 implementation.
7 Q Okay. So it's possible -- let me start
8 over.
9 If I understand you correctly, you would
10 agree that it's possible that if all four of these
11 electrodes in figure 15 were activated at the same
12 time, that some energy would flow between the
13 green electrodes, some energy would flow between
14 the purple electrodes, and some energy would flow
15 from the green electrodes to the purple electrodes
16 and vice versa?
17 MS. COHEN: Objection. Form.
18 A Yes. That's true depending on the precise
19 implementation.
20 Q Okay. Is it fair to say that the amount
21 of energy that flows between the electrodes
22 impacts how much the patient's tissue is heated?

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1 MS. COHEN: Objection. Form.
2 A Well, from the -- in the thermodynamic
3 sense you have to distinguish between, let's say,
4 energy and power, right. So for instance, if you
5 think of -- power is basically the speed at which
6 energy is delivered, you know, and so the tissue
7 has the ability to cool itself down.
8 So I would rather speak, to be accurate,
9 that the -- how much the tissue is heated is
10 dependent on the power delivered.
11 Q Okay. Again, I'm not an electrical
12 engineer, so would you mind kind of explaining the
13 relationship between current flow and power?
14 A Sure.
15 I mean, simply speaking, current times
16 voltage equals power, and that's -- that's simply
17 from Ohm's Law.
18 Q So, again, I'm sorry that I'm not --
19 A And let me say, so energy is equal to
20 power times time, the duration at which the power
21 is applied.
22 Q So bear with me while I try to understand

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1 this.
2 So if I understand this stuff correctly,
3 when you turn the electrodes on inside, if this
4 device were inside a patient, current would flow
5 from one electrode to another; is that right?
6 A Correct.
7 Q Okay. And then, I guess, how -- how do
8 you figure out the power from -- from there?
9 A So in a circuit like this you could easily
10 know what the voltage is at -- at the electrodes.
11 You could -- with additional circuitry, you could
12 measure the current at every electrode. You
13 could -- you would multiply those two factors and
14 then you would know the duration at which power is
15 applied, and you would be able to compute the
16 energy.
17 Q Okay.
18 A Now, it's -- it's slightly different.
19 Now, the example I just gave you is
20 absolutely true for direct current, right, when
21 you apply a voltage and you keep it there.
22 What's -- what's applied here, radiofrequency

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1 energy, instead of what's in the wall socket, is
2 alternating current, and so there you have to
3 compute -- you can't look at the -- just the
4 voltage at any one time because it's constantly
5 changing. So there are mathematical ways to sort
6 of basically convert that to the simple example I
7 just gave you where power is voltage times
8 current.
9 Q So I guess will the power be proportional
10 to the current that's flowing between the
11 electrodes?
12 A Yes, I -- yes.
13 Q Okay. So in other words, if more current
14 is flowing between the electrodes, more -- there's
15 more power?
16 A For the same voltage, yes.
17 Q Okay. I think I understand.
18 So I'm going to try and rephrase because
19 we -- I had asked you about energy before. So I'm
20 going to try and rephrase it using your
21 terminology and if I'm totally off base, just let
22 me know.

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1 So the question I asked before, I'm --
2 again, I'm going to rephrase it.
3 So the amount of current that flows
4 between the electrodes impacts how much the
5 patient's tissue is heated. Is that fair to say?
6 A No. It's the amount of power.
7 Q Okay.
8 A Power that's -- the amount of power that's
9 dissipated in the tissue, that determines how much
10 the tissue is heated.
11 Q Okay. And, again, the -- I guess when you
12 say the amount of power dissipated, what -- what
13 do you mean by that?
14 A So this gets back at what I was saying
15 before about alternating current, right.
16 So you can imagine that in tissue, tissue
17 is heated up by alternating current because you
18 have this voltage, let's say, that's changing and
19 it's literally at -- at a single electrode going
20 from positive to negative, let's say, back to
21 positive. That voltage is driving the motion of
22 the small ions in the tissue, think of like sodium

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1 potassium. Those small ions are trapped in this
2 voltage field, are being moved -- physically moved
3 in the voltage field. Those ions rubbing against
4 water molecules actually creates friction. That
5 friction creates the heat that then heats up the
6 tissue.
7 Q Okay.
8 A So there is -- at any given moment, there
9 is a part of the power that you're applying into
10 the tissue that hasn't been dissipated yet.
11 So you mentioned the word impedance,
12 right, and that's the correct terminology when
13 talking about what's effectively the relationship
14 between voltage and current and tissue.
15 But impedance has two components to it.
16 You can think of it as the dissipative component,
17 that's the one that creates heat; then you can
18 think of the energy storage component, that's the
19 one that you get the molecule back. And part of
20 that energy didn't get dissipated into heat and it
21 can be returned, if you will, to the electrode.
22 Q Okay. I'm going to try the question one

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1 more time and try and get it right using your
2 terminology.
3 So the amount of power that flows between
4 the electrodes impacts how much the patient's
5 tissue is heated. Is that fair to say?
6 MS. COHEN: Objection. Form.
7 A I think slightly more accurate would be
8 the -- the power dissipated in the tissue
9 determines how much the tissue is heated up.
10 Q Okay. And the amount of power that's
11 dissipated in the patient's tissue is proportional
12 to the current that flows between the electrodes?
13 MS. COHEN: Objection. Form.
14 A Proportional by way of the voltage.
15 Q What do you mean by that?
16 A So it's not just the current -- so just to
17 go back to Ohm's Law in the simplest sense.
18 Q Mm-hmm.
19 A Power equals voltage times current. So
20 it's proportional to the -- multiplying those two
21 factors together.
22 Q Okay. And I guess we had talked a little

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1 bit earlier about how, you know, impedance between
2 the electrodes, for example, can affect how much
3 current flows between the electrodes --
4 A Yes.
5 Q -- is that right?
6 A Correct. Yes.
7 Q Does the impedance between the tissue
8 affect the voltage, or is the voltage just
9 whatever is coming out of the generator?
10 A So -- yeah.
11 MS. COHEN: Objection. Form.
12 A So in a circuit like this, it's -- that
13 little squiggly line in the circle implies the
14 voltage source. So that means whatever is inside
15 that circle is designed to set the voltage.
16 And so in this example, in almost all
17 cases, the voltage at the -- at least what's -- we
18 can assume -- let's say we have perfect
19 conduction, right, throughout the wires in this.
20 We can assume that we know what the voltage is at
21 the surface of the electrode, it's approximately
22 the same as what comes out of that voltage source,

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1 to a point, right.
2 If -- every voltage source, from a concept
3 perspective, is an idealized concept. It -- it
4 may not be able to maintain that voltage at any
5 current. So if the current were to get too high,
6 the voltage source wouldn't be able to keep up
7 with it.
8 Q I think I understand.
9 A I mean, that's how -- that's how, you
10 know, you -- well, okay. Yeah. I'll pause there.
11 Q Okay. So let's go back to my original
12 question and -- and, again, I'll ask it one more
13 time, trying to get your -- the terminology
14 correct.
15 So the amount that the patient's tissue is
16 heated depends on the -- the power absorbed by the
17 tissue?
18 A That's one way to think of it. Yeah,
19 sure.
20 Q Okay. And how does the amount of power
21 that's absorbed by the tissue correlate to the
22 amount of current that flows between the

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1 electrodes?
2 A Well, it's proportional. So the power
3 that's dissipated in the tissue is proportional
4 to, if you will, the -- you know, the voltage
5 times the current, per Ohm's Law.
6 Q And I believe you said that the current
7 between the electrodes can -- can change or differ
8 based off of several factors; is that right?
9 A Yes.
10 Q Okay. So it's fair to say that if the
11 impedance between the electrodes is lower, we can
12 assume that more current will flow between the
13 electrodes?
14 A Correct, yeah.
15 Q Okay. And if, obviously, the impedance of
16 the tissue is higher, less current will flow
17 between the electrodes?
18 A Correct.
19 Q So it's fair to say that the impedance
20 between -- the impedance of the material between
21 the electrodes will -- will have an effect on the
22 amount of power dissipated in the patient's

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1 tissue?
2 MS. COHEN: Objection. Form.
3 A Yes.
4 Q And --
5 A Yeah. I mean, unless there are other
6 factors in the circuitry that can compensate for
7 that.
8 Q Okay. And is it fair to say that the --
9 let me make sure I get this right.
10 Is it fair to say that less impedance
11 between the electrodes would result in more power
12 being dissipated in the patient's tissue?
13 A For the same voltage -- so the voltage
14 constant, right, you drop the impedance. You
15 raise the current. So you increase the
16 dissipation -- the power dissipation in the
17 tissue, yes.
18 Q Okay. So it's fair to say that the lower
19 the impedance between -- in the tissue between the
20 electrodes, the more power will be dissipated in
21 that tissue?
22 A Yes, and I just want to clarify. Our use

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1 of the term impedance in this context is referring
2 to what we call the DC impedance, the resistive
3 impedance. We're not talking about the energy
4 storage component of the impedance.
5 Q Sorry. Were you asking me a question?
6 A No, no. I just want to clarify. I'm
7 clarifying that's -- when we say impedance, just
8 because the -- you know, as I said before,
9 impedance has two components: the dissipative
10 component and the energy storage component. For
11 the purposes, I believe, of these conversations,
12 we can ignore the energy storage component of
13 impedance and just focus on the dissipative.
14 Q Okay. So, again, just so I can for my own
15 purposes to help me understand, so is it fair to
16 say that the lower the impedance between the
17 electrodes, the more power will be dissipated in
18 that tissue between the electrodes?
19 MS. COHEN: Objection. Form.
20 A Yes.
21 Q And the more power that's dissipated in
22 that tissue, the more heating that will be in it.

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1 Is that fair to say?
2 A Are you talking about temperature rise
3 when you say more heating in that context?
4 Q And that -- would that be accurate to say,
5 or is there something else you have in mind?
6 A Well, it depends. So if I dissipate,
7 let's say, 1 watt of power in a particular tissue,
8 the heat is till 1 watt; right? The heating power
9 is still 1 watt, but the question really is what
10 temperature are you going to get? If I distribute
11 that 1 watt over your whole body, it's not going
12 to raise your temperature; right?
13 Q Okay.
14 A If I identify a smaller volume of tissue,
15 that's going to change the -- what the temperature
16 is and you're not really going to -- and what's
17 going to affect that specific temperature rise is
18 now what's the thermal connectivity of the tissue,
19 if you will, kind of like the -- it's sort like a
20 thermal impedance, if you will.
21 Q Okay. I think I understand what you're
22 saying. So let me -- let me kind of re-ask it

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1 again with your terminology. Is it fair to say
2 that the more power that's dissipated in the
3 patient's tissue, the more the patient's -- the
4 temperature of the patient's tissue will rise?
5 A Everything else being constant, right,
6 factoring in the volume of the dissipation, the
7 thermal connectivity of the tissue and potentially
8 the blood flow that's flowing because blood flow
9 would have a cooling effect on the tissue.
10 Q So generally speaking, the more power
11 that's dissipated in the patient's tissue, the
12 more of the temperature of the -- the more the
13 temperature of the tissue will rise?
14 A For a given -- yes, for all those things
15 constant, yes.
16 Q And I guess on the flip side, the, the
17 higher the impedance between -- let me start that
18 over.
19 The higher the impedance of the tissue
20 between the electrodes, the less current will flow
21 between the electrodes?
22 A For a given voltage, yes. Increase the

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1 impedance, lower the current.
2 Q Right. And the less current that flows
3 between the electrodes, the less power will be
4 dissipated in that tissue; right?
5 A Correct.
6 Q And the less power that's dissipated in
7 that tissue the less -- there will be less of a
8 temperature rise in that tissue; right?
9 A Given all of those heat transfer
10 qualifications I gave, holding those constant,
11 yes.
12 Q Okay. So to kind of try and put a bow on
13 this, I guess, is it fair to say that -- is it
14 fair to say the differences in the amount of
15 current flowing between the electrodes can lead to
16 differences in the amount of power absorption of
17 the underlying tissue?
18 MS. COHEN: Objection. Form.
19 A Well, that depends exactly on where these
20 electrodes are placed; right. So I think -- I
21 don't know if -- I don't know. It's -- it
22 depends; right.

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1 Q What does it depend on?
2 A So okay. Repeat the question again so --
3 just so I'm clear on it.
4 Q Yeah. Let me see if I can get it for you.
5 Is it fair to say that differences in the
6 amount of current flowing between the electrodes
7 can lead to differences in the amount of power
8 dissipation in the patient's underlying tissue?
9 A Okay. So -- so here's what that depends
10 on. If the electrodes are close together, right,
11 and so you may have differences of current, but
12 you're depositing all that power in the same
13 tissue volume so it's not going to make a
14 difference. If they're far apart such that the
15 thermal field from one set of electrodes doesn't
16 interact with the other, you're going to deposit
17 some power over here and maybe a lesser amount of
18 power over here, but the question is, in sum, is
19 it the same power. That's where I'm having a hard
20 time answering your question.
21 Q I guess let me ask you it generally. So,
22 generally speaking, differences in the amount of

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1 current flowing between the electrodes can lead to
2 differences in the amount of power dissipation in
3 the patient's tissue; is that fair to say?
4 A Well, then see that -- this is what we're
5 getting at. What are you defining as the
6 patient's tissue?
7 Q The tissue that's being contacted by the
8 electrodes.
9 A Okay. So, yeah. So I think -- the
10 challenge here, right, is power is additive. The
11 current between electrodes may be different, but
12 if their power is being deposited in the same
13 tissue, that's -- you're basically summing those
14 two because they get effectively summed together;
15 right? There's only one power being deposited in
16 the tissue.
17 Q Okay.
18 A It's like saying, you know, I've got a
19 hundred watt lightbulb over here, and I've got a
20 10 watt lightbulb over here.
21 Does that change my electricity bill? No,
22 because it sounds like you're burning still that

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1 power, you know, 10 watts and a hundred watts.
2 Q I guess, can differences in the amount of
3 current flowing between the various electrodes
4 lead to differences in the temperature rise at
5 various points in the patient's tissue?
6 MS. COHEN: Objection. Form.
7 A The answer to that is going to depend on a
8 lot of factors, where the electrodes are, all the
9 electrical properties, all the thermal properties,
10 but, yes, it is possible.
11 Q Okay. And would you call that uneven
12 heating?
13 MS. COHEN: Objection. Form.
14 A Well, it depends on -- it's -- it could
15 induce an uneven temperature distribution.
16 Q Okay. So it's fair to say that --
17 A But that may be desired depending on the
18 application.
19 Q Okay. Well, isn't it fair to say that
20 uneven heating is not desirable in radiofrequency
21 ablation?
22 A No. I think it depends on the

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1 application.
2 Q Would you mind picking up your
3 declaration. I'm at paragraph 16 -- or, sorry,
4 page 16, paragraph 26.
5 A Mm-hmm.
6 Q And I'm looking at that top sentence
7 there. And you kind of mention the desired
8 outcomes of even heating and destruction over an
9 entire area, and it goes on. Do you see that?
10 A Mm-hmm.
11 Q That was a yes?
12 A Yes, yes.
13 Q Okay.
14 A I see it.
15 Q So if I understand you correctly here,
16 you're saying that at least as it relates to the
17 '318 patent, that even heating is a desired
18 outcome; is that right?
19 MS. COHEN: Objection. Form.
20 A Well, it says another benefit is to allow
21 for selective tissue destruction across an entire
22 surface of tissue.

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1 Q I see that. I'm asking about the even
2 heating part of what you wrote there. Is it fair
3 to say that at least with respect to the '318
4 patent that you understood that even heating was a
5 desired outcome?
6 MS. COHEN: Objection. Form.
7 A Let's see. Let me just catch up to you
8 here. So let me just qualify. The -- what I
9 wrote says, "A person skilled in the art would
10 have understood that the desired outcomes of even
11 heating and destruction over an entire area of
12 tissue are accomplished by activating multiple
13 pairs at the same time."
14 So -- so tissue, I'm assuming, in this
15 context means the tissue that you want to treat;
16 right? So even heating and destruction. So
17 destruction is what you want, even destruction.
18 You don't necessarily get even destruction all the
19 time by even heating.
20 Q Okay. So when you wrote the desired
21 outcomes of even heating and destruction, what did
22 you mean by that? Did you --

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1 A Well, sometimes you want even heating, and
2 sometimes you want even destruction.
3 Q Okay. So is it your testimony today that
4 even heating is not a desired outcome of the '318
5 patent?
6 MS. COHEN: Objection. Form.
7 A It could be. It depends on how it's
8 implemented and what the application is.
9 Q Certainly in your declaration here at
10 paragraph 26, you believe that even heating was
11 the desired outcome of the '318 patent; correct?
12 MS. COHEN: Objection. Form.
13 A In some instances, yes.
14 Q Okay. You didn't mention in your
15 declaration any instances where uneven heating --
16 uneven heating would be a desired outcome. Did
17 you?
18 MS. COHEN: Objection. Form.
19 A Well, what -- so one thing I want to
20 qualify. Even heating doesn't always -- doesn't
21 give you even destruction, right. It's a desired
22 outcome of even heating and even destruction over

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1 an entire area are accomplished by activating
2 multiple pairs.
3 Q I understand. But my question was a
4 little bit different.
5 My question was: You did not mention in
6 your declaration any instances where uneven
7 heating would be a desired outcome, did you?
8 MS. COHEN: Objection. Form.
9 A Not exclusively, I don't think so.
10 Q Okay. You didn't put it in here, did you?
11 A I don't --
12 MS. COHEN: Objection. Form.
13 A I don't think so.
14 MR. GILFORD: Okay. We've been going
15 about an hour. Do you guys want to take a break?
16 THE WITNESS: Yeah. Take a quick bio
17 break.
18 MR. GILFORD: Let's go off the record.
19 (A recess was taken.)
20 BY MR. GILFORD:
21 Q So, Dr. Martin, if you could go flip to
22 page 25 of your declaration.

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1 A Yes.
2 Q Let me know when you're there.
3 A I'm on page 25.
4 Q So I'm looking at paragraph 36, the last
5 full sentence of that paragraph.
6 Do you see where you wrote, "Figure 40's
7 disclosure regarding its multiplexing capabilities
8 further confirms that the '318 patent teaches an
9 output channel as something that allows pairing
10 between chosen electrodes to form a complete
11 circuit."
12 Do you see that?
13 A I do.
14 Q So in your opinion, a radiofrequency
15 output channel is something that allows pairing
16 between chosen electrodes to form a complete
17 circuit; is that correct?
18 MS. COHEN: Objection to form.
19 A I'm sorry. What's the question again?
20 Q In your opinion, a radiofrequency output
21 channel is something that allows pairing between
22 chosen electrodes to form a complete circuit; is

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1 that correct?
2 MS. COHEN: Objection. Form.
3 A Radiofrequency output channels allows
4 paired electrodes to form a circuit, yes.
5 Q Okay. And when you say in your
6 declaration something that allows pairing between
7 chosen electrodes to form a complete circuit, what
8 do you mean by that?
9 A Well, in this case it would allow current
10 to flow from one electrode to another.
11 Q So I guess specifically when you say
12 something that allows pairing, what do you mean by
13 that?
14 A It's -- again, it allows -- you're
15 completing the circuit. You're allowing current
16 to flow from one electrode to another.
17 Q And when you say allows pairing between
18 chosen electrodes to form a complete circuit, what
19 do you mean by that?
20 A Well, you have the ability to select -- in
21 this figure 40, you have multiple electrodes, you
22 have multiple radiofrequency output channels, and

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1 you select -- you energize one and you energize
2 another, and then that completes the circuit.
3 Q So what is the something that allows
4 pairing between chosen electrodes?
5 MS. COHEN: Objection to form.
6 A Well, it says -- the sentence says the
7 multiplexing capability of current -- teaches an
8 output channel.
9 The output channel is something that
10 allows pairing between chosen electrodes to form a
11 complete circuit. I think it's -- it's pretty
12 plain -- plainly written.
13 Q So would a switching arrangement be
14 something that allows pairing between chosen
15 electrodes to form a complete circuit?
16 MS. COHEN: Objection to form.
17 A It depends. I mean, there are a number of
18 ways you could energize that -- that
19 radiofrequency output channel.
20 Q And would a switching arrangement be one
21 of those?
22 A You could use switching.

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1 Q Do you believe a switching arrangement can
2 be a radiofrequency output channel?
3 MS. COHEN: Objection. Form.
4 A It depends on how it's implemented.
5 Q What do you mean by that?
6 A Well, this is a good example, right, of --
7 the '318 patent defines this as a radiofrequency
8 output channel.
9 Q When you -- when you say "defines this,"
10 what are you pointing to?
11 A So I'm sorry. 961, in figure 40, right,
12 in -- in the '318 patent is labeled as a
13 radiofrequency output channel.
14 Q And the question was: Do you believe a
15 switching arrangement can be a radiofrequency
16 output channel?
17 MS. COHEN: Objection. Form.
18 A Possibly.
19 Q Why do you say that?
20 A Well, again, it depends on -- if this
21 is -- like, so in this example there are no
22 switches that appear, right. So could you --

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1 could you take one of these lines and put a switch
2 in there and it's still a radiofrequency output
3 channel? Yeah, possibly.
4 Q Is it your opinion that the claimed
5 radiofrequency output channels require a switching
6 arrangement?
7 MS. COHEN: Objection to form.
8 A No.
9 Q Why do you say that?
10 A Well, again, this is figure 40,
11 labeled 961, shows a radiofrequency output
12 channel. It doesn't require a switch to be a
13 radiofrequency output channel.
14 Q Could something that allows pairing
15 between chosen electrodes to form a complete
16 circuit be a human manually connecting different
17 wires together?
18 MS. COHEN: Objection. Form.
19 A You could, yeah.
20 Q Why do you say that?
21 A Well, at some point in time -- let's
22 say -- let's say figure 40 represents the device

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1 and then there's some RF generator. That circuit
2 is not complete until, let's say, the physician
3 plugs those two -- plugs the device into the --
4 into the RF generator.
5 Q I guess when I was saying a human manually
6 connecting different wires together, I was
7 thinking more like similar to a switching
8 arrangement but instead of switches you have
9 somebody literally taking one wire and connecting
10 it to another.
11 Do you kind of have that in mind?
12 A I mean, it wouldn't be practical, right,
13 but it would be possible.
14 Q Okay. And, again, just to tie -- tie
15 things together, you agree that a human manually
16 connecting different wires together could be
17 something that allows pairing between chosen
18 electrodes to form a complete circuit?
19 MS. COHEN: Objection to form.
20 A I would say among other things, as well.
21 I mean, there are a lot -- if -- if we look at
22 pairing as current flowing between electrodes,

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1 there -- there are a number of other factors that
2 enable that.
3 Q What are some of the other factors?
4 A Well, they have to have a certain
5 mechanical distance between the two of them. That
6 mechanical distance would have also impedance, a
7 tissue impedance that would, you know, permit
8 current flow.
9 Q Do you see -- I'm looking back at
10 paragraph 36, kind of like midway through that
11 paragraph.
12 A Mm-hmm.
13 Q Do you see that there's something
14 mentioned in there called a return signal?
15 A Yes.
16 Q What do you mean by a return signal?
17 A Well, it's a -- it's a -- basically you
18 could imagine a current flowing. It's basically a
19 model of where a current flows from positive to
20 negative. And so the negative is essentially
21 returning the current back to the RF generator.
22 Q Okay. So a return signal is the return

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1 current back to the RF generator; is that right?
2 A Yes.
3 Q Okay. How is a return signal different
4 than the active signal that you also mention in
5 this paragraph?
6 A So in this -- in this construct, right,
7 the active signal is the positive. So you can
8 think of it as, you know, the -- the power flowing
9 from positive to negative, back to the RF
10 generator.
11 Q Is the active signal the output from the
12 generator?
13 MS. COHEN: Objection. Form.
14 A It could be one of the outputs from the
15 generator.
16 Q Okay. And the return signal is what's
17 being returned back to the generator?
18 A Yes. And, again, this is -- this
19 characterization is a simplification, right, which
20 doesn't fully recognize what you have when you
21 have a radiofrequency signal in that the current,
22 like the actual flow of electrons -- you know, we

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1 talk about current going from positive to minus.
2 Well, the electrons actually flow the other way,
3 from negative to positive.
4 But in -- in radiofrequency you
5 essentially have like an alternating current. The
6 electrons are moving sort of in both directions,
7 if you will.
8 But this is a simplification that's kind
9 of routinely accepted shorthand.
10 Q Understood.
11 Could the something that allows pairing
12 between chosen electrodes to form a complete
13 circuit be on the return signal side of the
14 circuit?
15 MS. COHEN: Objection. Form.
16 A Well, a lot of things have to come
17 together, right, in order for a current to flow.
18 But, yes, something would have to be --
19 the -- for instance, it has to complete the
20 circuit, right, on the return side.
21 Q So you believe that the -- something that
22 allows pairing between chosen electrodes to form a

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1 complete circuit could be on the return signal
2 side; is that right?
3 MS. COHEN: Objection. Form.
4 A Well, I think the something there is not
5 any one thing, but -- but it would include things
6 that are on the return signal side.
7 Q Okay. I'm going to spend a minute drawing
8 a sample circuit on my notepad, and then we'll use
9 it as an exhibit. So just bear with me while I
10 kind of draw it out.
11 A Okay.
12 Q Let's go ahead and mark what I've drawn
13 here as Martin Exhibit 1.
14 (Martin Exhibit 1 was marked for
15 identification.)
16 Q So, Dr. Martin, kind of using the sample
17 circuit I've drawn there, are you able to tell how
18 many radiofrequency output channels there are in
19 this circuit?
20 MS. COHEN: Objection. Form.
21 A I think it depends on how you're defining
22 it.

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1 Q Would you mind elaborating a little
2 further?
3 A So the concept of an output channel,
4 right, is sort of relative to the device to which
5 it's output.
6 Q What do you mean by that?
7 A So -- so for instance, let's say in figure
8 40, right, you might count how many -- one, two,
9 three -- four output channels; right? But --
10 Q Okay.
11 A Right? So that's convenient; right. You
12 could individually address each of the electrodes,
13 but now if in this device I took these four output
14 channels and I shorted it, how many output
15 channels do I have?
16 Q What would you say?
17 A Well, it's not such an easy concept.
18 Going back to the previous example. I have four
19 electrodes here, four electrodes here. Each is
20 sort of individually addressable. So the concept
21 of an output channel is a logical construct.
22 If I have four independent positive, four

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1 independent minus, do I have four output channels?
2 Do I have eight? Do I have 16?
3 And the logical -- because I can use each
4 one, each positive to address individually each
5 negative and vice versa.
6 Q So, again, going back to the sample
7 circuit, are you able to tell from that sample
8 circuit we've been discussing, which has been
9 marked as Martin Exhibit 1, how many
10 radiofrequency output channels there are in that
11 circuit?
12 A No.
13 MS. COHEN: Objection. Form.
14 Q What else would you need to know to be
15 able to tell how many radiofrequency output
16 channels are in that circuit?
17 A I would want you to draw a dotted line
18 defining what the device is that we're defining
19 the radiofrequency output channels relative to.
20 Q I guess that's where I'm losing you a
21 little bit. What do you mean by that?
22 A So if you drew a dotted line around

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1 here --
2 Q And just for the record, you're indicating
3 around the three electrodes?
4 A Correct.
5 Q Okay. So continue.
6 A So in that case how many radiofrequency
7 output channels do you have? Two you could say.
8 Q And if you were to -- I guess why --
9 let's -- let's start with that. So why do you say
10 there would be two radiofrequency output channels
11 if you were to draw a dotted line around the three
12 electrodes in this exhibit?
13 A Well, I'm assuming each of these switches
14 as you've drawn them is independently
15 controllable.
16 Q What do you mean by that, independently
17 controllable?
18 A You can turn one on. You can turn one
19 off. You can turn the other one on. You can turn
20 the other one off. They can both be on at the
21 same time. They can both be off at the same time.
22 Q So when you say independently

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1 controllable, do you mean the ability to
2 independently turn on and off each of the
3 electrodes?
4 A In this -- in this case for these
5 switches, I mean when you turn one switch on or
6 off, it doesn't depend on the state of the other
7 switch. The other switch could be on or off, and
8 vice versa.
9 Q I guess going back to what I was asking,
10 you know, you said if you drew a dotted line
11 around the three electrodes in this exhibit that
12 you would then believe there would be two output
13 channels; is that right?
14 A Correct.
15 Q So, I guess, why do you say that?
16 A Well, again, as I said before, a
17 radiofrequency output channel is a logical
18 construct. So -- so we need to know where we are
19 applying that construct. So if we're applying it
20 to something that excludes the switches but
21 includes the electrodes, in this case I would
22 count two radiofrequency outputs.

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1 Q And why do you say that?
2 A Because you can control independently
3 each -- each electrode in this case.
4 Q Okay. And I guess if you were to draw the
5 dotted line around the electrodes and the two
6 switches in this figure, would your -- would your
7 answer change?
8 A You might -- yeah. You might construct
9 that to be logically the radiofrequency output
10 channels -- well, it would be -- would be one.
11 Q Why do you say that?
12 A Well, because now you only have -- to get
13 current to flow, you only have one choice; right?
14 Q What do you mean by you would only have
15 one choice?
16 A Well, if your logical construct is -- it's
17 basically your system here is either on or off.
18 Q So, I guess -- do you mind if I get that
19 back from you?
20 A Yeah.
21 Q So I'm going to quickly draw a dotted line
22 around the electrodes and the switches --

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1 A Okay.
2 Q -- just for reference.
3 So I guess, you know, now you see kind of
4 this dotted line I've drawn around the three
5 electrodes and the two switches in what's been
6 labeled Martin Exhibit 1.
7 Do you see that?
8 A Yes.
9 Q And I believe you said that if you were to
10 draw that dotted line around the three electrodes
11 and the two switches in this exhibit, you would
12 believe there would be one radiofrequency output
13 channel?
14 A Right.
15 MS. COHEN: Objection. Form.
16 A Correct.
17 Q And, again, why do you say that there
18 would be one radiofrequency output channel in the
19 sample circuit if you were to draw the dotted line
20 around the three electrodes and the two switches?
21 A So, again, the concept of radiofrequency
22 output channel, it's a logical construct. It's

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1 how you define it, and in this case if we define
2 it just relative to the inputs to the device --
3 and I'm assuming what's within this dotted line
4 is -- let's call it the device, so this device
5 essentially has one radiofrequency output channel.
6 Q And when you say the device, are you
7 talking about the device that would actually be
8 inserted into the patient?
9 A That would be one way to define it, yes.
10 Q Okay. And I guess -- sorry to -- just
11 bear with me. I'm trying to process this. So I
12 guess what we're saying in this sample circuit is
13 the device is what's being defined with the dotted
14 line; right?
15 A Yes.
16 Q Okay. And what's shown here is there's
17 one wire going into the device and one wire coming
18 out of the device?
19 A Correct.
20 Q And you believe that in that case because
21 there's one wire going in and one wire going out
22 that in that case there's one radiofrequency

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1 output channel?
2 MS. COHEN: Objection. Form.
3 A Correct.
4 Q Okay. Okay. I think I understand.
5 So if -- I guess if I'm understanding you
6 correctly, your understanding of what
7 radiofrequency output channel means depends on the
8 number of wires that goes into the device?
9 MS. COHEN: Objection. Form.
10 A Well, it's -- not necessarily; right. I
11 mean, it's -- it's -- as I said before, logical
12 construct. When we last spoke about figure 40,
13 right, how many RF output channels do you have?
14 Is it -- like, again, is it four? Is it eight?
15 Is it 16? Because, again, it's how you define it.
16 Q And I guess in your opinion, are you
17 defining it with respect to how many wires are
18 going into the device?
19 MS. COHEN: Objection. Form.
20 A In this case, yes.
21 Q Okay.
22 A This case being the -- your -- your

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1 drawing.
2 Q And what about in the case of your reply
3 declaration?
4 A I think in the case of the reply
5 declarations, I talk about multiple RF output
6 channels. I don't know if I go through and count
7 them.
8 Q Right, but in your reply declarations,
9 were you defining radiofrequency output channel
10 with respect to how many wires are going into the
11 device?
12 A No.
13 Q So how were you defining rad --
14 A Well, I was simply saying, I think, that
15 there were multiple radiofrequency output
16 channels. So more than one.
17 Q Right.
18 So how -- how were you defining
19 radiofrequency output channels in your reply
20 declarations?
21 MS. COHEN: Objection to form.
22 Q Let me re-ask that.

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1 So you've been talking -- you've been
2 saying you believe that radiofrequency output
3 channel is a logical concept; is that right?
4 A Yes.
5 Q And I believe you said that radiofrequency
6 output channel is a logical concept that has to be
7 defined with respect to something; is that right?
8 MS. COHEN: Objection to form.
9 A Yes.
10 Q Okay. So in your reply declarations, how
11 were -- what -- what were you defining the
12 radiofrequency output channel with respect to?
13 A Well, in the case of -- of figure 40, it's
14 respect to -- respect to the device, the -- what's
15 within the -- the box here in figure 40.
16 Q Well, let's talk about Stern figure 15
17 more specifically.
18 A Okay.
19 Q So in your -- I'm sure there's probably a
20 reproduction of it somewhere --
21 A Okay.
22 Q -- in your declaration.

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1 A So -- okay. So page 14.
2 Q Give me one second.
3 Okay. I'm with you.
4 So let's talk about Stern figure 15 a
5 little more specifically.
6 So in your reply declarations with respect
7 to Stern figure 15, what were you defining
8 radiofrequency output channel with respect to?
9 A So in this case, if you look at the dotted
10 line, right, in Stern, that forms a logical
11 construct by which you could count radiofrequency
12 output channels.
13 Q Okay. So in your analysis of Stern
14 figure 15, you were defining the radiofrequency
15 output channel with respect to the dotted box
16 shown here?
17 A Correct.
18 Q And I believe -- I believe your testimony
19 is that you believe that if you're -- if you're
20 defining radiofrequency output channel with
21 respect to this dotted box shown in Stern
22 figure 15, that in that case there are multiple

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1 radiofrequency output channels. Is that correct?
2 A Correct.
3 Q And, again, you know, with your definition
4 of -- strike that.
5 In your opinion if you were to define the
6 radiofrequency output channels in Stern figure 15
7 with respect to this dotted box, how many
8 radiofrequency output channels do you believe
9 there would be?
10 A That's -- I did not count them. I did not
11 offer an opinion as to how many. It depends on
12 how you would construct the device and actually
13 implement this device. But could be two, could be
14 four.
15 Q Okay. As you sit here today, you don't
16 know how many radiofrequency output channels there
17 would be in Stern figure 15 if you were to define
18 the radiofrequency output channels with respect to
19 the dotted box. Is that fair to say?
20 MS. COHEN: Objection. Form.
21 A I know there's -- there's more than one.
22 Regardless of how Stern figure 15 is

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1 implemented, there's going to be more than one.
2 Depending on how it's implemented, there could be
3 four.
4 Q Could there be more than four?
5 A Let's see. One, two, three, four, five --
6 could be six.
7 Q So your testimony here today is that in
8 Stern figure 15, there could be anywhere from two
9 to six radiofrequency output channels?
10 A Depending --
11 MS. COHEN: Objection. Form.
12 A Yes. Depending on how figure 15 is
13 implemented in an actual device.
14 Q Okay. And how did you make that
15 determination that there could be anywhere from
16 two to six radiofrequency output channels in Stern
17 figure 15?
18 MS. COHEN: Objection. Form.
19 A Well, if you're able to get current to
20 flow -- you can get current to flow that's based
21 on the switching arrangement. In this example,
22 you can get current to flow from 220 to 224. You

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1 can get current to flow from 220 to 226. I can go
2 from -- get current to flow 224 to 226, and 220 to
3 222. And then crosswise, 220 to 224 and 220 to
4 226.
5 Q Okay. So if I understand you correctly,
6 you're defining radiofrequency output channel with
7 respect to how current flows between the various
8 electrodes?
9 MS. COHEN: Objection. Form.
10 A Not necessarily, right. Going back to
11 this example here, your -- your circuit drawing,
12 right. If you close your two switches -- and I've
13 defined this as two radiofrequency output
14 channels -- you still might get current, right,
15 between these two electrodes.
16 So it has more to do with individual
17 control than it does to which current flows from
18 which electrode.
19 Q Okay. But let's talk specifically about
20 Stern and how you came up with the idea there
21 could be anywhere from two to six radiofrequency
22 output channels. Now, I believe you said that --

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1 when I asked you how you came up with that number,
2 you were pointing to how current could flow
3 between various electrodes; right?
4 A How under control -- under the switch
5 control, you can control the current to each of
6 those electrodes. Yes.
7 Q Okay. So it sounds like the -- the number
8 of radiofrequency output channels in -- at least
9 in your opinion in Stern figure 15 -- depends on
10 how current can flow between the various
11 electrodes; is that right?
12 A No.
13 Q Okay. Well, walk me through it. How did
14 you get this -- this number of between two and six
15 channels?
16 A So -- so, for instance, if I -- if I
17 closed what would be 248 and -- it would be 256.
18 So I can -- if I energize 220 and 224 alone,
19 right, that's -- it's under individual control and
20 so I can -- I can define that as a logical
21 radiofrequency output channel.
22 Q So if I understand you correctly, in your

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1 opinion, if the only switches that were closed
2 were switch 248 and switch 236, in that case Stern
3 figure 15 would have only one radiofrequency
4 output channel?
5 A Well, however, if your device was wired in
6 this, you would still have the other
7 radiofrequency output channel. It just would not
8 be energized.
9 Q Okay. Well, that's -- that's what I'm
10 trying to figure out is -- you gave us a range of
11 what -- of possible numbers of radiofrequency
12 output channels between two and six.
13 A Yes.
14 Q Do you remember that testimony?
15 A Correct.
16 Q So how -- how did you get that number?
17 A So --
18 MS. COHEN: Objection. Form.
19 A So the device -- let's say in this case
20 the device has four electrodes, right. Even if I
21 energize just two of those electrodes, the other
22 two electrodes are still wired up, right. If you

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1 imagine this as they might be hanging out of the
2 patient, right, but they're not wired, they still
3 constitute a radiofrequency output channel even
4 though they haven't been energized.
5 Q Okay. I'm still not quite sure how you're
6 getting the -- the two to six range though.
7 A So in this construct, in this example,
8 whatever device I'm building, right, I've got to
9 have four electrodes, right. And so those four
10 electrodes have to be energizable, even if they're
11 not energized.
12 So -- so I have, let's say, a minimum of
13 four wires coming off this device, so I have a
14 minimum of two RF output channels. Now, I may
15 choose to just energize one or the other at a
16 given time, but the device itself still has two --
17 a minimum of two radiofrequency output channels.
18 Q So how do you get to six though?
19 A Well, if -- let's say, for instance, if
20 I -- again, radiofrequency output channel is a
21 logical construct. It might be convenient for the
22 sake of how this device is operated to define up

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1 to six where I'm energizing each of the other
2 electrodes, each -- every other combination of
3 electrode, either in sequence or at the same time.
4 Q And just to be clear, you know, in
5 figure 15 you're defining the device as what's
6 inside the dashed line; right?
7 A For the sake of --
8 MS. COHEN: Objection. Form.
9 A For the sake of this discussion, yeah.
10 It doesn't have to be, but yeah. For the
11 sake of this discussion, yes.
12 Q And aren't there five wires coming out of
13 that device, not four?
14 A Well, yes, but it's -- in this case, it's
15 quickly -- it's sort of shorted out.
16 Q What do you mean by that?
17 A Well, so 234 connects to 242.
18 Q Mm-hmm.
19 A So you're only get -- if you -- if you
20 were to close 242 and 234, you would actually
21 short out the -- you would short out that circuit,
22 right.

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1 Q Okay.
2 A So I think it's -- I think it's a -- there
3 might be a -- there's a better way to -- you
4 couldn't have that condition happen and have the
5 device operating.
6 Q Let's just assume there's four wires
7 coming out of the device, like you said.
8 A Yes.
9 Q So I believe you testified that because
10 there's -- in your opinion because there's four --
11 there would be four wires coming out of the
12 device, that would tell you there's at least two
13 radiofrequency output channels. Is that your
14 testimony?
15 A Correct.
16 Q Okay. So, again, what I'm -- what I'm
17 trying to figure out is, you know, how you got to
18 the concept that there can potentially be up to
19 six radiofrequency output channels.
20 So, again just walk me through that.
21 A Well, again, the concept of radiofrequency
22 output channel, it's a logical concept, right. So

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1 it -- it requires at minimum, right, the hardware
2 to implement that in order to get current to flow.
3 Q Okay. So explain to me how you got to six
4 radiofrequency output channels.
5 A So if I close the requisite switches, so
6 the obvious ones are if I, if I energize 220, 224,
7 right, that's -- that's one. Let's call that one
8 output channel. Now I energize 222 and 226. That
9 would be a 2. Now I energize 220, 222. You could
10 logically call that another one because it's going
11 to have -- that current now is going to flow
12 through different tissue, but depending on how
13 this device is designed, you know, you could be
14 treating a slightly different part of tissue.
15 As the designers of such a device, you
16 would want to make sure the operator would be able
17 to clearly see that, so you would logically
18 potentially define that as a different
19 radiofrequency output channel.
20 Q So it sounds like you're saying the number
21 of radiofrequency output channels depends on which
22 electrodes are activated?

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1 MS. COHEN: Objection. Form.
2 A Except insofar as the device you design,
3 right, as I said before, it was just four wires,
4 let's say, coming out of it. So you're going to
5 have a minimum of two radiofrequency output
6 channels even if you choose not to energize one,
7 even if you choose to never energize in a certain
8 treatment.
9 Q So, I guess -- let me rephrase that again.
10 It sounds like you're saying the number of
11 radiofrequency output channels depends on which
12 electrodes are capable to have current flowing
13 between them?
14 MS. COHEN: Objection. Form.
15 A That's a possible way to look at it, yeah.
16 Q Okay. Now, again, we've been talking a
17 little bit about how, at least in your opinion,
18 you believe the concept of a radiofrequency output
19 channel is what you've been calling a logical
20 concept; right?
21 A Yes.
22 Q And I believe you said that the, I guess,

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1 for lack of a better word, the number of
2 radiofrequency output channels is kind of in the
3 eye of the beholder; right?
4 MS. COHEN: Objection. Form.
5 A I might say in the eye of the designer, in
6 the eye of the user.
7 Q Okay. So the number of radiofrequency
8 output channels in, for example, Stern figure 15,
9 could change depending on how you're defining
10 the -- depending on what you're defining the
11 radiofrequency output channels with respect to?
12 MS. COHEN: Objection. Form.
13 A In part. It's -- the radiofrequency
14 output channels are how is the device intended to
15 operate and how does it operate, and in some ways
16 you can think of it as a logical convenience for
17 both the designer and the operator; right? So for
18 instance for the operator, you would want to give
19 them clear instructions as to now you're
20 energizing these two electrodes, now you're
21 energizing these two electrodes over here. The
22 operator, the surgeon, is going to want to know,

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1 and it's going to want to be made abundantly clear
2 to them what they're doing and exactly how they're
3 doing it. The concept of the output channels
4 facilitates that.
5 Q I guess if in figure 15 of Stern -- you
6 know, we've been talking about the dotted lines.
7 If you drew the dotted line around everything but
8 the voltage source, 228, and the two wires coming
9 out of it, in that case there would be one
10 radiofrequency output channel; right?
11 MS. COHEN: Objection. Form.
12 A In that example do you still have the
13 switches, or do you not have the switches?
14 Q The switches would be inside what you've
15 called the dotted line.
16 A I think, again, as I've -- as I've sort of
17 talked about, the logical construct of the RF
18 output channel, I don't think that changes it, and
19 the reason is that even though the switches are
20 now in the handle, right, you would design this
21 device in such a way that you would want the
22 operator to understand exactly what they're

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1 energizing and when they're energizing it.
2 Now, if you got rid of the switches all
3 together and you hard-wired everything, and so
4 they're either all on -- well, you couldn't really
5 do that in this configuration, but if you
6 configure it in a way that there's only -- they
7 only have one choice, you turn on the machine and
8 let's say the top -- you know, 220, 222 are
9 positive, 224, 226 are negative and that's your
10 only choice, then, yes, then I would agree.
11 That's one RF output channel.
12 Q Okay. Let's go back to your declaration
13 and go to page 29. And I'm looking at the first
14 full sentence at the top of the page. Do you see
15 where you wrote, "The description of figure 43
16 further confirms that the '318 patent teaches an
17 output channel as something that allows pairing
18 between chosen electrodes to control a chosen
19 pairs of electrodes separately from another chosen
20 pair," and it goes on. Do you see that?
21 A Yes.
22 Q So in your opinion is a radiofrequency

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1 output channel something that allows pairing
2 between chosen electrodes to control a chosen pair
3 of electrodes separately from another chosen pair?
4 MS. COHEN: Objection. Form.
5 A It's as it's written. Yes.
6 Q Okay. And what do you mean by a chosen
7 pair of electrodes?
8 A So -- so this is actually a good example;
9 right. So figure 43, left-hand side. Assuming
10 that each of those positives, right, is
11 individually controllable somehow, we don't know;
12 right? We don't know what the generator looks
13 like, but you could incorporate, let's say, Stern
14 and figure 15 Stern to control a device like this,
15 you could individually choose any of these
16 positive electrodes. So here this would be a case
17 where you have four radiofrequency output
18 channels; right? And I say that not more because
19 this is implied -- I'm assuming that the
20 positive -- that plus sign denotes the fact that
21 those electrodes can only be positive. They can
22 never be negative. So you don't have other

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1 current flowing anywhere else other than between
2 one of the positives and the negative.
3 Q You had said something a second ago
4 about -- you had said, Assuming that each of those
5 positives is individually controllable somehow,
6 and then you said something, We don't know what
7 the generator looks like.
8 Do you recall saying something along those
9 lines?
10 A Yes.
11 Q What did you mean by that? Why do you
12 need to know what the generator looks like to know
13 whether these electrodes are individually
14 controllable?
15 MS. COHEN: Objection. Form.
16 A Well, we don't know -- well, we don't know
17 the wiring, right, between that point and what's
18 -- what's sending the power, and so, but I'll
19 assume that there's something, like Stern figure
20 15, or figure 5 between there and here for the
21 sake of this discussion; right? And so,
22 therefore, you can individually energize these or

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1 energize them all at your choosing.
2 Q Okay. So you're saying that in figure 43
3 of the '318 patent, there could be something in
4 the generator itself that allows you to
5 individually control these electrodes?
6 A I would say that's implied, right, in this
7 figure, the fact that they have individual trace
8 lines, right, or wires, if you will, to each
9 electrode.
10 Q Okay. If I understand you correctly,
11 you're saying that in figure 43 of the '318
12 patent, it's implied that there's something in the
13 generator itself that allows you to individually
14 control the electrodes; is that right?
15 MS. COHEN: Objection. Form.
16 A I mean, I don't think the '318 patent goes
17 into a lot of detail on that, but in order to sort
18 of get this to work the way it's described,
19 something like Stern figure 15 would be required.
20 Q So going back to this sentence we've been
21 talking about at the top of the page on page 29
22 where you wrote -- you mention chosen pairs of

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electrodes?

A Mm-hmm.

Q So when you say chosen pair of electrodes, what do you mean by that?

A Let's see.

Q Let me re-ask it. What's the difference between a pair of electrodes and a chosen pair of electrodes?

MS. COHEN: Objection. Form.

A Well, I would say, I mean, a pair of electrodes may or may not have current flowing through it, right, but regardless they have to have the ability to have current flowing through it. Once you do flow current through it, at the exclusion of others, that becomes the chosen pair.

Q I guess when you say "at the exclusion of others," what do you mean by that?

A Well, by virtue of the fact that you've chosen, right, separately. Okay. So it's the sentence says, The '318 patent teaches an output channel is something that allows pairing between chosen electrodes to control a chosen -- to

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1 control a chosen pair of electrodes separately
2 from another chosen pair.
3 Q So, I guess, are you saying that in your
4 opinion a radiofrequency output channel is
5 something that allows you to select two electrodes
6 to have current flow between at the exclusion of
7 other potential avenues of current flow?
8 MS. COHEN: Objection. Form.
9 A Well, a radiofrequency output channel, I
10 mean, it's not implemented this way here, right,
11 but you could imagine that one output channel
12 could energize two of the electrodes at the same
13 time or three or however you want to do it.
14 Q Okay. So, again, when you say an output
15 channel is something that allows pairing between
16 chosen electrodes to control chosen pairs of
17 electrodes separately from another chosen pair,
18 what do you mean by that?
19 A I -- sort of exactly what it says; right?
20 Q Well, I'm -- I'm having trouble with this
21 separately from another chosen pair part.
22 A Well, when you -- in this case, figure 43,

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1 as implied by the highlighting, right, you're
2 energizing one -- the negative electrode is always
3 connected, right, and then you're individually
4 connecting each of the positive electrodes. On
5 the left-hand side, you are energizing -- what's
6 that -- 983. And then -- are they both labeled
7 98 -- well --
8 Q Yeah. They're all labeled 983.
9 A Okay. All right.
10 But then you're selectively energizing the
11 one next to it.
12 Q And do you believe the radiofrequency
13 output channel requires the ability to
14 independently energize electrodes?
15 MS. COHEN: Objection. Form.
16 A No, because a radiofrequency output
17 channel could connect with multiple electrodes.
18 Q What -- what do you mean by that?
19 A Well, for instance, let's say I had the
20 ability -- let's say this wire didn't -- the wire
21 that comes from outside the device to inside the
22 device would contact two electrodes, right. So I

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1 have one radiofrequency output channel now
2 energizing two electrodes.
3 Q Do you think the term radiofrequency
4 output channel requires the ability to choose
5 different pairs of electrodes to energize?
6 MS. COHEN: Objection. Form.
7 A I don't think it's required.
8 Q Okay. Do you think the term
9 radiofrequency output channel requires the ability
10 to control a chosen pair of electrodes separately
11 from another chosen pair?
12 MS. COHEN: Objection. Form.
13 A Not necessarily.
14 Q What are the different ways that a
15 radiofrequency output channel can control a chosen
16 pair of electrodes separately from another chosen
17 pair?
18 A I think figure 43 here is a good example.
19 Q And what's shown in figure 43 that
20 allows -- allows control of a chosen pair of
21 electrodes separately from another chosen pair?
22 A So on the left-hand side -- just what I

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1 said before, right. You have -- there's the top
2 wire, if you will, that's highlighted that
3 connects to the leftmost electrode. So that's one
4 radiofrequency output channel. And then on the
5 right-hand side, you have -- let's say the next
6 wire down is highlighted, that connects to the
7 further right electrode that's highlighted.
8 So this is an example of two separate
9 radiofrequency output channels energizing two
10 separate electrodes.
11 Q And to be clear, you added the annotations
12 to the figures on page 29 of your declaration;
13 right?
14 A Yes.
15 Q So the purple and the orange don't appear
16 in the '318 patent; correct?
17 A Correct.
18 Q Okay. So with respect to the unannotated
19 version of figure 43 that you would find in the
20 actual '318 patent, what in that -- what in that
21 figure provides the ability to control a chosen
22 pair of electrodes separately from another chosen

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1 pair?
2 A Well, I mean, it's the same -- it's the
3 same answer but without the description with the
4 highlights, right. I mean, that -- that top wire
5 you could energize. That top wire connects to the
6 leftmost electrode. That's one radiofrequency
7 output channel.
8 On the right-hand side, the second wire
9 down connects to the second from the left
10 electrode. You could energize that by energizing
11 that wire.
12 Q Right. But I think my question is just
13 about the figure itself.
14 So in figure 43 itself, what -- what in
15 that figure shows the ability to control a chosen
16 pair of electrodes separately from another chosen
17 pair?
18 MS. COHEN: Objection to form.
19 A It's -- it's implied by the way the wires
20 are terminated on the right. Like if they were --
21 for instance, if they were meant to all be
22 energized at the same time, they all would have

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1 been connected. They would -- they would -- the
2 figure would show a common connection point. It
3 doesn't show that. So that implies that each one
4 of these wires can be energized separately.
5 Q Okay. You're saying that's implied but
6 you -- like you mentioned, the figure doesn't show
7 what happens in the rest of the circuit; correct?
8 A Because I think a lot of things are -- are
9 otherwise possible.
10 Q Okay. So it's possible that all four of
11 those wires coalesce into a single point; correct?
12 A We don't know.
13 MS. COHEN: Objection. Form.
14 Q We don't know because it's not shown in
15 the figure; right? Correct?
16 A Correct. Yes.
17 Q So going back to page 29 of your
18 declaration. I'm looking still in paragraph 39,
19 but at the last sentence of that paragraph.
20 A Okay.
21 Q And you see you mentioned a return line
22 there?

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1 A Yes.
2 Q What's a return line?
3 A That is defined as the negative -- well,
4 the wire that connects to the negative electrode.
5 Q So what -- what is the return line
6 returning to?
7 A Whatever's providing energy to the
8 circuit.
9 Q Would that be the radiofrequency
10 generator?
11 A It could be.
12 Q What else could it be?
13 A Well, I mean the -- in the most abstract
14 sense, you could put a battery across this and
15 energize it.
16 Q When you say you could put a battery
17 across this and energize it, what do you mean by
18 that?
19 A Well, you could attach the positive
20 terminal of a battery to one of the top electrode
21 wires and you would attach the negative side of
22 the battery to the negative wire. Current would

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1 then flow from one electrode to the other. If
2 there's intervening tissue of the right impedance,
3 you would get current flow.
4 Q Let's go to page 30, so the next page.
5 And I'm looking at the sentence that's
6 right above the figures. It kind of starts with
7 figure 44.
8 And do you see where you wrote, Figure 44
9 is described in a similar manner to figure 43,
10 again, further confirming that a person of
11 ordinary skill in the art would understand output
12 channels in the manner in which it is described in
13 the patent as an energy connector between
14 electrodes that allows for independent control of
15 bipolar pairs.
16 Do you see that?
17 A Yes.
18 Q So in your opinion, is a radiofrequency
19 output channel an energy connector between
20 electrodes that allows for independent control of
21 bipolar pairs?
22 MS. COHEN: Objection. Form.

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1 A Yeah. I think that's fair to say as
2 written.
3 Q And what do you mean by an energy
4 connector between electrodes?
5 A Well, it allows energy to flow to the --
6 to the electrodes.
7 Q So you believe a radiofrequency output
8 channel allows energy to flow to the electrodes?
9 A Correct.
10 Q Okay. Is the radiofrequency output
11 channel located between the electrodes?
12 MS. COHEN: Objection. Form.
13 A No.
14 Q What energy is the radiofrequency output
15 channel connecting the electrodes to?
16 MS. COHEN: Objection. Form.
17 A It would -- it could be a generator, RF
18 generator.
19 Q What else could it be?
20 A Well, in the crudest sense, as I mentioned
21 before, a battery. We don't -- some energy --
22 some electrical energy source.

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1 Q Okay. And for a radiofrequency output
2 channel, presumably that energy source is
3 something that outputs radiofrequency?
4 A Yes.
5 Q Okay. So going back to your declaration,
6 in the sentence we're looking at.
7 Do you see where you wrote, Allows for
8 independent control of bipolar pairs?
9 A Yes.
10 Q What do you mean by allows for independent
11 control of bipolar pairs?
12 A It's similar to what I have stated before
13 that -- and -- and the reason that, you know, we
14 can try and count the number of radiofrequency
15 output channels, right. You can individually
16 energize each electrode with a separate
17 radiofrequency output channel.
18 Q Okay. So you understand the term
19 radiofrequency output channel to mean that you can
20 individually energize each electrode with a
21 separate radiofrequency output channel?
22 MS. COHEN: Objection. Form.

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1 A I'm sorry. Repeat the question.
2 Q Is it your understanding that the term
3 radiofrequency output channel means the ability to
4 individually energize each electrode with a
5 separate radiofrequency output channel?
6 MS. COHEN: Objection. Form.
7 A Stated as such, that sounds like circular
8 logic.
9 Q Well, I'm trying to -- trying to
10 understand your position here that -- you say that
11 a radiofrequency output channel would be
12 understood to be something that allows for
13 independent control of bipolar pairs.
14 A Yes.
15 Q So I'm trying to understand what that
16 means.
17 A Do you know what independent control of
18 bipolar pairs is?
19 Q Well, that's what I'm trying to -- to get
20 at, is I'm not quite sure. So I was hoping you
21 would explain.
22 A Okay. So, for instance, if we look at

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1 figure 44, right. And implied in figure 44 is
2 that I can energize one electrode or the other. I
3 can do so with a separate wire. That separate
4 wire is -- can be thought of as a radiofrequency
5 output channel.
6 Q So is the -- are you saying that a
7 radiofrequency output channel is a wire?
8 MS. COHEN: Objection. Form.
9 A No, because a radiofrequency output
10 channel would also include the negative side, as
11 well, right. So it's not just one wire.
12 And, again, it's a logical construct.
13 Don't confuse it with something that's just
14 physical.
15 Q So is a radiofrequency output channel two
16 wires?
17 A It would have to include at a minimum,
18 right, two wires.
19 Q Okay. I mean, is that -- are you saying
20 that a radiofrequency output channel is two wires?
21 MS. COHEN: Objection. Form.
22 A No.

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1 Q Okay.
2 A Again, it's a logical construct that
3 includes physical aspects.
4 Q What do you mean a logical construct that
5 includes physical aspects?
6 A Well, it has to be -- the logical
7 construct, right, has to be implemented somehow
8 for it to work, and so it would -- it would have
9 to include connectors, let's say, for instance.
10 Q What do you mean by connectors?
11 A Well, the device has to connect to
12 something, right, to power it. That connection
13 could be a plug of some kind or another with
14 contacts and electrodes inside that that make the
15 contact. Depending on how you define that, you
16 could define that as part of the radiofrequency
17 output channel.
18 Q Does independent control of bipolar pairs
19 include activating different pairs sequentially?
20 A You could activate pairs sequentially.
21 Q Okay. So, I guess, for example, on page
22 30 of your declaration -- and, again, the orange

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1 and purple you show here is annotations you've
2 added to figure 44 of the '318 patent; correct?
3 A Correct.
4 Q And what you're showing here is -- at
5 least on the left side that the two electrodes
6 you've highlighted in purple are paired in that
7 instance?
8 A On the left side the two electrodes in
9 purple are paired in any instance.
10 Q Okay. Is what you're showing on the left
11 side, the two electrodes highlighted in purple,
12 are energized at that moment in time to form a
13 pair?
14 A They are energized in that moment in time.
15 Q Okay. And is what you're showing on --
16 well, I guess, let me ask it this way. What
17 you're showing on the left side, a pair of
18 electrodes in purple that are -- that are
19 currently activated?
20 A Yes.
21 Q Okay. And what you're showing on the
22 right side is another pair of electrodes that is

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1 highlighted in purple that's activated at that
2 point in time; right?
3 A Correct.
4 Q So if you were to switch from the -- from
5 activating the pair on the left side to activating
6 the pair on the right side, would you consider
7 that activating a different pair sequentially?
8 A Yes.
9 Q And activating different pairs
10 sequentially falls within the scope of independent
11 control of bipolar pairs; right?
12 A Yes.
13 Q Is it your opinion that the claimed
14 radiofrequency output channels must be able to
15 independently control bipolar pairs?
16 MS. COHEN: Objection. Form.
17 A Yes.
18 Q What are the ways that radiofrequency
19 output channels can independently control bipolar
20 pairs?
21 A What do you -- what do you mean?
22 Q What are the different mechanisms, I

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1 suppose, by which you could have independent
2 control of bipolar pairs?
3 A Well, a switch would be the simplest.
4 Q Anything else you can think of?
5 A Well, we talk about -- I mean, we talk
6 about switch, but a switch can be implemented in a
7 number of ways; right? You could use relay. You
8 could use some sort of solid-state switch.
9 Depends on the application.
10 Q So in other words, some sort of switching
11 arrangement could provide independent control of
12 bipolar pairs?
13 A Switching. You could -- since this is RF
14 energy, you could use a transformer arrangement.
15 Sure.
16 Q So it's fair to say that some of the
17 different ways you can have independent control of
18 bipolar pairs includes a switching arrangement or
19 a transformer arrangement; is that right?
20 A Yes.
21 Q Anything else you can think of?
22 A Well, I'm not an electrical engineer. I'm

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1 sure a good electrical engineer could come up with
2 some other ways, but I think for purposes of
3 discussion, those are the simplest.
4 Q Is it your opinion that the claimed
5 radiofrequency output channels require either a
6 switching arrangement or a transformer
7 arrangement?
8 A No.
9 MS. COHEN: Objection. Form.
10 Q Okay. You don't think either of those
11 things are required?
12 A Correct.
13 Q Okay. But you still think there needs to
14 be something that provides for independent control
15 of bipolar pairs; is that right?
16 MS. COHEN: Objection. Form.
17 A Correct. I mean, for instance, you -- you
18 talked before about the hand -- just plug in and
19 leave it plugged in or you don't leave it plugged
20 in. That could be a method as well.
21 Q This is probably a good time to take a
22 break. Does that sound good?

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1 A Yep. Sure.
2 (A discussion was held off the record.)
3 (A recess was taken.)
4 BY MR. GILFORD:
5 Q Do you mind if I grab the -- what we've
6 previously marked as Martin Exhibit 1. I wanted
7 to draw one more dotted box for you and ask you a
8 couple questions. So I'm going to draw this
9 dotted box in red. The previous box I drew was in
10 black.
11 So you see I drew a dotted box around the
12 three electrodes in Martin Exhibit 1. Do you see
13 that?
14 A Yes.
15 Q Okay. So if you're defining the
16 radiofrequency output channels with respect to
17 that red dotted box, how many radiofrequency
18 output channels would there be?
19 MS. COHEN: Objection. Form.
20 A Are you -- the electrode that's connected
21 to positive, are you requiring that to always be
22 positive?

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1 Q I don't know. Is that important to know
2 how many radiofrequency output channels there
3 would be?
4 A It could be.
5 Q Well, I guess, let me ask it this way. If
6 you're defining the radiofrequency output channels
7 with respect to the red dotted box in Martin
8 Exhibit 1, would there be one radiofrequency
9 output channel or multiple radiofrequency output
10 channels?
11 MS. COHEN: Objection. Form.
12 A So this would have multiple radiofrequency
13 output channels.
14 Q Okay. And can you tell that there's
15 multiple radiofrequency output channels because
16 there's more than two wires coming out of the red
17 dotted box?
18 A That's one way, yes.
19 Q Okay. You can put that to the side. So
20 let's go to page 32 of your '318 declaration, and
21 I'm looking at paragraph 42, the last full
22 sentence of that paragraph.

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1 A Uh-huh.
2 Q And do you see where you wrote in --
3 again, on page 32, the last full sentence of
4 paragraph 32, do you see where you wrote, The
5 output channel need only be a channel that carries
6 an output, i.e., the radiofrequency voltage from a
7 radiofrequency generator to an electrode pair.
8 Do you see that?
9 A Yes.
10 Q So in your opinion is a radiofrequency
11 output channel a channel that carries the output
12 from a radiofrequency generator to an electrode
13 pair?
14 MS. COHEN: Objection. Form.
15 A Well, I note, as I've stated previously in
16 the paragraph, that the connection need not be
17 direct, right, from the RF generator to the
18 radiofrequency output channel.
19 Q Okay. So the question I asked was a
20 little bit different.
21 Is it your opinion that a radiofrequency
22 output channel is a channel that carries the

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1 output from a radiofrequency generator to an
2 electrode pair?
3 MS. COHEN: Objection. Form.
4 A It's exactly what's written in my
5 declaration, yes.
6 Q Okay. And when you say a channel, what do
7 you mean by that? In other words, what do you
8 understand -- what do you understand the term
9 channel to mean?
10 A It's basically, you could think of it as a
11 conduit, and, again, this is a logical construct
12 as well.
13 Q When you say a conduit, what do you mean
14 by that? Like a wire?
15 A Well, a wire is not just a wire, right.
16 It would include insulation. It would include
17 connectors. It would include the ability to
18 contact it.
19 But, again, even channel here without
20 calling it an RF output channel, it's still --
21 it's a logical construct of what carries energy
22 between the generator to the electrodes.

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1 Q So, again, just -- what is a channel?
2 A As I said before, it's a logical construct
3 of the carrying of energy from the radiofrequency
4 generator to the electrode pair.
5 Q And what do you mean by the output from a
6 radiofrequency generator?
7 A You could think of it as the energy from
8 the radiofrequency generator, the RF electrical
9 energy.
10 Q And what's the difference between a
11 radiofrequency channel and a radiofrequency output
12 channel?
13 MS. COHEN: Objection. Form.
14 A I don't know if there's really a
15 distinction.
16 Q Okay. Sitting here today, you -- you
17 don't believe there's any distinction between a
18 radiofrequency channel and a radiofrequency output
19 channel?
20 MS. COHEN: Objection to form.
21 A Correct.
22 Q Is the output from a radiofrequency

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1 generator different than the input back to the
2 radiofrequency generator?
3 MS. COHEN: Objection. Form.
4 A Well, the way it's sort of defined, it --
5 the -- the plus and the minus, right, are part of
6 the same channel. No current would flow without
7 both of them.
8 Q So is the answer, no, you don't believe
9 there's any difference between the output from a
10 radiofrequency generator and the input back to the
11 radiofrequency generator?
12 MS. COHEN: Objection. Form.
13 A Again, input is also a -- a logical
14 construct, but in the case -- the way we've used
15 output, radiofrequency output, it -- it is --
16 doesn't matter which way the electrons are
17 flowing, right. We've used it in either -- either
18 case, that term.
19 Q Okay. So, again, I'm still trying to get
20 an answer to my question.
21 Is -- is there a difference between the
22 output from a radiofrequency generator and the

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1 input back to the radiofrequency generator?
2 MS. COHEN: Objection to form.
3 A So there could be. I don't know if input
4 is defined. I don't know if I have an opinion on
5 input, the term input.
6 Q And you had opinions about active signal
7 and return signal?
8 MS. COHEN: Objection to form.
9 A Right. I don't know if I used the term
10 input anywhere.
11 Q I don't know if you did either, but I -- I
12 guess -- again, my question is, you know: As you
13 sit here today, do you have an opinion on whether
14 output from a radiofrequency generator is
15 different than the input back to the
16 radiofrequency generator?
17 MS. COHEN: Objection to form.
18 A I don't know what you mean by input back
19 to the radiofrequency generator. Could you --
20 could you draw it?
21 Q I -- in my mind -- again, this is my
22 opinion. Maybe you have a different opinion.

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1 But in my mind, the input back to the
2 radiofrequency generator is the return signal?
3 A Yeah. Okay. I don't think I used that
4 terminology in my -- in my declaration.
5 Q You didn't use return signal back in
6 your --
7 A No. Input.
8 Q Okay. Well --
9 A I didn't use the word input anywhere.
10 Q Well, let me ask it the way you kind of
11 use it in your declaration.
12 So is the -- the active signal from the
13 generator different than the return signal back to
14 the generator?
15 A Okay. Where in the declaration are you
16 talking about?
17 Q Let me get the paragraph for you.
18 So look on page 25, and this is going to
19 be paragraph 36. If you look on page 25, it's
20 about the third and fourth lines.
21 Do you see where you wrote, An active
22 signal shown by a plus sign and a return signal

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1 shown by a minus sign.
2 Do you see that?
3 A Okay. Yep.
4 Q And that's where I'm getting active signal
5 and return signal from.
6 Do you see that, that it's in your
7 declaration?
8 A Yes.
9 Q Okay. So let me re-ask my question.
10 Is the active signal from the
11 radiofrequency generator different than the return
12 signal back to the radiofrequency generator?
13 MS. COHEN: Objection. Form.
14 A They differ in polarity it looks like from
15 the -- from the -- from declaration. Active
16 signal shown by a plus sign, that would imply it's
17 on the positive -- has positive polarity. Return
18 signal shown by a negative sign, that would imply
19 it's negative polarity.
20 Q So other than the -- other than the active
21 signal and the return signal having different
22 polarities, are there any other differences

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1 between the active signal and the return signal?
2 A I think from what's written here that's
3 all we know.
4 Q Do you think the term output in the claim
5 term radiofrequency output channel is superfluous?
6 MS. COHEN: Objection. Form.
7 A So -- so you want to say radiofrequency
8 channel instead of radiofrequency output channel.
9 I don't know. I think to say it's a
10 radiofrequency output channel is, I think,
11 clearer, right.
12 Q Well, I believe you previously testified
13 that there's no difference between a
14 radiofrequency channel and a radiofrequency output
15 channel; correct?
16 MS. COHEN: Objection. Form.
17 A Perhaps.
18 When did I testify to that?
19 Q Today.
20 A Okay. Yeah. Okay.
21 Q So --
22 A Well, given that, I mean, I prefer, you

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1 know, radiofrequency output channel. You're
2 outputting -- you're outputting --
3 Q Well, that's what's in the claim.
4 A You're outputting energy.
5 Q Okay. Do you think the term output is
6 superfluous in the claim term radiofrequency
7 output channel?
8 MS. COHEN: Objection. Form.
9 A No.
10 Q Okay. And yet, you don't believe there is
11 a difference between a radiofrequency channel and
12 a radiofrequency output channel; right?
13 MS. COHEN: Objection. Form.
14 A I'm sorry. Where did I write that in my
15 declaration?
16 Q You didn't. You testified to it earlier
17 today.
18 MS. COHEN: Objection. Form.
19 A Okay. Could you -- is it possible to get
20 that read back?
21 Q No. We're not going to do it. You said
22 what you said. So if I misread it, then I misread

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1 it. But I'm pretty sure I didn't. But we'll move
2 on.
3 Let's go to the bottom of page 33. And
4 I'm looking at paragraph 44. So it's the last
5 full sentence of paragraph 44, at the bottom of
6 page 33.
7 Do you see where you wrote, Stern,
8 therefore, explains the advantages associated with
9 figure 15, a multichannel circuit, and clearly
10 shows that the energy is broken down into multiple
11 channels after it is output from the
12 radiofrequency generator, and the -- the sentence
13 goes on.
14 Do you see that?
15 A Yes.
16 Q What do you mean here by the energy is
17 broken down into multiple channels?
18 A Hold on a second. Let me catch up to you
19 here.
20 Okay. So I interpret that meaning that
21 the energy can be shared, right. The energy from
22 the RF generator, which is finite, can be shared

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1 amongst the different electrodes.
2 Q Okay. So, again, when you -- when you say
3 the energy is broken down into multiple channels,
4 what -- what do you mean by that?
5 A Well --
6 Q It might be helpful to have figure 15
7 somewhere. I forgot what page it was on.
8 A Yeah.
9 Q Just to kind of ground us in this
10 conversation.
11 A Yeah. So page 14, right.
12 Q Yep.
13 A So --
14 Q And just for the record, we're -- we are
15 now looking at a figure 15 of Stern that you
16 reproduced on page 14 of your declaration; right?
17 A Correct.
18 Q Okay. Go ahead.
19 A So -- so the switching arrangement of
20 Stern allows the energy from the voltage source to
21 be shared amongst the different electrodes.
22 Q Okay. So when you say the energy is

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1 broken down into multiple channels, what do you
2 mean by that with respect to Stern figure 15?
3 A It's kind of just what I said, right, you
4 can -- you share the energy. So, for instance, if
5 the voltage source can put out let's say 100 watts
6 with the switches, you can apportion that, let's
7 say possibly, you know, some watts on one, or two
8 electrodes. Another set of -- set of apportioned
9 watts on the other two electrodes.
10 Q So where -- where in Stern figure 15 is
11 the energy broken down into multiple channels?
12 A Well, by virtue of the switches, right.
13 It's the switches that allows you to distribute
14 the energy.
15 Q Okay. So in Stern figure 15 you're saying
16 that the energy is broken down into multiple
17 channels at -- at the switches; is that right?
18 A Yes.
19 Q Okay.
20 A Well, so I should -- I should qualify this
21 a little bit, right, because the different
22 electrodes may not have the same impedance; right?

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1 So the tissue itself has a role. The switching
2 arrangement allows you to energize -- let's say,
3 let's just talk about two pairs are being
4 energized; right? The proportion of energy on the
5 one hand's going to be influenced by -- by the
6 impedance of the tissue, and that's also going to
7 play a role in how the -- let's call it power is
8 apportioned.
9 Q Okay. But, I guess, generally speaking,
10 the energy is broken down into multiple channels
11 at the switches in figure 15; right?
12 MS. COHEN: Objection. Form.
13 A I mean, it's really -- it's really the
14 impedance, right, that decides the power
15 distribution. Now, you can do things like, for
16 instance, if you had a sensing system, right, you
17 could sort of open and close the switches to try
18 and maintain, let's say, uniform power deposition
19 at each set of electrodes despite the fact the
20 impedance being different.
21 Q I guess, let me ask this a little bit of a
22 different way. So, again, looking at Stern figure

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15, the energy starts off in a single channel when it's output from the voltage source 228; right?

MS. COHEN: Objection. Form.

A Well, I don't know if I call that -- okay. Or it starts -- so the energy comes from the voltage source, yes.

Q And it starts off in a single channel; correct?

MS. COHEN: Objection. Form.

A I don't know if one would call that a channel, but through those wires, yes.

Q Okay. Well, it starts off in a single channel, and then is broken down into multiple channels. That's what you're saying; right?

MS. COHEN: Objection. Form.

A Well, as I said before, a channel is sort of a logical construct; right? And so, again, I don't know if I'd call it a channel, but, yes, energy comes from the voltage source to the switches.

Q Right. Well, the problem I'm having is, you know, your words in paragraph 44 is that the

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1 energy is broken down into multiple channels after
2 it is output from the radiofrequency generator?
3 A Correct.
4 Q Do you see that?
5 A Yes, yes, that is true.
6 Q So your words imply that it doesn't start
7 off in multiple channels.
8 MS. COHEN: Objection. Form.
9 Q Do you see that? Because it starts off in
10 one channel; right?
11 MS. COHEN: Objection. Form.
12 A Well, it starts -- my declaration says it
13 starts at the RF generator. It makes -- my
14 declaration makes no mention of a single channel.
15 Q Well, it says, The energy is broken down
16 into multiple channels after it is output from the
17 radiofrequency generator.
18 Do you see that?
19 A Correct.
20 Q So -- okay. So after -- before it's
21 output from the radiofrequency generator, it's not
22 broken down into multiple -- into multiple

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1 channels; right?
2 MS. COHEN: Objection. Form.
3 A Correct.
4 Q Okay. Because it starts off in one
5 channel; right?
6 MS. COHEN: Objection. Form.
7 A Well, again, like I said, a channel is a
8 logical construct which I'm not quite sure I would
9 apply in my declaration. I'm not applying that to
10 the voltage source.
11 Q But somebody could though; right?
12 MS. COHEN: Objection. Form.
13 A If they defined channel that way, perhaps.
14 That's not the way I've defined it.
15 Q That's not the way you defined it, but
16 somebody else could define it a different way;
17 right?
18 A A different expert maybe.
19 Q Okay. So really the number of
20 radiofrequency output channels depends on the
21 expert; right?
22 MS. COHEN: Objection. Form.

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1 A Well, it depends on how the device is
2 designed; right?
3 Q Well, you just said different experts
4 could come up with a different number of
5 radiofrequency channels, didn't you?
6 MS. COHEN: Objection. Form.
7 A Depending on how the device is designed or
8 intended to be used.
9 Q All right. But in any case, we were
10 talking -- you were mentioning this concept about
11 the energy being shared amongst the channels;
12 right?
13 A Yes.
14 Q Okay. It's fair to say that the energy
15 from the first channel's shared amongst what
16 you're calling the multiple channels; right? In
17 Stern figure 15?
18 MS. COHEN: Objection. Form.
19 A The energy from the voltage source is
20 shared among the multiple radiofrequency output
21 channels, yes.
22 Q Okay. Let's go flip to page 34 of your

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1 declaration. And let's look at the first full
2 sentence here at the top of the page. This is
3 paragraph 45 of your declaration.
4 Do you see where you wrote, Consistent
5 with the '318 patent's specification and its
6 description of figures 39 and 40, among others, it
7 is my opinion that an output channel connects
8 electrodes and provides the ability to
9 independently control pairs of electrodes.
10 Do you see that?
11 A Yes.
12 Q So in your opinion a radiofrequency output
13 channel connects electrodes and provides the
14 ability to independently control pairs of
15 electrodes; is that right?
16 A That's exact --
17 MS. COHEN: Objection. Form.
18 A Yes. That's exactly what's written in my
19 declaration.
20 Q What do you mean by connects electrodes?
21 A Well, connects to electrodes, I think,
22 might be more accurate.

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1 Q So you believe that an output channel
2 connect to electrodes?
3 A Correct.
4 Q Does the radiofrequency output channel
5 connect electrodes to each other?
6 A No. I said the tissue does that.
7 Q So what does the radiofrequency output
8 channel connect the electrodes to?
9 A Again, I think that might be a -- an
10 error. It connects to electrodes.
11 THE REPORTER: You're saying T-O.
12 A T-O, yes, yes, sorry.
13 Q Oh, okay. So a radiofrequency output
14 channel connects two electrodes to each other?
15 MS. COHEN: Objection. Form.
16 A You have a plus and you have a minus,
17 right, and so those contact two electrodes. In
18 between them is the tissue. I would not consider
19 the tissue to be part of the radiofrequency output
20 channel.
21 Q So does a radiofrequency output channel
22 connect two electrodes to something else?

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1 MS. COHEN: Objection. Form.
2 A Ultimately connects back to the RF
3 generator.
4 Q Okay. So is it fair to say that a
5 radiofrequency output channel connects two
6 electrodes to the radiofrequency output generator?
7 MS. COHEN: Objection. Form.
8 Q Let me restate that. I think I messed
9 that up. Is it fair to say that a radiofrequency
10 output channel connects two electrodes to the
11 radiofrequency generator?
12 MS. COHEN: Objection. Form.
13 A That's one example. Yes.
14 Q Okay. In going back to your declaration
15 here in that sentence we've been talking about,
16 what do you mean by the ability to independently
17 control pairs of electrodes?
18 A Wait, which?
19 Q Sorry. Paragraph 45, first sentence.
20 A Okay. And so I'm sorry. Repeat your
21 question.
22 Q What do you mean by the ability to

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1 independently control pairs of electrodes?
2 A So that simply means energizing one pair
3 at the exclusion of potentially other pairs of
4 electrodes.
5 Q Is it your opinion that a radiofrequency
6 output channel provides the ability to
7 independently control pairs of electrodes?
8 MS. COHEN: Objection. Form.
9 A Yes.
10 Q So going back to paragraph 45 that we've
11 been talking about and now I'm looking at the
12 second sentence.
13 A Mm-hmm.
14 Q Do you see where you wrote, The
15 embodiments in the '318 patent describe exactly
16 what Dr. Bikson opines should be excluded from the
17 scope of the claims. An output wire extending
18 from the voltage source, not shown, which further
19 branches into multiple output channels. Then it
20 goes on.
21 Do you see that?
22 A Yes.

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1 Q Where does the '318 patent describe an
2 output wire branching into multiple channels?
3 MS. COHEN: Objection. Form.
4 A I have to -- do you have a copy of the
5 '318 patent?
6 Q Yeah. Let me grab it for you.
7 All right. So I'm handing you what was
8 previously marked in the '318 patent proceeding as
9 Exhibit 1001, and I'll represent to you this is a
10 copy of the '318 patent. And for your reference
11 the question was, where does the '318 patent
12 describe an output wire branching into multiple
13 channels?
14 A Well, as far as I can tell, the '318
15 patent only shows multiple RF output channels. I
16 don't see a branching structure.
17 Q Right. The '318 patent doesn't show a
18 single output wire branching into multiple wires;
19 right?
20 MS. COHEN: Objection. Form.
21 A Yes.
22 Q Okay. It's possible there could be

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1 multiple output wires coming from the voltage
2 source; right?
3 MS. COHEN: Objection. Form.
4 A We don't know, yes.
5 Q Right.
6 There also could potentially be multiple
7 voltage sources in the '318 patent; right?
8 MS. COHEN: Objection. Form.
9 A Yeah. We don't know, it's not described.
10 Q Right. We don't know one way or the other
11 what's -- what's not shown; right?
12 A Yeah.
13 MS. COHEN: Objection. Form.
14 Q And, for example, you know, you have in
15 your declaration a discussion of several figures
16 in the '318 patent; correct?
17 A Which one are you talking about?
18 Q Well -- well, let's start with figure 39.
19 So if you look at figure 39 of the '318.
20 A Okay.
21 Q You got figure 9 -- figure 39 there?
22 A Correct.

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1 Q Right.
2 So in figure 39 of the '318 patent, this
3 figure doesn't show a single output wire branching
4 into multiple channels; right?
5 A Correct.
6 MS. COHEN: Objection. Form.
7 Q And figure 40 of the '318 patent, again,
8 this figure doesn't show a single output wire
9 branching into multiple channels; right?
10 MS. COHEN: Objection. Form.
11 A Correct.
12 Q Figure 41, same thing, doesn't show a
13 single output wire branching into multiple
14 channels; right?
15 MS. COHEN: Objection. Form.
16 A Correct.
17 Q Figure 42(A) of the '318 patent, again,
18 doesn't show a single output wire branching into
19 multiple channels; right?
20 MS. COHEN: Objection. Form.
21 A Correct.
22 Q Figure 42(B) does not show a single output

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1 wire branching into multiple channels; right?
2 MS. COHEN: Objection. Form.
3 A Correct.
4 Q And figure 43, that doesn't show a single
5 output wire branching into multiple channels;
6 correct?
7 MS. COHEN: Objection. Form.
8 A Correct.
9 Q And figure 44, that also does not show a
10 single output wire branching into multiple
11 channels; correct?
12 MS. COHEN: Objection. Form.
13 A Correct.
14 Q None of those figures we discussed show a
15 single output wire branching into multiple
16 channels; correct?
17 MS. COHEN: Objection. Form.
18 A Correct.
19 Q Now, generally speaking, with figures 39
20 through 44 of the '318 patent, none of those
21 figures show a voltage source; correct?
22 MS. COHEN: Objection. Form.

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1 A Right. Right.
2 As I wrote in my declaration, the '318
3 patent never explains, shows, or limits the
4 beginning of the output channel, how the channel
5 connects to the voltage source in the RF
6 generator.
7 Q Right. None of that is shown in the
8 figures; correct?
9 A Correct.
10 Q So none of the figures 39 through 44 of
11 the '318 patent show a radio- -- radiofrequency
12 generator; right?
13 A Correct.
14 Q None of those figures show how the -- the
15 channels are connected to the radiofrequency
16 generator; right?
17 MS. COHEN: Objection. Form.
18 A Correct.
19 Q None of those figures show how the
20 channels are connected to the voltage source;
21 correct?
22 MS. COHEN: Objection. Form.

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1 A Not from these figures, no.
2 Q Okay. None of those figures, figures 39
3 through 44 of the '318 patent show any switching
4 arrangement; correct?
5 MS. COHEN: Objection. Form.
6 A Correct.
7 Q None of those figures show a transformer
8 arrangement; correct?
9 MS. COHEN: Objection. Form.
10 A Correct.
11 Q None of those figures show any mechanism
12 for independently controlling the electrodes;
13 correct?
14 MS. COHEN: Objection. Form.
15 A Correct. But, you know, figure 45 has
16 what looks like some sort of energy source that it
17 connects to. It's labeled 1010.
18 Q Let's go to page 34 of your declaration.
19 A Yep.
20 Q And I'm looking at the two annotated
21 figures at the bottom of the page there.
22 Do you see those?

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1 A Yes.
2 Q We discussed those figures during your
3 prior deposition; correct?
4 A Yes.
5 Q And I believe you opine in your reply
6 declaration that the figures shown here on page 34
7 have multiple frequency -- multiple radiofrequency
8 output channels; is that right?
9 A Correct.
10 Q Now, does your opinion that those two
11 figures on the bottom of page 34 of your
12 declaration have multiple radiofrequency output
13 channels depend on how the radiofrequency
14 generator is defined in the figure?
15 A Yes.
16 MS. COHEN: Objection. Form.
17 A Yes.
18 Q It does depend on that?
19 A Yes.
20 Q Okay. How does -- I guess, why -- why do
21 you say that? What do you mean by that?
22 A Well, first of all, I mean, this is kind

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1 of a hypothetical construct, right, that was done
2 at the direction of -- of you at the last
3 deposition, but it also shows that the concept of
4 a radiofrequency output channel is a logical
5 construct.
6 Q So if I -- if I understand you correctly
7 and -- in these two figures at the bottom of
8 page 34, if the radiofrequency generator is
9 defined as what's inside the red box, would you
10 agree that there is a single radiofrequency output
11 channel in this figure?
12 MS. COHEN: Objection. Form.
13 A Well, this is a hypothetical construct,
14 right, that bears really little to no relationship
15 to Stern figure 15.
16 Q Okay. I understand that Stern figure 15
17 is different than these figures. I get that. So
18 we're talking about these figures right now, not
19 Stern figure 15.
20 So my question was: If the radiofrequency
21 generator is defined as what's inside the red box,
22 you would agree that this figure at the bottom of

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1 page 34 has one radiofrequency output channel;
2 right?
3 MS. COHEN: Objection. Form.
4 A Yeah. I just want to be clear. For my
5 opinion, I relied on Stern and Stern figure 15. I
6 didn't rely on these hypothetical drawings that
7 were drawn up during the last deposition.
8 Q Well, you put them in your declaration,
9 didn't you?
10 A Yes, because I think it -- it requires
11 clarification.
12 Q Okay. So let's get back to maybe
13 clarifying your opinion.
14 So my question was: If the radiofrequency
15 generator is defined as what's inside the red box
16 in the figure shown in page -- in page 34 of your
17 declaration, in that case you would agree that
18 there is a single radiofrequency output channel in
19 that figure; correct?
20 A In this hypothetical construct that is --
21 it bears no relationship to Stern, but using the
22 same logic that I've provided about a

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1 radiofrequency output construct, yes.
2 Q Okay. In other words, the answer is, yes,
3 you would agree that if the radiofrequency
4 generator is defined as what's inside the red box,
5 in that case there's a single radiofrequency
6 output channel; right?
7 MS. COHEN: Objection. Form.
8 A In this hypothetical example, again, that
9 bears no relationship to Stern, but applying the
10 same definition of an RF output, then yes.
11 Q Okay. And I believe you previously
12 testified if -- that if the radiofrequency
13 output -- strike that. Let me start over.
14 I believe you previously testified during
15 your prior deposition that if the radiofrequency
16 generator is defined as what's inside of the black
17 dotted line, that in that case this figure at the
18 bottom of page 34 of your declaration would have
19 multiple radiofrequency output channels; is that
20 right?
21 MS. COHEN: Objection. Form.
22 A Correct.

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1 Q Okay. Now, just generally speaking about
2 this -- this figure -- these figures here at the
3 bottom of page 34.
4 You would agree that nothing in the
5 figures shown here at the bottom of page 34 allows
6 pairing between chosen electrodes to control a
7 chosen pair of electrodes separately from another
8 chosen pair; right?
9 MS. COHEN: Objection. Form.
10 A Well, what's absurd about this
11 hypothetical example, right, is according to this
12 the device that's in the patient is always
13 connected, right, so... And that's -- that's
14 impossible, right.
15 And so there are always going to be
16 switches in either the left or the right, simply
17 the switch that unplugs the -- the device that's
18 in the patient from whatever we're defining as the
19 RF generator.
20 So there's going to be switches between
21 the two no matter what. The question is where
22 would those switches be.

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1 Q Let's assume there are switches in this.
2 Does the switch location matter in terms of
3 figuring out how many radiofrequency output
4 channels there are?
5 MS. COHEN: Objection. Form.
6 A Yes.
7 Q All right. So let's assume the switches
8 are inside the red box. In that case is there
9 still one radiofrequency output channel?
10 MS. COHEN: Objection. Form.
11 A In that hypothetical construct, yes.
12 Q Um --
13 A Well, actually let me qualify this. So
14 the wiring diagram is exactly the same as -- as
15 whatever, the left or right, right, but now you're
16 just putting a switch on the positive electrode
17 coming out.
18 Q You said there needs to be a switch so
19 that it's not turned on all the time; right?
20 A Correct.
21 Q So let's assume we're defining the
22 radiofrequency generator as what's inside the red

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1 box, but now we're going to put one switch --
2 A Or maybe one positive and one negative;
3 right.
4 Q Sure. So we're putting two switches
5 inside that red box so the thing's not on all the
6 time. In that case is there still one
7 radiofrequency output channel?
8 MS. COHEN: Objection. Form.
9 A In this hypothetical I would say yes.
10 Q Okay. Now, let's keep the same switches
11 like they would be inside the red box, but now
12 we're defining the radiofrequency generator as
13 what's inside the black box.
14 In that case is there one radiofrequency
15 output channel or multiple radiofrequency output
16 channels?
17 A Well, here I get confused, right, because
18 is the RF generator -- are you defining the RF
19 generator as the red box or the black box in that
20 case?
21 Q So we're switching it up a little bit. So
22 the switches are where we said they are before;

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1 right?
2 A Yes.
3 Q But now we're defining the radiofrequency
4 generator as what's inside the black box.
5 A But then you still have the problem of how
6 do you plug it in. So in your construct that
7 radiofrequency generator is always plugged into
8 the patient, right, which can't happen.
9 Q Why do you say it's always plugged into
10 the patient?
11 A Well, you just defined the radiofrequency
12 generator as the black box in this example.
13 Q Correct.
14 A But you got the switches inside the box,
15 which implies the device that's in the patient is
16 always plugged into the RF generator.
17 Q I guess that's where I'm losing you. Why
18 do you say that?
19 A Well, when you unplug the patient from the
20 RF generator, you're creating a switch. So the
21 switch is going to be outside the RF generator no
22 matter what in that case, or at the interface

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1 regardless. At some point you have to unplug the
2 patient; right? You have to plug them in or
3 unplug them from the RF generator. That plug
4 effectively creates a switch, manual or otherwise.
5 It can't be inside the generator. It's got to be
6 outside the generator.
7 Q I guess I'm a little confused. What do
8 you mean by unplug the patient?
9 A So -- so you have electrodes; right?
10 Those electrodes connect to your RF generator.
11 Q Right.
12 A And so that's -- you're going to plug that
13 in somehow. You have to plug that in. That
14 creates a natural switch.
15 Q When you say plug that in, what are you
16 referring to? The device?
17 A So you have -- so -- so in this
18 hypothetical, right, there are, let's say, two
19 different pieces. There's the piece that goes
20 inside the patient and there's the, what we're
21 calling the RF generator, and maybe some stuff in
22 between.

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1 Q With you.
2 A Okay. So at some point in time, you are
3 effectively plugging in the patient to that or
4 not; right? I mean --
5 Q But you plug the device -- you could plug
6 the device into the generator.
7 A Yeah. And that's effectively creating a
8 switch.
9 Q Is that what you're saying by plug the --
10 plug in the patient?
11 A Yes. Right. So that's -- that's the --
12 it's a -- you're effective -- you're affecting a
13 manual switch in that case.
14 Q Right. So I guess if you were to say in
15 this figure on page 34 if -- you know, if we're
16 defining the black box, the black dotted line as
17 the RF generator, you're saying there would be,
18 you know, where the wires are coming out of it, if
19 that would be where you would plug the device
20 into?
21 MS. COHEN: Objection. Form.
22 A Correct. And that effectively creates a

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1 switch.
2 Q Okay. And how -- how is that relevant to
3 determining the number of radiofrequency output
4 channels?
5 A Because it gives you independent control
6 over each of the pairs of electrodes.
7 Q Because the -- what you're saying because
8 the person using the device could manually plug in
9 the different wires?
10 A Yes.
11 Q Okay. Now, again, I understand we're
12 speaking hypothetically, but what -- what if --
13 what if you couldn't do that? In other words, the
14 wires are just going straight through the
15 radiofrequency generator to the -- to the voltage
16 source, but like I said, with two switches on
17 either side of the voltage source so that it's not
18 always running?
19 A Well, you probably wouldn't get FDA
20 approval for your device if that was the case.
21 Q Sure. But hypothetically speaking, if
22 that were the case, would that change the number

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1 of radiofrequency output channels?
2 A Well, the other concept is the patient
3 side; right. Are you contacting, if I have two
4 different pairs of electrodes, right, maybe I can
5 choose to contact one pair and not contact the
6 other.
7 Q Well, let me ask you this. Does the
8 number of radiofrequency output channels depend on
9 whether the device is in contact with the patient?
10 MS. COHEN: Objection. Form.
11 A No. It depends on how it's designed and
12 how it's intended to be used.
13 Q Right. So you don't need to actually put
14 this thing into somebody's nose in order to have
15 radiofrequency output channels; right?
16 A Correct.
17 Q Okay. So going back to my question.
18 If -- you know, if the device was designed as
19 shown here in the figure where the wires coming
20 out go -- you know, in other words, you're not
21 plugging the device into the radiofrequency
22 generator. The wires are just going straight

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1 through to the voltage source.
2 A Mm-hmm.
3 Q In that case would there be multiple
4 radiofrequency output channels?
5 MS. COHEN: Objection. Form.
6 A It depends on how the device is designed,
7 right, and in this construct, let's say on the
8 right-hand side, you're requiring all the
9 electrodes to be electrified at the same time.
10 Q Yes.
11 A Right.
12 Q Correct. In other words, no switching
13 arrangement where you can pick different pairs or
14 whatever.
15 A Mm-hmm. Mm-hmm.
16 Q So with that clarification, does that
17 impact in any way the number of radiofrequency
18 output channels?
19 A So, again, I go back to -- the
20 radiofrequency output channels is a logical
21 construct. So it depends on how you want to
22 define this construct. One thing to note is by

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1 virtue of let's say you have a voltage source
2 here. So all the electrodes will have the same
3 voltage, right, but they're not going to be in the
4 same tissue. So they will have different tissue
5 impedances, probably have different currents,
6 probably have different power depositions as well.
7 I think it depends on how the device is designed,
8 to be honest.
9 Q Okay.
10 A And intended to be used.
11 Q So in your opinion, the number of
12 radiofrequency output channels depends on how the
13 device is designed to be used?
14 A Yes.
15 Q Okay. What do you mean by that?
16 A So, for instance, let's say for the sake
17 of convenience these are two electrodes, but I put
18 them in two completely different places in the
19 body because for whatever reason I want to ablate
20 two different places in the body, but these two
21 places have completely different tissue
22 impedances. You might consider those separate

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1 channels even though they're at the same voltage.
2 Q Okay. So the number of radiofrequency
3 output channels can vary depending on where in the
4 body you're putting the electrodes?
5 MS. COHEN: Objection. Form.
6 A Well, it's based on how the device is
7 designed and intended to be used.
8 Q So if -- if you have a given device that's
9 designed to be used in the nose, that could have a
10 different number of radiofrequency output channels
11 compared to a device that's designed to be used in
12 the uterus, for example?
13 MS. COHEN: Objection. Form.
14 A In either case you could have two devices
15 designed to be used in the nose that could be
16 designed with different number of output channels.
17 Q So I'm going to draw another sample
18 circuit for you and we'll talk about it in a
19 second, so just bear with me while I draw it out.
20 So let's go ahead and mark this as Martin
21 Exhibit 2.
22 (Martin Exhibit 2 was marked for

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1 identification.)
2 Q So this is another sample circuit I've
3 drawn. Can you tell how many radiofrequency
4 output channels are in this figure?
5 A No.
6 Q What else would you need to see or know in
7 order to be able to make that determination?
8 A I would need you to assign polarities to
9 each of the lines and if they can be -- switch
10 polarity in any way.
11 Q Sorry. I didn't catch that last part.
12 A So -- so I can look at this and I can say,
13 okay, you know, you could have, let's say, up to,
14 you know -- one, two, three, four, five -- six
15 channels, right. And so I could say, well, I
16 could have six channels. Now, you could define
17 less, depending on how you further constrain that
18 circuit.
19 Q I guess is it possible that the figure
20 I've drawn for you, Martin Exhibit 2, has only one
21 radiofrequency output channel?
22 MS. COHEN: Objection. Form.

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1 A Not in this configuration, no.
2 Q You're saying that's not possible?
3 A It's -- correct.
4 Q Why do you say that?
5 A Because each of your wires can be
6 independently controlled.
7 Q Well, you're assuming that. I didn't tell
8 you that.
9 A Right. But I'm -- well, I'm assuming this
10 is a schematic diagram, right, and so -- and I'm
11 assuming, you know, whatever, even though this is
12 the capacitor symbol, I know you intend these to
13 be electrodes.
14 Q Mm-hmm.
15 A And so -- and that when it's in use, that
16 there's tissue in between all of these electrodes.
17 Q Okay. So you're making the assumption
18 that those four electrodes are independently
19 controllable?
20 MS. COHEN: Objection. Form.
21 A Well, you've implied that by leaving the
22 ends open. I only -- so I assume they're

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1 independently controllable, unless you somehow
2 further constrain the diagram.
3 Q If we were to assume that those four
4 electrodes were not independently controllable,
5 then how many radiofrequency output channels would
6 there be?
7 MS. COHEN: Objection. Form.
8 A You would have to modify this diagram in
9 order for me to answer that question.
10 Q Okay. Well, let's go back to the question
11 I had asked about what else you would need to know
12 or see in order to determine how many
13 radiofrequency output channels there are.
14 Do you remember I asked you something
15 along those lines?
16 A Yeah.
17 Q And I believe you said one of the things
18 you would need -- need to see is assigned
19 polarities to the lines?
20 A Yes.
21 Q Okay. What -- was there something else
22 that you need to see or know?

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1 A Well, for instance, can you switch
2 polarities. So let's say you make the top two
3 positive, you make the bottom ones negative.
4 Q Anything else you would need to see or
5 know in order to determine how many radiofrequency
6 output channels are in this figure?
7 MS. COHEN: Objection. Form.
8 A Just how it's intended to be operated. So
9 for instance, you might say to me, well, this is
10 in a place in the body where there's no way a
11 current can flow this way or this way, that it
12 only has to flow this way and this way.
13 Q And to just kind of --
14 A Kind of top to bottom, right.
15 Q Right.
16 A So that would also help make the
17 determination. And that gets back to what's the
18 intended use of the device.
19 Q Mm-hmm.
20 A That will help us determine, without any
21 other information, how many radiofrequency output
22 channels are capable in that device.

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1 Q Sure.
2 So if I understand you correctly, the
3 number of radiofrequency output channels that are
4 in this figure that we've labeled Martin Exhibit 2
5 could -- could vary depending on where this device
6 is intended to be used in the body?
7 MS. COHEN: Objection. Form.
8 A How it's designed, yes, and where it's
9 intended to be used.
10 Q Okay. And it's very -- if I understand
11 you correctly, you're saying that the number of
12 radiofrequency output channels that are in this
13 device could vary depending on what tissue is
14 located between the electrodes; correct?
15 MS. COHEN: Objection. Form.
16 A Well, I would say more how -- how was it
17 intended to be used.
18 Q Well, I believe you said something along
19 the lines of if there was a -- a tissue between
20 the leftmost electrodes and the rightmost
21 electrodes that -- that had a high enough
22 impedance, that it's going to block current from

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1 flowing from left to right, that that could impact
2 the number of channels; correct?
3 A Assuming that that's how it's intended to
4 be used.
5 Q Okay. Would you need to know if there's a
6 radiofrequency generator that's connected to those
7 lines in order to determine how many
8 radiofrequency output channels there are?
9 MS. COHEN: Objection. Form.
10 A We would need to know, again, how it's
11 intended to be used. I'm assuming -- I'm assuming
12 the intention, at least at this point, there were
13 some radiofrequency generator and what's missing
14 is exactly how it's connected, right.
15 Q Right. You can't have a radiofrequency
16 output channel without radiofrequency; right?
17 A Right. What you're drawing here is no
18 different than what the 40, 39 -- Stern 39, 40,
19 41, right, similar to that.
20 Q I understand.
21 A And same -- same applies to this, as well,
22 right. I mean, the difference being, right, 39,

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1 40, it's annotated. It's assigned positive, it's
2 assigned negative, and we'd know that these can be
3 individually controlled.
4 Q And how do you know that?
5 And just to be clear, you're pointing to
6 your annotated version of figure 39 of the
7 '318 patent?
8 A 39 -- yes.
9 Q And how do you know that what you've shown
10 in orange in that annotated figure that -- that
11 that can be individually controlled?
12 A Well, if it wasn't the case, a proper
13 schematic diagram would connect, right, the end of
14 these wires to a single point, and that's not the
15 case.
16 MR. GILFORD: I'm at a good stopping point
17 for the next break. So let's go off the record.
18 (A discussion was held off the record.)
19 (A lunch recess was taken.)
20 BY MR. GILFORD:
21 Q So, Dr. Martin, would you mind flipping to
22 page 40 of your '318 patent declaration. And I'm

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1 looking at paragraph 49. I'm looking at the last
2 sentence of the paragraph there.
3 Do you see it says, In the annotated
4 images below I identify one of the two or more
5 output channels present in each image, and then it
6 goes on.
7 Do you see that?
8 A Page 40.
9 Q So paragraph 49. And it looks like it
10 goes on to the next page.
11 A Okay.
12 Q Do you see that?
13 A Yes.
14 Q So let's go ahead and look at the next
15 page. This is page 41. And I'm looking in the
16 top right corner there. It looks like it's an
17 annotated version of Stern's figure 15.
18 Do you see that?
19 A Yes.
20 Q And this annotated figure shows only a
21 very small portion of figure 15; right?
22 A Correct.

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1 Q And I believe you stated that this image
2 depicts one of the output channels in Stern
3 figure 15; is that correct?
4 I'll help you out. So if you go to
5 page 42, first sentence.
6 Do you see where you cite, Consistent with
7 Dr. Bikson's testimony, figure 15 of Stern
8 discloses multiple radiofrequency output channels
9 which would include the one shown above supplying
10 energy to electrodes 224 and 226.
11 Do you see that?
12 A Yes.
13 Q So going back to page 41.
14 Is it fair to say that what you're
15 annotating here with the orange and purple is --
16 is what you're calling one of the output channels
17 of Stern figure 15?
18 A Yes. Yes. And I say in the disclosure,
19 Figure 15 of Stern discloses the multiple
20 radiofrequency output channels, which would
21 include the one shown above, supplying energy to
22 electrodes 224 and 226. Yes.

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1 Q Okay. So, yeah. Just to, again, clarify
2 the record.
3 On page 41, in the upper right corner, in
4 your annotated figure -- annotated version of
5 figure 15, what you're showing here with the
6 orange and purple is what you believe to be one of
7 Stern's output channels; is that right?
8 A Correct. It's one of their radiofrequency
9 output channels.
10 Q And what you're calling the output channel
11 is the two wires highlighted in orange; is that
12 right?
13 A It would include the two wires, yes, in
14 orange.
15 Q So is it your opinion that a
16 radiofrequency output channel is the wires
17 connected to an electrode pair?
18 A Well, as I've said before, a
19 radiofrequency output channel is -- is a logical
20 construct, right, which when implemented
21 physically includes a number of things, one of
22 which is the conductive wire, like you mentioned.

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1 If you were to actually design something that --
2 that actuates the radiofrequency output channel,
3 you would include other things like insulation,
4 for instance, around the wire and so forth, not
5 necessarily depicted in this particular drawing.
6 Q So other than the wires connected to the
7 electrode pair, what else must be present to have
8 a radiofrequency output channel?
9 A Well, I think more than wires what we
10 talked about is electrical conduction; right? You
11 have to individually be able to energize the
12 electrodes, and that's pretty much it.
13 Q Would a person of ordinary skill in the
14 art be able to tell how many radiofrequency output
15 channels are in Stern's figure 15 just by looking
16 at the figure shown in the top right of page 41 of
17 your declaration?
18 MS. COHEN: Objection. Form.
19 A I think they would be able to see there
20 are multiple radiofrequency output channels. I
21 don't know if they could determine the exact
22 number.

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1 Q And why do you say that a POSITA could be
2 able to tell that there are multiple
3 radiofrequency output channels just by looking at
4 the annotated figure you have in the top right of
5 page 41?
6 A Well, this annotated figure in the top of
7 41 is similar to your drawing here, right, and
8 so --
9 Q And you're pointing to Martin Exhibit 2;
10 is that right?
11 A Yes. Yes. I mean, it bears similarity.
12 Q Sure.
13 A And so the question is, are you asking me
14 about this figure, or you're asking me about Stern
15 overall?
16 Q I'm asking you just about what's shown in
17 the top right of page 41. If you put that in
18 front of a person of ordinary skill in the art and
19 they had no -- they had no other information, they
20 didn't have the actual figure in front of them --
21 A Right.
22 Q -- would they be able to tell just from

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1 what you have here on this page how many
2 radiofrequency output channels there are?
3 MS. COHEN: Objection. Form.
4 A I think the best they could say is that
5 there are multiple radiofrequency output channels.
6 Q And how would a person of ordinary skill
7 in the art, just by looking at the figure you have
8 in the top right at page 41, know just from that
9 figure that there are multiple radiofrequency
10 output channels?
11 A Similar to what we discussed before about
12 Exhibit 2, each of these wires in this figure --
13 in this figure in the upper right-hand corner of
14 page 41 is -- it basically has, if you will, it
15 doesn't have a termination, right, which means
16 that something could be connected to that, an
17 energy source could be connected to each of them
18 individually. And so, therefore, they could form
19 multiple radiofrequency output channels.
20 Q And a POSITA would know just from looking
21 at this figure you have on the top, right, at page
22 41 that an energy source could be connected to

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1 each of those electrodes individually?
2 A Yes.
3 MS. COHEN: Objection. Form.
4 Q How would a POSITA know that just by
5 looking at that figure?
6 A Well, the implication is that there's a
7 conductor; right. There's an electrode. The
8 electrode to operate there has to be a conductor.
9 That conductor doesn't -- in drawing, it doesn't
10 have any termination, so you could plug in an
11 energy source and energize that conductor.
12 Q Well, let's go back to page 34, your
13 declaration. I'm looking at those figures you
14 have on page 34.
15 Do you see those?
16 A Yes.
17 Q Now, again, we're -- I'm flipping between
18 page 41 and page 34. How would a POSITA know just
19 from looking at what's shown in the top right,
20 page 41, that the rest of the circuit doesn't look
21 something like what's shown on page 34?
22 MS. COHEN: Objection. Form.

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1 A I'm sorry. I don't -- I don't understand
2 the question.
3 Q Well, I believe you agreed earlier that in
4 the annotated figure in page 34 that even though
5 there's four electrodes and four wires coming from
6 those electrodes that if you define the
7 radiofrequency generator as what's shown in the
8 red box, that in that case it's a single-channel
9 circuit.
10 Do you remember saying something along
11 those lines?
12 MS. COHEN: Objection. Form.
13 A Something like that. Okay.
14 Q And you know, you would agree that, if we
15 go back to page 41, you know, what you have in the
16 top right shows four electrodes and four wires
17 coming from those electrodes; right?
18 A Yes.
19 Q You can't see anything else there; right?
20 A Yes, and I'll further make the assumption
21 that two wires that cross are not connected,
22 right --

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1 Q Sure.
2 A -- which I think is what's also implied in
3 Stern where this originates from.
4 Q Sure. But, again, you -- looking at the
5 figure in the top right at page 41, you can't see
6 any other -- you can't see any switches; right?
7 A Correct.
8 Q Can't see the radiofrequency generator;
9 correct?
10 A Correct.
11 Q Can't see the voltage source; right?
12 MS. COHEN: Objection. Form.
13 A Correct.
14 Q All you see there is four electrodes and
15 four wires; right?
16 A Yes.
17 Q And yet you believe that just from seeing
18 four electrodes and four wires, you can
19 determine -- or a person of ordinary skill in the
20 art would be able to determine that there's
21 multiple radiofrequency output channels.
22 Is that your testimony today?

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1 MS. COHEN: Objection. Form.
2 A Yes. Correct.
3 Q Thank you for clarifying. So let's go to
4 page 44 of your declaration. I'm looking at the
5 annotations at the top of the page there. These
6 are two annotated figures that you created;
7 correct?
8 A Correct.
9 Q They're annotated versions of Stern's
10 figure 15; right?
11 A Correct.
12 Q Is it your opinion that Stern addresses
13 the problem of uneven heating?
14 MS. COHEN: Objection. Form.
15 A I believe he does refer to it.
16 Q Right. I believe you say in paragraph 44
17 of your declaration that Stern does address the
18 problem of uneven heating; isn't that correct?
19 A Let me just double-check. I think so.
20 Hang on. Yes.
21 Q Okay. So, yes, Stern -- in your opinion,
22 Stern does address the problem of uneven heating;

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1 is that correct?
2 MS. COHEN: Objection. Form.
3 A Correct.
4 Q And isn't it your opinion that Stern
5 offers the circuitry of figure 15 as a solution to
6 the problem of uneven heating?
7 MS. COHEN: Objection. Form.
8 A 15 and 5, but yes.
9 Q Okay. So the answer is, yes, you believe
10 that Stern offers the circuitry of figure 15 as a
11 solution to the problem of uneven heating?
12 MS. COHEN: Objection. Form.
13 A Yes.
14 Q And Stern's figure 15 would address uneven
15 heating if the electrodes in the figure are paired
16 sequentially; right?
17 MS. COHEN: Objection. Form.
18 A Not necessarily.
19 Q Okay. But pairing the electrodes in
20 Stern's figure 15 sequentially would be one way to
21 address the problem of uneven heating; isn't that
22 correct?

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1 A Not necessarily. It could exacerbate it.
2 Q Well, wouldn't pairing -- wouldn't
3 creating multiple pairs at the same time also
4 exacerbate the problem of uneven heating?
5 A Well, it depends on, right, the precise
6 control.
7 Q So the answer is, yes, creating multiple
8 pairs at the same time in Stern's figure 15 could
9 have exacerbated the problem of uneven heating;
10 correct?
11 MS. COHEN: Objection. Form.
12 A Well, I think addressing -- you can't
13 address uneven heating unless you have some sort
14 of selective control of the different bipolar
15 electric pairs. Without knowing the device
16 design, without knowing the tissue, its electrical
17 thermal properties, you don't know in advance
18 exactly how long the switches need to be on and
19 for what duration to achieve that uniform heating.
20 Q So my question was a little bit different.
21 Isn't it true that activating multiple pairs at
22 the same time in Stern's figure 15 could

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1 exacerbate the problem of uneven heating?
2 MS. COHEN: Objection. Form.
3 A I would say we don't know.
4 Q You don't know. What would you need to
5 know in order to be able to make that
6 determination?
7 A Well, like I said, I mean, heating, let's
8 call it temperature, right, just for the sake of
9 clarity. So let's say achieving a uniform or a
10 controllable temperature is going to depend on
11 knowing what the tissue electrical properties are,
12 the thermal properties, as well as the geometry.
13 Now, this can be overcome in Stern, and it
14 is a little bit addressed. If you look at Stern's
15 figure 5, right, which includes feedback control
16 coupled to figure 15, it would address that. So
17 you would need additional information to ensure
18 uniform heating.
19 Q Okay. Let's go ahead and put the '318
20 declaration to the side. We're going to flip to
21 the '271 declaration.
22 There you go.

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1 So I'll represent to you that this is the
2 declaration -- your reply declaration that you
3 submitted in the '271 patent proceeding.
4 You've seen this document before; right?
5 A Yes.
6 Q So go ahead and flip to page 3. I'm
7 looking at paragraph 7, the last sentence of the
8 paragraph.
9 Do you see where you wrote, My review of
10 those documents confirms my opinion that claims 1,
11 4, and 8 through 10 of the '271 patent would have
12 been obvious.
13 Do you see that?
14 A Yes.
15 Q But in your original declaration, you did
16 not opine that claims 1, 4, and 8 through 10 of
17 the '271 patent are obvious, did you?
18 MS. COHEN: Objection. Form.
19 A No, I don't -- do you have a copy of the
20 original declaration?
21 Q Yeah. Let me grab it for you.
22 MS. COHEN: We also have a copy, too.

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1 A Are you okay with that?
2 MR. GILFORD: Assuming, you know, counsel,
3 you have --
4 MS. COHEN: I'll represent for the record
5 that it is a clean copy of the original
6 declaration.
7 MR. GILFORD: Okay. Perfect.
8 Q So what we're looking at is, I'm assuming,
9 what was previously marked as Exhibit 1004 in the
10 '271 patent proceeding; is that right?
11 A Yes. It's annotated at the bottom 1004.
12 Q Okay. Perfect.
13 So, continue.
14 For reference the question was: In your
15 original declaration, you did not opine that
16 claims 1, 4, and 8 through 10 of the '271 patent
17 are obvious, did you?
18 A Let's see.
19 Q Let me see if I can help you out here and
20 kind of to speed things along.
21 A Okay.
22 Q So in your original declaration with

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1 respect to claim 1, you provided opinions on
2 limitation 1(A); correct?
3 A Yes. Correct. Yes.
4 Q You did not provide opinions on any other
5 limitations of claim 1 of the '271 patent in your
6 original declaration; right?
7 A Correct.
8 Q And you can't conclude that a claim is
9 obvious just by looking at one limitation of the
10 claim; right?
11 MS. COHEN: Objection. Form.
12 A Yes.
13 Q And in order for you to make a conclusion
14 that a claim is obvious, you have to look at all
15 the limitations of the claim; correct?
16 A That is my understanding.
17 Q But you didn't do that in your original
18 declaration, did you?
19 A Correct.
20 MS. COHEN: Objection. Form.
21 A Correct.
22 Q And you also didn't look at all the

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1 limitations of claim 1 in your reply declaration
2 either, did you?
3 MS. COHEN: Objection. Form.
4 A Let me see here.
5 Correct.
6 Q And it's fair to say that in your original
7 declaration you did not opine that claim 1 of the
8 '271 patent is obvious; correct?
9 A I think I only address claim 1 limitation,
10 what's called limitation 1(A).
11 Q Right.
12 So in your original declaration, you were
13 opining only on that limitation but not on the
14 overall obviousness of claim 1; is that right?
15 MS. COHEN: Objection. Form.
16 A I believe that's correct.
17 Q And it's fair to say that you're not
18 opining that claim 1 of the '271 patent is obvious
19 in your reply declaration either, are you?
20 MS. COHEN: Objection. Form.
21 A That's correct.
22 Q Are you aware that claims 4 and 8 through

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1 10 depend from claim 1 of the '271 patent?
2 A Yes.
3 Q Are you aware that a dependent claim is
4 not obvious if the claim it depends from is not
5 obvious?
6 MS. COHEN: Objection. Form.
7 A Now, wait. So you're saying -- I'm sorry.
8 Can you repeat that statement again?
9 Q Yep.
10 Are you aware that a dependent claim, such
11 as claims 4 and 8 through 10, are not obvious if
12 the claim they depend from, so claim 1, is not
13 itself obvious?
14 A Yes. Yes.
15 Q Okay. So it's fair to say that in your
16 original declaration you did not opine that
17 claims 4 and 8 through 10 of the '271 patent are
18 obvious; correct?
19 MS. COHEN: Objection. Form.
20 A Certainly for claim 4 it's not mentioned.
21 Claim 8, 9, and 10 are in my original declaration.
22 Q Right. I understand you talk about those

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1 claims, but you cannot be opining that those
2 claims are obvious in your original declaration
3 because you didn't opine that claim 1 is obvious;
4 correct?
5 MS. COHEN: Objection. Form.
6 A Hold on. Let me see.
7 I don't recall off the top of my head.
8 Okay. I'm sorry.
9 Now, what's the question?
10 Q The question was: You cannot -- you could
11 not have opined in your original declaration that
12 claims 4 and 8 through 10 of the '271 patent are
13 obvious because you did not opine in your original
14 declaration that claim 1 is obvious. Isn't that
15 right?
16 MS. COHEN: Objection. Form.
17 A Okay. Wait. I'm sorry. Say it one more
18 time.
19 Q The question was you cannot -- you could
20 not have opined in your original declaration that
21 claims 4 and 8 through 10 of the '271 patent are
22 obvious because you did not opine in your original

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1 declaration that claim 1 of the '271 patent is
2 obvious. Isn't that correct?
3 MS. COHEN: Objection. Form.
4 A Yes. But if the original limitation -- if
5 the limitations of the dependent claim are
6 obvious, that can render the dependent claim
7 invalid.
8 Q My understanding is a little different
9 than yours.
10 A Okay.
11 Q So again --
12 A I'm not a lawyer, so I will...
13 Q So, my -- I'll give you my understanding.
14 You can let me know one way or the other whether
15 it's your understanding as well.
16 But my understanding is that if an
17 independent claim, so in this case claim 1, is not
18 obvious, so valid --
19 A Yeah.
20 Q -- then the claims that depend from it, in
21 this case 4 and 8 through 10, then those also have
22 to be valid as well.

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1 In other words, if the independent claim
2 is valid, the dependent claims must also be valid.
3 Is that your understanding?
4 A Well, each dependent claim introduces a
5 limitation, right, on the independent claim. If
6 that limitation is found to be invalid by prior
7 art, the dependent claim is invalid; right?
8 Q Is that your understanding?
9 And, again, we --
10 A I'm not a lawyer, right, and so --
11 Q Right. I'm asking -- I understand. I'm
12 just asking for your understanding.
13 MS. COHEN: Objection. Form.
14 Q Is that the answer to my question, that
15 is -- was your understanding that if -- if you
16 believe the limitations of the dependent claim are
17 obvious, that the dependent claims are obvious
18 even if the independent claim they depend from is
19 not obvious and valid?
20 MS. COHEN: Objection. Form.
21 A Correct. Yes.
22 And correct me if I'm wrong. Again, I'm

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1 not a lawyer.
2 Q I have a different understanding than you.
3 But, again, I'm just asking for your
4 understanding, so...
5 Okay. So in -- let's -- let's move on.
6 In your reply declaration for the
7 '271 patent you discuss the term -- the term row;
8 correct?
9 A Okay. I'm sorry. Where are you?
10 Q Just generally speaking, but...
11 A The term -- oh, row.
12 Q R-O-W.
13 A Okay.
14 Q A row is a straight line; right?
15 MS. COHEN: Objection. Form.
16 A I don't know if I agree with that.
17 Q Well, are -- objects arranged in a curve
18 or an arc, could those be in a row?
19 A They could be.
20 MS. COHEN: Objection.
21 Q And in your opinion, what -- what would --
22 what would make objects arranged in a curve or an

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1 arc -- what would make them a row, I guess?
2 A So, I mean, if you had a row of trees,
3 right, if -- if some of the trees were out of
4 alignment or if it sort of went, bent a little
5 bit, you wouldn't say it wasn't a row of trees
6 because it wasn't perfectly straight.
7 Q Would you say a row is generally a
8 straight line?
9 A I would say it follows -- well, it follows
10 some sort of line. I don't think it has to be
11 straight.
12 Q What do you mean by that?
13 A So it could be like -- like a curve,
14 right. A row of trees around a curve.
15 Q That's your opinion?
16 A Yes.
17 Q Okay. At what point does a curve or an
18 arc no longer become a row?
19 MS. COHEN: Objection. Form.
20 A Well, I don't know every instance, right,
21 but for instance, if the row of trees came back on
22 itself, right, that would be a circle of trees.

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1 Q So you agree that a circle is not a row?
2 MS. COHEN: Objection. Form.
3 A Yes.
4 Q Okay. I'm going to go ahead and make
5 another hand-drawn diagram here so, again, bear
6 with me. We'll make this Martin Exhibit 3.
7 (Martin Exhibit 3 was marked for
8 identification.)
9 Q So what I've given you is, more or less,
10 five different options; right? So each -- each
11 option, so to speak, has four squares, or they're
12 not perfect squares, but that's what I was going
13 for. So four squares in each option and obviously
14 they have different amounts of --
15 A Sure.
16 Q -- curvature, so to speak.
17 Do you see that?
18 A Sure. Yeah.
19 Q So, I guess, let's just go in order from 1
20 to 5, and just, you know, tell me -- we'll go in
21 order, and just tell me for each option whether
22 you think those four squares are in a row or not.

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1 So let's start with 1.
2 Would you say those four squares are in a
3 row?
4 A Yes.
5 Q Why do you say that?
6 A Well, I think they sort of, you know,
7 generally kind of line up a bit.
8 Q You think those four squares are in a row
9 because they generally line up a bit.
10 Is that what you're saying?
11 A Yeah.
12 Q Okay. Let's go to option 2.
13 Are those four squares in a row?
14 A Yeah.
15 Q Why do you say that?
16 A Again, they still generally line up
17 together.
18 Q Any other reason why you think those four
19 squares in option 2 are in a row?
20 MS. COHEN: Objection. Form.
21 A I mean, they're -- no. I think that's
22 about it.

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1 Q Okay. Let's go to option 3. Are those
2 four squares in option 3 in a row?
3 MS. COHEN: Objection. Form.
4 A Yeah. I would say they're probably still
5 in a row.
6 Q Why do you say that?
7 A Like I say, because they're still
8 generally lined up.
9 Q They're not lined up in a straight line;
10 right?
11 A Let me borrow a pen.
12 Q Do you want a blue one or just something a
13 different color?
14 A I mean, you know, I can draw a line -- one
15 way to think about it, I can draw a line that hits
16 all the shapes; right.
17 Q And just for the record, you've drawn a
18 straight blue line on what I've labeled as option
19 3; is that correct?
20 A Correct.
21 Q Okay. Sorry. Continue.
22 A And then continuing with this logic, you

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1 know, like, so -- so the concept of a row, could
2 things line up, you know, it's sort of relative to
3 their size, I would think, you know. And, again,
4 this is -- you know, just kind of taking words at
5 their plain and ordinary meaning. So if you look
6 at 4, you know, I can kind of -- I can define a
7 line that hits all the shapes in 4.
8 Q And just again for the record, you've
9 drawn another straight blue line in what I've
10 labeled as option 4; is that right?
11 A Correct.
12 Q All right. Continue.
13 A And then here, well, you know, you're not
14 going to hit that one, right, but you might be
15 able to argue, okay, well, those are kind of in a
16 row.
17 Q And just describe for the record what you
18 just did there.
19 A Example, on example 5 I drew a blue line
20 through the three leftmost shapes, and this line
21 does not connect -- the straight line does not
22 connect with the red-most shape.

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1 Q Okay. So let's go back to -- you were
2 talking about option 3. So I believe you said
3 that you believe the four squares in option 3 are
4 in a row; is that right?
5 A Yes.
6 Q And, again, why do you believe those four
7 squares in option 3 are in a row?
8 A Well, I mean, you know, one -- this is not
9 the only way to look at it, right, but one way to
10 look at it is, you know, of the size of the object
11 sort of relative to its skew, you could sort of
12 say, well, you know, if I can sort of draw a
13 straight line -- and there may be other
14 definitions of row but --
15 Q Well, which one did you apply when you
16 were drafting your opinions?
17 A You know, I did not -- I did not adopt a
18 strict definition of what a row is, but I think
19 this -- what I have drawn here generally captures
20 the concept.
21 Q And -- and what you drew there is a
22 straight line that passes through the four

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1 squares; right?
2 A Yes.
3 Q Okay. So in your opinion, if you can draw
4 a line that passes through a -- let me say that --
5 start that over.
6 Is it your opinion that if you can draw a
7 straight line that passes through the series of
8 objects, then those objects are in a row?
9 MS. COHEN: Objection.
10 A Or pass through or contacts, but yes.
11 Q And to be clear, let's start with your --
12 the option 3 example there. The straight line you
13 drew does not pass through each square at the same
14 point; right?
15 MS. COHEN: Objection. Form.
16 A Correct. That would only happen probably
17 with example 1.
18 Q Right. So at least in option 3, it looks
19 like, you know, some squares the straight line you
20 drew passes through the bottom left corner, and in
21 some squares the straight line you drew is passing
22 through the right top corner; is that correct?

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1 A That's about right, yeah.
2 Q Okay. But, again, your opinion of row, of
3 what that term means is if you can draw a straight
4 line through a series of objects or contacting
5 each of those series of objects, then that series
6 of objects is in a row; is that right?
7 A Yeah. I mean, there may be -- again,
8 there may be other ways to define row, but this is
9 something that I would just say intuitively makes
10 sense to me.
11 Q Okay. And, again, looking at option 4, do
12 you believe those four squares in option 4 are in
13 a row?
14 A Yes.
15 Q And why do you say that?
16 A Same thing as 3, right, and you can kind
17 of draw a line, and this line will contact each of
18 the shapes.
19 Q Okay. And you believe because the
20 straight line you drew contacts each of the
21 shapes, each of those four shapes, then those four
22 shapes are in a row; is that right?

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1 A Yes.
2 Q Okay. And at least to you, it doesn't
3 matter that the line you drew is contacting the
4 shapes in different locations; right?
5 A Correct.
6 Q Okay. Now let's go to option 5. Are
7 those five boxes in option 5 -- or, sorry. Are
8 the four squares in option 5, are those four
9 squares in a row?
10 A Well, as I've drawn -- applied the same
11 sort of construct, three of them are in a row and
12 then one is not in this row.
13 Q Okay. So you believe all four squares
14 together are not in a row; correct?
15 A Correct.
16 Q But in option 5 -- option 5 you believe
17 three of the four squares are in a row?
18 A Right. And then you could also argue
19 that, okay, well, these two are in a row.
20 Q Sure. But all four squares together, at
21 least to you, are not in a row; correct?
22 A Correct.

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1 Q And the reason you believe that all four
2 squares together in option 5 are not in a row is
3 because you can't draw a line, a single straight
4 line that connects all four of them; is that
5 right?
6 A Correct.
7 Q Okay. So, again -- I think I asked you
8 this earlier, but it's your opinion that objects
9 arranged in a curve or an arc can be arranged in a
10 row; is that right?
11 A Yes.
12 Q Okay. So it sounds like the extent of
13 when the objects no longer are in a row, it
14 depends on whether you can draw a single straight
15 line that connects all of them and that line, you
16 know, contacts each shape at some point; is that
17 right?
18 MS. COHEN: Objection. Form.
19 A Yes.
20 Q Okay. Let's go ahead and flip to page 31
21 of your '271 declaration.
22 Let me know when you're there.

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1 A I'm there.
2 Q All right. So is this an annotated figure
3 you created?
4 A Yes.
5 Q This annotated figure did not appear in
6 your original declaration; correct?
7 A I don't believe so.
8 Q Okay. And just so the record is clear, if
9 you flip to page 30.
10 A Yes.
11 Q The figure you have on page 30, that
12 annotated figure, is that something you created?
13 A Yes.
14 Q And that annotated figure you have on
15 page 30 of your reply declaration, that -- that
16 was not in your original declaration; correct?
17 A Yeah. I don't think so.
18 Q Okay. That's something you created just
19 for your reply declaration; correct?
20 MS. COHEN: Objection to form.
21 A Correct.
22 Q And likewise, the figure -- annotated

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1 figure you have on page 31, that's, again,
2 something you created just for your reply
3 declaration; right?
4 MS. COHEN: Objection. Form.
5 A Correct.
6 Q All right. Let's talk a little bit about
7 the figure on page 31.
8 So I want to make sure I'm understanding
9 your annotations correctly.
10 So in this annotated figure, one pair of
11 electrodes is highlighted in orange; is that
12 right?
13 A Correct.
14 Q You labeled that pair the first pair it
15 looks like; is that right?
16 A Correct.
17 Q And you have another pair of electrodes
18 highlighted in blue; correct?
19 A Correct.
20 Q And you highlighted that the second pair?
21 A Yes.
22 Q So according to your annotations, the

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electrodes highlighted in orange are not paired with the electrodes highlighted in blue; correct?

A Well, I don't know if I state that in my opinion.

Q Well, you didn't indicate with your annotations that a blue electrode's paired with an orange electrode, did you?

A I don't know if I said they couldn't be paired.

Q Well, I'm asking you about what you put in your annotation.

MS. COHEN: Objection. Form.

Q In your annotation, the orange electrodes are paired and the blue electrodes are paired; right?

A In the annotation, yes. It doesn't mean that they couldn't be compared.

Q Okay. Well, I'm talking about your annotation.

So, again, the question was: In your annotation, the orange electrodes are paired and the blue electrodes are paired; right?

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1 MS. COHEN: Objection. Form.
2 A Correct.
3 Q And in your annotations, the blue and the
4 orange are not paired together; right?
5 A In this example, correct.
6 Q Okay. So looking at what you labeled as
7 row 1, you would agree that what you've labeled as
8 row 1 shows a straight line going from an orange
9 electrode to a blue electrode; right?
10 A Yes.
11 Q And what you've labeled as row 2 shows a
12 straight line going from an orange electrode to a
13 blue electrode; right?
14 A Correct.
15 Q So it's fair to say in the -- your
16 annotated version of Stern figure 19, which you've
17 reproduced on page 31 of your '271 declaration,
18 that -- that what you're depicting is two rows of
19 electrodes; right?
20 A Let's see. What did I call it?
21 Yeah. Figure 19 discloses at least two
22 arrangements of electrode pairs that would satisfy

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1 the requirement that there be more than one pair
2 in each row.
3 Q Well, what you have as row 1 is -- is a
4 row of an orange electrode and a -- let me strike
5 that.
6 So what you have in row 1 is an orange
7 electrode and a blue electrode; correct?
8 A Correct.
9 Q And you agreed with me that in your
10 annotations you're not saying the blue and the
11 orange electrodes are paired; right?
12 A They could be paired.
13 Q Yeah. But that's not what you showed in
14 your annotations. Is it?
15 MS. COHEN: Objection to form.
16 A Okay. I'm sorry. What's the question
17 again?
18 Q What you showed in your annotated version
19 of Stern figure 19, the top of page 31 of your
20 '271 patent reply declaration, is two rows of
21 electrodes. Isn't that true?
22 A Yes.

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1 Q Okay. And the claim requires two rows of
2 bipolar electrode pairs. Isn't that right?
3 MS. COHEN: Objection. Form.
4 A Well, that claim is satisfied by
5 figure 19 -- I'm sorry -- on the -- on
6 paragraph 39.
7 Q Okay. Let me ask you something: Is two
8 rows of electrodes different than two rows of
9 bipolar electrode pairs?
10 A Two rows of electrodes --
11 Q Versus two rows of bipolar electrode
12 pairs.
13 A What's the difference?
14 Q Yeah. Is there a difference in your mind?
15 MS. COHEN: Objection. Form.
16 A Okay. So figure 19, right.
17 Q I'm asking, generally speaking, is there a
18 difference between those two things I've just
19 said.
20 MS. COHEN: Objection. Form.
21 A Well, figure 19 has two rows of bipolar
22 electrode pairs.

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1 Q Can you answer my question, please?
2 A Okay. What's your question again?
3 Q Sure.
4 The question was: Is two rows of
5 electrodes different than two rows of bipolar
6 electrode pairs?
7 A Yes.
8 Q What's the difference?
9 A By being bipolar, right, we know they're
10 going to have different polarities.
11 Q And how is that different than two rows of
12 electrodes?
13 A Well, it's a little less specific, right,
14 to have two rows of electrodes.
15 Q So two rows of electrodes is broader than
16 two rows of bipolar electrode pairs?
17 MS. COHEN: Objection. Form.
18 A Yes.
19 Q Okay. You had mentioned something before.
20 You said, By being bipolar, we know they're going
21 to have different polarities.
22 Do you recall saying that a second ago?

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1 A Yeah.
2 Q What -- what did you mean by that?
3 A Well, the -- the definition of bipolar
4 electrodes, right, that within two bipolar
5 electrodes they have different polarity current
6 flows between them.
7 Q Okay. So you -- it's fair to say -- is it
8 fair to say a bipolar electrode pair is two
9 electrodes with different polarities such that
10 current can flow between them?
11 A Yes.
12 Q Okay. And -- and when you say different
13 polarities, what do you mean by that? Like a
14 positive and a minus?
15 A Yes. That's one way to think of it, yes.
16 Q Okay. So two electrodes with the same
17 polarity would not be a bipolar electrode pair;
18 right?
19 A If -- well, if they're transiently at the
20 same voltage or if they're designed to be at the
21 same voltage.
22 Q If two electrodes, in this given

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1 instance -- well, let me see if I can kind of help
2 out.
3 So do you mind if I look through those
4 exhibits we've been drawing. Okay. This -- I
5 think this will work.
6 So -- so this is Martin Exhibit 1 that
7 we've been talking about, and I'm looking at the
8 two electrodes -- the two bottom-most electrodes
9 of what I've drawn here, and you see that there's
10 like a minus that I kind of used to indicate their
11 polarity.
12 Do you see that?
13 A Yeah, yeah, yeah.
14 Q So would those two electrodes be a pair --
15 A If you --
16 MS. COHEN: Objection. Form.
17 Q -- together?
18 A If you're constraining them both to be
19 negative at the same time.
20 Q Then they would not be a pair; right?
21 A Then I would say no, right.
22 Q Because they -- they have the same

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1 polarity?
2 A Always. Right.
3 And it's just compounded by the fact that
4 what we're calling a positive and what we're
5 calling a negative, when you actually operate
6 radiofrequency you might peg one at zero voltage
7 and the other voltage is -- is positive and
8 negative and positive and negative.
9 So there's a brief period of time, right,
10 where they're both zero. That doesn't change the
11 fact that they're -
12 Q I'm following --
13 A -- still bipolar pairs.
14 Q I follow you, but -- but let's assume that
15 at the same time they're always the same polarity.
16 A Right.
17 Q In that case, those two electrodes would
18 not be a bipolar pair; correct?
19 A Correct.
20 Q And they couldn't be because they have the
21 same polarity; right?
22 A Yes.

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1 Q Okay. And I guess if they have the same
2 polarity, current couldn't flow between them;
3 right?
4 A Correct.
5 Q Okay. And I lost my train of thought.
6 Give me one sec. Okay. I remembered.
7 So if -- if two electrodes didn't have a
8 polarity, I guess -- does that make sense? Could
9 an electrode not have a polarity?
10 A Well, in part. Depends on how they're
11 designed to operate versus how they might be in
12 the moment, right.
13 So when you unplug the device from the
14 generator, from the patient, there's effectively
15 no polarity on it, right.
16 Q Okay. Well, I guess, let me ask -- let me
17 ask you this. If two electrodes don't have a
18 polarity, could those two be a bipolar electrode
19 pair?
20 A Yes, because it depends on how they're
21 intended to be designed. I take that -- you know,
22 if I take that device, I unplug it, there's no

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1 polarity on it. It doesn't change the fact that
2 two electrodes might be intended to operate as an
3 electrode -- bipolar electrode pair.
4 Q Okay. If two electrodes do not have a
5 polarity, current won't flow between them; right?
6 A Correct.
7 Q Okay. Current only would flow between
8 them until -- or current can only flow between
9 them if at least one of those two has a polarity;
10 is that right?
11 A Well, let's say they have different
12 polarities. Let's just -- you know, so current
13 will flow between two electrodes if there's
14 different polarity and some finite resistance
15 between them, the electrodes.
16 Q Okay.
17 A So I polarize it just in air; right? No
18 current's going to flow.
19 Q But at the very least electrodes without
20 an assigned polarity are not a bipolar electrode
21 pair; right?
22 A What do you mean by the assigned polarity?

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1 Q I'm not even sure if I understood what I
2 meant. Regardless, I think I'm about done. I'm
3 going to just look through my notes, maybe make a
4 quick phone call and, I think, at least on my end
5 we'll be able to wrap up.
6 If your counsel has questions, you know,
7 they'll be able to ask you. So let's maybe go off
8 the record for five minutes, try to tie this up.
9 Sound good?
10 A Yeah.
11 (A discussion was held off the record.)
12 (A recess was taken.)
13 BY MR. GILFORD:
14 Q So, Dr. Martin, we had a couple breaks
15 today. During any of those breaks did you discuss
16 the substance of your testimony with anybody?
17 A No.
18 MR. GILFORD: Okay. I have no further
19 questions.
20 MS. COHEN: Let's take a little bit of a
21 break. I think we're going to have some
22 questions.

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1 MR. GILFORD: Okay.
2 (A recess was taken.)
3 MS. COHEN: We can go back on the record.
4 EXAMINATION BY COUNSEL FOR THE PETITIONERS
5 BY MS. COHEN:
6 Q All right. Dr. Martin, can you take your
7 '318 reply declaration?
8 A Yes.
9 Q Give me one moment to get my copy.
10 All right. Can you turn to page 17 in
11 your '318 reply declaration?
12 A Okay.
13 Q Okay. And do you recall being asked
14 questions about the annotated figure 15 that's
15 shown on page 17 on your '318 reply declaration?
16 A Yes.
17 Q Okay. And you recall you were asked a lot
18 of questions about the amount of energy that would
19 travel between the different electrodes shown in
20 figure 15 if energy was being delivered through
21 the electrodes at the same time.
22 Do you recall that?

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1 A Yes.
2 Q Does the difference in the amount of
3 energy that would be flowing between the
4 electrodes affect your opinion as to whether there
5 are multiple bipolar electrode pairs disclosed in
6 Stern?
7 MR. GILFORD: Object to form.
8 A No.
9 Q And even if energy is flowing between the
10 electrodes collectively, Stern discloses multiple
11 pairs of electrodes; correct?
12 MR. GILFORD: Object to form.
13 A Yes.
14 Q Apart from this figure that you include,
15 does Stern elsewhere disclose applying energy to
16 multiple pairs of bipolar electrodes?
17 MR. GILFORD: Object to form. Outside the
18 scope. You can answer.
19 A I think figure 5 discloses some of that --
20 Q And anything else --
21 A -- in Stern.
22 Q Anything else that you cited in your

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1 declaration?
2 MR. GILFORD: Same objection.
3 A I have to review Stern to completely
4 answer that, but I think that's -- I think that is
5 most of it.
6 Q If you turn to page 12 of your reply
7 declaration.
8 A Yes.
9 Q Do you recall being asked that the
10 sentence where you say, Though I disagree for the
11 purposes of the following analysis, I assume that
12 limitation 1D requires multiple pairs of bipolar
13 radiofrequency electrodes that are active, quote,
14 "at the same time as Dr. Bikson proposes"?
15 MR. GILFORD: Object to form. Outside the
16 scope. Go ahead.
17 A Yes.
18 Q I'm handing you a copy of the Neurent
19 Exhibit 1084, Dr. Bikson's transcript.
20 MR. GILFORD: And I'll object to the use
21 of this declara -- what is this? Is this is a
22 transcript of Dr. Bikson?

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1 MS. COHEN: Yes.
2 MR. GILFORD: Okay. I'll object to the
3 use of this transcript and any questions relating
4 to this as completely outside the scope of cross.
5 MS. COHEN: Your objection's noted. All
6 right.
7 MR. GILFORD: Was there a page you asked
8 him to open to or just the --
9 MS. COHEN: I've handed this. We will get
10 to the page. Okay.
11 Q Now, you testified you had reviewed
12 Dr. Bikson's transcript in offering your opinions
13 in your reply declaration; correct?
14 A Correct.
15 Q Can you please turn to page 117 of this
16 transcript?
17 A Okay.
18 Q And do you see Dr. Bikson's testimony at
19 line 11?
20 A Yes.
21 Q And you see he says, If Stern had shown
22 the delivery of energy to two or more pairs of

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1 bipolar electrodes, then in that case Stern would
2 be showing multiple bipolar electrode pairs.
3 Do you see that?
4 A Yes.
5 MR. GILFORD: Object to form. Outside the
6 scope, and just for the record this is starting at
7 line 12.
8 BY MS. COHEN:
9 Q Is it your opinion that Stern shows the
10 delivery of energy to two or more pairs of bipolar
11 electrodes?
12 MR. GILFORD: Object to form. Outside the
13 scope.
14 A Yes.
15 MS. COHEN: Stop with the speaking
16 objections.
17 MR. GILFORD: I'm going to make my
18 objection for the record, and it is outside the
19 scope.
20 MS. COHEN: You can't make a speaking
21 objection.
22 MR. GILFORD: For your own witness?

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1 MS. COHEN: You can't make a speaking
2 objection, period.
3 MR. GILFORD: I can't speak to make my
4 objection?
5 MS. COHEN: No, you can make an objection,
6 but you know what a speaking objection is, Ben.
7 MR. GILFORD: Yeah. The issue is when
8 it's your own witness and you're coaching your own
9 witness. He's not my witness, and I need to be
10 able to make my record so...
11 MS. COHEN: Your objection's noted.
12 MR. GILFORD: Okay.
13 Q All right. Do you recall being asked --
14 you can set that aside.
15 Do you recall being asked about whether
16 activating pairs of electrodes sequentially would
17 address the issue of uneven heating?
18 A Yes.
19 Q Okay. Do you have a copy of your original
20 declaration from '318? I think you do.
21 A Yes.
22 MR. GILFORD: Do you mind giving me one?

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1 MS. COHEN: Yes.
2 MR. GILFORD: Thanks.
3 Q Can you turn to page 72 of your
4 declaration?
5 MR. GILFORD: And for the record I am also
6 going to object to this exhibit and any questions
7 relating to it as outside the scope.
8 A I picked up the wrong one.
9 MR. GILFORD: You said 72; right?
10 A On the original '318?
11 Q Page 72.
12 A I have the original for '271 but not '318
13 in my possession.
14 Q Oh, okay.
15 MR. GILFORD: And for the record that's
16 because we did not talk about your original
17 declaration for the '318 on cross; right?
18 MS. COHEN: I'm asking questions now,
19 counselor.
20 Q So I've handed you your opening
21 declaration from the '318 IPR; correct?
22 A Correct.

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1 Q Can you please turn to page 72?
2 A Okay.
3 Q And can you please review paragraph 133 to
4 136?
5 A Okay.
6 Q What does Stern say about how the system
7 addresses uneven heating?
8 MR. GILFORD: Object to form.
9 A Okay. Do you want me to -- where would
10 you like me to start reading?
11 Q Well, if you can just summarize.
12 A Okay.
13 Q What does Stern say about how the system
14 addresses uneven heating?
15 MR. GILFORD: Object to form.
16 Go ahead.
17 A So -- so a couple of ways. Stern can
18 address -- addresses uneven heating.
19 Stern teaches pairing bipolar RF --
20 (Reporter clarification.)
21 THE WITNESS: Stern teaches pairing
22 bipolar RF electrodes and wiring them with

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1 switches to permit independent energy --
2 independent delivery of RF energy to each bipolar
3 pair. The user -- in doing so, the user can
4 precisely control the electrical current delivered
5 to tissue and, therefore, to the heated area to
6 ensure a complete heating of an area.
7 He also incorporates temperature and other
8 sense of feedback control and the different
9 electrodes that can be energized can direct heat
10 to one particular area and not others.
11 Q Thank you. You can set that aside.
12 And if you can get your '318 reply
13 declaration back in front of you.
14 A Okay.
15 Q Do you recall Mr. Gilford asked you
16 whether in your opinion an RF output channel is
17 something that allows pairing between chosen
18 electrodes to form a complete circuit?
19 A Yes.
20 Q In your opinion, does the switching
21 arrangement in Stern allow pairing between chosen
22 electrodes to form a complete circuit?

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1 A Yes.
2 Q You -- do you recall also being asked
3 whether, in your opinion, is a radiofrequency
4 output channel something that allows pairing
5 between chosen electrodes to control a chosen pair
6 of electrodes separately from another chosen pair?
7 A Yes.
8 Q Is that based on your understanding of how
9 output channels are described in the '318 patent?
10 A Correct. Yes.
11 Q Can you pull Martin Exhibit 1.
12 All right. Now in front of you, you have
13 Martin Exhibit 1.
14 Do you recall being asked questions about
15 this?
16 A Yes.
17 Q Is this figure found in the '318 patent?
18 A No.
19 Q Could you write "not the patent" on this
20 figure?
21 A Not from the patent or not the patent?
22 Q Sure. "Not from the '318 patent."

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1 A (Witness complied.)
2 Q And is this figure from any of the prior
3 art that you reviewed in this case?
4 A No.
5 Q Can you please write "not the prior art"
6 in Exhibit 1?
7 A (Witness complied.)
8 Not from any prior art.
9 Q Yes. Thanks.
10 Okay. You can set that aside.
11 Do you recall being asked about the
12 difference between an RF output channel and an RF
13 channel?
14 A Yes.
15 Q And counsel asked you about the difference
16 between the two?
17 A Yes.
18 Q Can you turn to page 24 of your reply
19 declaration?
20 A Okay.
21 MR. GILFORD: Give me one second to catch
22 up.

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1 You said page 24?
2 MS. COHEN: Yes.
3 MR. GILFORD: Okay.
4 Q And can you review paragraph 35, which
5 is -- starts on page 22 and goes to page 23, and
6 then also the figure 39 that you have on page 24.
7 And let me know when you're done.
8 A Okay.
9 Okay.
10 Q Can you tell me what element 961 is in
11 figure 39?
12 MR. GILFORD: Object to form. Outside the
13 scope.
14 A Yeah. It looks like the RF output
15 channel.
16 Q And as identified in the '318 patent, does
17 that include both the active and return signal?
18 MR. GILFORD: Object to form.
19 A Yes.
20 Q So to use counsel's word -- words
21 previously, the '318 patent includes both the
22 output from a generator and the input in its

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1 description of an RF output channel?
2 MR. GILFORD: Object to form.
3 A I'm sorry. Could you repeat the question?
4 Q Sure.
5 To use counsel's words previously, do you
6 recall him asking about the output and input into
7 a generator?
8 A Yes.
9 Q And there was discussion about output and
10 input versus active and return?
11 A Yes.
12 Q Okay. So to use his words, the
13 '318 patent includes both the output from a
14 generator and the input to a generator in its
15 description of an RF output channel?
16 MR. GILFORD: Object to form.
17 A Yes.
18 Q In figure 39 of the '318 patent, and the
19 other figures included in your declaration that
20 you were asked about, the '318 patent does not
21 show how many output channels are wired inside an
22 RF generator; correct?

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1 MR. GILFORD: Object to form.
2 A Correct.
3 Q And does the '318 patent show how many
4 output channels go into the device?
5 MR. GILFORD: Object to form.
6 A Not to my knowledge.
7 Q How does the '318 identify output
8 channels?
9 MR. GILFORD: Object to form.
10 A The '318 identifies them through
11 annotation --
12 Q And --
13 A -- of the figures.
14 Q Okay. And are the annotations relative to
15 the electrodes or the generator?
16 MR. GILFORD: Object to form.
17 A They're relative to the wires that connect
18 to the electrodes.
19 Q Okay. There was -- also, you were asked
20 about -- if you turn to page 34 of your '318 reply
21 declaration.
22 You were asked about the first sentence of

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1 paragraph 45, which says, Consistent with the
2 '318 patent specification and its description of
3 figures 39 and 40, among others, it is my opinion
4 that "output channel" connects electrodes and
5 provides the ability to independently control
6 pairs of electrodes?
7 A Correct.
8 Q Okay.
9 A Correct.
10 Q And you testified that there's a word
11 missing in the sentence, and I just wanted to
12 clarify the record regarding what, in your
13 opinion, is missing from this sentence?
14 MR. GILFORD: Object to form.
15 A Yes. So output channel connects
16 electrodes. It should be output channel connects
17 to electrodes. T-O.
18 Q Okay. So the word T-O and not the number
19 2?
20 A Not the number 2, yes.
21 Q Okay. All right. You can -- can you
22 pull -- get Martin Exhibit 2. And I'm going to

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1 ask you similar questions to Martin Exhibit 1.
2 Is the figure in Martin Exhibit 2 in the
3 '318 patent?
4 A No.
5 Q Can you write "not from the '318 patent"
6 on Exhibit 2?
7 A (Witness complied.)
8 Q And is Exhibit 2 from the prior art you
9 analyzed in providing your declarations in these
10 IPRs?
11 A No.
12 Q Can you write "not from the prior art" on
13 Exhibit 2?
14 A (Witness complied.)
15 Q Now holding onto Exhibit 2, can you also
16 take your reply declaration and open to page 24.
17 MR. GILFORD: Still on the '318 reply?
18 MS. COHEN: Yes.
19 A Okay.
20 Q Okay. So you're looking at Martin
21 Exhibit 2 and page 24 of your '318 reply
22 declaration.

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1 And you were asked about needing
2 additional information about Martin Exhibit 2
3 during your cross-examination.
4 Do you recall that?
5 A Yes.
6 Q What additional information is included in
7 figure 39 compared to Martin Exhibit 2?
8 MR. GILFORD: Object to form.
9 A Well, figure 39 includes what the polarity
10 is of the upper and lower traces. So the upper
11 traces for each of the electrodes, if they're all
12 independent and they all have a positive polarity.
13 And then on figure 39, all the -- the traces that
14 are lower are all indicated with a negative
15 polarity.
16 Q All right. You can set aside Martin
17 Exhibit 2.
18 Can you turn to page 41 of your '318 reply
19 declaration?
20 And do you see the series of answers and
21 images that are included on page 41?
22 A Yes.

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1 Q And you were asked a number of questions
2 about the annotations that you've included for
3 figure 15 from Stern.
4 Do you recall that?
5 A Yes.
6 Q And you were asked if a person of ordinary
7 skill in the art would be able to determine that
8 there's multiple RF output channels and you said
9 yes.
10 Do you recall that?
11 A Yes.
12 Q Can you explain what the bottom figure is
13 of these three annotated figures?
14 MR. GILFORD: Are you asking about this at
15 the very bottom of the page?
16 MS. COHEN: Sorry. Yes. Let me be clear.
17 Q Can you explain what's shown in the
18 annotated figure that is -- has the heading
19 Exhibit 1087, Exhibit B to Dr. Bikson's
20 deposition?
21 MR. GILFORD: Object to form. Outside the
22 scope.

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1 A This was, I believe, a -- from
2 Dr. Bikson's deposition. He drew this.
3 Q And what's your understanding of why he
4 drew this figure?
5 MR. GILFORD: Object to form. Outside the
6 scope.
7 A Well, I believe he was drawing bipolar
8 electrode pairs.
9 Q And as it relates to the output channels,
10 do you know what was -- what's your understanding
11 of what he was drawing?
12 MR. GILFORD: Object to form. Outside the
13 scope.
14 A Hold on.
15 Q And if it helps, you can turn to page 38
16 of your reply declaration as well.
17 MR. GILFORD: Same objection.
18 A Okay. I'm sorry.
19 What was the question?
20 Q Sorry.
21 So my question was: For the annotated
22 figure on page 41 of your '318 reply declaration,

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1 Exhibit 1087, Exhibit B to Dr. Bikson's
2 deposition, what is your understanding of what he
3 was drawing in this figure?
4 MR. GILFORD: Same objection.
5 A So according to what's in the reply
6 declaration, these are basically two bipolar
7 electrodes each with their own RF channel output.
8 Q And -- okay. Do you have any correction
9 to make to the text in paragraph 48 on page 40?
10 MR. GILFORD: Sorry. You said?
11 MS. COHEN: Any correction to the text.
12 MR. GILFORD: Yeah. In paragraph 48 on
13 page 40?
14 MS. COHEN: Right, because it carries over
15 from page 38 to 40.
16 MR. GILFORD: Can you just give me a
17 second to get there before you answer?
18 So -- sorry. Are you asking just about
19 the part that's on page 48?
20 MS. COHEN: Page -- the part that's on
21 page 40.
22 MR. GILFORD: The part of paragraph 48

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1 that's on page 40?
2 MS. COHEN: Correct.
3 A There's one correction to be made, yes.
4 Q And what is that?
5 MR. GILFORD: Sorry.
6 So object to form. Outside the scope.
7 Go ahead.
8 A There's a typo in the reference to
9 Dr. Bikson's transcript. The page number should
10 be 196, not 96.
11 Q Okay. Okay. Can you turn to page 42 --
12 or actually, no. Let's stay on page 41 of your
13 reply declaration for the '318 patent.
14 And do you recall being asked about the
15 number of output channels that are shown in Stern
16 figure 15?
17 A Yes.
18 Q And you testified that there were at least
19 two?
20 A Yes.
21 Q And you also testified that you had not
22 counted the total number of output channels?

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1 A Correct.
2 Q Even though you did not count the total
3 number of output channels shown in Stern, is it
4 still your opinion that Stern discloses each pair
5 of the multiple pairs of bipolar RF electrodes if
6 connected with the respected one of the multiple
7 RF output channels?
8 MR. GILFORD: Object to form. Outside the
9 scope.
10 A Yes.
11 Q All right. We can put this aside, this
12 being the '318 reply declaration.
13 And can you get Martin Exhibit 3?
14 Do you recall being asked about Martin
15 Exhibit 3?
16 A Yes.
17 Q And you were asked about Martin Exhibit 3
18 in connection with your opinion on the
19 '271 patent?
20 A Yes.
21 Q Are the figures shown in Martin Exhibit 3
22 from the '271 patent?

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1 A No.
2 Q Can you write "not from the '271 patent"
3 on Martin Exhibit 3?
4 A (Witness complied.)
5 Q And are the figures in Martin Exhibit 3
6 from the prior art you analyzed in offering your
7 opinions in these declarations?
8 A No.
9 Q Can you write "not from the prior art" on
10 Exhibit 3?
11 A (Witness complied.)
12 Q And you can set that aside.
13 Counsel asked you about the difference
14 between two rows of electrodes and two rows of
15 bipolar electrode pairs.
16 Do you recall that?
17 A Yes.
18 Q Can you have two rows of monopolar
19 electrodes?
20 A Yes.
21 Q And that would be different from two rows
22 of bipolar electrode pairs?

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1 A Yes.
2 MS. COHEN: I have no further questions.
3 MR. GILFORD: Nothing further from me.
4 Thanks for your time.
5 THE WITNESS: All right. Likewise.
6 (A discussion was held off the record.)
7 MS. COHEN: We'll take a rough draft.
8 MR. GILFORD: So a rough draft and final
9 by Monday morning.
10 (Off the record at 2:25 p.m.)
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1 CERTIFICATE OF SHORTHAND REPORTER - NOTARY PUBLIC
2
3 I, Janet A. Hamilton, Registered Diplomate
4 Reporter and Notary Public within and for the
5 District of Columbia, do hereby certify:
6 That GREGORY T. MARTIN, Ph.D., the witness
7 whose deposition is hereinbefore set forth, was
8 duly sworn by me before the commencement of such
9 deposition and that such deposition was taken
10 before me and is a true record of the testimony
11 given by such witness.
12 I further certify that the adverse party,
13 Petitioners, Neurent Medical Inc. & Neurent
14 Medical Ltd., was represented by counsel at the
15 deposition.
16 I further certify that the deposition of
17 GREGORY T. MARTIN, Ph.D. occurred at the offices
18 of Wilmer Cutler Pickering Hale and Dorr LLP, 2100
19 Pennsylvania Avenue NW, Washington, DC, 20037, on
20 Thursday, February 20, 2025, commencing at 9:13
21 a.m. to 2:25 p.m.
22 I further certify the inspection, reading and

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signing of said deposition was not discussed on the record.

I further certify that I am not related to any of the parties to this action by blood or marriage, I am not employed by or an attorney to any of the parties to this action, and that I am in no way interested, financially or otherwise, in the outcome of this matter

IN WITNESS WHEREOF, I have hereunto set my hand this 22nd day of February, 2025.

My commission expires:
March 30, 2028

_____
NOTARY PUBLIC IN AND FOR THE
DISTRICT OF COLUMBIA

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I, Dr. Gregory Martin, wish to make the following changes to the record:

Page	Line(s)	Now Reads	Should Read	Reason
37-38	22-1	sodium potassium	sodium and potassium	Clarification
45	8	till	still	Typo
45	18	thermal connectivity	thermal conductivity	Typo
46	7	thermal connectivity	thermal conductivity	Typo
45	19	it's sort like	it's sort of like	Clarification
109	18	hand	handle	Clarification
124	18	deposition	disposition	Typo
187	22	red-most	right-most	Typo
195	17	compared	paired	Clarification

Date: February 25, 2025

Signed: _____

Not from the '318 patent

Not from any prior art

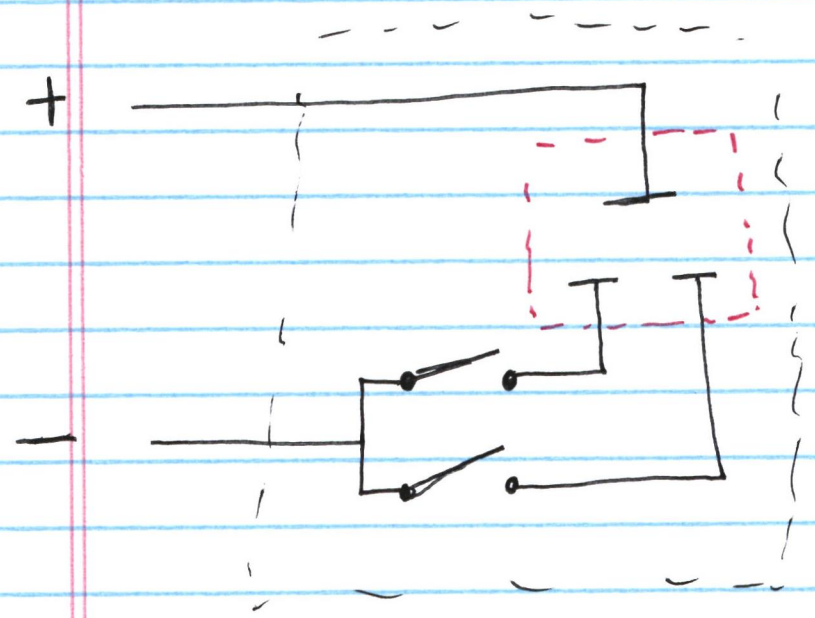

EXHIBIT 1
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DATE: 2-20-25
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Not from the '318 patent
Not from the prior art

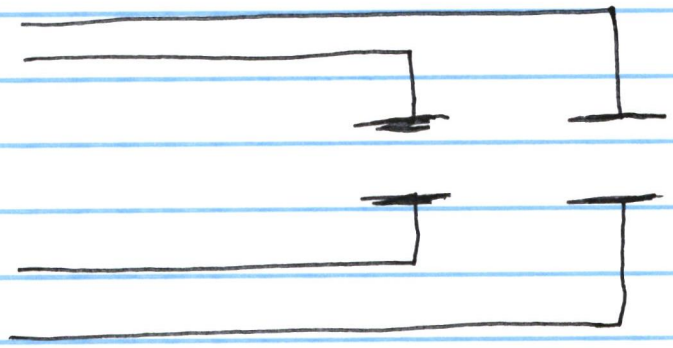
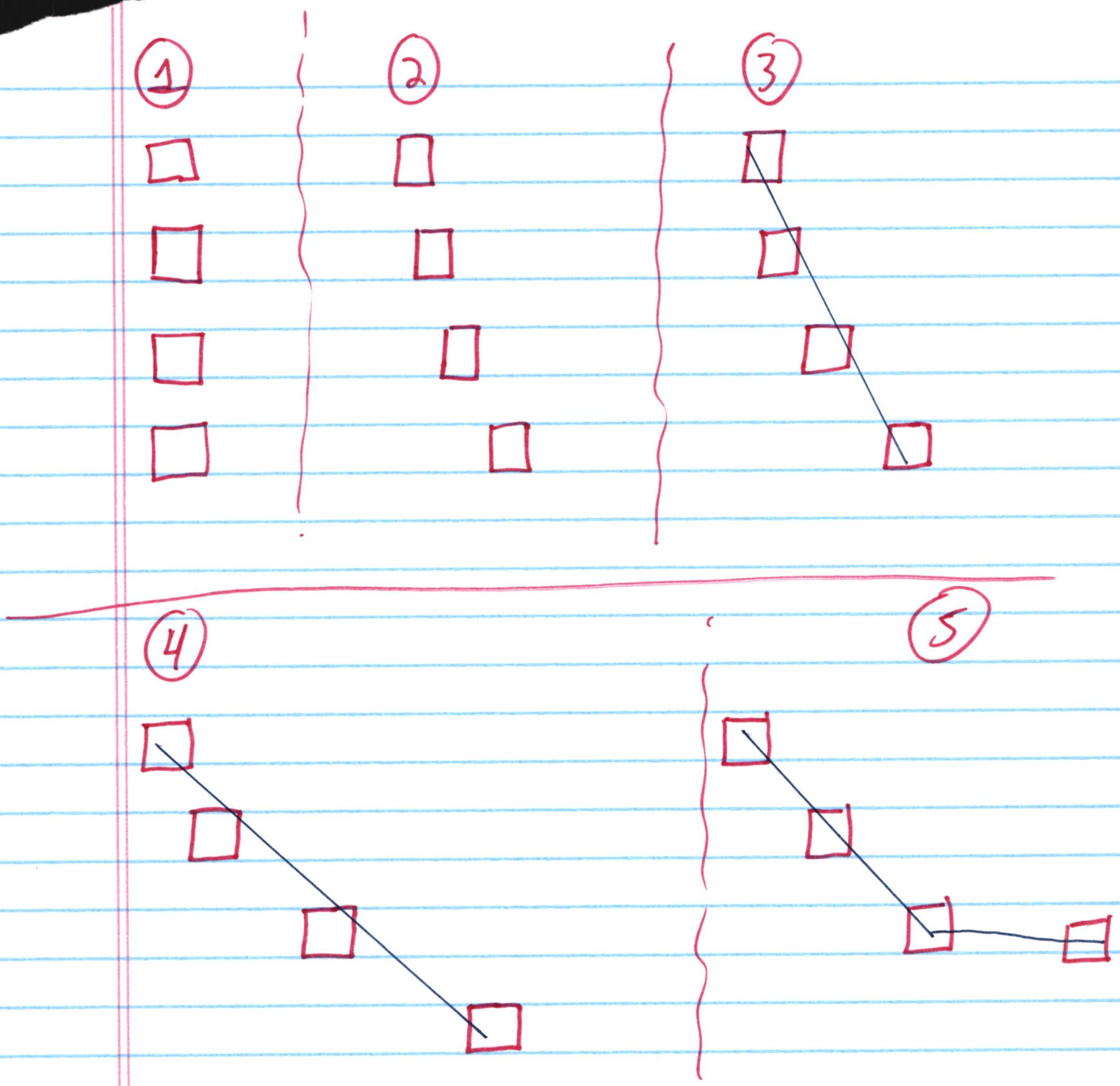


EXHIBIT 2
WIT: Dr. Martin
DATE: 2-20-25
JANET A. HAMILTON, RDR



Not from the '271 patent
Not from the priop art.

EXHIBIT 3
WIT: Dr. Martin
DATE: 2-20-25
JANET A. HOBBS TON, RDR

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