UNITED STATES PATENT AND TRADEMARK OFFICE

ZF NORTH AMERICA, INC., et al., Petitioners,	
v.	Review No. IPR2023-00273
	Patent No. 7,021,415
STONERIDGE CONTROL DEVICES, INC., Patent Owner.	

Alexandria, Virginia

Friday, July 28, 2023

Deposition of

BRUNO LEQUENSE

a witness, called for examination by counsel for Patent Owner, pursuant to notice and agreement of counsel, beginning at approximately 8:44 a.m., via Microsoft Teams teleconference, before Gary Euell of Anderson Court Reporting, participating remotely from Alexandria, Virginia, notary public in and for the Commonwealth of Virginia, when were present on behalf of the respective parties:

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APPEARANCES:

On behalf of Patent Owner:

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C O N T E N T S

EXAMINATION BY: PAGE

Counsel for Patent Owner 4

DEPOSITION EXHIBITS: 4

No. 1 - Notice of Deposition

No. 2 - Declaration of Lequense

No. 3 - CV of Mr. Lequense

No. 4 - E-Motors Consulting Website

No. 5 - Accused Device in Litigation

No. 6 - Pictures of Accused Device

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P R O C E E D I N G S

(Deposition Exhibit Nos. 1 through 6 were marked for identification.)

Whereupon,

BRUNO LEQUENSE

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

EXAMINATION BY COUNSEL FOR PATENT OWNER

BY MR. MURPHY:

Q Thank you. Good morning, Dr. Lequense. Could you please --

A Thank you. Good morning.

Q Good morning. Could you please state your name for the record?

A My name is Bruno Lequense.

Q And you understand you're under oath today?

A Yes.

Q Any reason you can't testify correctly today?

A No.

Q I'm going to ask you some questions

today and the ground rules are you have to answer them unless your attorney says not to. He may object from time to time, but unless he specifically says "don't answer," you have to answer. Do you understand?

A I understand.

Q And we're not taking a video today. It's just recorded by text. So if you could, please just answer yes or no and not use any non-verbal headshakes or --

A Understood.

Q Understood? If anything I say is unclear, which is probably likely at some point, if you could, ask me for clarification if you don't understand what I'm asking.

A Will do, thank you.

Q Thank you. Otherwise, if you answer, I'll understand that you understood the question at least enough to where you could give an answer.

A Okay.

Q And I will do you the courtesy of waiting until you're finished before I ask my next

question. And if you would, do the same for me. Just wait until I finish my question before you give your answer.

A Sounds good. Will do.

Q Thank you. And if you need to take a break, of course, let me know. I've pre-marked Exhibit 1 here. This is -- have you seen this document?

A Yes.

Q You understand generally what it is?

A Yes.

Q It's asking for you to appear today and give testimony in this case that's captioned on page 1?

A Yes.

Q And generally speaking, you are retained by the Petitioners, correct?

A Yes.

Q And you're aware that Petitioners are challenging the validity of a patent owned by the Patent Owner?

A Yes.

Q Are you aware of a co-pending district court litigation between the parties?
A Yes.
Q Are you giving any opinions today on that case?
A No.
Q Have you been asked to give any opinions on that case?
A No.
Q Did you prepare for today's deposition?
A Yes.
Q Without telling me what you said, without divulging anything you said to your attorneys, what, generally, did you do to prepare?
A I read the prior art -- read the patent at issue, 415. I read the prior art. Re-read my declaration and looked at different sources to refresh my memory.
Q Did you meet with your attorney?
A Yes.
Q For how long, approximately?
A A few hours.

Q And what documents did you review with your attorney?
A We reviewed my declaration and, again, the 415 and a number of patents that I'm citing in support of my declaration.
Q I've got an additional two exhibits. These are pre- marked as Exhibits 2 and 3. So Exhibit 2 is your declaration which was cited as Exhibit 1002 in this case and Exhibit 3 is, I believe, your résumé or your CV --
A Yes.
Q -- which was cited as Exhibit 1003 in this case.
A Yes.
Q I want to first ask about your résumé. So if you could, go to Exhibit 3. Is this the most up-to-date version of your résumé?
A Yes.
Q So this petition was filed back in December of 2022. There are no updates since then?
A No.

Q Let's go to page 2. Do you see the heading "Professional Experience"?
A Yes.
Q And it goes all the way from present, and then on page 3, it looks like it starts in 1979.
A Yes.
Q Did you omit any work experience?
A No.
Q What about between, for example, 1981 and 1984?
A I was a PhD student.
Q PhD student? Just generally speaking with respect to your résumé, are you aware that a judge might review this and use everything that's written in here to evaluate whether you are a credible witness?
A Yes.
MR. HUTCHINS: Objection.
MR. MURPHY: And you're aware that a judge might review this same document in determining whether to give your testimony weight?

MR. HUTCHINS: Same objection.

BY MR. MURPHY:

Q You did not overstate anything on your résumé?

A No.

Q So on page 1 of your résumé, there's a section that lists education. Can you walk me through generally what your studies entailed?

A Yes. I got my undergraduate degree in France at an engineering school and my major was electrical engineering. My specialty within electrical engineering was power systems in general. Then I did my PhD in the U.S. where my focus was the control of induction machines. So my education is electrical engineering in general with a particular focus on electric machines and electromechanical energy conversion and controls.

Q Did you give a thesis in support of your PhD?

A Yes.

Q What was that? What was the subject of your thesis?

A That was control of -- a special type of control for induction machines.

Q Are you aware or would you agree with me that one of the main aspects of this case -- excuse me. Are you aware -- pardon me. Would you agree with me that your opinions in this case relate to electromechanical park brake actuators?

A Yes.

Q And one of the main issues in this case relates to noise attenuation or vibration damping, would you agree?

A Yes.

MR. HUTCHINS: Objection.

MR. MURPHY: Does your education that you just described, does it relate to any of those two issues specifically?

MR. HUTCHINS: Objection.

MR. MURPHY: Go ahead. If it's unclear, I can try to clarify my question.

BY MR. MURPHY:

Q Did you study, for example, noise attenuation?

A I had some classes in mechanical engineering and noise attenuation is part of mechanical engineering.

Q What about vibration damping? Same question.

A Same answer.

Q With respect to your professional experience -- I'm looking now at your résumé on page 2 -- I'm wondering if in any of these roles you have worked on designing a system that relates to noise attenuation.

A Noise and vibration, yes.

Q Can you elaborate?

A Yes, that was more on electric power steering systems. In those systems, vibrations are particularly important because the driver can feel them directly on the steering wheel. So there was a lot of work going in terms of minimizing vibrations in power steering systems.

Q Which of your roles here did you do that work on power steering systems?

A That would straddle my work at GM in the

90s and Delphi in the early 00s. Delphi was a partner of General Motors, so my role didn't change. I mean, the corporation I worked with changed, but my role and the work I was doing didn't change. And in particular, GM divested with Delphi all of its chassis components like steering, brakes, and so forth. Powertrain as well. Powertrain accessories.

Q So you were at GM for approximately 15 years, it looks like.

A Yes.

Q And you're saying you basically continued in a similar capacity --

A Yes.

Q -- just under a different name at Delphi --

A Yes.

Q -- until 2009?

A Well, 2006, then in 2006, the research lab was closed and I moved to Delphi powertrain.

MR. HUTCHINS: Just make sure he finishes his whole question --

THE WITNESS: Okay.
MR. HUTCHINS: -- before you answer.
THE WITNESS: Sorry.
MR. HUTCHINS: No, that's fine. It's just you're talking over each other a tiny bit and --
THE WITNESS: Sorry about that.
MR. HUTCHINS: -- it's easier if you wait.
MR. MURPHY: I agree with him, by the way.
THE WITNESS: Good.
BY MR. MURPHY:
Q So I'm just trying to understand -- let me see if I can think of a good way to ask this. What percentage, just roughly, of your job duties between General Motors and Delphi related to noise attenuation or vibration damping?
A My work was -- I would say almost 100 percent electromechanical systems, all aspects that include reducing vibrations and so forth. So in terms of percentages, I don't know.

Q Is it -- would you say that issues related to noise and vibration damping came up periodically from time to time throughout your entire career?

A Yes.

Q And were you ever personally tasked with designing solutions to noise?

A I was part of the team that was developing electric power steering where vibration is important. Earlier, I should have added -- and I can do it now, actually -- when I was at Delphi powertrain 2006 to 2009, I was a group manager, and within my group, there was somebody who was specifically working on the attenuation of engine noise.

Q So but you weren't specifically working on that problem --

A I was managing him.

Q So one of your direct reports was working on --

A Yes.

Q -- solving that problem?

A Yes.
Q And it related to engine noise?
A Yes.
Q Okay, now I'm interested in your -- you have two more recent work experience positions here. I'm specifically looking at University of Wisconsin Milwaukee where it says you're presently an adjunct professor?
A Yes, research.
Q Yeah, my question is what do you do in that capacity?
A The point of research process to develop research projects. There's no teaching associated with it.
Q There's no teaching, you just do research?
A Right.
Q So what -- I guess my question is because it says you're holding this role presently, right?
A Right.
Q So what are you presently doing?

A At the moment, I do look at -- and same thing with Marquette University -- the point is to work with professors there on research projects on a case-by-case basis. I don't have an active role at the moment, but that can change at any time.

Q So are you under contract by the university presently?

A I have that title, that's -- yes.

Q So even though you're not doing anything active at the moment, you still hold the title --

A Yes.

Q -- of adjunct professor?

A Yes.

Q Is that -- what is the difference between an adjunct professor and a non-adjunct professor?

MR. HUTCHINS: Objection.

BY MR. MURPHY:

Q Do you understand, kind of, my question?

A Yes.

Q What I'm wondering is, my understanding of a professor is somebody that goes to work

generally during the school year and collects a paycheck from a university for teaching or research. It sounds like your situation is slightly different than that. I'm wondering if you can just elaborate on your understanding of those differences.

A Yes, you mentioned the paycheck. I don't get a paycheck. I get a paycheck only if there is a research project that allocates money for my part of the project.

Q Okay. And the university allows you to hold the title of adjunct professor despite there being no active work?

A Yes.

Q Because that benefits the university --

A Yes.

Q -- to hold you out as adjunct and you're ready and willing to do research?

MR. HUTCHINS: Objection.

BY MR. MURPHY:

Q Is that generally correct?

A That makes it possible for me to apply

for research grants --

MR. MURPHY: I see.

THE WITNESS: -- through the university or with the university.

Q Same question for Marquette University. My question specifically is are you actively doing any research?

A Same answers.

Q You're a research professor at Marquette University?

A Yes.

Q Not adjunct professor?

A I'm not sure the -- I think that's -- my role is really similar in both cases.

Q Okay. Have you applied for grants in either role that are still pending?

A No, not pending.

Q Okay. Are you preparing -- do you plan to apply for any grants at the moment?

A No immediate plan.

Q Have you studied or conducted research on noise attenuation or vibration damping in

either role?

A No.

Q Can you just explain for me your E-Motors Consulting LLC? What is that business?

A That's a consulting business. I don't have any reports or employees. I just provide consulting mostly on electric machine design and related topics. And I also work -- I've had several cases as an expert witness.

Q Is it the sort of thing where a company will come to you with a problem and ask you to consult -- analyze --

A Help them solve it, yes.

Q Have companies come to you with a problem of noise of vibration since you've been working at E-Motors Consulting?

A The work of designing electric machine implies minimizing torque ripple from -- you know, the torque output from the machine. The ripple is how much the torque varies from its nominal value. And one of the spec is always to minimize the torque ripple. And the torque ripple for electric

machine is one of the source of vibrations.

MR. HUTCHINS: And I apologize. Can you just repeat again? You were saying torque --

THE WITNESS: Ripple, R-I-P-P-L-E, ripple.

MR. HUTCHINS: Ripple. Okay, I apologize. I wasn't facing you, so I was having a little hard time hearing you. Torque ripple. Thank you.

BY MR. MURPHY:

Q And you might as well just explain what torque ripple is, if you don't mind.

A Yes, the torque from electric machine or from any machine has an average value and then varies around that average value. So if the average value is 100, doing a revolution may go from 110 to 90 in cycles. And the ripple is that variation of the average value.

Q And that torque ripple can lead to vibration in a system?

A Yes, yes.

Q And you may want to dampen that

vibration depending on how severe it is?

A I would not use the word dampen. More that you avoid vibration in the first place.

Q Okay. Let's flip to page 6, please. So in the section titled "Patents," do you see that?

A Yes.

Q It says you have 54 granted, 3 patents allowed, but not issued, 17 defensive publications, several --

A Provisional.

Q -- provisional patent applications. So do any of these relate to noise attenuation?

A The ones on the electric power steering, again, were devised to produce or design an electric power steering system with minimum vibrations.

Q So you're saying on page 7 of your résumé, there's a sub-heading, "Electric Power Steering, Two Patents" --

A Yes.

Q You're saying those relate to vibration damping?

A Yes. In fact, you look patent number 12, the title is "Torque Ripple-Free Electric Power Steering Drive," so it relates specifically to what I was saying earlier that any electric machines, depending on the application, you want to minimize the torque ripple. In some applications, it's more important than others. And power steering, it's particularly important to reduce the torque ripple to the smallest value possible.

Q So does that relate more to noise attenuation or vibration damping?

A Both are related mechanically, but here, that's more vibration because the steering system is connected to a steering wheel, so the driver would feel the vibrations in the steering wheel.

Q I'm not trying to ask a trick question. I thought earlier, you said you would want to avoid creating noise in the first place as opposed to damping it.

A Yes.

Q So does this relate to avoiding noise in

the first place or damping vibration?
A Avoiding vibrations in the first place.
Q And vibrations can lead to noise?
A Yes.
Q Do they always lead to noise?
A No.
Q And would you say this is the closest patent of yours to the concepts -- excuse me. Is this the patent or patents of yours that are most closely related to the concepts of noise attenuation and vibration damping?
A Some of -- I have a number of patents or sensors and some were devised for the power steering application with the goal of, again, minimizing vibrations in the steering system.
Q So help me understand that. I was wondering about that, actually. How does a patent that relates to a sensor tie into -- what does the sensor do that helps it avoid noise or avoid vibration?
A The sensors for power steering that I was involved with, I mean, some of them were

designed to control the motor which drives the power steering system, and part of the control of the motor has to do with reading the position of the motor as it rotates and the better knowledge you have of the position of the rotor, the more you can tune the current to avoid vibrations -- torque ripple, therefore vibrations.

Q Okay, I see. So the sensors that you're talking about determine motor position?

A That's some of them. You asked specifically about patents that dealt with vibration, so that's why I'm talking about those answers.

Q Right. I'm trying to get a sense of which patents you have that relate most closely to noise attenuation and vibration damping. So far, you've given me the electric power steering and motor position sensors --

A Yes.

Q -- that were designed to give you better motor control. Anything else?

A No.

Q Okay. On page 10, you list many publications beginning on page 10.

A Yes.

Q I'm wondering if you can help point me to those publications that, in your view, are most closely related to noise attenuation or vibration damping.

A I'd like to make a general comment, which is publications in academia, people publish everything. Working in industry, you publish what you are authorized to publish. So that's a good reflection of the kind of work I was doing, but it's not all of it in the same manner as a university professor, you can know everything they have done by reading their publications.

There is a paper I published in 2015 -- that's number 5 -- where I describe and invite a paper where I described a number of electromechanical systems for automotive applications, anything that was not propulsion related, and in there, I do cover power steering and electric brakes also. I cover both, but in

the context of your question, power steering and what design approaches people have used to reduce vibrations in power steering.

Q Publication number 3 here is titled "Active Damping of Ultrafast Mechanical Switches for Hybrid AC and DC Circuit Breakers." Do you see that one?

A Yes.

Q What damping are you talking about here? Or just generally, what kind of damping is discussed in that article?

A These are circuit breakers. Circuit breakers, as you can imagine, need to act very fast. So essentially, you try to open it with as much force as you can and then the moving part of the circuit breaker, which is a high velocity, and then once the circuit is open, you need to stop the arm that has just finished opening. You need to stop the motion, otherwise, you would break components. So you need to absorb the kinetic energy that you just gave to the system.

Q So there's like an arm that swings open

very harshly?

A It opens, then it has to stop. This is linear motion, so it goes from point A to point B and you want to go, let's say, cover halfway as fast as you can, and the rest of the motion, you need to stop the system so that it doesn't destroy itself at the end of motion.

Q So it softens the --

A It softens the --

Q -- closure?

A Yes.

Q Have you ever been invited to speak on the topic of vibration damping or noise attenuation?

A Not specifically.

Q How about electric park brake actuators? Have you been invited to speak on that topic?

A When I spoke about the paper I just mentioned, the 2015 paper, I had a presentation. And there, I did talk about electromechanical systems in general for automotive application, which includes vibration.

MR. MURPHY: I'm going to introduce another exhibit. I've marked this as Exhibit 4.

THE WITNESS: Yes.

MR. MURPHY: Do you know what this is?

THE WITNESS: Give me a second to look through it.

MR. MURPHY: I'll just represent to you -- I downloaded this off your website.

THE WITNESS: Yes, that's what I thought.

Q Does it appear to be -- well, you tell me. What is this?

A Well, the purpose of my website is to advertise myself and so I present in a few words and in PowerPoint format my experience and some of the work that I am doing or could be doing.

Q So the purpose of this is advertising for your consulting firm?

A Yes.

Q Can you go to page 3? Do you see at the top where it says "Expertise"?

A Yes.

Q And then on this slide or page, you list a number of areas of expertise. Is that right?
A Yes, yes.
Q And then, I believe, the same is true for page 4 as well. You say expertise and then you list a number of areas of expertise?
A Yes.
Q Do you see an area of expertise that's listed that relates to noise attenuation or vibration damping?
A Again, anything that has to do with electric machine design involves minimizing the generation of torque ripple and vibration, so that would be indirectly one aspect of this. The sensor concept, as I mentioned earlier, sensors can be used to reduce vibrations. The expertise in terms of systems, I'm speaking of electromechanical systems. We include electric machines as well as the mechanical system that they drive, which includes -- here, I'm showing the image of a cam phaser, but on page 3, I mention brakes specifically.

Q So is it fair to say that noise attenuation and vibration damping are inherently part of your design considerations within these subjects?

A Yes. I mean, that depends on the specifications, of course, but that's part of the design of electric machine and electromechanical system.

Q But you don't specifically list it on either of these pages as an area of expertise, right?

A This is a high level summary, but people who know about the electric machine design or linear actuators will understand that's part of the expertise. And the electromechanical systems even more so as much.

Q So correct me if I'm wrong. What I'm hearing you saying is a potential customer of yours reading, say for example, that you have expertise in electromechanical systems, they would just understand that you also have expertise in noise attenuation and vibration damping?

A Yes, in the context of the electric machine driving the system.

Q Have you ever been an expert witness in a patent case?

A Yes.

Q Back to your résumé on page 3, it looks like -- yes, you're listing a number of cases where you have served as an expert witness.

A Yes.

Q And what is this first bullet point, inter partes case ongoing 2022? Is that our case?

A Yes.

Q Have you served as an expert witness before the PTAB? P-T-A-B?

A I did not -- can you clarify your question? What do you mean exactly?

Q Actually, I see it here. Do you see the second to last bullet point --

A Yes.

Q -- AM General, it says four IPR cases.

A Yes.

Q So in those cases, you served as an

expert and you provided a declaration --

A Deposition, yes.

Q You were deposed in those four cases?

A Yes.

Q And who did you represent in those cases? Who was your client?

A AM General, I believe, if I remember correctly.

Q Do you remember if it was the patent owner or the patent challenger?

A I believe it was the patent owner, but I don't quite remember.

Q So if you were representing the patent owner, were you taking the position that patents were valid?

A Well, that's what you do if you represent the patent owner.

Q Why is that what you do? That's just a matter of fact if you represent the patent owner, that's what you say?

A Well -- no.

MR. HUTCHINS: Objection.

THE WITNESS: That's not what I meant.

BY MR. MURPHY:

Q Are you reviewing all the information in each case and analyzing it according to your expertise and giving it a fair and unbiased evaluation?

A Yes.

Q And in that case, it just so happened to be that you were representing the patent owner and thought the patents were not invalid?

A Yes. There is one case where I was hired and, at some point, stopped or declined to move forward because I didn't think I was on the right side.

Q Which case was that?

A MPC versus Standex Electronics.

Q And it looks like that was not a patent case. Is that right?

A It was not, right. It was a warranty dispute.

Q And the lawyers in that case were asking you to support a position that you didn't feel

comfortable supporting?

A That is right.

Q So you withdrew from that case?

A Yes.

Q Were you deposed in that case?

A No.

Q You withdrew at kind of an early stage where --

A Somewhere along the line. I don't know what you mean by early, but before I was deposed.

MR. MURPHY: That's what I meant. Thank you.

THE WITNESS: Yes.

Q Do you know what claim construction is?

A This is a legal definition. So I am an engineer, so I'm going to give you my engineer's understanding --

MR. MURPHY: Please do.

THE WITNESS: Claim construction is the meaning that is given to a claim or part of a claim.

Q And how did you come to that

understanding?

A From my experience and from my working with attorneys both as an expert witness but even before. I mean, I have a number of patents --

MR. MURPHY: Right.

THE WITNESS: -- so I've worked with patent attorneys to prepare my patents but also answer office actions.

Q So in your 50 or so patents that you have, you have reviewed office actions periodically --

A Yes.

Q -- over the years?

A Yes.

Q Are you aware of what the patent law, the patent concept -- excuse me. Are you aware of the concept in patent law called obviousness?

A Yes.

Q Can you tell me just your own understanding of what obviousness is?

A That something that at the time of the invention somebody with skill in the art would

reasonably know to do based on his or her knowledge of the art at the time.

Q What is the relevant time in this case?

A 2002-2003.

Q So are you able to -- with all your work experience, how are you able to transport yourself mentally back to that time?

A I was there, so I still remember there is a Delphi specifically when I was working with others on electric brakes, so I can remember those days and working with people as a team, people with different backgrounds, but all of which I would consider people skilled in the art.

Q You're not using any new knowledge that you've gleaned more recently when you're opining on --

A No.

Q -- whether the patent in suit is obvious?

A No.

Q Your client in this matter is ZF Group, is that right?

A Yes.
Q Did you ever interact with ZF Group professionally before your involvement in this case?
A No.
Q ZF Group wasn't a customer of General Motors?
A I don't know. I don't know.
Q If they were, you didn't interface with ZF?
A Right, right.
MR. HUTCHINS: Make sure you let him finish his question.
THE WITNESS: Sorry.
MR. HUTCHINS: That's okay. It's just you're a couple words ahead of him sometimes.
MR. MURPHY: You're too smart for your own good. You know where I'm going.
THE WITNESS: No -- sorry.
BY MR. MURPHY:
Q So my question just generally is you've never directly interfaced with ZF ever in your

professional career?
A That is correct.
Q I'd like to go to your report. This is Exhibit 2. Page 4, please. Do you see the subheading entitled "Materials Considered"?
A Yes.
Q And then if you continue on paragraph 14 onto the next page, and I'm looking at paragraph 15, actually, there's a list of exhibits.
A Yes.
Q Is this a complete list of the materials you reviewed in forming your opinions in your declaration?
A I considered all the material, but that's what I chose to use in my declaration.
Q Is there other material that contradicts anything in your declaration that you chose to omit?
A No.
Q This just happened to be the most relevant material to you?
A Yes.

Q Who wrote this declaration?
A I wrote it with the attorneys. We wrote it together.
Q How much time did you personally spend on this declaration?
A I don't know.
Q A 100 hours or 5?
MR. HUTCHINS: Objection.
BY MR. MURPHY:
Q Closer to 100 or closer to 5?
A Closer to 100.
Q Do you keep accurate records of the time that you spent preparing your report?
A Yes.
Q Did you spend any time on this case that you did not bill to your client?
A No.
Q I had a question on one paragraph in your report specifically. It's on page 73. Do you see paragraph 170?
A Yes.
MR. MURPHY: It says, "moreover," and

then there's a name that I assume is French. I will butcher the pronunciation. You can maybe help me with that.

THE WITNESS: No problem. That's fine.

MR. MURPHY: What's the name?

THE WITNESS: Boucheret.

Q Boucheret. Boucheret expressly describes isolators placed at different ends of a motor. I'm wondering specifically about this word "ends". To me, when I think of an end of a motor, I'm thinking of the axial end. Is that your understanding of the word end?

MR. HUTCHINS: Objection.

MR. MURPHY: I'm just trying to understand this sentence here, if you think it's correct or if you think maybe it needs to be elaborated on.

MR. HUTCHINS: Objection. You can answer if you understand.

THE WITNESS: The way I used end, I mean, a motor has to have -- to be connected to a supporting element, and that can be considered the

end of the motor. And in that sense, the word here can be understood as where the motor ends and is supported.

MR. MURPHY: So you're describing different radial ends of the motor?

MR. HUTCHINS: Objection.

MR. MURPHY: You were describing radial ends of the motor?

MR. HUTCHINS: Same objection. You can answer.

THE WITNESS: I'm describing -- I'm pointing to where the motor is connected to the supporting structure.

BY MR. MURPHY:

Q Right. And what you're pointing to, that's not the axial end, right?

A Not in that case.

Q So are you referring to just an endpoint of the motor?

A Yes, there are elements called number 13 in figure 3 which, I believe, were lugs or that support the motor and in cavities called 4.

Q Right. So you agree with me that the isolators in Boucheret, they are at the ends of the lugs 13?

A Yes, they are at the point where the motor is supported by its supporting structure.

Q Okay. So you don't think that you need to -- you think that this sentence that we just read, the first sentence of paragraph 170, stands as being accurate and doesn't require any further explanation?

A I don't think so. I mean, I give a number of citations from the patent, including a figure that, I believe, make clear what I was meaning.

Q Right. Just generally, though, if, for any object that's cylindrical, there's ends and then there is an outer circumferential portion, would you agree?

A Depending on the context, yes, that can be a correct interpretation.

Q And it seems like you've referred to something that's at the outer circumferential

portion as being at the ends?

A Yes, and motors actually can be long and have a small circumference, or conversely, can be very short and have a large diameter, so what is meant by end of a motor can vary depending on context. But here, the way I used the word was really to indicate where the motor was -- where the supporting lugs or elements from the motor ended and mated with the supporting structure.

Q I understand. Can you tell me generally what an isolator is?

MR. HUTCHINS: Objection. Go ahead.

THE WITNESS: That is something that isolate as an element. That element that isolates one thing from another.

MR. MURPHY: In a mechanical system, what does an isolator do?

MR. HUTCHINS: Objection.

BY MR. MURPHY:

Q If I have a mechanical system with component A next to component B and there's an isolator between those two things, what does the

isolator do?

A It isolate the two meaning that some physical element from one doesn't go to the other and vice versa.

Q Does the isolator have to be a certain type of material?

MR. HUTCHINS: Objection.

BY MR. MURPHY:

Q For example, in my example, if elements A and B were made of steel, could the isolator be made of steel?

A It depends what you are trying to isolate. Isolator can mean temperature. It can be vibration. It can be noise. It can magnetic field. You can isolate from all kind of physical phenomena, and depending which one you are trying to isolate A from B, you are going to select different materials.

Q So what if I wanted to isolate for vibration in my example, would I choose a material that's the same type of material as the mechanical components that are mounted next to one another?

MR. HUTCHINS: Objection. You can answer.

THE WITNESS: I would not rule it out in the abstract. It depends.

MR. MURPHY: Do you agree with me that isolators are typically rubber or elastomer?

MR. HUTCHINS: Objection. You can answer.

THE WITNESS: In the context of vibrations or noise, that is a common material, but that's not the only one.

BY MR. MURPHY:

Q What are some others?

A Plastics can work. Metal in some circumstances. You could have a spring. A spring could work, isolate two parts and the spring could be made of metal.

Q So I have a mechanical engineering degree and I'm very far removed from my studies, but my understanding is objects have -- any object has a spring constant and it also has damping properties. Am I right in saying that?

A That's my understanding, yes.

Q And when we're talking about vibration isolators, are we referring to spring constants or damping properties?

A It can be both. Either -- I mean, in some cases, one would be more important than the other.

MR. MURPHY: So --

THE WITNESS: Excuse me. Earlier, I mentioned -- you asked about elastomer materials. They are active. Usually, they are active -- or not necessarily active -- isolators that can be all film too, so there can be many different kind of mechanism to absorb vibrations.

Q So I guess what I'm trying to get at, even a diamond, for example, that has a spring constant, right?

A I suppose so.

Q But people aren't sticking diamonds in between two mechanical components to dampen vibrations, so what type of material would a designer be looking for when they're trying to

dampen vibrations?

MR. HUTCHINS: Objection. You can answer.

THE WITNESS: Really, you said it earlier, spring and dampening properties.

BY MR. MURPHY:

Q But I guess my question is, do you agree with me that ever material under the sun has a spring constant?

A Under the sun -- you are very broad, but I believe so, yes.

Q But there's got to be some point where somebody says that wouldn't work as a vibration damper.

A Yes, because a spring constant can be in some cases so negligible for all intents and purposes to not be there.

Q So just help me understand. What types of materials would a designer seek out if they're trying to dampen -- or excuse me -- if they were trying to dampen vibrations?

MR. HUTCHINS: Objection. You can

answer.

THE WITNESS: Again, you have a variety of materials. Rubber is a common one. Plastic also can be used.

MR. MURPHY: Now, when somebody uses the term vibration damper to refer to a structure, you would agree with me that that structure also has typically spring-like properties as well, right?

THE WITNESS: Yes.

MR. HUTCHINS: Objection.

MR. MURPHY: So where do you draw the line between referring to a structure as a spring or a damper?

MR. HUTCHINS: Objection. You can answer.

THE WITNESS: The main -- it depends on the application where you emphasize one over the other.

MR. MURPHY: So if you're emphasizing damping, you can call it a damper, but the same structure, if it was being used as a spring, you would call it a spring?

MR. HUTCHINS: Objection. You can answer.

THE WITNESS: That's one way to say it. Damper is sometimes used, at least from my understanding, in somewhat of a broader way that includes spring characteristics. But damper, strictly speaking, is there to dampen.

MR. MURPHY: When you say -- pardon me. When someone says the term vibration isolator, are they referring -- is that a generic term for a spring and a damper?

MR. HUTCHINS: Objection.

THE WITNESS: The vibration isolator will have spring and damper characteristics and you select one over the other depending on your specifications and depending on the specific situation.

MR. MURPHY: So back to my example where you have mechanical components A and B and a vibration isolator C between them, the vibration isolator becomes an isolator because of what it's designed to do. Is that fair to say?

MR. HUTCHINS: Objection.

BY MR. MURPHY:

Q I'm just trying to understand the difference between, for example, if all three components in my example were all the exact same material type, could element C still be considered a vibration isolator?

A Yes.

Q And why do you say yes? Because it could be designed to dampen vibration?

A Yes.

Q So it's not -- when you think of an isolator, you don't think of a specific material?

A There can a number of materials.

Q Can you go to your declaration at page 7? I'm sorry, it starts on page 6. This is where you're defining person having ordinary skill in the art.

A Yes.

Q And why are you defining that?

A Just so that it is clear what I mean by a person of skill in the art, because I use the

term throughout and that's the position I put myself in when writing this, a person of skill in the art at the time that is relevant to the case.

Q Can you go to paragraph 19, please, on the next page? So here, it looks like this is your proposed definition for person of ordinary skill in the art. You're saying at the time of the alleged invention of the 415 patent, a POSA would have had a bachelor's degree or equivalent in mechanical engineering, electrical engineering, automotive engineering, or a similar discipline or at least two years of experience with electromechanical devices such as actuators. Do you agree with that statement?

A Yes.

Q So why is electrical engineering included in your definition?

A Because it's an electromechanical system.

Q So according to your definition, if you were an electrical engineer but you did not have at least two years of experience with

electromechanical devices such as actuators, you would not fit within the definition. Is that right?

A This is a very -- that's a broad definition. Yes, just having a degree, I mean, it gives you the basis for understanding a discipline. Having experience puts it in practice. And depending on what your studies were, for instance, I say that you don't necessarily have to have a bachelor's degree. If somebody doesn't have a bachelor's degree, I would understand that there would be a need for more years of experience. Yes.

Q But my specific question is, if someone has an electrical engineering degree but they have zero years of experience with electromechanical devices such as actuators, would they be considered a POSA according to your definition?

A I would have to look at specifics of their career and experience.

MR. HUTCHINS: I think his question is assuming lack of experience.

MR. MURPHY: Yes. Assume a lack of experience. Simply because I have an electrical engineering degree, I'm not a person of ordinary skill in this art, am I?

THE WITNESS: Right. If you have a bachelor's degree in electrical engineering and you changed professions and do whatever that are unrelated to engineering, yes. The farther you are from having practiced engineering, the less likely you would be considered a POSA.

MR. HUTCHINS: We've been going about an hour and ten, so when you get to a spot.

MR. MURPHY: I'm close.

BY MR. MURPHY:

Q If someone had a bachelor's degree in mechanical engineering and zero experiences with electromechanical devices and actuators but they had experience with noise attenuation and vibration damping that was significant, would you consider them a POSA?

A It's a highly theoretical question. It's hard to think of somebody working in noise

that's not working on systems of some sort. So, I mean, it's hard for me to imagine somebody that's -- unless you really define electromechanical or actuator very narrowly -- but certainly somebody who has a mechanical engineering degree and works on the transmission of vibration and noise would be a POSA.

Q You would consider that person a POSA?

A Yes. Yes.

MR. MURPHY: We can take a break.

(Recess)

BY MR. MURPHY:

MR. MURPHY: Ready?

THE WITNESS: I'm ready, yes.

MR. MURPHY: Did you speak with your attorney during the break?

THE WITNESS: Briefly.

MR. MURPHY: Anything about the case?

THE WITNESS: No.

MR. MURPHY: Can you turn to your declaration at paragraph 27? That's page 9.

THE WITNESS: Yes.

Q So this is under the subheading obviousness.

A Yes.

Q Paragraph 27 says, I also understand that an obviousness determination includes several factual inquiries, including, and then element number 4 is taking into consideration any secondary indicia objective evidence of non-obviousness. Do you see that?

A Yes.

Q And then paragraph 27 picks up on the concept of this objective evidence that might be present. It says, I also understand that such objective evidence that non- obviousness may include, then it lists a bunch of things. Number two is commercial success attributable to the claimed invention. Do you see that?

A Yes.

Q And number 9 is evidence that competitors in the marketplace have copied the invention instead of using the prior art. Do you see that?

A Yes.
Q Did you evaluate these factors in reaching your conclusions? Specifically, did you evaluate whether there was any commercial success attributable to the claimed invention?
A I did not look very in detail about that, but I did not see any.
Q Have you evaluated any of the accused devices in the corresponding district court case?
A No.
Q So is it fair to say you did not also evaluate in detail this element number 9 here in paragraph 28, which is evidence that competitors in the marketplace have copied the invention?
A I didn't see any.
Q Did your attorneys make any information available to you that would suggest that there might be copying?
A No.
MR. MURPHY: I'm going to mark a physical exhibit, number 5. And then this is Exhibit 6. It's a collection of pictures I took

of Exhibit number 5. Have you seen this device before today?

THE WITNESS: No.

MR. MURPHY: Do you see at the bottom where it says TRW?

THE WITNESS: I'm pointing to this --

MR. MURPHY: Yes.

THE WITNESS: I see TRW on this side of the --

MR. MURPHY: Yes. I'll just represent to you that this is one of the accused devices in the co-pending district court litigation.

THE WITNESS: Okay.

Q I'm wondering -- so I have -- do you see this sort of two piece shell here?

A Yes.

Q I've actually cracked that open. Can you open it? Or I can open it for you. Yeah. And then if you look at maybe the second picture in this collection of pictures, do you see what I'm pointing to right here, this big white sort of oblong piece?

A Yes.
Q Do you mind, with your pen, because this is going to be the exhibit, can you put a letter A on it? Now can you look at the corresponding piece in the physical exhibit? Can you tell me, is that a vibration isolator?
MR. HUTCHINS: Objection.
BY MR. MURPHY:
Q Can you tell me? Do you know if that is a vibration isolator?
A I cannot make such a determination just by looking at it.
Q It could be, right?
A It could be or it could not be.
Q Right. Do you see the black piece of material that the element A is attached to?
A Yes.
Q Would you agree with me that that black piece of material is plastic?
MR. HUTCHINS: Objection.
THE WITNESS: It looks like it. I can't say.

MR. MURPHY: Would you agree that it's most likely plastic?

THE WITNESS: It looks like plastic.

MR. MURPHY: Would you agree with me that it is harder than element A?

MR. HUTCHINS: Objection.

THE WITNESS: I could not tell just by looking.

MR. MURPHY: So you can't tell by looking and holding that element, this exhibit, you can't tell if element A is a vibration damper?

MR. HUTCHINS: Objection. Asked and answered. You can answer again.

THE WITNESS: I think I already answered. I cannot tell by just looking. It takes some analysis to determine that. I'd like to say another thing is it's not common for an object to have two or more purposes, so something can be A and at the same time B. In our context here, something can be whatever and also serve as an isolation. For instance, the rubber belt is primarily a belt, but it's good for in terms of

vibration.

BY MR. MURPHY:

Q So the rubber belt that is in Exhibit 5 spanning between those two gears, that helps with vibration?

A Or at least compared to alternatives, it's a good choice in terms of vibrations.

Q Do you see these other structures? They're specifically these two nubs and this one here.

A Yes.

Q Can you label those B and C?

MR. HUTCHINS: I'm sorry, which do you want the image B and C?

MR. MURPHY: B for the small ones and then C for the --

THE WITNESS: So there are two Bs.

MR. MURPHY: Yeah, two Bs, right. I have the same question that I had for A. Is that a vibration damper?

MR. HUTCHINS: Objection.

THE WITNESS: Same answer. I don't know

by just looking.

MR. MURPHY: You don't know? How would you find out?

MR. HUTCHINS: Objection.

BY MR. MURPHY:

Q Is there some modeling or study that you could do?

A All the standard practice of engineering, being testing, modeling, analysis, and so forth.

Q And have you done any modeling or testing or analysis in this case?

A No, not for this case. We have worked on electric brakes and I have done modeling and testing of electric brakes back in those days, but not for this case.

Q So if I'm hearing you correctly, you can't tell just by looking at those if they are vibration dampers and you would need to test them further to determine whether they are? Is that right?

A Test or analysis. I mean, there are a

number of approaches that can be used to make that determination.

Q Is it possible you could take, say, element A and use it in a different type of system and it would serve the function of a vibration damper?

MR. HUTCHINS: Objection.

BY MR. MURPHY:

Q Is that possible?

A This is a very, very broad question because I don't know if you are referring to the material that A is made of, the shape, the location, the size, and so forth. And all of that would have to be taken into consideration to answer your question.

Q So say there is a material that has a specific size and shape and it's used as a vibration damper, if you took that same structure and put it in another system, it wouldn't necessarily be a vibration damper, right?

MR. HUTCHINS: Objection.

MR. MURPHY: That's what you just said.

THE WITNESS: It's not necessarily a vibration damper.

BY MR. MURPHY:

Q You would need to then separately evaluate and test and model to see if it still served the same purpose of vibration damping when moved into a new system?

A Yes, I mean, you use and. Don't necessarily have to do all of it, but certainly make some analysis including possibly testing, modeling, and so forth.

MR. MURPHY: I'm done.

MR. HUTCHINS: Okay. Just give me one minute to collect my thoughts.

MR. MURPHY: I may have some follow-up questions depending on if he asks you questions, but I appreciate your time.

THE WITNESS: Thank you.

MR. MURPHY: Thank you very much.

THE WITNESS: I appreciate your coming.

MR. MURPHY: Thanks for the hospitality and all that.

MR. HUTCHINS: And you can say no further questions if you need it on the record.

(Whereupon, at 10:12 a.m., the deposition of BRUNO LEQUENSE was adjourned.)

* * * * *

CERTIFICATE OF NOTARY PUBLIC

COMMONWEALTH OF VIRGINIA

I, Gary Euell, notary public in and for the Commonwealth of Virginia, do hereby certify that the forgoing PROCEEDING was duly recorded and thereafter reduced to print under my direction; that the witnesses were sworn to tell the truth under penalty of perjury; that said transcript is a true record of the testimony given by witnesses; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this proceeding was called; and, furthermore, that I am not a relative or employee of any attorney or counsel employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.

(Signature and Seal on File)

Notary Public, in and for the Commonwealth of Virginia

Gary Euell

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