UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

- x

NEURENT MEDICAL INC. & NEURENT MEDICAL LTD.

Petitioners,

v.

THE FOUNDRY, LLC,

Patent Owner.

- x

Case No. IPR2024-00669

U.S. Patent No. 11,679,077

- x

Deposition of MAROM BIKSON, Ph.D.

New York, New York

Tuesday, January 7, 2025

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Reported By: Anita M. Trombetta, RMR, CRR,

California CSR No. 14647

NEURENT 1084
NEURENT v. AERIN
IPR2024-00277

Deposition of MAROM BIKSON, Ph.D., held at the offices of:

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Before Anita M. Trombetta, a Certified Shorthand Reporter in the State of California, RMR, CRR, and Notary Public in and for the State of New York.

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----------I N D E X----------

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P R O C E E D I N G S

M A R O M B I K S O N, Ph.D.,

called as a witness, having been duly sworn by a Notary Public, was examined and testified as follows:

EXAMINATION BY

ATTORNEY COHEN:

Q Good morning.

A Good morning.

Q What is your full name?

A Marom Bikson.

Q And where do you live?

A I live in the 75 Green, Apartment 3B, in Brooklyn, New York.

Q And you understand that the oath you just took is the same oath you would be required to take if you were testifying in the United States court?

A I understand.

Q Is there any reason you cannot provide accurate and truthful testimony today?

A No.

Q I'm going to go through a few ground rules for today before we get started. So first we have a transcript and a court reporter. So please give audible answers instead of shaking your head or nodding.

Please let me finish my questions before you answer so the court reporter can create a clear transcript.

I will take breaks throughout the day. If you ever need a break, let me know, and we'll take one whenever is possible.

We can't take a break with a question pending though. So I would ask you to answer my question before we take a break.

After we take breaks, I may ask if you've had conversation with your counsel about the substance of your testimony today. Okay?

A Okay.

Q Have you ever been deposed before?

A I have.

Q How many times?

A I don't remember the exact number of

times.

Q Is it more than five?

A I think it's about five.

Q What are the cases? What's the subject matter in the cases where you've been deposed?

ATTORNEY BRIGGS: Objection. Form.

A There -- there were varied cases. One of them was also about intellectual property.

Q So just one case involving intellectual property?

A As far as -- as far as depositions?

Q Yes.

A I don't remember.

Q What do you recall about that case? What was the subject matter in that one case?

ATTORNEY BRIGGS: Objection. Form.

A So the -- the case I was previously deposed on that related to intellectual property had to do with the application of energy to the body, including for aesthetic purposes.

Q And was that related to the ITC case?

A That is correct.

Q And is there any other case related to intellectual property where you have been deposed, that you recall?

A I don't recall.

Q For the cases not related to intellectual property, what was the subject matter in those cases where you were deposed?

A One of the cases related to potential personal injury related to exposure or proximity to a substation utility company.

Q And you said that there -- you recalled about five depositions. So we've got one in the ITC case, one that was a personal injury case about exposure from a substation.

What are the other cases about?

A There was a case where -- which was related, as I recall, related to patent invention. It wasn't an IP dispute like this matter. It more involved two parties and questions about who -- who owned or who had rights to the invention.

Q Were you an expert witness in that case or a fact witness?

A I don't remember.
Q Did you have personal knowledge about the facts in that case?
A No.
Q Okay.
A I had knowledge in my professional capacity.
Q What was that knowledge?
A This was also related to devices that applied energy to the body for therapeutic purposes. So that's my professional field.
Q And what were you asked to evaluate there?
A It was a while ago, but as I remember it, there was a question of an inventor who -- and there were certain patents, and there was a question about the time frame in which the inventions were -- were made or conceived.
Q And so were you asked to give an overview of the field at the time the inventions were made?
A I don't remember that.
Q Okay. Well, I guess what I'm trying to understand is you said there was a question about

the time frame in which the inventions were made or conceived, and what was that question?

A As best as I recall -- it was a while ago. As best as I recall, there was a -- there was a patent. And the patent was used for one indication and then another indication. And again, as best as I can recall, there was a question about whether -- when it was invented for the first indication, did that also apply to the second indication or were these separate inventions, but, again, this was a while ago, which is why I don't remember the specifics.

Q Okay. So you got the ITC case, personal injury, the patent invention dispute.

What other -- what was the subject matter of the other depositions?

A I don't remember.

Q Okay. Do you know when those took place?

A Those would be several years ago, more than several years ago.

Q Like more than ten years ago?

A I believe it would be more than five years

ago. I'm not sure about ten -- whether they were before or after ten years ago.

Q When was the last time you were deposed?

A The last time I remember being deposed was in that ITC case, which was during COVID, it was through Zoom.

Q So sometime in 2020, 2021?

A I don't remember -- I don't remember the exact date, but it was -- I'm -- I believe it was during COVID. So it was absolutely restricted to Zoom.

Q What did you do to prepare for today's deposition?

ATTORNEY BRIGGS: Objection. The witness is cautioned to not reveal any attorney-client privileged information.

You may answer.

A I reviewed the depositions that I prepared, and the materials that I relied on.

Q Did you meet with counsel?

A I did.

Q When did you meet with counsel?

A I met with counsel yesterday.
Q And how long did you meet with counsel?
A About eight hours.
Q Before yesterday, did you have any other meetings with counsel to prepare for your deposition?
A I think so.
Q About how many meetings do you recall?
A Specifically to prepare for the deposition, I recall one meeting. It was by Zoom.
Q And how long was that meeting?
A I don't remember exactly. I want to say about an hour.
Q Did you meet with anyone other than Heath Briggs and Elana Araj to prepare for your deposition?
A Yes.
Q Who else?
A There was an additional lawyer, his first name is Ben.
Q Ben Gifford?
A You know, I'm sorry, I don't remember his

last name.

Q That's fine.

A Okay.

Q Did you meet with any other counsel?

A In preparation for --

Q For the deposition.

A -- the deposition.

No.

Q Did you speak with anyone other than counsel to prepare for the deposition?

A I didn't speak to anyone other than counsel to prepare for the deposition.

Q Okay. When were you first retained to work on this matter?

A I don't remember the date.

Q Do you remember a time frame?

A It was several months ago. I can't be more specific.

Q Was it during 2024?

A I'm not -- I'm not certain.

Q It could have been in 2024 or 2023?

A Again, I don't remember exactly, which is

why I don't want to answer, but I would certainly have records of it.

Q Who first reached out to you?

A For my -- expertise here?

Q Sorry. Let me rephrase that.

Who first reached out to you to work on this matter?

A The -- the work I'm doing on this matter is through an expert consulting firm that's actually based, I believe, in Boston. And so the way it works is that they reach out to me and they asked me whether I have relevant expertise on the matter and they tell me who the parties are and ask me if I have any conflicts. So that's how I believe it started with this matter as well.

Q And what's the name of that expert consulting firm?

A I don't remember.

Q Have you worked with them before?

A Yes.

Q How many times have you worked with them?

A I'm sorry. I do remember their name.

Q Oh, okay. Let's go back to them.
A I believe it's Rubin Anders.
Q Okay. Okay. So Rubin Anders is the name of the expert consulting firm that you worked with to get retained for this matter?
A I believe so.
Q And how many times have you worked with Rubin Anders before?
A I'm not sure the exact amount, but it -- a handful.
Q When did you start working with Rubin Anders?
A I don't remember.
Q Was it before COVID?
A I don't remember.
Q What is your standard hourly rate?
A It is $600 an hour.
Q So you are here in relation to the six declarations that you have provided in six different IPRs; is that correct?
A My understanding is that I'm -- I'm here to be deposed and -- in relation to the six

reports that I prepared.

Q And you have six copies of those reports in front of you? Or let me rephrase that. You have a copy of each of the six reports in front of you?

A I have a copy of each of the reports in front of me.

Q Okay. So I think just to make sure we're working from the same framework, you have three declarations that you have provided that relate to petitions filed against patents that are owned by Aerin Medical, correct, and those are in IPR2024-00277, IPR2024-00278, and IPR2024-00282; is that correct?

A Yeah, I can confirm that I see those numbers and the case number of the three documents here.

Q Okay. At times I may refer to those three IPRs as the Aerin IPRs, okay?

A Okay.

Q And you have also offered declarations in three IPRs related to petitions filed against

patents owned by the Foundry LLC; is that correct? And those IPRs are: IPR2024-00279, IPR2024-00280, and IPR2024-00669; is that correct?

A Yes, I can confirm that I -- those are the case numbers on the documents in front of me.

Q At times throughout today I may refer to those three IPRs as the Foundry IPRs. Okay?

A Okay.

Q Do you know any of the inventors on the patents being challenged across these six IPRs?

A I don't recall knowing any of the inventors.

Q For the IPRs challenging the Foundry -- the Foundry patents, you state that you relied on a conversation you had on October 23rd, 2024, with patent owner's other expert Dr. Howard Levine who is an expert in the treatment of the nasopharyngeal passage using devices that apply radiofrequency energy. And I have a few questions about that conversation.

How long was that conversation?

A As I remember that conversation, it was

about an hour.

Q And what did you discuss?

A One of the things we discussed were my analysis that went into my preparation of these reports.

Q Did you discuss anything else?

A Yeah.

Q What else did you discuss?

A There were some things we discussed that were not related, for example, to the case.

Q What were those items?

A He has a practice in Cleveland and I went to school in Cleveland. So we talked a little bit about that.

Q About your shared history in Cleveland?

A Yes.

Q Did you ask him any questions during that conversation?

A I don't remember if I asked him specific questions, but I did want to understand whether he concurred with my analysis.

Q So did he mostly ask you questions during

that conversation?

A I don't remember.

Q Did you review a copy of his declaration before the conversation you had?

A No.

Q Have you reviewed a copy of his declaration --

A Yes.

Q -- since that conversation?

A I -- I reviewed a copy of his declaration since the conversation -- after the conversation.

Q Okay. Did you review a copy of his declaration in preparation for today's deposition?

A Yes.

Q Do you know if he reviewed a copy of your declaration before that call?

A I don't think so.

Q Had you met Dr. Levine before that conversation?

A No.

Q Now, you have a Ph.D. in biomedical engineering; is that correct?

A Correct.
Q And you do not have an MD; is that correct?
A I do not have an MD.
Q Before this case, had you heard of rhinitis?
A I think so.
Q When do you first recall hearing about rhinitis? And in what context?
ATTORNEY BRIGGS: Objection. Form.
A I don't remember.
Q Have you -- did you ever study rhinitis before this case?
ATTORNEY BRIGGS: Objection. Form.
A I don't remember. I don't remember.
Q Before working on this case, did you ever evaluate methods for treating rhinitis?
A I studied technology that is used for the treatment.
Q What technology was that?
A One of the areas that I work in is technology that delivers energy into the body.

Q Did you ever study, prior to working on this case, delivering energy into the body for the treatment of rhinitis?

A Prior to working on this case, the work I did on delivering energy into the body is broadly relevant for applying energy to different regions of the body.

Q Right. And my question is specific to rhinitis. Before working on this case, did you ever study delivering energy into the body to treat rhinitis?

A Prior to working on this case, I worked on technology that is broadly relevant for application of energy to treat diseases. I don't remember if I specifically discussed treatment of rhinitis in those -- in the documents I prepared.

Q Sorry. What documents are you referring to?

A Sorry, I was not clear. I meant to say papers or things of that nature.

Q To the best of your recollection, have you ever published on treating rhinitis?

A I have not published papers specifically related to or focused on the treatment of rhinitis.

Q Have you ever worked any studies focused on the treatment of rhinitis?

A As I mentioned, I study the effects of medical devices that apply energy in general. I don't recall if any of those papers were specific studies focused on the treatment of rhinitis.

Q To best of your recollection, none of those papers were focused on the treatment of rhinitis; is that correct?

ATTORNEY BRIGGS: Objection. Form.

A Could you just restate the question, please?

Q Sure. To the best of your recollection, none of the papers or studies that you have performed were related to the treatment of rhinitis; is that correct?

A No. What I was saying was I don't remember if the papers were specifically focused on the treatment of rhinitis.

Q Do you recall any papers that you have published that have focused on the treatment of rhinitis?

A No.

Q Have you ever worked on a medical device intended to treat rhinitis?

A I've worked on medical devices with technology that's relevant to treat rhinitis.

Q Have you ever worked on a device that is intended to treat rhinitis?

A Can you clarify what you mean?

Q Sure. So you are familiar with medical devices, correct?

A Yes.

Q And you understand that medical devices have different intended uses, correct?

A Yes.

Q Have you ever worked or developed a device that is intended to be used to treat rhinitis?

A I never specifically worked on a device with a medical indication to treat rhinitis, but I worked on the technology that underlies those

systems.

Q And when you say "the technology that underlies those systems," what are you referring to?

A These systems can use energy that is directed into the body in a very controlled way. And that is one of the areas that I study in my capacity as a professor at the City College of New York.

Q Okay. You study the delivery of energy into the body; is that correct?

A Yes, that's one of the things I focus on.

Q You have never treated a patient for rhinitis; is that correct?

A Correct.

Q And you have never delivered radiofrequency energy to a patient, correct?

A Correct.

Q You have never delivered energy to a patient to ablate tissue in the patient's body, correct?

A Correct.

Q Prior to working on this case, were you aware of the mechanisms for mucous production inside the nose?

A Can you clarify what you mean?

Q Sure. So have you heard of goblet cells in relation to your work on this case?

ATTORNEY BRIGGS: Objection. Form.

A I'm sorry, can you repeat the question?

Q Let me just rephrase it.

Do you know what goblet cells are?

A No.

Q Do you know about the parasympathetic nerve structures inside the nasal cavity?

A I'm not an expert on the parasympathetic nerve structure inside the nasal cavity.

Q Have you heard of turbinates before working on this case?

A Yes.

Q In what context have you heard of turbinates?

A I don't recall the exact context.

Q Do you recall when you first heard about

turbinates?

A I don't. I've been learning and taking classes about anatomy and physiology since I was, you know, in my late teens. So that's -- I don't remember exactly when I might have first heard about turbinates.

Q Had you ever studied or evaluated turbinates before working on this case? Let me strike that.

Have you ever done any work outside of the anatomy and physiology courses involving the analysis of turbinates?

A I'm not sure.

Q When was the last anatomy class that you recall taking? Or let me strike that.

When did you complete the last anatomy class that you recall taking?

A It's been a while since I took classes. The last classes I took would have been completed before 2000.

Q Did you ever take a course focused solely on nasal anatomy?

A No.

Q Have you ever imaged a human head for the purpose of imaging the nasal cavity?

ATTORNEY BRIGGS: Objection. Form.

A Can you clarify the question?

Q So in your declaration, you say, "I have extensive experience in human head imaging, which includes imaging of the nasal cavity."

So my question is: Have you ever imaged a human head for the purpose of creating an image of the nasal cavity?

A Yes.

Q When was that?

A It wasn't just once, if that's your question, and it would be multiple times.

Q Was it for the purpose of treating a condition inside the nasal cavity?

A It could be used for that purpose, yes.

Q What sort of imaging do you perform?

ATTORNEY BRIGGS: Objection. Form.

A Could you clarify the question?

Q Sure. I guess to start with, do you

perform imaging on patients?

A So usually when the imaging on patients is done, it would be done at a facility. I -- I could be overseeing the collection of scans, but there usually would be other people there as well supporting the -- the collection of the images.

Q Have you ever overseen the collection of scans of a person's nasal cavity for the purpose of treating a condition inside the nasal cavity?

A The scans I've collected can be used for that purpose, yes.

Q Do you know if any of the scans you have collected were you ever used for the purpose of treating a condition inside the nasal cavity?

A You're asking me if the scans themselves were used for treatment? The way it would work is I would be collecting the scans and then those scans would be used for the purpose of device design, device optimization. And then once those devices have been optimized, then they could be used. And so just in that sense, you know, the way you phrased it, you know, if the images were

used for treatment, I would just qualify it that that would be the conventional pipeline for how I would be using imaging.

Q Okay. Is you -- you collect a scan for device design, but you are not scanning people for evaluating treatment options?

ATTORNEY BRIGGS: Objection. Form.

A So again, when you say "I scan," usually I would be part of a team that is conducting the scans. And I have been involved in projects where people were being imaged as part of a process to evaluate treatment options.

Q Treatment options for a nasal condition?

A Just so I understand, can you just repeat the full question?

Q Sure. So when you've been involved in a team that's conducting a scan on a patient, have any of those patients been imaged as part of a process to evaluate treatment options for a nasal condition like chronic rhinitis?

A The scans that we collect can be used for the design of different medical devices including

those that apply energy to the nose. I don't recall that we were being involved in a project where patients were being scanned with a special focus on treating diseases related to applying energy to the nose.

Q Have you ever worked on a device that delivers energy to the nasal cavity?

A Yes.

Q What device is that?

A There are devices that are used for electrical stimulation inside the nose. I've worked on those devices.

Q And what are those devices?

ATTORNEY BRIGGS: Objection. Form.

A Can you clarify the question?

Q Well, you said, "There are devices that are used for electrical stimulation inside the nose. I've worked on those devices."

And so my question is: When you refer to those devices, what are you referring to?

A Devices that are designed and used specifically for the purpose of applying energy

inside the nose.

Q Do these devices have a name?

A I can't think of a generic name that would cover all these devices.

Q What type of energy -- let me strike that.

What type of electrical stimulation is being applied by these devices?

A So this would be -- in cases, examples would include devices where a -- one or more electrodes are inserted inside the nasal cavity. Those electrodes would be connected by a wire to a stimulator that is programmed and designed to deliver a prescribed amount of energy. That energy is then delivered to those electrodes and it enters the body.

Q What are those devices used -- strike that.

What type of conditions are those devices used to treat?

A Those devices can be used to treat neurological and psychiatric disorders.

Q Where are they positioned inside the nasal

cavity?

ATTORNEY BRIGGS: Objection to form.

A Can you clarify that question?

Q Do you know what the nasal cavity is?

A Yes.

Q And do you understand it to be kind of the anatomical structure that's inside your nose?

A That is my general understanding.

Q Okay. And the devices that you are talking about, do you know where they are applying energy inside the nasal cavity?

A I don't remember.

Q Do you know if they are applying energy inside the nasal cavity?

A Some of them are applying energy inside the nasal cavity.

Q Okay. But you do not know where they are applying energy inside the nasal cavity?

A I -- sitting here right now, I don't remember for specific devices where they position their electrodes inside the nasal cavity.

Q But you know they are positioned inside

the nasal cavity?
A Yes.
Q Do you work with companies on these devices?
ATTORNEY BRIGGS: Objection to form.
A Can you clarify the question?
Q Sure. Are you -- are there any companies that you consult with that are developing or using these devices?
A Which devices?
Q These devices we've been talking about that apply energy inside the nasal cavity?
A If the question is if I consult directly for companies that use devices that apply energy into the nasal cavity, I do not consult for any company that does that.
Q Are these devices used to apply energy elsewhere in the body?
ATTORNEY BRIGGS: Objection. Form.
A Which devices?
Q The devices we've been talking about that you -- that you say you've worked on that deliver

energy inside the nasal cavity? Do you have that in mind?

A Yes, I understand.

Q Okay. Are those devices used to apply energy elsewhere in the body?

A I think it would depend on the device.

Q Okay. Let's take a step back. We've been talking about devices that you say you've worked on that apply energy inside the nasal cavity, correct?

A Correct.

Q What kind of energy is being applied?

A These devices, the ones I was referring to, some of them would apply electrical energy.

Q What other types of energy do they apply?

A I don't remember if there were other types of energy.

Q When -- do you have some name that you give these devices?

A I don't have a name that I would broadly use to describe all these devices.

Q If you were working with a colleague and

you said, hey, I'm going to work on this project related to this device that's going to apply energy to the nasal cavity, what would you call that device?

ATTORNEY BRIGGS: Objection. Form.

A I don't think I understand the question.

Q Okay. When you say "all these devices," what are you referring to?

A I just want to be careful here because I'm -- I know we've been having this conversation, I'm not exactly sure which --

Q Sure.

A -- thing to refer to here.

Q Let me take a step back. I'm still on these devices that you say you've worked on that apply electrical energy inside the nasal cavity. So to start with, you don't know where they apply energy inside the nasal cavity; is that correct?

A I don't recall for specific devices where the electrodes are positioned inside the nasal cavity.

Q Do you know the electrode design for these

devices that are positioned inside the nasal cavity?

A I don't remember -- specifically for what you're asking me, I don't remember the -- the electrode design used in these devices.

Q Do you recall how many electrodes are used in these devices?

A I don't recall how many electrodes were used in these devices.

Q And you said these devices are intended to treat, I think you said, neurological and psychological issues; is that correct?

A Correct.

Q And you said these devices deliver electrical energy?

A Correct.

Q What type of electrical energy?

A Can you clarify what you mean by that?

Q Sure. Is there a particular frequency range of energy that these devices are intended to apply?

A I don't remember the frequency range used

by each one of these devices.

Q Are these devices intended to ablate tissue?

A Like which devices?

Q These devices you've been talking about that are, as you've stated, used to apply electrical energy inside the nasal cavity.

Are any of them intended to ablate tissue?

A I'm just a little bit unsure about the scope of your question. I'm not sure which devices.

Q I think I'm having a hard time --

A Okay.

Q -- figuring out what devices you're talking about, because we've been talking about devices that apply energy inside the nasal cavity, right?

A Yes.

Q Okay. So do you know the names of any companies that make these devices?

A Which devices?

Q The devices that you've been talking about

that you say apply -- okay. Let me take a step back.

You say you've worked on devices that apply electrical energy to the nasal cavity, correct?

A Yes.

Q How many different types of devices does that refer to?

A I don't remember.

Q And do these devices have a name?

A I don't know what general name I would use to describe all of them.

Q Are they stimulators?

A They apply electrical energy into the body.

Q Would you refer to them as stimulators?

A You could refer to some of them as stimulators.

Q For the ones that you would not refer to them as stimulators, what would you call them?

A I'm not sure.

Q When did you work on these devices?

A Again, when you're saying "these devices," I just want -- I just want to answer your questions very precisely. So can you just clarify what you mean?

Q I'm referring to the devices that you've been talking about that you say deliver electrical energy inside the nasal cavity?

A So I've been working on these device -- studying these types of devices for a long period of time.

Q Have you ever studied -- have you yourself ever studied these devices applying electrical energy to the nasal cavity?

A I have studied these devices.

Q My question is a little bit more focused. Have you ever evaluated the effects of these devices applying energy to the nasal cavity?

A Yes.

Q When was that?

A This was over, again, a broad period of time.

Q Have you ever -- sorry. Let's just take a

step back.

Do you understand what I mean when I say ablate tissue?

A I believe I do.

Q And do you understand ablation to refer to the destruction of tissue?

A Ablation can refer to the destruction of tissue.

Q Does ablation refer to anything else in your view?

A I believe that ablation generally refers to the destruction of tissue.

Q Okay. Have you worked on a device that is intended to ablate tissue?

A I've worked on technology that is used in devices that ablate tissue.

Q Have you worked on a device that is intended to ablate tissue?

A Can you clarify the question?

Q Sure. So you said I've worked on technology that is used in devices that ablate tissue. I assume that technology involves the

delivery of energy to the body.

My question is: Have you ever worked on a device that is intended to ablate tissue in the body, that is its outcome, that it is going to ablate tissue in the body?

A I've worked on technology that is supporting of that. I don't recall if I worked on technology or when I worked on technology with a medical indication associated with it --

Q Okay.

A -- for a patient.

Q Sitting here today, you do not recall working on a device where the indication for use is to ablate tissue; is that correct?

A I don't recall.

Q Okay. So sitting here today, you do not recall working on a device where the indication for use is to ablate tissue, correct?

A Just because I've been working on these technologies for many decades, and I've worked with a large number of companies on a variety of different products. So just there has been so

much work and that's why I want to be very careful in answering question that I don't recall -- I can't recall to you a specific instance where the label was ablation.

Q Can you recall a specific instance on working on a device that delivers radiofrequency energy to the body intended to ablate tissue?

A For the same reason I responded to you before, I do not recall working on a device with that medical label, though I worked on the technology that is used in those devices.

Q And when you say you worked on the technology that's used on those devices, are you are referring to the application of electrical energy to the body?

A Broadly speaking, that's what I'm referring to, yes.

Q Do you have any publications evaluating application of radiofrequency energy to the body?

A I have publications relevant to the application of radiofrequency to the body, yes.

Q My question was more do you have any

publications where you have evaluated application -- actual application of radiofrequency energy to the body?

A Can you repeat the question?

Q Do you have any publications where you have evaluated the application of radiofrequency energy to the body?

A Yes.

Q Which publications are those that you recall?

A I have publications that analyze the effects of high frequency energy applied into the body, and how that energy then results in the elevation of tissue temperature, which is a mechanism by which that energy would influence the body.

Q Now, before we were talking about how you have yourself never treated a patient for rhinitis, correct?

A Correct.

Q And you do not know what steps a physician would take before performing a treatment on a

nasal airway; is that correct?

ATTORNEY BRIGGS: Objection to form.

A Can you clarify the question?

Q Do you know what steps a physician would perform before -- strike that.

Do you know what steps a physician would take before performing a treatment on a nasal airway?

A I'm not a doctor or -- or a specialist in the performance of those treatments.

Q Okay. So my question was: Do you know what steps a physician would take before performing a treatment on a nasal airway?

A I think that question is very broad. I have some understanding of the steps that would be involved.

Q And where is that understanding from?

A An understanding of -- sorry.

Q What steps would be performed prior to performing a treatment on the nasal airway?

A I would have that understanding from my general education.

Q Here this case involves application of radiofrequency energy inside the nasal cavity, correct?

ATTORNEY BRIGGS: Objection. Form.

A Can you be specific about which matter you're referring to?

Q Sure. So broadly, let's take a step back.

Are you aware that Aerin Medical sells a device called the RhinAer device?

A I have not studied specific products sold by Aerin Medical.

Q Are you familiar with devices that deliver radiofrequency energy inside the nasal cavity?

A Yes.

Q Are you familiar with devices that deliver radiofrequency inside the nasal cavity that are intended to ablate tissue?

A What do you mean by familiar?

Q Do you know about devices that deliver radiofrequency energy inside the nasal cavity that are intended to ablate tissue?

A I know about devices that deliver energy

into the nasal cavity for ablating tissue.

Q Do you know what steps are taken by a physician before they perform a procedure where they deliver energy inside -- into the nasal cavity for ablating tissue?

A Since I'm not a doctor, I don't think I would have the same level of -- or the complete level of familiarity that a physician would have. I would understand some of those steps.

Q Okay. But you do not have the same level of knowledge that a doctor would have as to what steps are performed before delivering radiofrequency energy into the nasal cavity for ablation?

A There would be things that a doctor knows that I do not know.

ATTORNEY BRIGGS: Counsel, just about an hour. Do you want to -- if it's a good point.

ATTORNEY COHEN: Sure. We can take a break.

ATTORNEY BRIGGS: Okay.

(Recess.)

BY ATTORNEY COHEN:

Q Now, before earlier we were talking about devices that deliver energy into the body that are intended to ablate tissue.

Do you recall that?

A Yes.

Q And you had testified that you have never worked on a device that is -- that its indication for use is to -- or let me strike that.

You do not recall having worked on a device where the indication for use is to ablate tissue.

Do you recall that?

A I think so.

Q You have never designed a generator that is intended to deliver radiofrequency energy into the body; is that correct?

ATTORNEY BRIGGS: Objection to form.

A I have worked on the design of generators that are capable of delivering radiofrequency energy into the body.

Q Have you worked on the design of

generators that are intended to deliver radiofrequency energy into the body?

ATTORNEY BRIGGS: Objection to form.

A I have worked on the design of generators that among their intentional purposes could be the application of radiofrequency energy into the body.

Q Are you aware if any of those generators that you have worked on are used for the application of radiofrequency energy into the body?

A I'm not sure.

Q Have you ever designed a device that is intended to cause irreversible electroporation?

ATTORNEY BRIGGS: Objection. Form.

A I have.

Q What device is that?

A One of the devices that my laboratory has developed and worked on was a specialized device for producing electroporation.

Q What was the name of the device?

A I don't think it had a name. It was a

device we developed in my lab.

Q Where was it intended to apply energy?

ATTORNEY BRIGGS: Objection to form.

A Could you clarify the question?

Q You said you worked on a specialized device for producing electroporation, correct?

A Yes.

Q Okay. Where was it intended to produce electroporation?

A The device by its design could be used across different targets.

Q What targets was it designed to be used in?

A I don't think the design of it was specific to one target.

Q Okay. So was a device that could be used across the body to produce electroporation in various tissues?

A It could.

Q Was it intended to produce reversible electroporation or irreversible electroporation?

A The device could be used for either

irreversible electroporation or for reversible electroporation.

Q And when you were developing it, were you intending it to be used for irreversible or reversible electroporation?

A As I recall, the device would be used for the study of either reversible or irreversible electroporation.

Q Did you study the device's use for electroporation in the body?

ATTORNEY BRIGGS: Objection. Form.

A In my lab we focused on the design and the build of the device and its performance verification.

Q Okay. What was -- has that device been commercialized?

A The specific device that I've sort of been referring to here has not been commercialized.

Q Did you have a project name for it in your lab?

A Not really.

Q Who worked on it?

A This would have been worked on by technicians or graduate students in my lab.

Q Do you recall any specifically that worked on this?

ATTORNEY BRIGGS: Objection. Form.

A You're asking me their names?

Yeah.

Q Who were they?

A One of the people who worked on it is named Mohamad Fallahrad.

Q Do you recall any other names?

A I don't.

Q Was this device ever used on humans?

ATTORNEY BRIGGS: Objection. Form.

A I don't think so.

Q Was this device intended to be used on animals?

A Yes.

Q What type of animals?

A The design of the device allowed it to be used on different kinds of animals.

Q Were there any animals that you had in

mind when designing the device?

A I don't recall.

Q Was this device used on rats?

A So the device that specifically you're asking about here, when it was used in my own laboratory, we didn't use it on animals. We just used it up to the point of bench-top verification.

Q How did you perform bench-top verification of this device that was developed in your lab?

A One way you can perform bench-top verification is you would take the device, you would program it according to some setting, and then you connect it to a load. So essentially if you have an output of the device and you have the electrodes, you would put those electrodes across a load or, alternatively, you would take the wires themselves and put that across a load. So if you're using the wires themselves, an example of a load might be something as basic as a resister. Then if you're using the electrodes themselves, the load might be something like a phantom, which is essentially -- could be something like a

conductive jelly, almost like Jello with an electrolyte in it. It could even be a fruit.

And then the device is discharged across the load and you measure the performance of the device. And so you would be measuring things like the voltage at the output of the device. You would be measuring the current output coming out of the device. You would be looking at things like intensity, wave form, and you could also vary the load to see how the device performance would vary depending on the load. All the tests I've described to you don't require using an animal.

Q Do you know if the device that you developed in your lab that is intended to evaluate irreversible or reversible electroporation has ever been used on an animal?

A My understanding is it has been used on an animal.

Q What animal?

A I'm not sure.

Q Who used it on an animal?

A The device was used by a research team.

One site where that research team works is, I believe, the University of Massachusetts at Amherst.

Q And do you recall who on that research team used the device?

A I recall the name of the PI, yes.

Q And who is that?

A It's a professor. His first name is Govind. He has a rather long last name that I'm a little bit worried that I -- I can't pronounce his last name.

Q How do you spell his first name?

A G-O-V-I-N-D. That's his -- that's -- that's the -- maybe he has a more formal name he uses.

Q Is his last name S-R-I-M-A-T-H-V-E-E-R-A-V-A-L-L-I, Srimathveeravalli?

A That sounds about right, yes.

Q Okay. And so his research team has used this device that your lab developed on an animal?

A That is my understanding.

Q What is your understanding of the research he was performing?

A I'm -- my understanding of it is -- I'm just speaking here very generally -- is that he's very interested in reversible and irreversible electroporation. And he's interested in the optimization of wave forms, stimulation wave forms for that purpose.

Q And are the wave forms that are used for reversible electroporation different from the wave forms used for irreversible electroporation?

A Generally speaking, whether reversible electroporation is produced or irreversible electroporation is produced is going to depend on a lot of things, but one of those things is going to be the nature of the energy that the tissue is exposed to.

And so by designing the energy to have certain features, you could attempt to preferentially produce either reversible electroporation or irreversible electroporation.

Q Okay. And you said at the beginning of

that, whether reversible electroporation or irreversible electroporation is produced is going to depend on a lot of things.

What are some of the parameters that will affect whether you produce reversible or irreversible electroporation?

A Sure. So as I said, we can think of parameters that -- I think you're asking really the parameters related to stimulation, but in addition to that there would be parameters related to the anatomy and there would be parameters related to the cell types as well.

So on the stimulation side, the overarching -- one of the overarching parameters you want to be aware of is something called dose, which, you know, I've described in my publications. The dose are those features of the device that govern the delivery of energy into the body and so those would include the size of the electrodes, the placement of the electrodes, the intensity provided, whether it was voltage or current controlled -- the wave form, the pulse

pattern if you're using pulses, and so on.

So all of that would be something that is controllable and is described as a stimulation dose. And so it's within that space that you are sort of designing and going back to what I was saying before. One thing you could be designing for is to try to distinguish between reversible -- to preferentially produce reversible versus irreversible electroporation.

Q And when you say "preferentially produce reversible versus irreversible electroporation," is that because you produce reversible or irreversible electroporation when you're intending to produce the other. So let me rephrase that.

For example, if you design the device that is intended to preferentially produce reversible electroporation, is there the risk that you will also produce irreversible electroporation?

A Yes.

Q And when you are designing that device, at most you can design a device that is preferably trying to reversibly electroporate versus

irreversibly electroporate?

A Sorry, can you say that again?

Q Sure. If you are designing a device that you would prefer produce reversible electroporation, you cannot necessarily prevent irreversible electroporation from occurring?

ATTORNEY BRIGGS: Objection. Form.

A It depends what you mean. I believe you could design a device that under certain situations could be expected to lead to a irreversible electroporation and you could design a device that under some -- you would expect could lead to reversible electroporation. So I don't think it's a matter -- it's not out of control. It's something that can be designed for, if I understood the question.

Q Okay. Okay. But it is a risk that if you design a device that is intended to reversibly electroporate, it could also irreversibly electroporate?

ATTORNEY BRIGGS: Objection. Form.

A I think it would depend on the device.

Q And earlier you said whether a device will irreversibly or reversibly electroporate can also depend on the -- the cell type, for example.

Can you explain what you mean by that?

A The effects of energy, in general, on cells in the body will depend on the specific cells you are discussing. And so it's possible that you would be applying, let's say, a specific amount of energy, that you have cell type A and cell type B. And the way cell type A is not the way that cell type B will respond.

So in some situations, it's important to be aware of the -- of the cell type. I don't want to make the claim that it's always the case, but in some cases cell types may -- may show different responses to stimulation.

Q If you design a device that's intended to preferentially cause reversible electroporation, do you know how many cells would undergo irreversible electroporation?

ATTORNEY BRIGGS: Objection to form.

A I think that would very much depend on the

device and the use case, to even start to answer that question.

Q Okay. When did you develop this device?

ATTORNEY BRIGGS: Objection to form.

A The device --

Q Let me just -- I'll rephrase.

When did you develop the device we've been discussing that's intended to evaluate reversible or irreversible electroporation?

A So the device that we've sort of been focusing on for the past few minutes, I don't remember exactly, but generally I think we've been working on that device over the past few years.

Q Do you know when the project began to develop this device?

A I don't remember.

Q But --

A Sorry.

Q Go ahead.

A I would definitely say it was several years ago.

Q Was it before COVID began in 2020? I like

to use that as a kind of clear divider.

ATTORNEY BRIGGS: Objection. Form.

A I don't recall exactly, but I believe that we were working on this project before COVID.

Q Do you know when Govind at the University of Massachusetts used the device to evaluate electroporation in animals?

A So I can't speak precisely from memory to when he used the device. I also want to clarify that he also has a team, or had a team, at other institutions as well. I believe he was at Memorial Sloan-Kettering Cancer Center here in the city. So the device might have been -- a device might have been used there and a device might have been used at UMass as well. And --

Q Oh --

A Sorry, go ahead.

Q My question is more just, do you know when he -- strike that.

You know he evaluated and actually used the device that your lab developed, correct?

A That is my understanding, yes.

Q Do you recall when he evaluated and used the device that your lab developed?

A I don't recall the exact dates.

Q Was it in the last two years?

A I believe that as recently as the past two years he has been using the device.

Q Why did you develop this device to evaluate electroporation in cells?

ATTORNEY BRIGGS: Objection. Form.

A So the device that we were sort of talking about before was developed, if I remember correctly, the impetus for developing it largely came through discussions with Govind and his research interests.

Q And do you recall why he was interested in this type of device?

A As I recall it, he was generally interested in the ability to select between reversible and irreversible electroporation.

I don't recall the precise area that he was coming from, though he was at Memorial Sloan-Kettering Cancer Center, and so it's

possible it was related to cancer treatment.

Q And to evaluate reversible and irreversible electroporation, he wanted to have a device so he could test out different energy parameters on different cells to see what the outcome would be?

ATTORNEY BRIGGS: Objection to form.

A Yes.

Q Have you ever designed a device that is intended to deliver electroporation energy inside the nasal cavity?

ATTORNEY BRIGGS: Objection. Form.

A I've developed technology that is relevant for the delivery of electrical energy inside the nasal cavity.

Q Right, and I think we talked about that before, but my question is: Have you ever designed a device that is intended to cause electroporation to cells inside the nasal cavity?

ATTORNEY BRIGGS: Objection to form.

A I have not worked on a project where its primary objective was to generate electroporation

to create a device, for example, whose primary purpose was the generation of electroporation inside the nasal cavity.

Q Have you ever designed a device that is intended to ablate cells inside the nasal cavity using radiofrequency energy?

A I haven't in my lab worked on a project to design a device where its primary objective is to ablate tissue inside the nasal cavity.

Q Have you ever designed a device that is intended to ablate cells anywhere in the body using radiofrequency energy?

ATTORNEY BRIGGS: Objection to form.

A The -- yes.

Q Where in the body?

A The device I designed wasn't specific to a part of the body.

Q What was the device that you were referring to now? Sorry, let me strike that.

So as I understand it, you were talking about a device that was intended to ablate cells in the body using radiofrequency energy; is that

correct?

A I guess I was talking about a device that is capable of delivering energy that can be used to ablate tissue in the body.

Q Okay. Have you ever designed a device that is intended to deliver energy to ablate tissue in the body?

A If you're using intended in the sense of, you know, a medical label, then no.

Q Okay. I kind of want to go back to the reversible versus irreversible electroporation we were talking about before.

And you had said -- I asked you, when you're trying to cause reversible electroporation, do you know how many cells would possibly undergo irreversible electroporation.

Do you recall that discussion?

A Yes.

Q What are some of the parameters you would have to evaluate to understand whether reversible or irreversible electroporation occurred?

A So whether you produce reversible or

irreversible electroporation will depend on different factors, but a dominant factor would be the nature of the energy that is applied to the body and that therefore the cells are exposed to.

When you're looking at the parameters of that energy, one parameter that would matter would be the intensity of that energy. And that could be described in terms of current density or electric field at the target tissue, but certainly there is a -- you would have to consider a range of or a constellation of parameters in that analysis, not just one parameter.

Q Would that constellation of parameters include the amount of voltage applied?

ATTORNEY BRIGGS: Objection. Form.

A So if you're doing an analysis of whether you're going to produce irreversible or reversible electroporation from a -- from a device, one of the parameters that may be important to consider is the voltage produced by the device.

Q Would you also need to understand the number of pulses that are delivered with a

particular application?

ATTORNEY BRIGGS: Objection. Form.

A If you're studying whether you would produce reversible or irreversible electroporation, and as I said, the parameters of the energy then become very important, then the number of pulses would be -- could be a very important factor.

Q And if you're trying to treat a particular condition using reversible or irreversible electroporation, do you also have to understand how many cells would be affected by the irreversible or reversible electroporation?

ATTORNEY BRIGGS: Objection. Form.

A Can you clarify the question for me, please?

Q Sure. So if you are trying to treat a condition using -- let me -- for example, if you're trying to destroy a tumor using irreversible electroporation, would you have to evaluate how many cells are affected and undergo irreversible electroporation to understand whether

the therapy is effective?

ATTORNEY BRIGGS: Objection. Form.

A I don't think so.

Q How so?

A If I understood your question about the number of cells, that implies to me you're sort of counting the number of cells. And I -- I wouldn't think that in the process of designing a therapy you would necessarily need to count the number of cells.

Q Would you need to understand that you would reliably produce irreversible electroporation across a certain area?

ATTORNEY BRIGGS: Objection. Form.

A Can you -- sorry, can you give me the whole question?

Q Sure. If you were, for example, trying to destroy a tumor, would you need to understand whether you were reliably causing irreversible electroporation across that entire tumor?

ATTORNEY BRIGGS: Objection. Form.

A I'm not sure I can answer that. The

question is a little broad. So I guess I'm not sure how to answer that.

Q Okay. That's fine. We can move on.

So is Govind still using your -- your device that you developed in your lab to evaluate reversible and irreversible electroporation?

A My understanding is he is still using a device that we developed in my lab.

Q And he is using it to evaluate whether he will cause and -- strike that.

He is using it to evaluate whether he will cause reversible or irreversible electroporation?

ATTORNEY BRIGGS: Objection. Form.

A So I'm not directly involved in his experiments on animals. So my understanding is that that is a question that he is interested in.

Q All right. I'm handing you Exhibit 2002 from IPR2024-00278.

Now, Dr. Bikson, this is a copy of your CV, correct?

A (Document review.)

Yes.

Q Okay. Can you turn to Page 24 on the bottom of, we'll say, 24 of 84. Actually, let's go to Page 25.

A I'm on Page 25.

Q Okay. Do you see the section titled: "Litigation support"?

A I do.

Q Do you -- you list a number of entries below that.

Do you see that?

A I do.

Q Do the entries starting from Brown against the Mount Sinai Medical Center up to Daniel Richmond versus Southern California, do these matters have anything to do with intellectual property?

A Some of them relate to intellectual property.

Q Which ones?

A There is one that's at the bottom of page -- yes, at the bottom of Page 25, there is one that starts with United States International

Trade Commission Washington D.C., matter of Certain Noninvasive Aesthetic Body Contouring Devices and Components.

Q Hold on. Let me stop you because I was asking specifically about the entries from Daniel Richmond versus Southern California, right above that up to the top of the list.

A Oh, okay. Okay.

Q Let me start over.

Under litigation support for the entries from Brown against the Mount Sinai Medical Center up to Daniel Richmond versus Southern California Edison Company, do any of these relate to intellectual property?

A Yes.

Q Which one?

A Omand vs. Zabara, related indirectly -- related to intellectual property.

Q How did it relate to intellectual property?

A That was the matter we were discussing earlier where there was, as I remember it, there

were questions related to patents and inventions. And the -- the facts or issues and the time frame involved in the creation of those inventions.

Q And you were deposed in that case?

A I recollect being deposed.

Q For the entries that we're discussing, Brown against the Mount Sinai Medical Center up to Daniel Richmond versus Southern California Edison Company, do you recall being deposed in any other matter that's listed?

A I believe I was deposed in a matter that's labeled Superior Court of the State of California Los Angeles versus Southern California Edison Company.

Q What was that case about?

A That -- if I remember correctly, that case was about concerns about individuals who had been exposed to electricity, accidental exposure to electricity.

Q And do any of these other matters that we've been discussing from Brown up to Superior Court of the State of California, County of Los

Angeles, involve intellectual property other than Omand vs. Zabara?

A Not that I recall.

Q So then starting with United States International Trade Commission and then going through on Page 26 up to Aerin Medical and the Foundry, do you see that?

A I do.

Q Are these all intellectual property matters?

A So the -- the item, just to get it clear. So the first item which is U.S. -- the one, Trade Commission, that one was -- I remember that one was IP related.

The second item, Lumenis versus BTL, my recollection was that one was intellectual property related. The HiDow International matter, I believe that was intellectual property related. Wave Neuroscience vs. PeakLogic was intellectual property related.

The Serendia matter, I'm not sure I was retained on that matter, but I don't recall

actually getting to do any work on it so I just listed it here for completion. And then also you have the current matter.

Q For the HiDow International vs Wheellock, what do you recall was the subject matter of your consulting?

A The -- as I recall, it related to TENS, which is transcutaneous electrical nerve stimulation devices. These are wearable or hand-held devices that apply energy to the body through electrodes positioned on the body. They're used for different purposes, including management of pain, and that was the general area of -- of that matter.

Q What were you asked to evaluate in that matter?

A I don't remember exactly. So I don't want to speculate.

Q Did you ever meet Scott Wolf as part of your work on the International Trade Commission case?

ATTORNEY BRIGGS: Objection. Form.

A Scott Wolf?
Q Does that name ring a bell?
A That name doesn't ring a bell, but, you know, I've been -- I've interacted with a lot of people in my career.
Q Do you recall if you met any of the founders of the Zeltiq organizations that are listed?
ATTORNEY BRIGGS: Objection. Form.
A I don't recall meeting the founders of the Zeltiq corporation.
Q Now, for the cases that involve intellectual property that we've been talking about, apart from this matter, did any involve devices intended to ablate tissue?
A Yes.
Q Which one?
A As I recall, the -- and again, it's been a few years since, as best as I recall, the Brown against Mount Sinai included ablation.
Q What type of case was that?
A If I remember correctly, that had to do

with an individual who had been injured during a medical procedure.

Q And the medical procedure involved causing an ablation?

A It's been a while, but as I recall, the medical procedure was intended to produce a controlled ablation, but instead it resulted in an explosion inside the person's body.

Q Where was the ablation supposed to occur?

A It would have been somewhere in their throat as I -- again, as I recollect it.

Q And what were you asked to evaluate there, as best you can recall?

A As best as I recall, my analysis there focused on the device itself, either whether the device -- if the device had malfunctioned or if it had been used according to its intended use. It has been a while though, so I don't remember all the details.

Q Do you recall what your conclusion was?

A I don't, but it was certainly the case that obviously something had gone horribly wrong.

Q What year was that case?

A I see that it's -- the dates are not marked here. Possibly about a decade ago.

Q Was that the first litigation matter that you recall working on?

A I believe so, but I'm not entirely certain that the items that I'm listing here are all in the exact chronological order.

Q Apart from that matter and apart from the Aerin Medical matter that's listed, do any of the other matters under litigation support involve devices that are intended to ablate tissue in the body?

A I don't remember the precise details, but I believe that the matter with United States International Trade Commission had aspects of it that were related to ablation.

Q What type of energy was delivered in that -- in the International -- sorry, strike that.

What type of energy was delivered by the devices that were the subject of the International

Trade Commission case?

ATTORNEY BRIGGS: Objection. Form.

A So to the best of my recollection, it's also a little bit complicated, because as I remember it, there were many patents and devices at issue there. Some of those -- and -- but what -- what my contribution was, was that these devices were related to the application of energy to the body.

Q Do you recall what type of energy was being applied to the body?

ATTORNEY BRIGGS: Objection. Form.

A As I recall, one type of energy was energy that was generated, produced in the body through magnetic stimulation using a coil.

And as best as I recall, another form of energy was energy applied to the body using electrodes. That was RF energy. There may have been other types of energy as well.

Q And were the RF energy electrodes intended to ablate tissue?

A As I recall, one use of those RF

electrodes specifically was for the purpose of ablation.

Q And do you recall where they were used in the body?

A I don't recall specifically, but based on what I remember about the case, this would have been on the surface of the body.

Q Like through skin?

A Correct. But, again, they were -- there were a lot of patents. As you know these patents can cover a very wide range of material, but generally what I remember as far as what I was working on the case, these were devices that were applied through the skin.

Q Were they intended to ablate tissue at the skin's surface?

A I don't recall.

Q And -- but they weren't -- those devices that were at issue in that case were not applying radiofrequency energy inside the nasal cavity; is that correct?

ATTORNEY BRIGGS: Objection. Form.

A I don't recall if that -- if application within the nasal cavity would have been within the scope of the materials in that case.

Q Now, below that you have a number of patent applications and patents listed. Do you see that?

A I do.

Q Are any of the patents that you list directed to a device that is intended to ablate tissue using the delivery of radiofrequency energy?

A I don't recall.

Q Are any of the patents that you list directed to a device that is intended to be inserted into the nasal cavity?

ATTORNEY BRIGGS: Objection to form.

A I don't remember.

Q To the best of your recollection, none of the patents are directed to a device that's intended to be inserted into the nasal cavity; is that correct?

ATTORNEY BRIGGS: Objection. Form.

A I don't recall one way or the other.

ATTORNEY COHEN: Do you have copies of his declarations or --

ATTORNEY BRIGGS: I'm good.

ATTORNEY COHEN: -- printouts.

BY ATTORNEY COHEN:

Q All right. So now I'm going to turn to your declarations that were offered in the Aerin IPRs.

A Okay.

Q And we're going to start with the declaration that you offered in IPR2024-00277 challenging or patent number 11,241,271.

A I'm sorry, maybe if it would be all right, could we take a break now?

Q Sure.

A Okay.

Q Yeah, that's fine.

ATTORNEY BRIGGS: Perfect stopping point.

(Recess.)

BY ATTORNEY COHEN:

Q So before the break we started looking at

the declaration that you offered in IPR2024-00277 on Patent Number 11,241,271.

You have that in front of you, correct?

A I have my declaration, yes.

Q Okay. Now, you have a copy reproduced in your declaration on Page 16 of the independent challenged Claim 1.

Do you see that?

A I see it.

Q Okay. And that's in paragraph 48, correct?

A Yes.

Q And this is, as you say, the only independent claim of the '271 patent and it starts with "a method for treating a nasal airway to reduce mucous production."

Do you see that?

A I see that.

Q And a physician would practice a method for treating a nasal airway to reduce mucous production; is that correct?

ATTORNEY BRIGGS: Objection. Form.

A I understand that that is something a physician could practice, yes.

Q You would not perform a method for treating a nasal airway to reduce mucous production; is that correct?

ATTORNEY BRIGGS: Objection to form.

A I wouldn't perform any medical treatment on a patient.

Q Okay. And that -- this claim is directed to a medical treatment being performed on a patient, correct?

ATTORNEY BRIGGS: Objection to form.

A My understanding that -- as it's written, that it's a method for treating the nasal airway to reduce mucous production.

Q And so that is a medical treatment being performed on a patient, correct?

ATTORNEY BRIGGS: Objection to form.

A Yeah, I understand that that can refer to a medical treatment performed on a patient.

Q Do you know what type of physicians would perform the method that's described in challenged

Claim 1?

A You mean what would be their specialty?

I don't know among the medical specialties who would, you know, be licensed to do these type of procedures.

Q Okay. Have you heard of sinus surgeons?

A I have not.

Q Have you heard of otolaryngologists?

A I've heard that term, yes.

Q Would an otolaryngologist perform a method for treating a nasal airway to reduce mucous production using the steps in challenged Claim 1?

ATTORNEY BRIGGS: Objection to form.

A I don't know.

Q Okay.

A I don't know if they would be allowed to do that procedure.

Q Now, you offer an opinion starting on Page 11 to Page 13 on the definition of a person of ordinary skill in the art.

Do you see that?

ATTORNEY BRIGGS: Objection to form.

A On Page 11 to 13 is the section: "Person of ordinary skill in the art."

Q And in paragraph 38, you say, "I disagree with part 2 of petitioner's definition."

Do you see that?

A Yes.

Q And in paragraph 41, you offer your opinion on the correct definition of a person of ordinary skill in the art, correct?

A Yes.

Q In forming the opinion that's in paragraph 41, what did you consider?

ATTORNEY BRIGGS: Objection to form.

A In trying to understand the qualifications for a POSITA, I considered the -- the patent, the specifications and the claims.

Q And in your definition, you remove as a category of experience the clinical use or testing of medical devices; is that correct?

ATTORNEY BRIGGS: Objection. Form.

A The -- the petitioner's definition, the clause 2, is "at least three years of experience

in the clinical use, design, development, and/or testing of medical devices including medical devices to deliver energy to the tissue."

And then the definition I proposed is "at least three years of experience in the design and development of medical devices, including medical devices that deliver energy to tissue."

Q So in your definition, you removed the three years of experience in the clinical use and/or testing of medical devices, correct?

ATTORNEY BRIGGS: Objection. Form.

A I see that clinical use was removed and/or testing was removed.

Q Okay. And we just discussed that the claims are directed to the clinical use of a device, correct?

ATTORNEY BRIGGS: Objection. Form.

Q It's on Page 16.

A I understand that the claims are directed to a method that can be used as part of a medical treatment, yes.

Q And it's your opinion that clinical use

should not be part of the POSITA definition?

A In my definition it's three years of experience in the design and development of medical devices.

Q Even though the claims are directed to the clinical use of a device, correct?

A Yes. The --

Q You say that this includes medical devices that deliver energy to the -- to tissue. Actually, let me just state the whole thing: "At least three years of experience in the design and development of medical devices, including medical devices that deliver energy to tissue."

Do you see that?

A Yes.

Q So in your opinion, the experience in the design and development of medical devices is not limited to medical devices that deliver energy to tissue.

Do I understand that correctly?

ATTORNEY BRIGGS: Objection to form.

A I believe that the appropriate background

of a POSITA would be one that includes medical devices that deliver energy to the tissue.

Q And my question is: The design and development that you include here of medical devices is not limited to medical devices that deliver energy to tissue; is that correct?

A If I understand your question, the first part, the design and development of medical devices is all medical devices, but the second part is including medical devices that deliver energy to the tissue.

Q Okay. And I guess my question is, the "at least three years of experience in the design and development of medical devices" could include medical devices that do not deliver energy to tissue?

A Some of that experience could be about other things.

Q Okay. Are you familiar -- I think we talked about this earlier. Are you familiar with the products sold by the patent owner Aerin Medical?

A I'm not familiar with those products.
Q Have you in the course of your career ever reviewed instructions for use that are provided with medical devices to physicians who use those devices?
ATTORNEY BRIGGS: Objection to form.
A I have reviewed instructions for use for medical devices that are provided to clinicians who use medical devices.
Q What's your understanding of how instructions for use are used?
ATTORNEY BRIGGS: Objection to form.
A I'm not sure the question.
Q What is your understanding of the purpose of having instructions for use?
ATTORNEY BRIGGS: Objection. Form.
A The instructions for use would be to support the -- the appropriate use of the devices.
Q And are the instructions for use typically used by doctors and other clinicians that are using a device?
ATTORNEY BRIGGS: Objection to form.

A Sorry, can you say the question again?
Q Sure. The instructions for use that are provided with the device are intended to be read and understood by doctors and clinicians that are using that device; is that correct?
ATTORNEY BRIGGS: Objection to form.
A There are -- there are instructions that are provided with a device, and, again, depending on the device, some of those instructions would be for the person operating the device, which could be a clinician.
Q Exhibit A.
(Bikson Exhibit A, Instructions for Use RhinAer Stylus, marked for identification.)
Q So I'm handing you what's been marked as Bikson Exhibit A. Have you ever seen this before?
ATTORNEY BRIGGS: Objection. Form.
A (Document review.)
I have not seen this before.
Q Okay.
A I don't recall seeing this before.
Q Okay. For the record, these are

instructions for use RhinAer stylus that I pulled from the Internet.

Now, on Page 3 -- of the instructions I just sent, I just gave you.

A Okay.

Q It's three of 12. Now, you've reviewed instructions for use before, correct?

ATTORNEY BRIGGS: Objection to form.

A I have reviewed instructions for medical use of devices.

Q Okay. Now do you see on Page 3 there is an intended user section. It says, "The intended users of the RhinAer stylus are physicians, including otolaryngologists, maxillofacial surgeons, and other physicians specialized in nasal procedures."

Do you see that?

A I see that.

Q And I think we covered earlier, you don't know what other physicians specialized in nasal procedures would cover, correct?

A I don't.

Q Now, if you go back to Page 2, you'll see that there is a description of the device, correct?

ATTORNEY BRIGGS: Objection. Form.

A I see the device description section.

Q Okay. And this is saying that "the RhinAer stylus is a disposable hand-held device capable of delivering bipolar energy to tissue," correct?

A I see that.

Q And then in the next paragraph, it talks about the stylus, and it says in the second full sentence, "an array of bipolar electrodes is positioned on a nonconductive tip," correct?

A I see that.

Q So this is communicating to intended users aspects of the device including that it has bipolar electrodes, correct?

ATTORNEY BRIGGS: Objection to form.

A It's a description of the device.

Q And the instructions for use are intended to be used by the people using the device,

correct?

ATTORNEY BRIGGS: Objection. Form.

A Instructions for use would be generally directed for the people who are using the device.

Q Okay. And then also on Page 2, below the pictures of the device and the electrodes, it also talks about how the stylus treats symptoms of chronic rhinitis.

And you can read that paragraph if you like.

A I'm sorry, which? The third paragraph, you mean?

Q The third full paragraph on Page 2 that starts "The RhinAer stylus treats symptoms."

A Sure.

(Document review.)

I see that.

Q So this is describing how low doses of radiofrequency energy destroy tissue, correct?

ATTORNEY BRIGGS: Objection. Form.

A I guess it's a description of the device and how low power radiofrequency energy generates

heat, creating a coagulation lesion.

Q And this entire document is intending to be directed to physicians who are using the RhinAer stylus, correct?

ATTORNEY BRIGGS: Objection to form.

A I understand that this document is directed towards individuals who are using the device that it's referring to.

Q You can set that aside.

Going back to your declaration for the '271 patent, you offer the opinion that one of the references relied on in the petition, Stern, does not have bipolar electrode pairs; is that correct?

ATTORNEY BRIGGS: Objection to form.

A Can you just point me to where you are in the document?

Q Yeah, if you can go to Page 24.

A I'm at Page 24.

Q Okay. And in paragraph 64, you say, "I disagree with petitioners that Stern teaches the claimed bipolar electrode pairs. Rather, Stern teaches a device comprising at most a single pair

of bipolar electrodes."

Do you see that?

A I do.

Q Okay. You also offer similar opinions in your other declarations that Stern does not disclose multiple pairs of bipolar radiofrequency electrodes; is that correct?

ATTORNEY BRIGGS: Objection. Form.

A Stern does not disclose the elements in the claim that relate to those issues.

Q And your position is that Stern does not disclose more than one pair of bipolar electrodes, correct?

ATTORNEY BRIGGS: Objection. Form.

A Yes. Stern teaches a device comprising at most a single pair of bipolar electrodes.

Q And that's because in paragraph 68, you have the opinion that there are no pairs when all of the switches are open in Stern's device, and therefore a pair is only formed when certain switches are closed, correct?

A A bipolar pair is only formed in Stern

Figure 15 when certain switches are closed.

Q Can you turn back to Page 16 of this declaration?

A I'm now on Page 16.

Q Okay. What we see is the challenged Claim 1 from the '271 patent that's reproduced, correct?

A Yes.

Q And we were talking earlier, it's a method for treating a nasal airway, correct?

A The first element is a method for treating a nasal airway.

Q And it includes three method steps, "contacting, applying, and removing."

Do you see that?

ATTORNEY BRIGGS: Objection. Form.

A I see 1A starts with contacting; 1B starts with applying; and 1C has -- starts with removing.

Q Okay. And focusing specifically on limitation 1A, it talks about "contacting a treatment element of a nasal airway treatment device directly with nasal mucosa of the nasal

airway, wherein the treatment element comprises two rows of bipolar electrode pairs."

Do you see that?

A I do.

Q And 1B says "applying radiofrequency energy with the bipolar electrode pairs through the nasal mucosa to a target tissue underlying the nasal mucosa," correct?

A Yes.

Q Now, under the -- under Claim 1, when the treatment element is being -- is -- that first step is being performed where you are contacting a treatment element of a device directly with nasal mucosa, no radiofrequency energy is being delivered by that device, correct?

ATTORNEY BRIGGS: Objection. Form.

A I don't know if that's necessarily the case.

Q In your opinion, would you already be applying radiofrequency energy before you contact nasal mucosa?

ATTORNEY BRIGGS: Objection. Form.

A I don't know if you're asking what I would do or what's sort of --

Q I guess --

A -- reflected in the claim.

Q -- in your opinion, what's required by the claim?

ATTORNEY BRIGGS: Objection to form.

A In my opinion, what's required by the claim is -- is contracting a treatment element with the remaining terms. Then it's required that you apply the radiofrequency energy with additional qualifications. And then it's required that you remove the treatment element.

Q Okay. So in your view, no radiofrequency energy under this claim is being applied when you contact the treatment element with the nasal mucosa, correct?

ATTORNEY BRIGGS: Objection to form.

A Are you referring to something specific in my report or are you just asking me in general?

Q I'm -- I'm asking you in general. In your -- related to your opinions you've offered in

this declaration, is it your opinion that there is any radiofrequency energy being delivered when you contact the treatment element with nasal mucosa?

ATTORNEY BRIGGS: Objection. Form.

A I don't recollect providing an opinion on that. If you could point me to where in my report I provided an opinion on that.

Q I guess my question is: In your opinion if a device like Stern does not have bipolar electrode pairs because its switches are open and you only form pairs when the switches are closed, is a device that is not applying radiofrequency energy, does it have two rows of bipolar electrode pairs? Or is a bipolar electrode pair only formed when energy is being delivered?

ATTORNEY BRIGGS: Objection. Form.

A I'm sorry. I heard multiple questions. Can you just --

Q Yeah, let me -- I think the last question there is what I'm really curious about.

It's your opinion that Stern does not have bipolar electrode pairs, correct?

A Stern has, at most, a single pair of bipolar electrodes.

Q And that's because it's only delivering energy through one pair at a given time, correct?

A Stern delivers energy through, at most, a single pair at a given time.

Q And that's why it does not have multiple pairs of bipolar electrodes, in your opinion?

A Stern does not teach bipolar electrode pairs.

Q Because it, in your opinion, does not teach delivering energy through multiple pairs at the same time, correct?

A I think that if Stern did teach delivering energy through multiple pairs at the same time, then that would be bipolar electrode pairs.

Q Okay. And so my question going back to the claim on Page 16, will a device that's not delivering any radiofrequency energy have two rows of bipolar electrode pairs?

A A device that is not delivering any electrical energy can have two rows of bipolar

electrode pairs.

Q How would it have two rows of bipolar electrode pairs?

A So, for example, in my report on Page 30, I point to Figure 8F, which is from the patent. And there you can see a device which has two rolls -- two rows of bipole electrode pairs.

Q Okay. Those are not actually going to be performing as bipolar pairs until energy is delivered, correct?

A I don't know what you mean by performing.

Q Will they -- you would agree that when this device is taken out of the box, energy is not being delivered, correct?

ATTORNEY BRIGGS: Objection to form.

A I think you're asking me when the device is, let's say, first delivered and is taken out of the box and it's not being powered is any electrical stimulation being delivered through electrodes. So not at that point.

Q But this device still, in your opinion, would have bipolar electrode pairs?

A The device shown in Figure 8F shows a device with two rows of bipolar electrode pairs.

Q Now, in Stern, and I'm not talking about the part of your opinion about the two rows, I'm just talking about the bipolar electrode pairs. If we go to Page 28, okay, so you see that there in Figure 19, there is an array of electrodes, correct?

ATTORNEY BRIGGS: Objection to form.

A I see the -- the -- I see the devices that are marked in -- there is, like, two Figure 19s.

Q Okay. And it's your opinion that this doesn't have multiple bipolar electrode pairs because the pairs are not delivering energy at the same time, correct?

A The -- so I just want to clarify that the -- the figure -- Figure 19 that's being shown here is not directly the way it was in the original patent. The purple stuff that you're seeing here in the figures were additions made after the fact.

So I'm sorry. So if you can just repeat

the question.

Q Okay. So my question is: There are four electrodes, setting aside the purple annotations, Figure 19 in Stern shows four electrodes, correct?

ATTORNEY BRIGGS: Objection to form.

A Figure 19, where it's the three -- my understanding is that those -- that 322 label refers to electrodes.

Q Okay. And it's your opinion that Stern does not disclose multiple pairs of bipolar electrodes because it doesn't disclose delivering bipolar energy through four electrodes at the same time?

ATTORNEY BRIGGS: Objection to form.

A If Stern had -- it did not, but if it had disclosed delivering energy through four electrodes at the same time, then it might have shown multiple bipolar pairs.

Q Okay. So then if we look at the device on Figure 8F which you were referring to earlier on Page 30.

A Yes.

Q If each of these pairs were individually energized, would that device have multiple bipolar electrode pairs?

ATTORNEY BRIGGS: Objection to form.

A Can you clarify what you mean by individually?

Q Sure. Let's say you deliver energy through one pair, then you turn that off; then you deliver energy through another pair of electrodes, then you turn it off; and then you deliver energy through a third pair and you turn it off; does that device have multiple bipolar electrode pairs?

A If the device in Figure 8F was used according to your description, from what I -- from what I understand your -- your hypothetical, that device would have multiple electrode pairs.

Q Sorry. It would have multiple electrode pairs?

A Yes.

Q Why would that device have multiple electrode pairs but Stern does not?

A So if you look at Figure 8F, you'll see

that there is two rows. And even if we just look at one row, you'll see where it's marked positive negative, positive negative, positive negative; so the positive and negative, you can say -- if you -- each positive and negative is a bipolar pair. So now you have three bipole pairs. So just in a single row in Figure 8F you can see that there are multiple pairs, and also multiple pairs in a row.

Q Right. I guess my question is: Setting aside the rows, it is your opinion that Stern does not disclose multiple pairs of bipolar electrodes, correct?

A Stern does not disclose multiple pairs of bipolar electrodes.

Q Okay. And it's your opinion that it doesn't do that because it only delivers energy through a single pair at a given time, correct? And that's in paragraph 68 and in 69.

A I'm sorry, could you repeat the question?

Q Sure. My question was: It's your opinion that Stern does not disclose multiple pairs of

bipolar electrodes because, in your opinion, it only delivers energy through a single pair at a given time, correct?

A I think it would be more correct to say that if Stern had shown delivery of energy through multiple pairs of bipolar electrodes at the same time, then Stern could be showing multiple bipolar electrode pairs.

Q But it has to show that you would deliver energy through multiple pairs at the same time?

ATTORNEY BRIGGS: Objection. Form.

A I don't think that's the way I described it in my report.

Q Well, I'm just -- I think that's what you were just saying. If Stern had shown delivery of energy through multiple pairs at the same time, then Stern could be showing multiple bipolar electrode pairs, correct?

A Yes, I think that's what I just said.

Q Okay. Because you agree that Stern shows -- if we look at Figure 15 on Page 24, Stern shows four different electrodes, correct?

A Figure 15, my understanding is that the elements that are labeled 220, 222, 224, and 226 refer to electrodes.

Q Okay. And Stern teaches that you could pair -- you agree Stern teaches you could pair, for example, 220 and 222, correct?

A And I -- I don't want to -- I know -- I want to answer your question, but then I wouldn't mind having another restroom break.

ATTORNEY BRIGGS: You have to answer the question.

A Yeah, so I just want to -- go ahead.

Q Okay. You agree -- just a couple more questions, then I promise, just two more minutes.

A Sure. Sure.

Q You agree Stern teaches you could pair 220 and 222, correct?

A You could pair 220 and 222?

I believe that if -- if switches 248 and 236 were closed, then you would pair electrodes to 220 and 222. If that's what you're asking.

Q Yes. And 224 and 226 could also be

paired, correct?

A So if you were to start over and you were to close -- if all the switches were open and then you close two other switches, you could pair 224 and 226. Sorry, yeah.

Q And that's a different pair than 220 and 222, correct?

A 224 and 226 are different electrodes than 220 and 222.

ATTORNEY COHEN: All right. We can take a quick break.

THE WITNESS: Okay.

(Recess.)

BY ATTORNEY COHEN:

Q I'm handing you Neurent Exhibit 1033. This is the Stern patent that we've been talking about.

This is the Stern patent that you reviewed in providing your opinions in this case, correct?

A Yes.

Q Okay. And we have been talking a lot about how it's your opinion that Stern does not

disclose bipolar electrode pairs, correct?

A Stern teaches at most a single pair of bipolar electrodes.

Q And that's, in your opinion, because it teaches delivering energy through a single pair at a given time, correct?

A Stern does teach delivering energy through a single pair.

Q Okay. You agree that Stern shows different pairs of electrodes, correct?

A I agree that Stern shows that different pairs can be stimulated.

Q Okay. And the why it doesn't disclose multiple pairs is because those pairs are not being stimulated at the same time?

A I think I would say that if Stern had shown that multiple pairs were being stimulated at the same time, then Stern would have shown multiple bipolar electrode pairs.

Q Okay. And because Stern does not say to stimulate multiple pairs at the same time, it does not disclose multiple bipolar electrode pairs,

correct?

ATTORNEY BRIGGS: Objection. Form.

A If Stern had shown stimulation of multiple bipolar pairs at the same time, then Stern would have demonstrated bipolar electrode pairs, multiple bipolar electrode pairs.

Q Okay. Can you turn to Column 13 in Stern. And can you go to around line 39. And read that paragraph that begins, "The embodiment of Figure 15 not only provides a choice."

Do you see that?

A (Document review.)

Yes.

Q And do you see that paragraph, "The embodiment of Figure 15, not only provides a choice between monopolar and bipolar operations, but also provides flexibility within the bipolar operation so that any pair or any combination of pairs of electrodes may be utilized together."

Do you see that?

A I see that.

Q Okay. So there it is saying that you can

use a combination of pairs together, correct?

ATTORNEY BRIGGS: Objection. Form.

A It's saying -- it reads, "any pair of any combination of pairs may be utilized together."

Q Okay. So there it is saying you can use pairs of electrodes together.

ATTORNEY BRIGGS: Objection. Form.

Q Correct?

A It says, "Or any combination of pairs of electrodes may be utilized together."

Q Okay. And so that's talking about using more than one pair of electrodes together, correct?

A What Stern is describing there, as I understand it, could be selecting, for example, one pair of electrodes, and then through closing switches, and then you can separately start with a situation where you have the switches are open and you could close switches. So that would activate a pair separately from the first pair.

Q Okay. So you would be using two different pairs of electrodes together, correct?

ATTORNEY BRIGGS: Objection. Form.

A I don't think he describes using -- I wouldn't describe it that way.

Q Okay. But I guess in the combination of pairs, it's your opinion that Stern is saying activate one pair of electrodes and then activate a second set of electrodes, correct?

A Stern is saying that you can at one point choose to activate a single pair of electrodes. You could then open the switches. It's then possible to activate another different pair of electrodes.

Q Okay. And so if a device only delivered RF energy through a single pair of bipolar electrodes at a time, in your opinion that device would not have multiple bipolar electrode pairs, correct?

ATTORNEY BRIGGS: Objection. Form.

A Are you referring to something specific in my report?

Q Well, it's your opinion with Stern, correct?

ATTORNEY BRIGGS: Objection. Form.
A Sorry, can you repeat the question?
Q Sure. You agree Stern has at least two different pairs of bipolar electrodes, correct?
ATTORNEY BRIGGS: Objection. Form.
A I think we've discussed that Stern allows you to select one pair of electrodes. And then if you return to the situation where the switches were open, you can select then another single, different pair.
Q Okay. And those are, as we talked about, two different pairs, correct?
A The electrodes selected in the example we just went through, if I understand it, you could select, for example, 220 and 222. But in another example, you could select 224 and 226.
Q And Stern discloses that you could select 220 and 222 and then select 224 and 226, correct?
ATTORNEY BRIGGS: Objection. Form.
A I'm not sure what you mean by, "and then."
Q We were just talking about the line where Stern says you can -- you can use combination --

"any combination of pairs of electrodes may be utilized together," correct?

A I see that.

Q Okay. So there what we were talking about, in your opinion, you could select one pair and then use a second pair.

A You could select one pair, apply energy to that one pair. You could separately select another pair and apply energy to that other pair.

Q Okay. And so that would involve two different pairs of electrodes, correct?

A The pairs used in the first case may not be the pairs used in the second case.

Q Okay. So that is two different pairs of electrodes, correct?

A The pairs used in the first case do not have to be the same as the pair -- bipolar pair used in the second case.

Q Okay. So that is two separate pairs, correct?

ATTORNEY BRIGGS: Objection. Form.

A They do not have to be the same pairs in

the first case as in the second case.

Q Okay. And I guess my question is more: Then that would include two pairs of bipolar electrodes, one pair in the first case, and one pair in the second case.

But there are two pairs, correct?

A If you were to -- we talked about a first case where you had one pair. We talked about a second case where you also had one pair. If you were to then add those up, you would get to the number two.

Q Okay.

A That would be two separate cases though.

Q What do you mean two separate cases?

A In the one case you have one pair. In another case you have a different pair.

Q Okay. And Stern teaches that you could use that combination of pairs together, correct?

ATTORNEY BRIGGS: Objection. Form.

A Stern writes, "bipolar operations that any pair or any combination of pairs of electrodes may be utilized together."

But as I've explained, what Stern is about is just selecting a single pair, and then you can disconnect.

Q And be energized through a pair?

A You could start over and select a different pair and energize that pair, yes.

Q When you say "start over," what do you mean?

A You start from the condition -- as Stern explains where all the switches are open. When all the switches are open, there is no bipolar electrode pair in Stern. And then Stern explains that you close two switches to form a pair. Which switches you close will determine the pair. So you could have a situation where you close a given two switches and produce a given pair. You could have a different situation where you close a different two switches and then you would activate a different pair, but obviously in each one of those cases you would just have one pair.

Q Okay. So delivery of energy through a single bipolar pair at a time, in your opinion,

does not involve multiple bipolar electrode pairs, correct?

ATTORNEY BRIGGS: Objection. Form.

A Can you repeat the question?

Q Delivery of energy through a single bipolar pair at a time, in your opinion, even though there might be different bipolar pairs, does not involve multiple bipolar electrode pairs, correct?

ATTORNEY BRIGGS: Objection. Form.

A My analysis is -- well, we're talking maybe specifically now about Stern. If Stern had shown the delivery of energy to two or more pairs of bipolar electrodes, then in that case Stern would be showing multiple bipolar electrode pairs.

Q If you turn back to your declaration and we go to Page 30 where you have Figure 8F. And this is from the '271 patent, correct?

A I see that, yes.

Q So in the '271 patent, give me a minute --

ATTORNEY BRIGGS: We'll mark it?

ATTORNEY COHEN: Well, this is exhibit.

ATTORNEY BRIGGS: 1001.

ATTORNEY COHEN: 1001. From the 271 IPR. But this is an unstamped copy.

ATTORNEY BRIGGS: We'll go with the true and correct -- we'll go with the representation that this is a true and correct copy of Exhibit 1001 from IPR2024-00277.

Q And you reviewed the '271 patent, correct, Dr. Bikson?

A I did.

Q Okay. And we've been talking about Figure 8F, correct?

A We did discuss Figure 8 -- just turning to it now. We did discuss Figure 8F.

Q Okay.

So if you go to paragraph -- or column 23 of the '271 patent.

A Column 23.

Q Yeah. Down at line -- starting at Line 40 and going into Column 24, Line 17, do you see that there this is a description of figures 8F and 8G?

A Okay.

(Document review.)
Okay.
Q So this is talking about the bipolar electrode pairs in 8F and 8G, correct?
ATTORNEY BRIGGS: Objection. Form.
A It's a description of the -- yeah, it includes a description of the Figure 8F and Figure 8G.
Q So in Column 23, Line 64, it -- and 65, it says that "in some embodiments, each pair comprising an array or multiple pairs -- each pair of electrodes or each electrode may have a separate controlled electrical channel to allow for different regions of the treatment element to be activated separately," correct?
A I see that.
Q Okay. So in that description there is an embodiment where you can selectively activate one pair of electrodes and then activate a different pair, correct?
A So the text talks about an embodiment where you would have separate controlled

electrical channels to allow for different regions to be activated separately.

Q Okay. So you could separately activate each pair of electrodes in this embodiment, correct?

A You can separately activate selected pairs.

Q Okay. Well, you can actually activate a single pair at a time because it says, "Each pair may have a separate controlled electrical channel," correct?

A Could you repeat the question?

Q This says you could activate a single pair at a time because it says each pair of electrodes, bipolar, may have a separate controlled electrical channel to allow for different regions to be activated separately?

A You're asking me whether this is consistent with being able to activate a single pair?

Q Correct.

A That is my understanding.

Q Okay. All right. You can set that aside for now.

Okay. So we're going to turn to your '318 declaration.

ATTORNEY BRIGGS: How much time do you want on '318?

ATTORNEY COHEN: I'm sorry?

ATTORNEY BRIGGS: I'm just wondering how much time you need on '318 or if you want to keep going or lunch?

ATTORNEY COHEN: What, do you want to do lunch now.

ATTORNEY BRIGGS: You're going to do probably more than half an hour, I'd like to lunch now. If you're going to do less than half an hour, then it's fine with me.

ATTORNEY COHEN: Let's go for a little bit and then we'll stop.

ATTORNEY BRIGGS: Sure.

BY ATTORNEY COHEN:

Q So you're looking at your declaration from IPR2024-00278 related to patent number 11,033,318.

Do you have that in front of you?
A Yes.
Q Okay. Can you turn to Page 16 of your declaration.
A I'm on Page 16.
Q Okay. And do you see that this is independent challenged Claim 1?
A I see that.
Q Okay. And this is a device for delivering energy, correct?
A Yeah, the first -- it starts with a, "device for delivering energy."
Q Okay. And you see that limitation 1D is to "an array of multiple pairs of bipolar radiofrequency electrodes disposed along the treatment surface of the treatment element," correct?
A Yes, that is 1D.
Q And it's your opinion that Stern does not disclose an array of multiple pairs of bipolar radiofrequency electrodes because it discloses only activating one pair at a time, correct?

A Are you asking me about something specific in this report? About a specific section.

Q It's the same opinion we've been discussing, but if you want to see it, it's on Page 22 --

A Okay.

Q -- to, like, 24.

A I'm sorry. Can you repeat the question, please?

Q Sure. It's your opinion that Stern does not disclose an array of multiple pairs of bipolar radiofrequency electrodes because, although it discloses different pairs of electrodes, it discloses only activating each pair at a single time, correct?

ATTORNEY BRIGGS: Objection. Form.

A My analysis is that if Stern is shown activating multiple bipolar pairs at the same time, which it does not, then it may have shown multiple pairs of bipolar radiofrequency electrodes.

Q Okay. Because we agree that Stern shows

different pairs of bipolar electrodes, correct?

A As we discussed, Stern does go through different cases. And one case you could have one pair. In another case you could have a different pair.

Q Okay. And the issue with Stern in your opinion is that it's not disclosing activating those pairs at the same time?

ATTORNEY BRIGGS: Objection. Form.

A Yeah, can you just clarify what you mean by my issue?

Q Your opinion that Stern does not disclose multiple pairs of bipolar radiofrequency electrodes is because Stern does not disclose activating its different pairs of bipolar electrodes at the same time?

ATTORNEY BRIGGS: Objection. Form.

A My opinion is that if Stern had disclosed activating multiple pairs of bipolar radiofrequency electrodes at the same time, then he may have satisfied the multiple pairs of bipolar radiofrequency electrodes element.

Q Because Stern does disclose different pairs of bipolar radiofrequency electrodes, correct?

ATTORNEY BRIGGS: Objection. Form.

A Stern discloses activating one pair of bipolar electrodes. Stern also describes that you could have activated a different pair, a single different pair of electrodes.

Q Okay. If you go back to Page 16, when a device is -- when one of these devices is sold and shipped to a physician, you would agree it is not in that state delivering radiofrequency energy, correct?

ATTORNEY BRIGGS: Objection. Form.

A When a device is shipped and it's in the box, it is in that state not passing current from itself into the body.

Q And so in that state, does it have an array of multiple pairs of bipolar radiofrequency electrodes?

ATTORNEY BRIGGS: Objection to form.

A I think that answer would depend on the

device.

Q What would it depend on?

A Just that, if it has an array of multiple pairs of bipolar radiofrequency electrodes.

Q Well, you only know that if it's going to, in your opinion activate multiple pairs at the same time?

ATTORNEY BRIGGS: Objection. Form.

A I don't think that's what I said.

Q Well, I'm trying to understand what the difference is between Stern and any other device that would meet this claim, in your opinion.

If a device is being shipped and it has an array of bipolar radiofrequency electrodes, none of those electrodes are activated, correct?

A I think what you're asking is when it's in the box is current passing from the device into the body. So no.

Q And so how would you know if that device has an array of multiple bipolar radiofrequency electrodes?

A So, for example, we can look at Figure 8F,

which is, actually, right there on Page 15. So -- or in this case you can also look at Figure 8G, but if you look at Figure 8F, you can see that there is a device and the -- the label there 252 is indicating the electrodes. And so in -- and so -- you can see that some of those electrodes have a positive next to it and some of those electrodes have a negative next to it. So a positive and electrode together forms a -- a bipole. And so in that case, for example in Figure 8F, you could see that that device has multiple pairs of bipolar radiofrequency electrodes because there are multiple pluses and minuses.

Q So that's how you would know, is if it has multiple pluses or minuses?

ATTORNEY BRIGGS: Objection to form.

A That's -- what I explained is why Figure 8F specifically has multiple pairs.

Q We talked about how Figure 8F also can be activated so you have a single pair active at a single time, correct?

A My understanding of what is shown in Figure 8F as described in the patent is that a single pair can be activated independently.

Q And so in your opinion, does that still constitute an array of multiple pairs of bipolar radiofrequency electrodes?

ATTORNEY BRIGGS: Objection to form.

A Whether figure -- whether Figure 8F -- Figure 8F, yes, is an array of multiple pairs of bipolar radiofrequency electrodes.

Q Even when a single pair is activated independently from other pairs, so if you activate one pair at a time, it still constitutes an array of multiple pairs of bipolar radiofrequency electrodes?

ATTORNEY BRIGGS: Objection to form.

A Figure 8F shows an array of multiple pairs of bipolar frequency radio electrodes and a specification. And my understanding of them do describe that a single pair can be activated independently.

ATTORNEY COHEN: Okay. Why don't we take

a break for lunch.

ATTORNEY BRIGGS: Okay.

(Luncheon recess.)

BY ATTORNEY COHEN:

Q Welcome back, Dr. Bikson.

During the break did you discuss the substance of your testimony with counsel?

A No.

Q Have you discussed the substance of your testimony with counsel on any of the breaks?

A No.

Q I want to turn back to Stern which you should have in front of you, the Stern patent.

A Okay.

Q If you go to Column 12, Line 25. And do you see the paragraph that begins, "in specific instances"?

And actually, let's begin above that, let's start with the line at Column 12, Line 7, "the delivery of power can be improved."

Do you see that?

A Yeah, let me read that, please.

Q Yeah.
A (Document review.)
Q I'm really focused on the second half of that paragraph, starting around Line 18, so not Figure 5 or 13. I saw you flipping through.
A Okay.
Q So from around Line 18 to like Line 37.
A (Document review.)
Q Okay. So here it says, at the bottom of that first paragraph, "when a bipolar operation occurs, the flow of the current return is a path between selected pairs of the electrodes. A switching arrangement to be described determines such pairs of electrodes or combinations of electrodes between which the current flows in the return path."
Do you see that?
A I do.
Q So here it is talking about how it does have pairs or more than one pair of electrodes, correct?
ATTORNEY BRIGGS: Objection. Form.

A My understanding of this is that this is referring to -- to the figures I was looking at, Figure 5 and Figure -- Figure 5, for example.

And it is referring to -- I'm sorry -- if you can just repeat the question?

Q Sure. My question is about where it says, "When a bipolar operation occurs, the flow of the current return is a path between selected pairs of the electrodes. A switching arrangement to be described determines such pairs of electrodes or combinations of electrodes between which the current flows."

My question was: Here it is talking about how it has pairs or more than one pair of electrodes, correct?

ATTORNEY BRIGGS: Objection. Form.

A I believe it's describing selected as indicated, selected pairs of electrodes. What Stern is describing here is selecting one pair of bipolar electrodes and then possibly selecting separately another pair of bipolar electrodes.

Q Okay.

A And the selection is based on the switches that are shown, for example, in Figure 5.

Q Okay. And it's your opinion if we go down to around Line 29 where it says, "In such instances, if particular pairs of electrodes were chosen in a bipolar arrangement to receive RF energy, the return path could be controlled selectively by a physician."

Do you see that?

A I do.

Q So that, in your opinion, is also saying you select one pair and then a different pair?

ATTORNEY BRIGGS: Objection to form.

A It's describing there a pair of electrodes. So that would be two electrodes. Two electrodes form a single bipolar. And what he's describing is that you select bipolar, and that the selection could be controlled by a physician.

Q And it says in Line 29, because you just said, it says "selecting a pair."

In line 29, it does say "in such instances if particular pairs of electrodes were chosen."

So it's saying more than one pair in that line, correct?

A I see that.

Q And pairs means more than one pair, correct?

A Pairs means more than one pair.

Q Okay. Let's set this aside for now. And go back to your '271 declaration. Actually, one quick -- let's quickly turn to the Foundry declarations. This will be quick just to confirm if you go to -- give me one second.

In the 077IPR that is the declaration offered in IPR2024-00669 related to patent number 11,679,077.

A I have that in front of me.

Q Okay. And in this IPR at Page 36, you also offer the opinion that Stern does not disclose multiple pairs of bipolar electrodes, correct?

A So I disagreed with the petitioner that Stern teaches the multiple pairs of bipolar radiofrequency electrodes.

Q And for the same reasons we've been discussing, which is that Stern does not disclose delivering energy to two pairs of electrodes at the same time?

A If Stern had disclosed delivering energy to multiple pairs of greater frequency electrodes at the same time, then that would be delivery of energy to multiple pairs.

Q Okay. So the opinions that you have in this specific section of the '077 declaration are the same as what we've been discussing about your opinion as to whether Stern has multiple pairs of bipolar electrodes, correct?

A If I understand your question, I think my opinions about Stern are generally consistent across the different depositions, though I might be talking about specifically different claims or claim elements.

Q Okay. And I think I've been -- we've been talking about your opinion that Stern does not have multiple pairs of bipolar electrodes.

My question is: The reason you give in

the Aerin declarations is the same reason that you give in the '077 declaration, correct?

A So I mean to answer that very precisely. I need to compare the back-and-forth, but I do believe that generally I use at least some of the same rationale since it is the same -- it is the same patent we're discussing.

Q Okay. You can set that aside for now. Let's go back to the '271 declaration.

Okay. I'm going to ask you about your opinions about the two rows of bipolar electrode pairs. Okay?

A Okay.

Q So you -- you've been talking about your opinion that Stern does not have bipolar electrode pairs. You also have the opinion which starts on Page 27 that Stern does not close -- disclose two rows of bipolar electrode pairs, correct?

A Stern does not teach two rows of bipolar electrode pairs.

Q Okay. And it's your opinion that Stern does not disclose two rows of bipolar electrode

pairs because the claims require a row that includes more than one bipolar electrode pair; is that correct?

ATTORNEY BRIGGS: Objection. Form.

A I understand that the claim term "bipolar electrode pairs" is plural, therefore it requires multiple pairs.

Q It requires -- sorry. In your opinion, the claim term "two rows of bipolar electrode pairs" requires two rows where in each row there is -- there are multiple pairs of bipolar electrodes; is that correct?

ATTORNEY BRIGGS: Objection. Form.

A I'm sorry. Could you repeat the question?

Q Sure. In your opinion, the claim term "two rows of bipolar electrode pairs" requires two rows where in each row there are multiple pairs of bipolar electrodes; is that correct?

ATTORNEY BRIGGS: Same objection.

A My understanding is the claim requires two rows and each row has multiple bipolar electrode pairs.

Q When you say, "my understanding," is that understanding that's been provided to you from counsel?

ATTORNEY BRIGGS: Objection to form.

A I was referring to the analysis I did of -- of Stern.

Q Okay. So it is your opinion that the claim term "two rows of bipolar electrode pairs" requires two rows where in each row there are multiple pairs of bipolar electrodes; is that correct?

ATTORNEY BRIGGS: Objection. Form.

A And again, I was -- I'm not a lawyer, so I wasn't sure if there is a distinction between saying my understanding or my opinion, but it is my opinion that the claim element 1A is describing two rows, and each row has multiple bipolar electrode pairs.

Q Okay. And on Page 29 you refer to the '271 patent. In Paragraph 77 you say, "My opinion is consistent with the '271 patent's teachings as illustrated below."

And then on Page 30, you have annotated figures of Figure 8F and 8G, correct?

A I see that.

Q Okay. And in Figure 8F on Page 30, you draw the two rows going down the length of the treatment element, correct?

ATTORNEY BRIGGS: Objection. Form.

A In Figure 8F, I've marked Row 1 and Row 2 on the device.

Q And the rows are going along the length of that treatment element, correct?

A The rows are going down the long axis, yes.

Q Okay. And similarly in Figure 8G, you draw -- annotate one row going down the length of treatment element, correct?

A In Figure 8G I have marked one row going down the length of the device.

Q Okay. So it's your opinion that in Figure 8F -- can you give me the --

ATTORNEY COHEN: I'm going to mark this as Exhibit B.

(Bikson Exhibit B, Figure 8F From the '271 Patent, marked for identification.)

BY ATTORNEY COHEN:

Q All right. What's been marked as Exhibit Bikson B is Figure 8F from the '271 patent. And if you want, you can take a look at the '271 patent, which is also in front of you, to confirm that this is an accurate depiction of Figure 8F taken from the patent.

A Okay.

Q Can you please circle for me where the pairs of electrodes are on figure 8F.

A (Witness complies.)

So I circled one example of how you can form pairs.

Q Okay. And that --

A There are other ways you can form pairs, however.

Q What are some of the other ways you can form pairs?

A By connecting different combinations of positive and negative electrodes in the same row.

Q Okay. In the same row?
A Yes.
Q And by "row," you are referring to the row that is going along the length of the treatment element, correct?
A That was the row I was referring to, yes.
Q Could you draw a line on that figure to show kind of through the electrodes where the row is that you're referring to?
A Sure.
(Witness complies.)
Q So that's Row 1?
A That is corresponding to Row 1, yes.
Q Could you label it Row 1.
And could you also show the second row.
A (Witness complies.)
Q And could you label that Row 2?
A (Witness complies.)
Q So in your opinion, the '271 patent is disclosing that you have multiple pairs along the length of treatment element -- the treatment element that's shown in Figure 8F; is that

correct?

ATTORNEY BRIGGS: Objection to form.

A The -- the Figure 8F, Figure 8F does depict treatment elements with two rows of five electrodes -- and I'm sorry. Can you repeat the question?

Q In your opinion, the '271 patent in Figure 8F is disclosing that you have multiple pairs along the length of the treatment element within the rows that you've labeled, correct?

ATTORNEY BRIGGS: Objection to form.

A I've labelled two rows, and each one of those rows has multiple bipolar pairs.

Q Okay. Can you take the '271 patent itself and turn to Column 23 that we were looking at before.

And we were looking at this section earlier. I'm talking starting around Line 54. We were looking at this section, but feel free if you want to review it again.

My question is: The -- the patent says at line 40, "as shown in Figure 8F in some

embodiments, an array of electrodes comprising one, two, or many pairs are located on a treatment element."

A I'm sorry, what line are you at?

Q That was Line 40. Do you see that?

A Oh, Line 40. Yes.

Q Okay. And then in Line 54 it says, "Figure 8G illustrates another embodiment of a treatment element comprising one, two, or many pairs. As opposed to Figure 8F where the pairs of electrodes are arranged side by side, the embodiment of Figure 8G arranges the pairs of electrodes along the length of the treatment element," correct?

A Okay.

Q Do you see that?

A Yes.

Q So isn't that saying that instead of the pairs being formed as you've labeled, the pairs are actually across the short axis of the treatment element in contrast to Figure 8G?

ATTORNEY BRIGGS: Objection. Form.

A Could you repeat the question?
Q Sure. So it says, "As opposed to Figure 8F" --
A Yes.
Q -- "where the pairs are arranged side by side, the embodiment of 8G arranges the pairs along the length of the treatment element," correct?
A Okay.
Q So in Figure 8F, what that is saying is that in contrast to what you've labeled as the pairs in Figure 8F, the pairs are actually side by side?
A That's not my opinion.
Q What is that saying?
A I think it's -- I'm just reading it just according to the -- sort of what it's saying here where in Figure 8F you have two rows and the pairs are arranged -- there is pairs in one row and there is pairs in another row, but if you look at Figure 8G --
Q You have -- if you move your one tab and

go to Page 30.

A If you look at the -- what's shown in Figure 8F is not like what's shown in Figure 8G. In Figure 8F I've marked that there are two rows. I've marked that as sort of Row 1 and Row 2 in my report. And in Figure 8G I marked Row 1, and that is the unique role.

And so what is being described here is consistent with my annotation.

Q Okay. And what it says here is that "Figure 8G arranges the pairs along the length of the treatment element," correct?

A Yes.

Q And then it says, "that is opposed to Figure 8F where the pairs are side by side," correct?

A It says, "as opposed to Figure 8, the pairs are side by side." Right. And that is referring to the two rows.

Q Well, in your embodiment, what you've labeled Figure 8F, the pairs are still along the length of the treatment element, correct?

A But there are two rows.
Q Okay.
A And --
Q I'm sorry?
A There are two rows in 8F, but in 8G there is one row.
Q Okay. And in your opinion, it would be inaccurate to say that electricity is going from one electrode in Row 1 to one electrode in Row 2, correct?
ATTORNEY BRIGGS: Objection to form.
A That would depend.
Q In your opinion, does the '271 patent disclose delivering energy from Row 1 to an electrode in Row 2?
ATTORNEY BRIGGS: Objection. Form.
A So what I was specifically commenting on our discussion so far was the arrangement of bipole electrodes. I think you're now asking me a separate question which more relates to how current might be flowing through the tissue, which is a little bit different. We can certainly talk

about that, but that's like a different consideration.

Q I want to talk about the bipolar electrodes. Can you have a bipolar electrode pair formed across Row 1 and Row 2?

ATTORNEY BRIGGS: Objection to form.

A I'm sorry. Can you clarify that, please?

Q Sure. So if we just look at the top two electrodes at the distal-most point of this treatment element.

A So Figure 8F.

Q Figure 8F.

A And looking at the -- the most distal electrical electrode labeled plus and the most distal labeled negative.

Q Correct.

A I see that.

Q Could that be a bipolar electrode pair?

A That could be a bipolar electrode pair.

Q Okay. And then the second two electrodes that have a plus and a minus could be another bipolar electrode pair, correct?

A You could define those as another bipolar electrode pair, but that's not my understanding of the '271.

Q Okay. Can you turn to the abstract of the '271?

A Yes.

Q And the last sentence says, "The radiofrequency delivery member includes two rows of protruding electrodes disposed on a tissue contact surface. And the device is configured to deliver radiofrequency energy from one row of electrodes to the other row of electrodes."

Do you see that?

A I see that.

Q And so that, based on the rows that you have drawn, would involve delivering energy from Row 1 into Row 2, correct?

A So when in my analysis of Figure 8F, I understood that the specifications described at the bipoles are arranged inside of the row.

Q Did you ignore this sentence in the abstract?

ATTORNEY BRIGGS: Objection to form.

A I don't -- I considered the entire patent when I -- when I did my analysis, but I also -- as I mentioned earlier, I think it's important when analyzing, generally, these type of devices to -- you know, you can talk about stimulation dose and bipolar electrical configurations, and you can also talk about energy flow patterns. So I think it's important to be clear what we're talking about, you know, when discussing how these devices work.

Q Okay. In this sentence it is saying you deliver radiofrequency energy from -- from one row of electrodes to the other row of electrodes.

Do you see that?

A I see that.

Q So that is disclosing forming a pair across the two rows, correct, because you were delivering energy from one row to the other row?

ATTORNEY BRIGGS: Is that a question?

ATTORNEY COHEN: Yes.

A Can you repeat the question?

Q This sentence is disclosing delivering energy from one row across the device to the other row and forming a bipolar pair that way, correct?

A It describes delivering one row of electrodes to the other row of electrodes, but I don't see where -- the other thing you're mentioning about the bipoles.

Q Okay. So you -- so this to you is disclosing you can deliver energy from one row to another row, but that they are not formed in bipolar pairs?

ATTORNEY BRIGGS: Objection to form.

A I'm just not seeing any mention of bipole pairs in this sentence.

Q Do you want to read the rest of the paragraph? It does talk about bipolar radiofrequency delivery.

A I see that.

Q And so in your opinion, it's talking about a bipolar radiofrequency delivery member, bipolar energy delivery requires a pair of electrodes, correct?

A A bipolar would indicate a pair of electrodes. That's correct.

Q And it involves delivering energy from one electrode to another, correct?

A It's -- you can describe bipolar energy delivery as delivery energy -- as delivering energy from one electrode to the other.

Q Okay. So that last sentence is saying, you can deliver energy from one row to another row of electrodes?

A Yes.

Q And so isn't that disclosing a bipolar pair across the rows of electrodes?

A That is not disclosing that.

Q What is that disclosing?

A It's disclosing that you can have a device where you have energy from one row to the other row.

Q Okay. And so where are the bipolar pairs in that?

A That sentence doesn't specify what the -- how the bipolar pairs are being positioned.

Q In your view are there bipolar pairs in the devices being described in the abstract?

A The device -- there are various embodiments, but the abstract indicates that an embodiment can include bipolar radiofrequency delivery.

Q Okay. And so when energy is being delivered from one electrode to another electrode, we talk about how that's bipolar energy delivery, correct?

ATTORNEY BRIGGS: Objection. Form.

A When you have bipolar electrodes and you are delivering energy from one electrode to the other electrode, I think that's correct to describe that it's bipolar energy delivery.

Q Okay. And so when it says, "Deliver energy from one row of electrodes to the other row of electrodes," isn't that involving bipolar energy delivery?

A The -- the discussion of how energy flows and the discussion of how the dose is configured, for example using bipolar electrode pairs, are not

the same. These are not -- these are not the same thing. So when you configure a device to operate in a certain way, you can configure the electrodes. For example, you can configure the electrodes to be a bipolar or you can configure multiple bipoles as well.

That is separate from a discussion of how the energy then flows through the tissue --

Q Okay.

A -- which is the resulting pattern.

Q Right. This isn't talking about energy flow through tissue. This is saying the device --

A Yes.

Q -- is configured to deliver radiofrequency energy from one row of electrodes to the other row of electrodes, correct?

A That's what it says, yes.

Q So the device is configured to deliver energy -- we're not talking about the tissue, we're talking about the device being configured to deliver energy from one row of electrodes to the other row of electrodes, correct?

A Yes.

Q And so that is talking about bipolar energy delivery from one row to another, correct?

A No.

Q Why not?

A Bipolar -- when we talk about bipolar energy delivery, we're specifically referring to the -- the device dose. For example, what is shown in Figure 8F, where you have multiple bipoles. This last sentence is talking about the energy flow itself, which I think should be understood in the context of -- of this patent as energy through the tissue.

Q Even though it's talking about the device being configured to deliver energy from one row to another, correct?

A Yeah, this needs to be -- my understanding of the sentence is that it is describing the energy being delivered across the tissue.

Q You mean it was talking about the device being configured to deliver from one row to another?

A I'm sorry. Is that a question? I'm sorry.

Q We talked earlier --

A Yes.

Q About how in Figure 8F, the '271 patent discusses that you can independently activate the pairs of electrodes, correct?

A I remember that -- us discussing that.

Q Okay. So if you were to independently activate the different pairs, you would not deliver energy, in your opinion, across the two rows of electrodes, correct?

ATTORNEY BRIGGS: Objection. Form.

Q Because you'd only have one pair active in each row at a given time, correct?

ATTORNEY BRIGGS: Objection. Form.

A Just so I understand the hypothetical here, you're suggesting to look at Figure 8F and you're suggesting to activate just one of the -- apply energy through one of the indicated bipoles?

Q Correct.

A Okay. And then the question is in that --

so then in that hypothetical your question is --

Q Well, which is an embodiment that we've discussed in this patent. It talks about independent activation and control of each bipolar pair, correct?

A We've discussed that, yes.

Q Okay. And so when each bipolar pair is being independently activated and you're delivering energy through one bipolar pair, energy will not flow from one row to another row, correct?

ATTORNEY BRIGGS: Objection to form.

A I think that would depend on the configuration.

Q Well, if the second row is inactivated, where is the -- the energy is not going to flow to a return electrode on the second row, correct?

ATTORNEY BRIGGS: Objection. Form.

A It would not, based on my understanding of the hypothetical, the energy would take a particular pattern. That pattern may overlap tissue under Row 2 and may overlap tissue under

Row 1.

Q But it wouldn't return to an electrode on Row 2, because that electrode would not be activated, correct?

A If I understand the hypothetical, if you were only activating a -- a single -- only applying energy to a selected single bipole, for example, in Row 2, so that energy was being passed in and out of two electrodes, and then you would not necessarily have current passing in and out of other electrodes.

Q Like electrodes in Row 1?

ATTORNEY BRIGGS: Objection. Form.

A You would not necessarily have current flowing in and out of the electrodes in Row 1. It would, of course, depend on the details.

Q Okay.

THE WITNESS: Can I ask for a restroom break whenever is good?

ATTORNEY COHEN: Sure.

ATTORNEY BRIGGS: Yeah, five minutes?

THE WITNESS: Yeah.

(Recess.)

BY ATTORNEY COHEN:

Q Welcome back, Dr. Bikson.

So before we left we were talking about the bipolar electrode pairs that are disclosed in the '271 patent.

Do you recall that?

A Yes.

Q Okay. And earlier we had discussed that energy can flow from this negative electrode to this positive electrode?

ATTORNEY BRIGGS: Objection. Form.

A Just so I can see where you're pointing at, please?

Q I'm talking about Figure 8F.

A Yes.

Q Energy can flow -- this is a negative electrode and this is a positive, correct?

A Yes.

ATTORNEY BRIGGS: Counsel, we can't tell on the record which ones you're pointing to.

Q Okay. Figure 8F, I'm referring to the

distal-most, top-most two electrodes that are side by side in Figure 8F. Okay.

Do you have that in mind?

A Yes.

Q One has a negative next to it and one has a positive, correct?

A Yes.

Q And they are both labelled with element number 252, correct?

A I see that.

Q Those could deliver energy from one to the other, correct? Let me -- those electrodes could be configured to deliver energy from one electrode to the other electrode, correct?

A You could configure the device in Figure 8F so that energy is delivered from -- between the two electrodes that you indicate.

Q Okay. Could you circle that and how that energy would flow on that --

ATTORNEY BRIGGS: Is this a different exhibit?

ATTORNEY COHEN: Yeah, we'll do this as

Exhibit C. Let's label this as Exhibit c.

(Bikson Exhibit C, Figure 8F, Element 252, marked for identification.)

A Can you just clarify what you'd like me to do, please?

Q Sure. So we were talking about the two electrodes that are labelled with Element No. 252. And you said you could configure the device so energy is delivered between the two electrodes. So I was hoping you could circle the two electrodes that we've been discussing.

A Okay. I'm circling the two electrodes.

Q Okay. And we were also talking about, earlier, how you could configure the next two electrodes which are labeled with opposing positive and negative symbols to deliver energy from one electrode to the next, the second in that row, correct?

ATTORNEY BRIGGS: Objection to form.

A I remember our discussion and -- on that topic, yes.

Q And do you agree you could configure

energy to be delivered from an electrode in one row to the electrode in the other row?

A You could hypothetically configure the device to deliver energy from one row to -- I'm sorry. Can you repeat the question?

Q Sure. Do you agree you can configure energy to be delivered from an electrode in one row to the electrode in the other row?

A Yes.

Q Okay. Could you circle what that pair would be?

A I already circled the pair.

Q I guess my question was about the second electrodes in that row, the ones that are not circled but are next to the ones that are circled.

Do you also agree you could configure energy to be delivered from an electrode in one row to the electrode in the other row for that second set of electrodes?

A I think what you're asking is -- I'm going to circle the electrodes I think you're referring to.

Q Okay.
A So I've circled the electrodes I think you're referring to.
Q Okay. Yeah.
And those two sets of electrodes could also be configured as bipolar electrode pairs, correct?
A You could configure these two electrodes to function as a bipolar electrode pair.
ATTORNEY BRIGGS: Counsel, can we put maybe a little bit more labels on this so we know which row we're talking about here? It's kind of hard for me.
Q Sure. Can you label on Figure 8F what you have labeled as Row 1 in your report?
A So similar to what I had done earlier? Do you want me to write in Row 1?
Q Can you also label Row 2?
A As I had done earlier.
Q Yes. You can set that aside.
(An off-the-record discussion was held at this time.)

BY ATTORNEY COHEN:

Q Now, the '271 patent, if you go to the claims at the back of the patent. And I see you have your declaration opened to Claim 1, correct?

A I do.

Q Okay. So as we were talking about earlier, Claim 1 is a method for treating a nasal airway to reduce mucous production.

Do you recall that discussion?

A I believe so.

Q And as we were discussing, you yourself would not perform a method for treating a nasal airway to reduce mucous production, correct?

A I would not perform a medical procedure.

Q And you don't know which doctors and what specialties they have that would perform a method for treating a nasal airway to reduce mucous production that follows the steps that are claimed, correct?

ATTORNEY BRIGGS: Objection to form.

A I don't have an understanding of the regulations that pertain to different medical

specialties as may relate to practicing the claim.

Q Okay. If you turn to the next page, the, like, last page in the '271 patent, and you see that there are a number of other claims, these -- every claim in the '271 patent depends from Claim 1, correct?

A I understand that.

Q And these are all method claims, correct?

A I see that they're all indicated as a method.

Q And you've also offered opinions on Claim 11 -- Claims 11 and Claim 16, correct?

A I have.

Q And if you look back at the patent, if you look at Claim 11, this involves, "before removing the treatment element from the nasal airway, repositioning the treatment element to contact a different portion of nasal mucosa and applying radiofrequency energy with the bipolar electrode pairs through the different portion of nasal mucosa to a different portion of target tissue for the amount of time to heat the different portion

of target tissue."

Do you see that?

A I do.

Q And you would not perform this method of repositioning the treatment element to treat a different portion of nasal mucosa, correct?

A I wouldn't perform any medical procedure, as I understand it, associated with these claims.

Q Okay. Have you ever seen a medical procedure performed that involves the application of radiofrequency energy through nasal mucosa?

A I don't recall.

Q Have you ever studied medical procedures that involve the application of radiofrequency energy through nasal mucosa?

A I have.

Q Have you ever studied medical procedures that involve the application of radiofrequency energy through nasal mucosa that are intended to ablate tissue?

A I have.

Q Which ones?

A What do you mean by, "which ones"?
Q Let me strike that.
Before working on this case, did you ever study any medical procedures that involve the application of radiofrequency energy through nasal mucosa that are intended to ablate tissue?
A I don't recall especially focusing on those types of procedures.
Q Okay. And then "Claim 16 requires the method of Claim 1 further comprising bending a shaft of the nasal airway treatment device before contacting the treatment element with the nasal mucosa."
Do you see that?
A I do.
Q And similar to the other claims, you would not perform this step of bending a shaft of the nasal airway treatment device before contacting the treatment element with nasal mucosa, correct?
A I would not perform that step as part of a medical procedure.
Q Okay. You can set the '271 patent aside

for now.

Okay. Going back to your '271 declaration, on Page 33 you offer an opinion that petitioners had failed to show that a POSITA would have been motivated to combine Edwards 535 with Stern.

Do you see that?

A I do.

Q And here you're specifically addressing whether a POSITA would have been motivated to combine Edwards 535 with Stern's electrode arrangement, correct?

ATTORNEY BRIGGS: Objection. Form.

A I -- I address petitioner's arguments on whether a POSITA would have been motivated to combine Edwards 535 with Stern.

Q And you're addressing specifically Stern's electrode arrangement, correct?

ATTORNEY BRIGGS: Objection. Form.

A The -- the petitioner argues that a POSITA would have combined electrode -- combined Edwards 535 with Stern's electrode arrangement and I

address that.

Q Okay. And the first point you raise is that, in your opinion, "Edwards 535 does not incorporate the Baker application in its entirety."

If you go to paragraph 87 of your declaration, do you see that?

A Yes.

Q What is your understanding of what is required for a patent to incorporate another reference in its entirety?

A So, of course, I'm not a lawyer, so I just want to qualify that. And so my understanding of this does depend on things that I was, you know, taught by counsel.

My understanding is that -- and, again, I'm not a lawyer, but my understanding is that a reference can be incorporated either in its entirety or it might also be incorporated not in its entirety. And my understanding is that Edwards, in the manner that it referenced the Baker application, did not incorporate it in its

entirety. For one thing, Edwards does not say that it incorporates the Baker application in its entirety.

Also the way in which Edwards references Baker was very specific. As I describe in my report, Edwards is talking about an expandible porous membrane that is permeable to an electrolyte. And I believe that's the only point where Baker is mentioned as describing a similar porous surface.

So that was my understanding of the extent that the Baker was incorporated by Edwards.

Q Is it your understanding that any particular wording needs to be included for a reference to be incorporated?

ATTORNEY BRIGGS: Objection. Form.

A To be incorporated in its entirety or to be incorporated?

Q To be incorporated in its entirety.

A Yeah, I'm not a lawyer, so I can't comment on the exact phrasing you would need.

Q Okay. So you don't know what sort of

phrasing you would need to incorporate Baker into its entirety into Edwards, correct?

A I can speculate, if you want me to speculate.

Q I don't -- I'm just asking, you don't know what phrasing you would need to incorporate Baker in its entirety into Edwards, correct?

A I don't know from a legal standpoint what would be the standard for the phrasing you would need to use.

Q Okay. Is it your understanding that Baker is only relevant to the issues in this case if it is incorporated by reference in its entirety into Edwards?

ATTORNEY BRIGGS: Objection. Form.

A Can you repeat the question?

Q I said, is it your understanding that Baker is only relevant to the issues in this case if it is incorporated by reference in its entirety into Edwards?

ATTORNEY BRIGGS: Same objection.

A I didn't analyze that.

Q Okay. Have you designed devices that have two rows of bipolar electrode pairs previously?

A I can't recall specifically.

Q You've worked with devices that involve an array of electrodes being applied on the outside of a patient's head, correct?

A Yes.

Q And in those devices, are there rows of electrodes?

A In some embodiments of those devices there are rows of electrodes.

Q In some embodiment of those devices, are the electrodes bipolar?

A Yes.

Q And in some embodiments of those devices, are there bipolar electrode pairs -- are there multiple rows of bipolar electrode pairs?

A I don't recall specifically.

Q Why -- why do you arrange the -- strike that.

In the devices we've been discussing that involve an array of electrodes positioned on the

outside of a patient's head where there are rows of electrodes and some are bipolar, why do you arrange electrodes in that manner?

ATTORNEY BRIGGS: Objection. Form.

A So to understand the question, you're talking about -- you're asking about a device that has multiple rows? And you're asking when those rows have a bipolar electrode in them? Was that your question?

Q I was talking about the devices we've been discussing where you said in some embodiments of the devices that involve an array of electrodes on the outside of a patient's head, you will have rows and you will also have bipolar electrode pairs, correct?

ATTORNEY BRIGGS: Objection. Form.

A Yes, in devices that I worked on that are placed on the person's head, some of those devices can have rows of electrodes. And in some cases you can have bipole electrode pairs.

Q And why would you have rows and bipolar electrode pairs in those devices?

ATTORNEY BRIGGS: Objection. Form.

A So as I understand your question, it's -- it's rather general, but I can get as specific as you want. Generally, when you are deciding how many electrodes to use, where to position them on the head, and also how to energize them, you're doing that with a consideration of several factors, but one of the major factors is the energy pattern as it would be delivered into the head. Typically, there would be regions that are your target regions, but also there would be regions which are not your target.

And so the general approach -- very generally, I'm not sure if I'm answering your specific question, but the general approach would be the dose, the electrode montage, would be guided by those factors, but maybe I can answer something more specific.

Q Outside of the devices I've been talking about that are applied on the outside of your head, have you worked on devices that involve multiple bipolar pairs that deliver energy inside

the body?

ATTORNEY BRIGGS: Objection. Form.

A I have worked on devices that deliver energy inside of the body that can include multiple pairs of bipoles.

Q And in any of those devices, do you have multiple rows of bipolar electrode pairs?

A I don't recall exactly.

Q Can you go to paragraph 89 in your declaration of -- for the '271 patent that we've been talking about?

A Yes.

Q And so in this paragraph you say you "disagree with petitioner's argument that the proposed combination would have been a mere duplication of parts, correct?

(Reporter clarification.)

Q Sorry. "That the proposed combination would have been a mere duplication of parts," correct?

A Correct.

Q And your opinion here is related to

Edwards 535 disclosing a single row of four ring electrodes, correct?

A Edwards, yeah, discloses a single row of four ring electrodes.

Q Okay. And it's your opinion that Edwards only discloses a single row of four ring electrodes, correct?

ATTORNEY BRIGGS: Objection. Form.

A I don't remember if Edwards discloses anything else.

Q But your opinion here is based on Edwards disclosing a single row of four ring electrodes, correct?

A My opinion here is based on Edwards disclosing a single row of four ring electrodes.

Q Okay. So is your opinion here limited to the embodiment where Edwards discloses a single row of four ring electrodes?

ATTORNEY BRIGGS: Objection to form.

A I'm not sure of the question.

Q Well, you said you don't remember if Edwards discloses anything other than a single row

of four ring electrodes. And so my follow-up question was: Is your opinion in paragraph 89 limited to the embodiment that you can recall where Edwards discloses a single row of four-ring electrodes?

ATTORNEY BRIGGS: Objection. Form.

A I don't think so.

Q You only describe an embodiment with a single row of four-ring electrodes in this paragraph, correct?

A When I -- when I describe Edwards, I describe Edwards disclosing a single row of four ring electrodes.

Q And you say Stern on the other hand discloses five surface electrodes, correct?

A I say that, yes.

Q Okay. Can you turn to your '318 declaration?

A I have my 318.

Q So we are looking at for the record, the declaration you offered in IPR2024-00278 on patent number 11,033,318.

Do you see that?

A I have my '318 declaration.

Q So we spent some time talking about the opinion you have on an array of multiple pairs of bipolar radiofrequency electrodes. I now want to turn to your opinion on the limitation 1E about multiple radiofrequency output channels. Okay?

A Okay. Should I close this?

Q Is that the '271 declaration?

A Yes.

Q Yes. You can for now.

Okay. If we go to Page 32, and I guess it starts earlier than that, but you have the -- this starting on Page 26, it's your opinion that Stern does not teach multiple radiofrequency output channels, correct?

A I disagree that Stern teaches multiple radiofrequency output channels. Stern teaches, at most, a single radiofrequency output channel.

Q Okay. And that's because as you show in paragraph 79, there is one output from the RF generator and one input, correct?

ATTORNEY BRIGGS: Objection. Form.

A The -- what I'm annotating there is that there is an RF generator, and that RF generator is associated with one radiofrequency output channel. But a channel has two wires.

Q Okay. Sorry. A channel has two wires because it has an output and an input?

ATTORNEY BRIGGS: Objection to form.

A You can -- when -- when I'm describing a channel here, one way to -- because a channel has two wires associated with it, one way to facilitate that explanation is to mark one of the wires as the output and one of the wires as the input, which is what I did on Page 32.

Q Is it your opinion that to have multiple radiofrequency output channels, Stern would need to disclose multiple sources of RF energy?

ATTORNEY BRIGGS: Objection. Form.

A I think that would depend on the details.

Q Like what details?

A I'm not sure, but you sort of gave a hypothetical, so I would probably want to

understand -- you know, look at that full disclosure to understand what we described to answer your question.

Q Well, I'm trying to understand your opinion on Stern, because I don't really understand it, if I'm being honest.

Have you ever encountered a system that has more than one radiofrequency signal generator? And I'm talking about the part of the system that actually is generating an RF signal?

ATTORNEY BRIGGS: Objection. Form.

A What do you mean by encountered?

Q Have you ever analyzed a device like a generator that has more than one RF signal source?

ATTORNEY BRIGGS: Objection. Form.

A Do you mean like a physical device?

Q Mm-hmm.

A I don't recall if I've analyzed a physical device that had multiple RF generators.

Q Okay. And I guess within an RF generator, there is going to be a source that is actually generating the RF signal.

Do you have that in mind?

A The -- so specifically in regards to Stern, which is -- I think what you're asking me about Stern uses the term power source, power supply, voltage source, RF generator, and other terms interchangeably.

Q Let's set aside Stern for a moment. I'm asking about your personal experience. Okay.

And you designed generators in the past, correct?

A Correct.

Q And within a generator there is going to be a component that actually is creating the signal that's going to be delivered to tissue, correct?

ATTORNEY BRIGGS: Objection to form.

Q Setting aside Stern, just talking from your experience in designing generators, within a generator there is going to be some component that actually generates the electrical energy that's delivered to tissue, correct?

ATTORNEY BRIGGS: Objection to form.

A The generator generates the electrical energy that's delivered to tissue.

Q Okay. Could you also call it an oscillator?

ATTORNEY BRIGGS: Objection. Form.

A Again, it would, of course, depend on the situation, but I think in some situations, you can refer to the generator as an oscillator.

Q Now, within an overall, like, console that you might connect a device to, you will have the RF signal generator and you may have other wiring, correct?

ATTORNEY BRIGGS: Objection. Form.

A So now you're describing that there is an RF generator and you are asking me if that RF generator can have wiring?

Q Well, there is the actual signal source within a generator, correct?

ATTORNEY BRIGGS: Objection to form.

A The generator is the signal source.

Q And what sort of wiring exists inside a generator?

ATTORNEY BRIGGS: Objection to form.

A What kind of wiring exists? I think one kind of wiring, if I understand your question, would be that there are two wires that come out of the generators, as I've marked.

Q Have you ever seen a generator that has multiple wires connected to the RF signal source?

ATTORNEY BRIGGS: Objection. Form.

A A generator that has multiple wires connected... it's difficult to answer your question. You are generally talking about a piece of -- like an electronic system. So the way it's built can be rather complex. So there could be all kinds of wires as part of that system's design, so I'm not sure exactly how to answer your question.

Q When -- you've designed devices where electrical energy will be delivered to some electrodes and not others, correct?

A Yes.

Q How do you typically control the delivery energy in those devices?

A Generally, you have a -- a voltage source or it can be called a current source as well. It is almost universally programmable. So you would have different settings that you can set it to. Those settings could include intensity, frequency, it could be other parameters as well. And then you would connect the -- that voltage source would be connected, for example, to two electrodes. And the energy provided by that source would then be delivered to those electrodes. And if those electrodes were placed on the body, then that energy would then be delivered to the body.

Q How would you control delivering energy to only one of those two electrodes?

ATTORNEY BRIGGS: Objection. Form.

A Generally, when you're delivering stimulation, you need at least two electrodes. And the reason is that you need to imagine the currents are going to make a path.

So I don't know a situation where you could get away with just one electrode. You really need to have the two electrodes. It's

related to the reason why there are two wires coming out of the generator.

Q So when you say "coming out of the generator," where are you referring to?

A So, for example, in Page 30 of my report I've annotated Figure 15. You have the source which is 228, and there are two wires connected to that voltage source.

Q Okay. I guess for the devices we are -- right. So that you need the two bipolar electrodes, which I think is what you're saying, you definitely need two.

Have you worked with devices where you have four electrodes and you're delivering to two -- energy to two electrodes and not two other electrodes?

ATTORNEY BRIGGS: Objection. Form.

A If I understand the question, I have worked with devices where there are -- if I understood the question, I've worked with devices where there are two electrodes that are being energized and two other electrodes that are not

being energized.

Q And in those devices, how are you controlling that the two electrodes are being energized and the two other electrodes are not energized?

A That would depend on the device.

Q What are some design implementations you've used?

A The most simple implementation is that you could look at the two electrodes that are not being energized and they could not be connected to anything.

Q How are they not connected to anything?

A So you would have an electrode. Perhaps that electrode is on the surface of the body. But there is no wire connected to that electrode.

Q Turning back to this output channel idea, you mentioned in any kind of generator, you have a -- a voltage source, right?

ATTORNEY BRIGGS: Objection. Form.

A Are you referring to something specific in my report?

Q Well, I was referring to our discussion earlier. You said that when you're designing a device to deliver electrical energy to the body you're going to need a voltage source or could be a current source, correct?

A Correct.

Q And coming out of that voltage source, in your opinion, to have multiple output channels, do you need more than two wires?

ATTORNEY BRIGGS: Objection. Form.

A Can you repeat the question?

Q In your opinion, to have multiple output channels do you need more than two wires that connect to a voltage source?

ATTORNEY BRIGGS: Same objection.

A So a channel consists of two wires. If you have a channel connected to a voltage source, you would have two wires associated with that channel.

Q So my question is: There is a claim limitation in the '318 patent that says the device -- if you go to Page 16 -- the device has

multiple radiofrequency output channels connected with the multiple pairs of bipolar radiofrequency electrodes.

A Yes.

Q So my question is: In order to constitute multiple output channels as required by the claim, do you need more than two wires to connect to a voltage source?

ATTORNEY BRIGGS: Objection to form.

A To have multiple radiofrequency output channels, you would need more than two wires.

Q Connected to the voltage source?

A Can you be more specific?

Q Sure. So -- and maybe some paper would be helpful. And can I have my pen back? This is a voltage source, correct?

ATTORNEY BRIGGS: Is this a new exhibit?

ATTORNEY COHEN: It will be in a moment.

ATTORNEY BRIGGS: So that's going to be D?

ATTORNEY COHEN: Yes.

Q Okay. I have drawn a circle with a sinusoid inside that circle.

Would you understand that to be a voltage source?

A Yeah, that can be a symbol for a voltage source.

Q Okay. I have now drawn two single line brackets coming out of that voltage source.

In your opinion, this only has a single output channel, correct?

ATTORNEY BRIGGS: Objection. Form.

A My understanding of what you've represented there is that is a voltage source with a single output channel.

Q I have now added two brackets. Is this -- does this voltage source that I've drawn now have multiple radiofrequency output channels?

A I don't know, based on that figure.

Q What do you not know? What would you need to know?

A What you're showing there is not sort of a complete picture of the system. So I think I would want to understand. I understand you're giving me a hypothetical. So to I think to answer

this I would need to understand how you're configuring the system.

Q Sure. I think you have a drawing that's on Page 27 of your declaration.

A Yes.

Q And here we have Exhibit 2007 from this IPR. And you see that this is an entire system that has two pairs of electrodes, correct?

ATTORNEY BRIGGS: Objection. Form.

A One, two, three, and four are electrodes.

Q Okay. And so in your opinion, does this system have multiple radiofrequency output channels?

ATTORNEY BRIGGS: Just to be clear, counsel is pointing to Exhibit 2007 when she asked the question.

A If the -- the item indicated inside of the red box would have -- is indicating a single output channel.

Q Okay. What about the -- do you see the black dashed box that is larger than the red dashed box on Page 27 of your declaration?

A Yes.
Q Does the black dashed box include multiple radiofrequency output channels?
A With the limited information that's provided here, I would say that it depends.
Q What does it depend on?
A It would, for example, depend on what the devices might be used for.
Q What do you mean?
A Again, we gave one example, for example, where two electrodes may not be -- let's say electrodes two and four are not contacting anything, right? So there are different variations to consider. So I think the figure that's shown here was a figure that was, you know, provided to me by counsel. It's used to illustrate a very generic point, but it's not a complete description of a system.
Q Okay. If electrodes one, two, three, and four were in contact with tissue --
A Yes.
Q And one and two -- or let's say one and

three are one bipolar pair and two and four are another bipolar pair.

Do you have that in mind?

A Yes.

Q In that situation, does the dashed black line include multiple radiofrequency output channels?

A I wouldn't describe it that way.

Q Why not?

A Because the -- when you're talking about channels, you're talking about the -- about the output of the radiofrequency generator, and that's what's in the red box. And that red box has one -- has one output channel.

Q When we're talking about radiofrequency generator, are we just -- are you talking about anything that's housed in a console that you connect to for radiofrequency energy?

ATTORNEY BRIGGS: Objection. Form.

A Can you repeat the question?

Q Sure. You said that the red box is the RF generator and so that includes one output channel,

correct?

A That was how I was interpreting this figure.

Q What if the RF generator included all the wiring that's shown in the black dashed box? And ignore the red dashed box. Okay? Do you have that in mind?

A Okay.

Q Would that include multiple radiofrequency output channels?

A Can you repeat the question? I'm sorry, one more time.

Q Okay. If you ignore the red dashed box --

A Yes.

Q And you have an RF generator where everything shown in the black dashed line is housed inside the generator, does that have multiple radiofrequency output channels?

A I think I'm just a bit confused by the premise of your question. The generator is the item in -- in this picture the generator is the item in the red box? That is my understanding of

what's being illustrated here. The red box is the generator.

Q Is there a world where the black dashed box could be the generator?

A I guess what you're asking me is the red box is a generator, but let's -- now we're going to say it's not the generator and the black box instead is the generator, even though the red box is the generator, is what you're asking?

Q I think I'm trying to understand what your understanding of generator is.

A Yes.

Q What is your understanding of generator?

A Specifically, in the context of the Stern patent, which is what we're discussing here, a generator can be considered a voltage source.

Q Okay.

A Which why that's what's being clearly marked by the red box.

ATTORNEY COHEN: Okay. I'm going to label this as Exhibit D.

ATTORNEY BRIGGS: I thought we already had

D.

ATTORNEY COHEN: I didn't enter it as an exhibit.

ATTORNEY BRIGGS: Well, you drew on it and you showed him questions on it. So it needs to be entered as an exhibit. This can be E.

ATTORNEY COHEN: All right. We can make that D. This one.

(Bikson Exhibit D, Drawing, marked for identification.)

ATTORNEY COHEN: Let's label this E.

(Bikson Exhibit E, Drawing of RF Generator, marked for identification.)

BY ATTORNEY COHEN:

Q All right. I've handed you a blank sheet of paper with lines on it.

A Okay.

Q Can you draw an RF generator that has multiple output channels?

A I'm not sure how to do that.

Q What is -- what do you not understand?

A I don't think I understand the question.

Q Okay. You've offered opinions on the '318 patent, correct?

A Yes.

Q And the '318 patent has a limitation that requires multiple radiofrequency output channels connected with the multiple pairs of bipolar radiofrequency electrodes, correct?

A Yes.

Q And I'm asking you, because you're also offering an opinion that Stern does not have multiple radiofrequency output channels, correct?

A That's correct.

Q Can you draw a device that has multiple radiofrequency output channels as required by this claim?

A So, again, just hypothetically, I'm drawing four electrodes. I guess I can label them one, two, three, four?

And I'm drawing wires going to electrodes one and two. And I'm drawing wires going to electrode three and four. And I guess I'll put a circle around one and two and around three and

four, so each -- this is one bipole and this is another bipole. And the wires coming to them would represent one channel and this would represent another channel.

Q Where is the voltage source?

A The voltage source is not shown here.

Q Is the voltage source relevant to whether there are multiple radiofrequency output channels?

A It can be.

Q If we turn to Stern, and you can look at your declaration Page --

A Okay.

Q -- 28.

A Yes.

Q You would agree that Stern, within the dashed box in Figure 15, that black dashed box, looking at Stern Figure 15 on Page 28 of your declaration --

A Stern -- oh, sorry. Yes. Go ahead.

Q That shows the same number of electrodes and connections as you drew in Bikson Exhibit E, correct?

A I mean, not exactly, but...
Q What -- what are the differences?
A So, specifically, there is an additional wire here.
Q Okay. That's fair.
But otherwise in the dashed box in Stern Figure 15, it also shows four electrodes and each electrode is connected to its own wire, correct?
A The -- it's correct that in Figure 15 from Stern you have four electrodes and each electrode is associated with a wire.
Q Okay. And in your depiction in Bikson Exhibit E, that shows two pairs of bipolar electrodes with multiple radiofrequency output channels, correct?
A That is what I intended to show, yes.
Q Okay. You can set that aside.
A One thing though I didn't draw here, I guess I should clarify is that these are energized so that there is current flowing here and current flowing here. So the reason I describe these as multiple pairs is with the understanding that I

think I said in words but I didn't write down that there was current simultaneously flowing here and here.

Q Okay. Like we were talking about earlier?

A Yes.

ATTORNEY BRIGGS: Objection. Form.

Q Okay. Along these same lines in your '318 declaration, on Page 33 --

A Okay.

Q -- you also opine that "Regardless of whether Stern teaches multiple pairs of bipolar radiofrequency electrodes and multiple radiofrequency output channels (it does not), petitioners and Dr. Martin have failed to show that Stern teaches wherein each of the pairs of multiple bipolar radiofrequency electrodes is connected with a respective one of the multiple radiofrequency output channels."

Do you see that?

A Yes.

Q And I guess if you can get back that -- oh, exhibit -- Bikson Exhibit E that you drew.

Does that drawing that you have show where in each pair of the multiple pairs of bipolar radiofrequency electrodes is connected with a respective one of the multiple radiofrequency output channels?

A I think it does though, again with the caveats that I was explaining that these are energized channels.

Q Okay. We'll set that aside.

In -- okay, in your '318 declaration on Page 47, you offer opinions on Claim 6 of the '318 patent.

Do you see that?

A I do.

Q And you include the claim language in Claim 6, that "the device of Claim 4 wherein the multiple segments comprise a shape-memory alloy material configured to expand to a desired size and shape."

Do you see that?

A I do.

Q What's your understanding of the claimed

multiple segments?

A The -- the patent describes that the device can be divided up into multiple segments.

Q Do you know what those segments are?

A So can I see the '318 patent?

Q Sure.

ATTORNEY BRIGGS: Do you just want to stipulate the same disclosures in the '271?

ATTORNEY COHEN: Yeah, I assume it's the same that it is labeled --

(Court reporter clarification.)

ATTORNEY COHEN: So this is going to be Exhibit 1001 from the '318 IPR. We will stipulate that this is the same as the '318 patent that was submitted as Exhibit 1001, even though it is not labeled as Exhibit 1001 from the IPR.

ATTORNEY BRIGGS: Do you know what that means? That we are all agreeing that is the same exhibit. It's in the IPRs we already had.

THE WITNESS: Okay.

ATTORNEY BRIGGS: It's the patent. They just don't have the number on it.

THE WITNESS: Okay.
BY ATTORNEY COHEN:
Q So you now have the '318 patent and you are going to be looking at what segment means.
(Court reporter clarification.)
ATTORNEY COHEN: Means, or what his opinion is of what segments mean.
A I'm looking through now. Did you want to point me where the '318 segments are described?
Q I was mostly asking your understanding of it, but -- I mean, do you have an understanding in offering your opinion on multiple segments what that means in terms of the '318 patent?
A I'd rather refresh myself and read the '318 sections --
Q Okay.
A -- and segment.
Q Why don't we set that aside. We can come back to that later. I can give you a cite.
But one question I had is: If you've ever worked with a shape-memory alloy metal in your design work prior to working on this case?

ATTORNEY BRIGGS: Objection. Form.

A I don't recall in the devices that I've designed working with a shape-memory alloy.

ATTORNEY COHEN: Okay. Why don't we take a break because we've been going a bit.

ATTORNEY BRIGGS: Okay. Off the record.

(Recess.)

BY ATTORNEY COHEN:

Q Welcome back, Dr. Bikson.

You can set aside your '271 declaration and the '271 patent. And we're now going to turn -- and I'll make a little pile over here. We're going to turn to the Foundry IPRs and, specifically, your declaration that you offered for '077IPR, which is IPR2024-00669.

Just let me know when you have that.

A (Document review.)

Q Do you have that in front of you, Dr. Bikson?

A I do.

Q And starting on Page 22 of this declaration, you opine that "a POSITA would not

have had a reasonable expectation of success in treating target tissue with the Makower Figure 5H device."

Do you see that?

A I do.

Q Okay. First, I want to talk about what you say in paragraph 63 in this section. You say, "I have been asked by counsel to assume that supplying radiofrequency energy to the target tissue as per Claim 1 of the '077 reads on supplying ablative radiofrequency energy to that target tissue."

Then you have in footnote 3 the claim limitation.

Do you see that?

A I do.

Q And you say, "Thus, to read on the claims, Makower's 5H device must reasonably be expected to ablate the target tissue," correct?

A I see that.

Q And so you were instructed to assume that supplying radiofrequency energy in Claim 1 means

that the device will ablate tissues using radiofrequency energy; is that correct?

ATTORNEY BRIGGS: Objection to form.

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

Q I said you were instructed to assume that supplying radiofrequency energy necessarily meant and required ablating tissue using radiofrequency energy; is that correct?

ATTORNEY BRIGGS: Objection to form.

A I think I was asked to assume that supplying radiofrequency to target tissue as per Claim 1 reads on supplying ablative radiofrequency to that target tissue.

Q Okay. Because then you go on to say, "Makower's Figure 5H device must reasonably be expected to ablate the target tissue in order to read on the claims," correct?

A That's what I say.

Q Not all radiofrequency energy that will be delivered to tissue is necessarily ablative, correct?

A Correct.

Q What are some things you would need to know if radiofrequency energy were going to ablate tissue?

A I think as we were discussing before, the effects of energy on the body will be influenced by many things, but a dominant factor will be the type of energy that the target tissue is exposed to. And as we were discussing earlier, that the nature of that target energy will depend, among other things, on the features of the device and specifically of the dose of the device.

So these would be, again, things like intensity, and you asked about number of pulses and so on. And so, in general, what energy does to the body will depend on the nature of the energy. And whether or not the energy produces ablation will therefore depend on the nature of the energy applied.

Q Is radiofrequency energy typically delivered in pulses?

ATTORNEY BRIGGS: Objection. Form.

A It can be delivered in pulses. I think it

would depend on the application.

Q Is radiofrequency energy typically delivered as, like, a sinusoid --

ATTORNEY BRIGGS: Objection to form.

Q -- at a certain frequency?

A Often radiofrequency energy is delivered using -- as a sinusoid or with a carrier being a sinusoid.

Q I think you explain in paragraph 65 some of the information you would need to understand to know if RF energy is going to ablate tissue; is that correct?

A Can you repeat the question?

Q In paragraph 65 of your declaration --

A Yes.

Q -- does this include some of the information you would need to understand to know if RF energy is going to ablate tissue?

A If I understand the question, a POSITA or I would -- would understand that for there to be ablation, the RF energy must have certain characteristics, including as indicated there, the

amount of time, sufficient energy, and those factors may actually interact. And then -- sorry.

Q Go ahead.

A And as I summarize in the next sentence, I or a POSITA would understand that if a tissue does not receive enough energy, then it may not be ablated.

Q And when you say "a sufficient amount of time," what is that amount of time?

ATTORNEY BRIGGS: Objection. Form.

A The amount of time that a device may need to be activated in order to produce ablation would vary, would depend on the application and the type of device. As I mentioned, time, for example, and energy interact.

Q Would the amount of energy being delivered into the body depend on the voltage amounts of the energy being delivered?

ATTORNEY BRIGGS: Objection. Form.

A The amount of energy delivered into the body will depend on the voltage -- can depend on the voltage generated by the source.

Q Can it also depend on the current generated by the source?

A Yes.

Q Can it depend on the size of the electrodes that are used?

A The amount of energy that is delivered into the body, and therefore its effect on the body can depend on the size of the electrodes.

Q In paragraph 64 you say you've "never seen or used a device like Figure 5H device of Makower to deliver energy to the nasal phalangeal passage."

Do you see that?

A Yes.

Q Do you think it is necessary for Neurent, the petitioner, to establish that a device like that shown in Figure 5H of Makower has ever been seen or used?

ATTORNEY BRIGGS: Objection. Form.

A I -- I think I think you asked me a legal question. I'm not sure I understand it, but I don't know if it's a legal question.

Q Okay. Well, you include here, "I also understand that neither" -- or I have never -- sorry -- strike that.

You say, "I have never seen or used a device like the Figure 5H device of Makower. I also understand that neither Dr. Levine nor Dr. Bu-Saba have ever seen or used a device like of that Makower 5H."

So I guess my question is: Are those statements relevant to your analysis?

A I think they inform my analysis.

Q How so?

A I suppose that if hypothetical -- if Dr. Levine or Dr. Bu-Saba had used a device like Makower in Figure 5H, that would be a different fact for me to consider, as opposed to neither of them having seen or used a device like that. I understand that both Dr. Levine and Dr. Bu-Saba are very -- have substantial experience that is relevant. And so that's why I simply note that they have not seen or used a device like that.

Q Did these statements factor into your

opinion on whether petitioner had established invalidity?

ATTORNEY BRIGGS: Objection to form.

A You mean my opinion about whether a POSITA would have a reasonable expectation of success in treating the target tissue?

Q Yes. Let me rephrase then.

Did the statements in paragraph 64 factor into your opinion as to whether a POSITA would have a reasonable expectation of success in treating tissue with Makower Figure 5H?

A I would say that my opinion was primarily developed based on my understanding of the underlying technical factors and not primarily developed based on those statements. Though I do think those statements are confirmatory of my conclusions that are reached through engineering analysis.

Q Okay. Okay. In paragraph 67, you opine, "a POSITA would not have had a reasonable expectation of success in the Makower-Fang combination because a POSITA would have understood

that the 5H structure" -- and then it continues.

But this is your opinion on why a POSITA would not have had a reasonable expectation of success in Figure 5H working in the nasopharyngeal passage; is that correct?

ATTORNEY BRIGGS: Objection to form.

A I'm not sure I understood the question.

Q That's fair. I want to point you to paragraph 67.

Is that fair?

A Okay.

Q And the paragraphs that follow.

Your opinion is that Figure 5H in Makower would not work in the nasopharyngeal passage, correct?

ATTORNEY BRIGGS: Objection. Form.

A My opinion is that the device shown in Figure 5H of Makower would not be reasonably expected to succeed in treating the target tissue.

Q And if you go to Page 29, that's because the interior of the device is hollow and as you show in Figure 29, you would understand the -- the

interior of the device to be filled with electrolytic fluid; is that correct?

ATTORNEY BRIGGS: Objection to form.

A I think there were certain multiple elements in your question. Could you ask it -- I'm sorry, could you repeat the question, please?

Q Your opinion that Figure 5H of Makower would not be reasonably expected to succeed in treating tissue in the nasopharyngeal passage is because, as you show on Page 29, it's your understanding that the interior of that structure would be filled with electrolytic fluid; is that correct?

ATTORNEY BRIGGS: Objection. Form.

A So as I describe in my report, my analysis of why the device would not have a reasonable expectation of success was based, among other things, my expertise in analyzing how energy is delivered into the body by devices such as this. You know, sort of explaining earlier that when you're analyzing how energy is delivered into the body, among other things, you need to be

considering the configuration of the stimulation technology itself, but you also need to be aware of the anatomy where that device is being used. So both those factors were therefore considered in this case here. As you already mentioned, I point out to the fact that the device is hollow. I also point to the fact that the electrodes are cylindrical electrodes. And only a small amount of the cylindrical electrodes could be touching the neighboring tissue.

And I point to the fact that the space -- because the device is hollow and because of the nature of the space, there is going to be different forms of electrolytes in the space marked by yellow. And so those were all the factors that came together in supporting my conclusion.

Q Your understanding that there is fluid in this passage comes from Dr. Levine; is that correct?

A That's one of the sources of my understanding.

Q And I think we talked earlier, but you don't know the steps that are taken to perform a procedure in the nasopharyngeal passage; is that correct?

ATTORNEY BRIGGS: Objection to form.

A I think before you were asking whether I understood those steps as well as a clinician who was operating them, and I do not think I would understand all the steps as completely as -- necessarily as completely as a clinician who was trained in this procedure.

Q Do you understand any steps that would be taken before performing a procedure in the nasopharyngeal passage?

ATTORNEY BRIGGS: Objection to form.

A Yes.

Q What steps do you understand?

A It would depend, of course, on the application, but one step would be to position the device.

Q Do you know if there is any -- do you know about any other steps taken before performing one

of these procedures?

A Of course, another -- it would depend on the details of the device, but one would expect for these type of devices another step would be energizing the electrodes.

Q Okay. Anything else?

A Because the device is not intended to be left inside the nostril, another step would be at least some of the devices we discussed, you would move the device.

Q Okay. Do you know about any steps that are taken before positioning the device?

A One of the steps, in fact, that Dr. Levine explained to me during our phone call is that the nostril is irrigated, essentially cleaned, and that this is actually done with an electrolyte. This factored into my analysis because that would further contribute to the presence of an electrolytic fluid in the region I'm showing there with yellow.

Q So it's your understanding from Dr. Levine that the nostril would be irrigated with fluid and

that that fluid would remain in the nasopharyngeal passage?

A My understanding is that some of that fluid would remain.

Q Do you know how much?

A I don't know how much.

Q If we took the drawing that's shown on Page 29 --

A Yes.

Q -- and in a hypothetical if you assumed that there was no electrolytic fluid in that space that you colored in yellow?

A Okay.

Q So it's filled with air --

A Okay.

Q -- in my example.

Is the electrical energy going to go through the tissue or through the air?

ATTORNEY BRIGGS: Objection. Form.

A So now, I understand you're asking me a hypothetical, so now we're not talking about something being in the nose?

Q Well, if it was in the nose but if it was filled with air and there was no fluid --

ATTORNEY BRIGGS: Objection. Form.

A If it was in the nose, then there is going to be some fluid.

Q Which is your understanding based on Dr. Levine. Based -- in my hypothetical, if there is air inside this device, where is the radiofrequency energy going to go?

A If I'm understanding your hypothetical, you're asking me, this is still inside the nose?

Q I guess if -- let's just take a passage in the body --

A Right.

Q And inside what we see in Figure 5H in Makower, it's filled with air.

A Okay.

Q The energy in that situation would go into the tissue, it is not going to travel across air, correct?

A So if I understand your hypothetical, it's not the nose, it's a passage in the body in which

there is no electrolyte and I'm not aware of a passage in the body that would be like that. Then you're asking me in this hypothetical situation where would the current go?

Q Correct.

A I'm sorry. Can you repeat the question, just so I got it?

Q Sure. If we look at Figure 5H.

A Yes.

Q And the area that you filled in yellow is actually filled in with air.

A Yes.

Q Is the current going to travel across the air or is it going to travel through the tissue?

A In the hypothetical you gave, which of course would not be the case in the nose, the current cannot travel through the air.

Q And the current would only travel through the tissue?

A In sort of this hypothetical tissue that has no electrolyte on the surface of it, then the current would travel -- I mean, again it would

depend I guess on the configuration.

Q But the current would travel through the tissue, correct?

A If there was a perfectly dry orifice with no electrolyte in it, then there may be ways to configure the device so that the current can't travel through the air so it would travel through the tissue.

Q Well, current really can't travel through air, correct?

A That's correct.

Q Have you ever worked on any cardiac ablation devices?

ATTORNEY BRIGGS: Objection. Form.

A I believe I have.

Q What cardiac ablation devices have you worked on?

A I don't remember all the details. I do remember it was a catheter-delivered device that went inside the heart.

Q What did you do?

ATTORNEY BRIGGS: Objection to form.

Q What was your work related to that device?
A I don't -- I can describe it. I'm not sure if it is -- I believe I did that. It was a consulting work that was done for a company. I'm not sure if the work necessarily was confidential. Should I still talk about it?
Q No, you don't need to -- if you can talk about it at a high level. I don't want to know confidential information.
A They had come up with -- this was a while ago, but as I remember it, they had come up with a way to maneuver the catheter along the interior of the heart before applying the energy. So I was part of a team that was supporting them, if I remember correctly, with some computational models.
Q What were the computational models of, were they of applying energy or maneuvering the catheter?
ATTORNEY BRIGGS: Objection to form.
A They included biomechanical models. I don't remember if they also include models of -- I

don't remember if it also included models of the energy application.

Q Okay. But you recall working on biomechanical models of how this catheter would be maneuvered to the heart, correct?

ATTORNEY BRIGGS: Objection. Form.

A I do, but again it was a while ago, so I don't have a precise -- as I'm sitting here now, I don't have a precise recollection of all the steps we took.

Q And you don't recall, sitting here today, working on any models of energy application inside the heart?

ATTORNEY BRIGGS: Objection. Form.

A I don't. Though I think a lot of the other work I've done, general principles related to energy deployment would certainly be relevant inside the heart.

Q Now, you've used ring electrodes in devices before, correct?

ATTORNEY BRIGGS: Objection. Form.

A I have worked with technologies that use

ring electrodes.

Q And you've been able to use those ring electrodes and configure them to deliver energy to the target tissue in the way that you want, correct?

ATTORNEY BRIGGS: Objection. Form.

A So the work I've done with devices that use ring electrodes, this included, for example, deep brain stimulation electrodes. These are electrodes that are inserted into the brain. They're used to treat different neurological and psychiatric disorders. Majority of those electrodes would be using ring electrodes. And part of the analysis that -- among the analysis that my lab has done, for example, would be analyzing how current is delivered by these devices.

Q If I were to put -- if this pen had a ring electrode on it, and I were to put that on the surface of my skin, the current would flow through my skin into my tissue and not into the air, correct?

ATTORNEY BRIGGS: Objection. Form.

A I think that's good intuition, and, obviously, you have to have another electrode and so on, but that's correct. The current would not flow into the air. In the example you gave, based on my understanding of, it would flow into the skin.

Q Okay. Can you turn to paragraph 84.

And in this section you're talking about Imran and Makower, correct?

A I'm talking about Makower and I'm talking about Imran -- yes.

Q On Page 35, you have an annotated figure from Imran. Excuse me, Imran.

Do you see that?

A I do.

Q Who created these annotations?

A I don't remember. I might have created the initial version and counsel created the version that you see here.

Q And this figure is showing arrows in multiple directions, correct?

ATTORNEY BRIGGS: Objection. Form.

A The -- yes, there are arrows pointed in multiple directions.

Q And one of these directions is in a perpendicular orientation to the axis of that strut on which the electrode is positioned; is that correct?

ATTORNEY BRIGGS: Objection to form.

A Yeah, yes, you can describe it that way.

Q And so in the Imran device, in addition to delivering energy in -- in your opinion in the parallel to that axis, it will also deliver energy perpendicular to the longitudinal axis of the strut on which the electrode is positioned, correct?

ATTORNEY BRIGGS: Objection to form.

A My understanding is that the majority of energy would be delivered in sort of that longitudinal axis shown by the other two arrows.

Q And some energy would be delivered in the perpendicular axis, correct?

A I expect that a small amount of energy

could be delivered in that direction. It would, of course, depend on the details.

Q And that direction is lateral to the longitudinal axis, correct?

ATTORNEY BRIGGS: Objection to form.

A I think that direction is a direction that I generally refer to as the lateral direction in my report.

Q And in the Imran device --

A But I just would like to clarify that the arrows that were created here perhaps a version initially by me and then by counsel, the size of the arrows is not intended to represent the amount of current. It's simply supposed to -- as indicated, indicate that there are multiple possibilities of where the current would flow where the actual amount would be determined by the anatomical factors.

Q Okay. And in the Imran device, you would agree that unlike in the Makower device, these are not ring electrodes, correct?

ATTORNEY BRIGGS: Objection. Form.

A My understanding -- when I was interpreting Imran, I was interpreting it as not being a complete ring. Though it could be a partial ring.

Q Okay. And in the Imran device, it is not going to deliver energy in the interior portion of the structure that we see in Figure 1 on Page 35 of your declaration?

ATTORNEY BRIGGS: Objection to form.

A I'm sorry. Which figure?

Q So I'm looking at Page 35 of your declaration.

A Page 35, yes.

Q Figure 1 from Imran.

Do you see that?

A Yes.

Q And there is an internal space in Figure 1 between the struts of the device that are shown.

Do you see that?

A Yes.

Q Imran is not going to be delivering energy into that internal space, correct?

A Imran would deliver energy into that internal space.

Q How?

A So that internal space for the applications we've been discussing so far includes conductive electrolyte and that electrolyte is preferentially conductive to the current. There's that expression that the current takes the path of least resistance, and that would be true in this case as well.

So the current would travel through that electrolyte as well.

Q Even though it just has surface electrodes on the external surface of the struts of Imran?

A The deficiency of Imran, as I tried to explain, is that the struts stick above the electrode in this case. And I'm showing in the -- sort of the expansion in 35, how that -- how the fact that it extends above creates a pathway for the current to not enter the -- the tissue, but rather, you know, escape laterally, and from there it would be traveling through the electrolyte.

Q Have you worked on a device that looks like this device shown in Imran?

ATTORNEY BRIGGS: Objection. Form.

A I have not worked on a device that bears a lot of resemblance to the image shown in Figure 1.

Q Prior to working on this case, did you know Dr. Levine?

A No.

Q Do you know Dr. Martin?

ATTORNEY BRIGGS: Objection. Form.

A I don't know Dr. Martin, prior to working on this case, yes.

Q Do you know Dr. Bu-Saba prior to working on this case?

A I don't.

Q Do you know Dr. Delgaudio prior to working on this case?

A I don't think so.

ATTORNEY COHEN: Let's take a ten-minute break off the record.

(Recess.)

BY ATTORNEY COHEN:

Q Throughout the day on any of the breaks, have you discussed the substance of your testimony with counsel?

A No.

Q Can you -- do you still have your CV in front of you?

A Yes.

Q Can you turn to Page 25 and 26. And I'm back in the litigation support.

A Okay.

Q Is there anything missing from this list of litigation support where you've offered expert opinions?

A Not that I'm aware of. I do my best to keep this complete.

Q Did you offer a series of declarations in IPRs between Boston Scientific and Nevro?

A I was engaged on a matter related to Boston Scientific and Nevro. I don't think -- I don't think I've provided any declarations.

Q You don't recall providing any declarations in that matter?

A I -- as I recall, I did not provide declarations in that matter.

ATTORNEY COHEN: I don't think we have any further questions.

ATTORNEY BRIGGS: Okay. We will, but we're going to go get ready.

(Recess.)

EXAMINATION BY
ATTORNEY BRIGGS:

Q Okay. Dr. Bikson, earlier today counsel for asked about the definition of POSITA as relates to the '271 patent.

Do you remember that?

A Yes.

Q Can you please grab your '271 declaration, please.

A I have it.

Q Can you please turn to the section on POSITA, especially turning to 13 in your correct definition of paragraph 41.

A Okay.

Q Do you see paragraph 41?

A I do.

Q Do you remember when counsel asked you about the removal of clinical use or testing of medical devices today?

A I do.

Q Does your definition preclude the use -- the experience of clinical use or testing medical devices?

A No.

Q So in other words, you can have at least three years of experience in the design and development of medical devices and also could have experience with clinical use of medical testing?

A Correct. You could have three years of experience in the design and development --

(Court reporter clarification.)

A You could have at least three years of experience in the design and development of medical devices, as well as experience in the use of medical devices.

Q Okay.

And looking at Paragraph 42, do you still

agree with the substance of your testimony in Paragraph 42?

A Yes.

Q And what is that substance of that testimony?

A That I meet both parties' definition of a POSITA at the time of the challenged claims of the '271.

Q Okay. So moving to a different topic, do you remember earlier today when counsel asked you about whether you designed devices that have an intended use of ablating the nasopharyngeal passage?

A Yes.

Q Are you familiar with ablation?

A Yes.

Q How so?

A I've worked for several decades on devices that can produce ablation. I have studied the device features that can lead to ablation. I have studied and published extensively on the mechanisms leading to ablation, how to control the

degree of ablation, and I think I'm broadly recognized as an expert on that topic.

Q Do you remember when you were asked about the patent matters listed in your CV today?

A I do.

Q What I'm going to introduce as exhibit, is that F? Dr. Bikson, I'm handing what will be Bikson F.

Do you recognize this document?

(Bikson Exhibit F, United States Patent Application Publication Number U.S. 2010 0217356, marked for identification.)

Q So Dr. Bikson, now that you have Exhibit F in front of you, do you recognize this document?

A I do.

Q If you look at the front page of this document, it is U.S. -- United States patent application publication number U.S. 2010 0217356.

Do you see that?

A I do.

Q And in the -- off the left-hand side towards the top there is an inventor list.

Do you see that?
A I do.
Q Who are the named inventors?
A Myself, Marom Bikson; Maged Elwassif, and Qingjun Kong.
Q You're the Marom Bikson listed as the inventor on this patent?
A Correct.
Q When was this patent filed?
A This application was filed in February of 2009.
Q And that predates the priority date of the Aerin patents; is that correct?
A That is correct.
Q Can you please turn to Paragraph 17 of this document.
A I'm on Paragraph 17.
Q Just read it to yourself and let me know when you're ready.
A I've read it.
Q It says, "Excessive heating can lead to tissue ablation, brain damage, and death."

Do you see that?

A I do.

Q So you're discussing ablation in this paragraph, correct?

A That is correct.

Q Where did your understanding of ablation concepts relative to Paragraph 17 of this patent come from?

ATTORNEY COHEN: Objection. Beyond the scope of cross-examination.

Q You can answer.

A So as I mentioned, I've studied the principles of ablation for a long period of time. By the time this application had been filed, I would be -- I would have looked at the principles of ablation for approximately 15 years. One of the key mechanisms that's understood to drive ablation is temperature increases. And that is a topic that is addressed in this patent. So I have in the course of this patent and throughout my career considered how devices that apply energy to the body can produce heating and when that heating

crosses a critical threshold that heating can lead to irreversible tissue damage.

And, therefore, ablation and so a lot of my work relates to how to apply energy to the body in a controlled way. I've developed the most advanced computational models, I believe, and published on that as far as how to control the delivery of -- how to control the delivery of energy into the body, how that energy delivery then leads to temperature rises as a consequence of both the device parameters and the anatomy and tissue properties. And then considered the consequences of that temperature rise which can include ablation.

ATTORNEY COHEN: I'm going to object to that entire answer as being beyond the scope of my cross-examination.

ATTORNEY BRIGGS: Your objection is noted.

We are done with that one. You can give her...

BY ATTORNEY BRIGGS:

Q Dr. Bikson, can you please go back to your

'271 patent declaration. And specifically, can you look at Claim 1 on Page 16.

A Okay.

Q Do you remember when counsel earlier today asked you about the order of the contacting and applying steps in 1A and 1B?

A I believe so.

Q Is it appropriate in your opinion to do the applying step before the contacting step?

A That would not -- no.

Q Why is it not appropriate?

A You need to apply contact, in this case of the electrodes, with the tissue. Once you apply contact there is a pathway for the energy to be delivered into the tissue.

Q Could the contacting and applying steps occur at about the same time?

A They could occur at about the same time.

Q Could the applying step occur after the contacting step?

A The applying step can occur after the contacting step.

Q Okay. Could you please turn to Page 24 of that same declaration.

Do you remember earlier today when counsel asked you about Figure 15 of Stern?

A Yes.

Q And do you remember testifying that if Stern had multiple pairs of bipolar electrodes, something along the lines of that phrasing?

A Yes.

Q Does Stern have multiple pairs of bipolar electrodes?

A Stern does not have multiple pairs of bipolar electrodes. In reviewing the Stern patent, I understood that Figure 15 is a key figure in illustrating the scope of Stern's invention. In Figure 15, you have a single voltage source, which is the generator, you have some switches that are labeled from 232 to 248, then you have electrodes, and those are labelled from 220 from --

(Court reporter clarification.)

A I'm sorry. The electrodes are labelled

from 220, 222, 224, and 226.

What Stern describes is the closing of two switches. So, for example, one can close switch 248 and one could close switch 236. The closing of two switches produces a single bipole. A single bipole is not multiple bipoles. We simply have two electrodes forming one bipole.

Alternatively, you could, for example, close switch 246 and switch 234. That would activate electrodes 226 and 222. Those two electrodes form a single bipole, and a single bipole is not multiple bipoles or bipole electrode pairs.

Therefore Stern does not disclose multiple electrode pairs. Stern, at most, discloses a single electrode pair. When all of the switches are open, then there are no electrode pairs at all.

ATTORNEY BRIGGS: Okay. Next topic, can we please see Exhibit C, I believe it is. Thank you.

BY ATTORNEY BRIGGS:

Q So in front of you now, Dr. Bikson, is Exhibit C.

Do you see that?

A I see it.

Q Do you remember creating this drawing at counsel's request today?

A I do.

Q And do you see that you have a Row 1 at the top that goes laterally across the page?

A I see that there is a -- a row at the top.

Q What do you see in this figure?

A It's -- it's from the '271 patent. This shows an embodiment where you have a device. There are multiple electrodes on the surface of the device. Some of them are labeled as positive and negative. And that device can be configured into bipoles.

Q You have a first circled set of electrodes at the top, correct?

A Correct.

Q Is that two electrodes at the top you that you circled?

A That is two electrodes.

Q Is that a row of multiple -- is that a row of pairs of electrodes?

ATTORNEY COHEN: Objection. Beyond the scope.

A That is a row with a single bipole.

Q And then below that you have Row 2, correct?

A Correct.

Q Is that a row a multiple -- is that a pair -- is that a pair or pairs of electrodes?

A That is a row with a single bipole pair.

Q Do the two circled instances at the top of the figure read on Claim 1 of the '318 patent, specifically if you look at your declaration at Page 16, I believe, of the '318 -- excuse me. Scratch that. It's the '271. I apologize. Claim 1 of the '271.

That is column 16, Page 16, excuse me.

ATTORNEY COHEN: Objection. This is beyond the scope of cross-examination. It is improper redirect testimony. And also leading.

ATTORNEY BRIGGS: We disagree. It's -- you asked him a ton of questions about rows. We're going over what the rows means in the context of the claim of the patent.

ATTORNEY COHEN: You're going beyond the figure.

ATTORNEY BRIGGS: We're asking what the figure means and relative to the claims, which is completely within the bounds.

ATTORNEY COHEN: No, it is not.

ATTORNEY BRIGGS: Okay. You can object.

BY ATTORNEY BRIGGS:

Q Do you see element A, it says, "wherein the treatment element comprises two rows of bipolar electrode pairs"?

A I see that.

Q Does the circled instances that you have in Exhibit C read on that requirement?

A No.

Q All right. Can we please go to Exhibit E.

Do you remember drawing this at counsel's instance?

A Yes.

Q And I believe she was asking you to draw this in relation to the claims of the '318 patent in the context of multiple frequency output channels.

Do you recall that?

A Yes.

Q Can you please explain to me whether it's possible to have multiple radiofrequency output channels in relation to figure E? Exhibit E, excuse me.

A It is. What I drew here was four electrodes. I labeled them 1, 2, 3, 4. Electrodes one and two are forming a one bipole. Electrodes three and four are forming another bipole. The two wires going to 1-2 are a first channel and the wires going to 3-4 are a second channel.

Q And how do you generate two different or how do you -- how do you get to multiple radiofrequency output channels with those multiple pairs in that drawing?

A One way you can do it as an implementation. This would just be one way to do it would be to have a voltage source at the position I'm showing here. I'm -- I'm pointing to the -- the first two lines. You would have a separate voltage source to the position I'm pointing to here. I'm pointing at the lines going to electrodes 3 and 4.

ATTORNEY BRIGGS: No further questions.

ATTORNEY COHEN: I have a few follow-up.

CONTINUED EXAMINATION BY
ATTORNEY COHEN:

Q Let's go back to paragraph 41 of your '271 declaration.

And you were asked by counsel whether your definition precludes the clinical use of medical devices, and you said it did not.

Do you recall that?

A Yes.

Q But in your opinion, it is insufficient for a person to have an MD and three years of experience in the clinical use of medical devices

without having three years of experience in the design and development of medical devices, correct?

A In my opinion, it would be insufficient for a POSITA to have an MD or a bachelor's of science degree in engineering and at least three years of experience in only the clinical use.

Q And then you were asked about paragraph 42.

Do you recall that?

A 42?

Q Sorry. You were asked by Mr. Briggs about your opinions in Paragraph 42 during your redirect examination.

Do you recall that?

A Yes.

Q And you said it's still your opinion that you meet both parties' definitions of a POSITA at the time of the invention.

Do you see that?

A Yes.

Q It's also still your opinion that your

opinions are the same regardless of which definition applies, correct?

A Correct.

Q All right. I want to turn back to the patent publication that Mr. Briggs introduced. Do you still have that in front of you or -- here it is. This -- we're back to Bikson Exhibit F. And you have that?

A I do.

Q And so this device relates to a device that's used for deep brain stimulation; is that correct?

ATTORNEY BRIGGS: Objection. Form.

A It -- it -- among its scope, it can apply to a device that's used for deep brain stimulation.

Q And in this patent application, are you trying to avoid ablation occurring?

A In this patent application, you were trying to manage how much ablation is occurring.

Q Do you want ablation to occur when you're applying deep brain stimulation?

A For -- for applications of deep brain stimulation for things like movement disorders and other applications like that, often the goal is not to produce ablation. There are other examples where the treatment of, for example, these movement disorders does involve the intentional production of ablation.

Q But that -- those don't involve deep brain stimulation?

A The term deep brain stimulation is usually used to apply to the first example where you are not trying to produce ablation. The technologies that you would then use intentionally to produce ablation, I don't think would be called deep brain stimulation.

Q Okay. You can set that aside.

Let's turn back to your '271 declaration. And you were asked at Page 24 about your opinion about Stern not disclosing two bipolar electrode pairs.

And counsel asked you, is it your opinion, I think we all know it's not.

If Stern disclosed closing switches 248 and 246 and 236 and 234, would Stern have multiple bipolar electrode pairs?

ATTORNEY BRIGGS: Objection to form.

A Stern does not disclose closing the switches at the same time.

Q If it did, would Stern have multiple bipolar electrode pairs?

ATTORNEY BRIGGS: Objection. Form.

A So you're asking me if Stern does not disclose it. But if those switches were closed -- one of the reasons why it is important to have multiple channels is that they can be independently controlled. And I think that the -- the '271 patent is pretty clear in explaining why that is. And I think it would also be consistent with what a POSITA would know.

In a situation like what you just described where all those switches are closed, you now have a single source. And, again, the situation you described is not in Stern, but if you were to treat it as a hypothetical, you now

have a single source and it's connected to four electrodes. And the difficulty at this point is that you are not controlling the delivery of the energy to those bipoles independently. As described in the -- in the '271 patent, you could, for example, have an a situation where there is an impedence mismatch. Let's say the 220, 224 pair has a very high impedence, and the 222, 226 has a very low impedence. In such a situation, the current flow to the 222-226, and the current would not flow to the 220-224.

So even if we did what you were describing, which is not described in Stern, it would have this problem with it that is overcome in -- in the -- invention.

Q I'm going to point you to Page 16 of your declaration because you were just talking about radiofrequency output channels and this whole independent control. The '271 patent doesn't require multiple radiofrequency output channels, correct?

A Claim 1 does not specify multiple

radiofrequency output channels.

Q Okay. So then turning back to Page 24, we're only talking about multiple bipolar electrode pairs.

A Yes.

Q Not radiofrequency output channels.

Do you have in mind?

A Okay.

Q And you were asked by Mr. Briggs about your opinion as to whether Stern has multiple bipolar electrode pairs.

And my question was, I understand it's your opinion Stern does not disclose this, but if Stern disclosed closing switches 248, 246, 236, and 234, would it have multiple bipolar electrode pairs?

ATTORNEY BRIGGS: Objection. Form.

A I'm sorry. Can you repeat the question one more time?

Q If Stern disclosed closing switches 248, 246, 236, and 234, would Stern have multiple bipolar electrode pairs?

ATTORNEY BRIGGS: Same objection.

A I'm not sure how to answer that since Stern doesn't disclose that.

Q Do you not understand what happens when you close the switches in Stern?

A Stern describes closing, at most, two switches at a time. So -- and that -- based on that I was able to analyze the -- what Stern is describing. I think what you're describing is something different.

Q I understand your understanding of Stern. My question is in a hypothetical where switches 248, 246, 236, and 234 are all closed, are there multiple bipolar electrode pairs?

A I think I would need to understand more about the hypothetical to answer that.

Q What would you need to understand?

A I -- I would want to understand what else you are changing about Figure 15.

Q I'm just closing four switches. That's all I'm doing. I'm closing switch 248, 246, 236, and 234.

In that scenario are there multiple bipolar electrode pairs?

A I don't think you would do that, because if you did that you would lose control. You would not have the -- the independent control that you desire. And so it's not something that you would do.

Q If you did that, though, would you have multiple bipolar electrode pairs?

ATTORNEY BRIGGS: Objection. Form.

A I would not do it.

Q Okay. I'm instructing you in this hypothetical that you do close switch 248, 246, 236, and 234. In that scenario, are there multiple bipolar electrode pairs?

ATTORNEY BRIGGS: Same objection.

A I'm not sure how to answer that question.

Q Why not?

A My analysis was focused on Stern and the Stern specification. Stern describes, at most, the closing of two switches. And so what you're describing is -- is -- is not compatible with

Stern. It's not compatible with Figure 15 in Stern.

Q Is there something that would malfunction -- strike that.

You understand the circuit diagram that we see in Figure 15, correct?

A I do.

Q And if you closed switches 248 and 246, electricity would flow to electrodes 220 and 222, correct?

A Not necessarily.

Q I think we discussed earlier that Stern does disclose pairs of electrodes, correct?

A Discloses a single bipolar electrode pair.

Q If electrodes 220, 222, 224, and 226 were all contacted with tissue, do you have that in mind?

A Okay.

Q And you close switch 248 and 246 and switch 236 and 234, you would deliver bipolar energy through multiple bipolar electrode pairs, correct?

ATTORNEY BRIGGS: Objection. Form.

A That would depend on additional details.

Q What details?

A Such as the impedence between the electrodes.

Q If the impedence was equal between the two sets of electrodes and you closed switch 248 and 236 and switches 236 and 234, you would deliver bipolar energy through multiple bipolar electrode pairs, correct?

ATTORNEY BRIGGS: Objection to form.

A If I understand the hypothetical that you're suggesting, you're suggesting those two aspects of the hypothetical. The first one is doing something contrary to Stern.

The second part of the hypothetical has to do with something that is impossible. You can't control the impedence between the electrodes. It's not something you can control.

Because you can't control the impedence, it's why it's valuable to have multiple channels. So when the impedence is not even and you have

multiple channels, you are able to deliver current to -- current effectively across a multiple bipole pairs. You can't just set the impedence in any actual application.

Q Is it outside your expertise to be able to tell me what happens if you close switches 248, 246, 236, and 234?

ATTORNEY BRIGGS: Objection. Form.

A I think I'm -- as far as the kind of matters that we're discussing here today, I think I'm an expert on these matters.

Q And Stern itself does not disclose the impedence that is present between the different electrodes, correct?

A I would need to look at Stern.

Q And --

A I don't remember.

Q And so -- it's your opinion that you are an expert on the matters we've been discussing today, correct?

A I am.

Q And you cannot tell me whether two bipolar

electrode pairs would be formed if you closed switch 248, 246, 236, and 234; is that correct?

ATTORNEY BRIGGS: Objection. Form.

A I don't think I fully understand the -- the rationale for your question. So it's hard for me to answer precisely.

Q Well, I don't think you need to understand the rationale for my question. You need to answer my question.

And my question is: If you were to close switch 248, 246, 236, and 234, will energy be delivered through multiple bipolar electrode pairs?

ATTORNEY BRIGGS: Objection. To form.

A That would depend on additional parameters.

Q What parameters?

A One of those parameters would be the impedence between the electrodes.

Q Is it your opinion that if you closed switch 248, 246, 236, and 234, you are unable to determine if there are multiple bipolar electrode

pairs without understanding the impedence of tissue between the bipolar pairs?

ATTORNEY BRIGGS: Objection. Form.

A I think the hypothetical that you're suggesting is not consistent with Stern. And so it's hard for me to understand how to answer your question.

Q It's fine. You cannot tell me what is going to happen looking at the circuit diagram in Figure 15 if we close switch 248, 246, and 236 and 234; is that correct?

ATTORNEY BRIGGS: Objection to form.

A It would depend on additional parameters that you would have to specify.

Q And you said the impedence of tissue; is that correct?

A The impedence would be one parameter.

Q What other parameters?

A I would -- I'm not sure. I would have to think more about it.

Q If you close switch 248, 246, 236, and 234 and you assume similar impedence, like the tissue

hasn't been ablated at all, and electrodes 220, 222, 224, 226 are all in contact with mucosal tissue, are you able to tell me if that involves the delivery of bipolar energy through multiple bipolar electrode pairs?

ATTORNEY BRIGGS: Objection. Form.

A The -- whether there is differences in -- of impedence between these electrodes does not depend on whether you have started to deliver ablation or not. Even in the situation where you have tissue where none of the tissue has been ablated, you can, in fact, expect that there are going to be differences in impedence between different electrodes pairs.

Q Even if there are differences of impedence between the electrode pairs, is it your opinion that if you close 248, 246, 236, and 234, those switches, you would not be delivering bipolar energy through multiple bipolar electrode pairs.

ATTORNEY BRIGGS: Objection. Form.

A As I sit here today, I'm not sure how to answer that hypothetical. I would need to think

more about it.

Q Now, if you return to your Bikson Exhibit E, Mr. Briggs asked you questions about that.

Do you recall that?

A Yes, should I close this?

Q Yes.

A Yes.

Q And you said one way you would have multiple radiofrequency output channels is that you would have separate voltage sources.

Do you recall that?

A I do.

Q Is it your opinion that the '318 patent requires separate voltage sources in order to have multiple radiofrequency output channels?

ATTORNEY BRIGGS: Objection. Form.

A I just want to go to the '318 to understand the question.

I'm sorry. Can you repeat the question?

Q Sure. You're on Page 16 of your '318 declaration.

Do you see that?

A Yes.

Q Is it your opinion that the '318 patent requires separate voltage sources in order to have multiple radiofrequency output channels?

A No.

ATTORNEY COHEN: I have no further questions.

ATTORNEY BRIGGS: We do not either.

(Time Noted: 5:20 P.M.)

ACKNOWLEDGMENT OF DEPONENT

I, MAROM BIKSON, Ph.D., do hereby acknowledge that I have read and examined the foregoing testimony and the same is a true, correct, and complete transcription of the testimony given by me and any corrections appear on the attached errata sheet signed by me.

_____ _____

(SIGNATURE) (DATE)

CERTIFICATE OF SHORTHAND REPORTER - NOTARY PUBLIC

I, Anita M. Trombetta, Certified Reporter, Notary Public within and for the State of New York do hereby certify: That MAROM BIKSON, Ph.D., the witness whose deposition is hereinbefore set forth, was duly sworn by me before the commencement of such deposition and that such deposition was taken before me and is a true record of the testimony given by such witness.

I further certify that the adverse party was represented by counsel at the deposition.

I further certify that the deposition of MAROM BIKSON, Ph.D., occurred at the offices of Greenberg Traurig, LLP on January 7th, 2025, commencing at 9:08 A.M. to 5:20 P.M.

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 10th day of January, 2025.



_____

Anita M. Trombetta

NOTARY PUBLIC IN AND FOR THE STATE OF NEW YORK

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