UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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INTUITIVE SURGICAL, INC.,

Petitioner,

vs.

ETHICON, LLC,

Patent Owner.

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Case IPR2018-01247 and Case IPR2018-01254

U.S. Patent No. 8,479,969

PATENT OWNER'S NOTICE OF DEPOSITION of

BRYAN KNODEL, Ph.D.

AUGUST 12, 2019

Phoenix, Arizona

9:41 A.M.

Reporter: Sommer E. Greene, RPR, CRR, RMR
Job No. 47323B
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I N D E X

WITNESS: BRYAN KNODEL, Ph.D.

* * *

INDEX TO EXHIBITS

PHOENIX, ARIZONA;
AUGUST 12, 2019; 9:41 A.M.

BRYAN KNODEL, Ph.D.,
having been first duly sworn, testifies as follows:

EXAMINATION

BY MR. DESAI:

Q. Okay. Dr. Knodel, I'm handing you the copy of the declaration -- the supplemental declaration you submitted in the two of the '969 IPRs.

A. Yes.

Q. It's the 1247 and 1254 IPRs.

A. Right.

Q. This is a copy for you. Okay. Let me ask you, what did you prepare -- what did you do to prepare for the deposition in the '969 IPRs?

A. So I read the -- my supplemental declaration, and I read one of the opinions -- I can't remember which -- which one it was. But one of the -- one of the opinions I read and went through parts of the other one by Ethicon's experts.

Q. Okay. Do you recall which one -- was it -- when you say you read one of them, was it -- do you

recall if that was the Fengelman declaration?

A. It was the Fengelman declaration that I read. I see them now here written. And I review portions of the Awtar declaration.

Q. A-w-t-a-r.

All right. Did you do anything else besides that?

A. That was pretty much it. Oh, I apologize. I -- I did look back at the Tierney reference and the references that -- that are included in Tierney, I looked at portions of that as well.

Q. The Tierney reference is not mentioned in your supplemental declaration?

A. No. I just wanted to remind myself that I -- you know, that the -- the topic of tactile feedback and just wanted to make sure I was -- just looked at those things again.

Q. Okay. Besides Tierney, did you review anything else?

A. Like I say, just the, you know, one other references referred to in Tierney, '666.

Q. Is that -- is that referenced in your supplemental declaration?

A. No. Like I say, it was not part of -- my supplemental declaration was just more going back to my

thinking when I did the Anderson gee owe initial declarations.

Q. Okay. What experience do you have with tactile feedback in robotic systems?

A. Are you asking what experience do I have of using robotic systems, tactile feedback?

Q. What experience do you have at all with respect to tactile feedback in robotic systems?

MR. KATZ: And I'll just caution you that this is an open deposition, so if you have any information that's confidential, just note that.

THE WITNESS: Okay. I have considered and thought about the need for tactile feedback in robotic systems in -- as an engineering requirement.

Q. BY MR. DESAI: When was this?

A. In my consulting practice.

Q. Do you have a time frame?

A. Within the last ten years.

Q. Over the course of the last ten years or sometime in those --

A. At some time during the last ten years, I have considered that, yes.

Q. Could you be more specific?

A. I cannot.

Q. What was the reason for your consideration of

the need for tactile feedback in robotic systems?

A. Just -- just the typical needs of surgical devices and -- and just being able to place them accurately, and tactile feedback gives you an idea of, you know, if you're dealing with something that's rigid, difficult to compress, those kind of things.

Q. When you say the need for tactile feedback in robotic systems, what do you mean?

A. There are sometimes when you want tactile feedback, and so it can become -- so then I use the term need because it's very desirable feedback to have it for the surgeon, yeah.

Q. Are you -- who are you consulting for --

A. I can't say the names of the companies.

Q. You can't tell us the time frame and you can't tell us who?

A. That's correct.

Q. How long did this consulting last on this topic?

A. I don't recall.

Q. Was it for a company that was developing a robotic system? Or was it for a company that was making a robotic tool?

A. They had both.

Q. Is there anything that you've put forward in

your declarations that the board can use to assess your experience in tactile feedback in robotic systems?

A. I've put forth my experience and my training as an engineer. So I guess that's what they have to assess my experience.

Q. Aside from this -- was this one consulting -- so this -- I want to focus on this work you were doing that involved, in your words, consideration of the need for tactile feedback. That was -- those are your words, I think.

A. Right.

Q. And was this one consulting project?

A. I don't -- I believe it was two different consulting projects where I was considering the tactile feedback that would be available or could be available in a design.

Q. Okay. And can you give me more details about what you were considering?

A. Um, I -- no. I don't know. I don't know whether I understand your question or what you're trying to get at, that the forces would be -- that the surgeon would be feeling, would -- would they be able to feel those forces.

Q. Okay. Did you actually do any work in the development of a tactile feedback?

A. For a robot, no.

Q. So you've never done that before?

A. No.

Q. Okay. So this -- when you were talking about considering the need in this consulting project or projects, you were just talking about whether or not it would be desirable to have?

A. Whether or not it would be -- whether the device that I was working on would be amenable to providing that to the --

Q. Okay.

A. -- to the surgeon.

Q. And as far as experience with designing or developing tactile feedback in robotic systems, is it fair to say that you have no experience there?

A. It is fair to say I have no experience on the robotic side of it.

Q. Well, do you have experience with developing tactile feedback for tools for robotic systems?

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

Q. It wasn't clear from your answer. That's all.

A. Okay. Yeah, so when designing tools for robotic systems, I have had to give consideration to tactile feedback as part of that design.

Q. Okay. So then -- but the question is, have you

actually -- aside from considering whether or not you would want it for a tool, have you actually done any design or development of a tactile feedback system for a robotic tool?

A. I have designed robotic tools that you could sense -- the force could be sensed by the robot, but I did not design the system on the robot to do that sensing. Just this force that is being applied is sensible.

Q. Okay.

A. Okay.

Q. Maybe we should go back and talk about what we mean by tactile feedback.

A. Okay.

Q. I think in the context of the declaration that is admitted in the '969 IPRs, it's -- my understanding is tactile feedback with respect to, you know, a tool in a robotic system is feedback that the surgeon can -- can sense or feel.

A. I understand that, yes.

Q. Okay. Have you had any experience designing that type of system?

A. Not at the surgeon's hand, no.

Q. Okay. So then you're -- you're limiting it to not in the surgeon's hands. So what experience did you

have?

MR. KATZ: I'll say objection. Asked and answered.

THE WITNESS: Yeah. I'm just trying to differentiate between you could design a device that there's no way that you could ever get that signal back to the surgeon's hands, or you could design a device where you could, the way it -- the way it transmits the force, what it does, if it has a CO2 cartridge in it and you fire that, there's no way that's going to get to the surgeon's hands. That's what I'm saying.

Q. BY MR. DESAI: Okay.

A. Okay.

Q. All right. So you said I have designed robotic tools that you could sense the force could be sensed by the robot.

A. Right.

Q. But I did not design the system on the robot to do that sensing.

A. Okay.

Q. What kind of tools were they?

A. It's confidential.

Q. The kind of tool is confidential?

A. Yes.

Q. When was this?

A. I've already answered that question.

Q. No, not specifically these robotic tools.

A. This is -- this is the consulting work that I mentioned over -- during the course over the last ten years, I have had contracts where I was developing things for robots.

Q. Okay. When in the last ten years?

A. I don't recall.

Q. Was it in 2009?

MR. KATZ: Objection to form. Asked and answered. Badgering the witness.

THE WITNESS: I don't know.

Q. BY MR. DESAI: Was it an endo cutter?

A. I'm not disclosing in this -- in this format the nature of the products that I designed for companies under a confidentiality agreement.

Q. Is it any of the companies that are involved in this case?

A. No.

Q. Okay. Do you know if the work you did resulted in a commercial device that was a robotic tool that provided feedback to the surgeon?

A. I'm not aware.

Q. Have you ever worked on the design of a linear cutter for robotic system?

A. No.

Q. So all of the linear cutters that you have worked on or with were hand-held. Is that right?

A. Yes. My work at Ethicon Endo-Surgery focused on hand-held endoscopic linear cutters, yes.

Q. Okay. You've done other work outside of Ethicon --

A. Yeah.

Q. -- so I was asking in general, all of the work you've done on linear cutters over the course of your career were on hand-held. Right?

A. Yes.

Q. All right.

A. To the best of my recollection.

Q. And I think you might have asked in the previous deposition. All of the hand -- the hand-held linear cutters that you worked on were manually actuated with triggers and didn't involve power drive systems. Is that right?

A. Not power drives, yeah.

Q. Okay.

A. Not power drive systems.

Q. And so all of the instruments that you've -- the linear cutter instruments that you've worked on, the surgeon had the instrument in their hands and was able to

feel the forces associated with clamping and firing. Is that right?

A. Sorry. I have to think back.

Q. Yeah.

A. There were some CO2-powered stuff that I'm trying to remember if it was exactly a linear cutter or not. But let's -- to the best of my recollection, everything -- any linear cutter that I designed was manually actuated.

Q. Right. And to be more clear about manually actuated, it didn't involve a power drive system. Right? Because power drive can also be manual actuated. That's why the confusion.

A. So actually -- okay. Then I -- I'm sorry. No. As I've had more time to think, no. I have done a stapler that was CO2 actuated. I have done.

Q. What does that mean?

A. It means it has a CO2 cartridge in it, and what you do to actuate it is you -- initially you arm the device, you puncture the CO2 and then when you position it in -- this one had a manual clamp and then a secondary -- you push a button and the CO2 fires, and it deploys the staples.

Q. When did you do that? When did you work on that?

A. I worked on that in the -- 2005, early 2000s time frame.

Q. And that was at Ethicon?

A. No. It was at Cardica.

Q. Okay. And was that ever something that made it to market?

A. It went to clinical trials, et cetera, and some limited work in Europe. It was not released, to my knowledge, in the US.

Q. You have any understanding as to why not?

A. No. I don't recall why we made that decision.

Q. Okay. Are you aware of any CO2 -- I guess it's called CO2-driven endo cutters that --

A. Oh, yeah.

Q. -- made it to market?

A. Absolutely.

Q. Okay.

A. The GA60 was a huge product for US Surgical at the time that I was at Ethicon.

Q. Okay.

A. That was CO2 powered.

Q. Got it.

A. It was manually clamped, and you actuated an actuator on the back, and that would fire the device.

Q. Have you ever discussed with any surgeons the

problems associated with removing a linear cutter from their hand?

A. Removing a linear cutter from their hand?

Q. Yeah.

A. No.

Q. Okay.

A. Not that I recall.

Q. So why don't we take a look at paragraph 5 in your declaration.

A. Uh-huh.

Q. And you cite to some lines here in the '969 patent. Do you see that?

A. I do.

Q. And the quote you have here, as I read it, relates to providing indication to the surgeon of closure of the anvil. Is that right?

A. The specific quote is related to closure of the anvil.

Q. Right. It's some type of feedback in the form of a light audible sound or tactile feedback to indicate closure of the anvil. Right?

A. (Witness reading.)

Yes, it is.

Q. And so that has nothing whatsoever to do with passive articulation. Right?

A. It has to do with the tactile feedback for closing anvil.

Q. Which has nothing to do with passive articulation. Right?

A. This sentence does not relate to passive articulation. That's right.

Q. All right. And you would agree that the '969 patent actually doesn't disclose passive articulation. Right?

A. '969 patent? Right, that's correct. Sorry.

Q. And in fact, a person that's skilled in the art reading the '969 patent would understand it discloses only active articulation joints. Right?

A. I'd have to look at '969.

Q. I can hand it to you. I have it. There you go.

MR. KATZ: Thank you.

THE WITNESS: This should just take a minute.

Q. BY MR. DESAI: Yeah.

A. I mean, the simple answer is I don't recall whether it -- whether inside of this document it ever refers to passive articulation. We could look at the figures and see if it shows anything, but it would be a lot for me to go through it and try to figure out if --

at any point in here or the references that it cites, if it ever talks to passive articulation. I can't say.

Q. Well, I'm not -- we're not going to go through the references that are cited.

A. Okay.

Q. That has nothing to do with my question.

So I guess sitting here today, you don't know whether or not the '969 patent discloses a passive articulation joint?

A. I don't recall whether at some point somewhere in there it mentions it or not. I don't recall.

Q. All right. You know, why don't you take a look at just a couple of the figures and see if maybe we can narrow this down a bit.

A. Okay.

Q. Take a look at figure 32.

A. Uh-huh.

Q. All right. And that's -- that is showing at least in part the -- an articulation joint. Right?

A. It is.

Q. And you understand that's an active articulation joint. Right?

A. I don't believe you can tell that from 32 by itself.

Q. Okay.

A. All it shows it there are linkages that move, but you don't know whether those move because they became unlocked back at the handle and then they could be moved and then locked again. You can't tell -- you can't generally tell from the joint whether it's active or passive.

Q. Okay.

A. You have to look at the control.

Q. In forming your opinions in this case about the '969 patent, did you gain an understanding of whether or not the '969 patent discloses passive articulation joints?

A. I don't recall whether --

Q. You never looked for that?

A. I just don't recall if I did or I didn't.

Q. Okay. And sitting here today, you have no real view on that. Right?

A. Sitting here today, I don't -- I'm hesitant to make a sweeping statement that this does not ever refer to passive articulation. I just don't recall if it does or not.

Q. Okay. Have you ever been involved in the design of a passively articulating tool?

A. No, I have not.

Q. Have you ever conducted an analysis of a

passive articulating tool?

A. At the time that I was at Ethicon, they were -- they were introducing conceptually passive articulation, so I have discussed -- been talked to by engineers about what they were doing. It was a different team, so I -- I have heard discussions, they've -- I have had engineers explain to me what they were doing, how it was going to work and how cool it was.

Q. Okay. Have you ever conducted any analysis of a passively articulating tool?

A. I haven't analyzed it. I have -- I don't know exactly what you mean by analysis.

Q. Okay. That's fine.

A. Sorry.

Q. Have you ever used a passively articulating tool?

A. Yes.

Q. When was that?

A. When they handed me a prototype at Ethicon.

Q. Any idea the time frame?

A. I don't recall.

Q. Okay.

A. It may have -- it may even not have been at the company. I may have been a consultant for them at the time. I don't recall.

Q. And I would assume you've never used a passively articulating tool in a surgery. Is that right? You are a doctor but not that kind of doctor?

A. That is absolutely true.

Q. Okay. And have you ever had any discussions with any surgeons about passively articulating tools?

A. No.

Q. Going back to your -- you said you've used a passively articulating tool and you said they handed me a prototype at Ethicon.

A. Uh-huh.

Q. Was it just one time or was that, like, multiple times or --

A. I don't --

Q. -- was it just kind of like --

A. I don't recall the specifics. I just remembered that, you know, you -- you pull it back on a -- on its housing and then the front became limp and you can push it against something and you can let it go, and it would relock. I mean, I tried it out. I don't remember if I tried it out once or a dozen times. I just don't recall.

Q. Have you ever seen a passively articulating robotic tool?

A. I don't believe so.

Q. Why don't we take a look at paragraph 12.

A. Okay.

Q. All right. Well, before we do this, did you -- you reviewed Dr. Awtar's and -- at some point, you reviewed Dr. Awtar's declaration and also Dr. Fengelman's deposition?

A. I have reviewed Dr. Fengelman's. I have reviewed portions of Awtar. I didn't go through the whole thing.

Q. I'm trying to distinguish between preparing for the deposition today. You wrote this -- this supplemental declaration.

A. Right.

Q. Before you wrote the supplemental declaration, did you read Dr. Awtar's entire declaration or did you just read parts of it?

A. I think I just focused on parts of it. I don't recall exactly.

Q. So you've never -- you have actually not read the whole thing?

A. Cover to cover, I don't recall reading it cover to cover. I think I've focused on certain sections.

Q. Okay. How did you decide what to focus on?

A. In collaboration with -- you know, just looking at the topic of what we were discussing and...

Q. Did you read the exhibits that were cited by Dr. Awtar and Dr. Fengelman, any of them?

A. I don't recall.

Q. Okay. And here in paragraph 12, you say -- you talk about robotic surgical instruments such as graspers are used without tactile feedback. Right?

A. Uh-huh.

Q. And then because of that, in your opinion, well, if you can use those without tactile feedback, well, then you can use passive articulation without tactile feedback. Right? That's the conclusion you're drawing here?

A. Yeah. They -- what I'm saying, yes, is that if you can use -- if -- if -- as Dr. Awtar discusses, that you can use these other devices without, why does tactile feedback become a requirement -- a critical requirement for actuating a passive articulation device.

Q. You -- when you were talking about the passive articulation tool that you kind of said you maybe played with a little bit at Ethicon --

A. Uh-huh.

Q. -- you said it was -- you pointed it was -- how cool it was is what you said. Right?

A. Well, the engineers were telling me how cool it was, yes, yeah.

Q. Why hasn't passive articulation been used on robotic tools?

A. I don't know.

Q. All right. Going back to this issue about graspers --

A. Uh-huh.

Q. -- are you aware that in the 2009 time frame, the lack of feedback was reported as a major limitation of robotic minimally invasive surgery?

MR. KATZ: Objection to form.

THE WITNESS: I was not aware of that.

(Exhibit 1018 was marked for identification.)

Q. BY MR. DESAI: I'll hand you Exhibit 2018.

MR. KATZ: Thank you.

THE WITNESS: I think --

Q. BY MR. DESAI: Let me ask you a question about it first.

A. I'm sorry.

Q. If you have something to say about it, go ahead. I was going to ask you a question.

A. I was just -- now that you handed it to me, I recall one of the -- I think one of the experts, either Fengelman or Awtar, referenced a study that was done on the need for feedback.

Q. Right.
A. I recall that now.
Q. Did you review this Exhibit 2018? Did you read it?
A. No.
Q. Okay. You can put it aside.
All right. Why don't we take a look at paragraph 15. And here you are referencing the Anderson reference. Is that right?
A. Yes, I am.
Q. Here it is. You can have that.
A. Thank you.
Q. And give me one second. You cite to two portions of Anderson. Right? Column 16, lines 14 to 24.
A. Uh-huh.
Q. And then column 6, line 33 to 37. Right?
A. Yes, that's what I'm referring to.
Q. Okay. First of all, you agree that Anderson does not disclose a passive articulation joint. Right?
A. Yes, I believe that is correct.
Q. Okay.
A. Anderson does not have a passive articulation joint. Right.
Q. So then you also agree that Anderson does not disclose tactile feedback for passive articulation.

Right?

A. Not that I recall. Right.

Q. Okay. And you have this -- you paraphrase what's in column 6. You don't quote it, you have a -- sort of a description of what's in paragraph -- column 6, lines 33 to 37. Right?

A. Yes. I'm -- there's not a direct quote.

Q. And you say here, "It's discussing feedback sensors in a motor pack, which can detect forces on the instrument by the resistance the motor senses as it tries to move the instrument or hold the instrument in a single position."

A. Right. Uh-huh.

Q. Okay. I want to get some clarity on what you mean by moving the instrument. Okay? Holding the instrument in a single position.

The part in Anderson that you cite is talking about -- my understanding is using a potentially motor pack as a substitute for the rotatable bodies that are on the robotic arm that would drive some of the end effectors degrees that feed them. Right?

A. I do not know if that is in fact what he's talking about at all. A motor pack.

Q. Did you read it before you quoted it and described it?

A. Yes.

Q. Okay.

A. But I --

Q. Why don't we take a moment to read it and decide?

A. But what you just said, that they replace the rotary elements, I don't know. What you said, I don't know if that's -- that's in fact what he's saying.

Q. Okay. Well, why don't we start at column 6. Look at line 9.

A. Okay.

Q. First sentence talks about rotatable bodies. Right?

A. Uh-huh.

Q. Do you understand what those are referring to, the rotatable interface body?

A. I have to look at specifically what he's talking about. The terminology, rotatable body, is used in different patents and pointed to different things. I don't -- I don't understand what you're asking me.

Q. I'm asking if you understand what the rotatable interface body is that's being referred to here in column 6 of Anderson.

A. Okay. Well, let me look through it then. I want to see what he's specifically referring to.

Q. So just take a moment. Let's go to column 6. Let's try and focus this a little bit.

A. Okay.

Q. Column 6, lines 9 through 20. Do you understand what's being described there?

A. Yes, I believe I do.

Q. And do you understand that it's talking about -- I'm going to try and put this into plain English that --

A. Okay.

Q. -- perhaps one of our PTAB judges will understand this in a simpler way than what's written here, which is that you have rotatable interface body on the robotic system and that's going to interface with rotatable shaft on the instrument and the purpose being to impart a motion for one of the degrees of freedom of all or a portion of the instrument. Right?

A. Yes.

Q. Okay. And then if we go to column 6 and we go to the next paragraph, it talks about an alternative -- another type of activation modality may be substituted for the rotatable interface body. Right?

A. Uh-huh.

Q. And go down to the next sentence, it's talking about using a motor pack mounted on the instrument to

impart the motion for one of these degrees of freedom. Right?

A. Yes. They're talking about a motor pack mounted on the instrument base.

Q. Yes.

A. Yes.

Q. Okay.

A. Uh-huh.

Q. So the motor pack and then you -- you cite in your declaration the very last sentence of column 6, that second paragraph.

A. Right, uh-huh.

Q. That motor pack that's being referred to is something mounted on the base. Right?

A. Right, uh-huh.

Q. So you can agree that that motor pack is not something that's moving the whole instrument. Right?

A. This -- this particular motor pack is on the instrument. That's correct.

Q. All right. And for passive articulation, we understand how that works, we have to move the whole instrument to press it up against something. Right?

MR. KATZ: Objection. Form.

THE WITNESS: I don't believe that's the only way to actually passively articulate the device, no.

Q. BY MR. DESAI: Okay. How would you move a passive -- so let's assume we have a robotic tool that's mounted on a robotic arm. Okay?

A. Uh-huh.

Q. And it has a passive articulation joint.

A. Uh-huh.

Q. How would you get that tool -- that would move that tool in order to bend the joint?

A. Another instrument would be brought in contact with the end effectors and move into the position desired.

Q. So you're talking about bringing another tool and pushing that tool up against --

A. Uh-huh.

Q. -- that's one way?

A. Yes.

Q. So what's another way?

A. I haven't really thought about all the different ways.

Q. I'm asking for one more.

MR. KATZ: Objection. Form. Badgering the witness.

THE WITNESS: I haven't thought about it.

Q. BY MR. DESAI: So the only way that you've thought about a passive articulating tool mounted on a

robotic arm the way that that could be moved is by holding that still and bringing another instrument up and pushing up against it?

A. That is one way. The other way is to -- as you mentioned before, that's the only -- that's -- the only way I am thinking of right now sitting in this room to not have to move the device -- that's what you said, how could you articulate it without moving the device. And that's the answer to the question.

Q. Okay. And another way --

A. Would be to move the device.

Q. Right. Okay. And if you were moving the device on the robotic arm, that wouldn't involve the motor that's on the motor pad -- mounted to the instrument base. Right?

A. That would not involve that motor. That's right.

Q. Likewise, if you're pushing up another instrument against the tool -- let me finish my question.

A. Okay.

Q. You got to let me finish my question before you start answering. All right. So I have --

MR. KATZ: Probably best for the court reporter and for the questioner and for you.

Q. BY MR. DESAI: Right. So I have a passively

articulating robotic tool mounted on an arm. And in your scenario, I'm bringing up another tool against it and I'm pushing it.

A. Uh-huh.

Q. Okay?

A. Uh-huh.

Q. That also would not involve a motor pack mounted on the instrument.

MR. KATZ: Objection to form.

THE WITNESS: The -- I did say that before, but in thinking about it, they -- the motor pack is connected to the actuators that actually -- the idea is that you want to be able to lock this thing in place when you're done. So the motor pack could actually be the lock. In other words -- and therefore when you would move it, you would -- the feedback would come back through that motor.

So what I said before was not accurate. You could -- the motor pack could sense, by being back driven, motion that is imparted to it by another instrument even though it physically is on the instrument itself.

Q. BY MR. DESAI: Okay. But none of that is described in Anderson. Right?

A. No, I have to think about this. But yes,

Anderson does not specifically describe that, but a motor pack designed there -- depending upon how they design it, that motor pack could sense the -- anything being activated. One of those anythings could be a passive articulation.

Q. Where -- are you aware of any prior art that describes a system for feedback associated with a passive articulating tool?

A. I'm -- I'm not aware of that, no.

Q. All right. And you yourself have never seen a passively articulating tool that had a system for providing feedback?

A. I have not.

Q. And you would agree that there's obviously a difference between providing feedback, for example, for closure of an anvil versus providing feedback with passive articulation. Those two things are not the same. Correct?

A. They're -- I don't understand why they're not the same. No, I don't understand that.

Q. So you think that providing feedback for closure of an anvil is the same as providing feedback for forces on the exterior of a device?

A. I think that providing force feedback, whether it's clamping or articulation, can be very similar

problems from an engineering standpoint.

Q. Have you ever dealt with those problems?

A. I have not been asked to solve those problems, no.

Q. Have you talked to anyone who has had to deal with those problems?

A. Not that I recall.

Q. I'm going to hand you what's been marked as -- actually, you know what, that's interesting. It wasn't marked. We don't need to mark this as an exhibit. It's US patent 6,132,368. You refer to this in your declaration, but it wasn't submitted as an exhibit in the proceeding.

A. Right. I recall -- I recall this specific reference, yes.

Q. Yeah. Give me a second.

A. Uh-huh.

Q. So you said in your declaration, paragraph 16, that Wallace -- let me hand you Wallace too so you have it. Here's Wallace.

MR. KATZ: Thanks.

THE WITNESS: Okay.

Q. BY MR. DESAI: Okay. And you talk about how Wallace incorporates by reference a certain patent application. Right?

A. Okay.

Q. And then that application issued as US 6,132,368 which is what I just handed you. Right? It's all mentioned in paragraph 16 and 17 of your declaration.

A. I see it, yes.

Q. Okay. Let's talk about Wallace first.

A. Okay.

Q. Wallace is largely about a wrist mechanism. Right?

A. Uh-huh.

Q. For a robotic tool?

A. It is called a wrist mechanism.

Q. And it is an actively articulated wrist. Right?

A. It is an actively articulated wrist, yes.

Q. So you would agree that there is nothing in Wallace that relates to passive articulation. Right?

A. I don't recall whether Wallace mentioned anywhere passive articulation.

Q. Okay. You would agree that there's no discussion in Wallace about feedback for a passive articulation joint. Right?

A. I don't recall Wallace mentioning feedback for passive articulation. That's correct.

Q. Well, you said Wallace discloses tactile

feedback in paragraph 16 of your declaration. It's at the top -- I'm looking --

A. Yeah, I understand.

Q. I just want to be clear. You've read Wallace, and you understand that it does not disclose feedback for a passive articulating joint. Right?

MR. KATZ: Objection to form. Asked and answered.

THE WITNESS: Okay. I don't recall -- looking at the Wallace reference and the specific -- the specific images of it, I didn't recall that. But the -- but the additional references -- like I say, that's why I hesitate to say that it's not in here at all because it may be.

Q. BY MR. DESAI: All right. I understand what you're saying. Let's just focus on -- I understand you're talking about this other incorporated by reference patent. For now my question is limited to what's written in Wallace. Okay?

A. Okay.

Q. I'm not trying to trick you. All right?

A. Okay.

Q. I want to understand --

A. Does Wallace mention passive articulation?

Q. Yeah.

A. It does? Okay.

Q. No, no. I'm asking you if it does or not.

A. I don't --

Q. I mean, you're the one who read it.

A. I read this a while ago. I don't recall -- I don't recall whether Wallace specifically mentions passive articulation.

Q. Okay. You did say here that Wallace discloses tactile feedback. Okay? And is that only because of the incorporation by reference, or is there something else in Wallace that you were referring to?

A. I don't recall whether there was something else in Wallace that I was referring to, but I do specifically mention this one reference.

Q. Okay. You didn't cite any -- how about this. You didn't cite anything else in Wallace. Is that fair?

A. That I don't -- I don't see a citation to Wallace for that.

Q. Right.

A. Okay.

Q. Okay. So let's go to this other patent.

A. Cooper.

Q. Yeah.

A. Uh-huh.

Q. Well, there's another Cooper that we have in

another proceeding, so let's -- we'll just call this the '368 patent.

A. Okay.

Q. All right? So we don't get confused.

And you have -- one, two, three -- four places you cite. Column 3, column 5, twice in column 5 and column 9. Right?

A. Yes.

Q. I believe -- you can confirm for me. I believe those are all citing, like, basically the same exact description. In other words, it's just repeated four times in the Cooper -- in this '368 patent. You want to check that?

A. Yeah, let me just check that.

Q. Yeah. Actually, sorry. I'm looking at that now. Let me just -- give me one second to clarify my question. All right. Let's take a look at -- let's start at 343 to 48.

A. So 3 is just talking about title presence.

Q. Actually, if you look at 348 -- 43 to 48, it says "position force and tactile feedback sensors, not shown" --

A. Yes.

Q. -- "may also be employed."

Do you see that sentence?

A. Yes, I do.

Q. And that's the sentence that you've actually quoted in your declaration?

A. Right.

Q. Now, if we go to column 5, 918 --

A. Okay.

Q. -- that's the same sentence, looks like to me. Right?

A. Yes, it does look like the same wording, uh-huh.

Q. Okay. And then let's go to 546 to 67. This is a little different.

A. Okay.

Q. And this is talking about the servomechanism, and then it says, "The servomechanism will usually provide force and torque feedback to the hand-operated controllers."

Do you see that?

A. I do see it, uh-huh.

Q. Okay. And then the last one is column 9 and, again, this at the bottom -- 56 to 66, it says, you know, the drive motors will preferably, including coders not shown, for responding to servomechanisms and four sensors not shown for transmitting force and torque feedback to the surgeon. Okay?

A. Okay. Uh-huh.

Q. Right. So this is patent that was filed in '97 and issued in 2000?

A. Right.

Q. And it's got some general statements in it about tactile feedback for a robotic system. Right?

A. They're general and sort of specific in that it tells that it's bringing the force feedback to the controllers at the user's hands, yes.

Q. Right. But this patent doesn't actually describe the guts of how it would work?

A. No, it doesn't tell you how to do it. It tells you that you could do this.

Q. Yeah, right. Okay. And so getting to the fact that you could do it, we know that as of at least 2009, tactile feedback was considered a major disadvantage of robotic systems. Right?

MR. KATZ: Objection to form.

THE WITNESS: I don't -- there's a paper that talks about this being a lead that's referred to, yes.

Q. BY MR. DESAI: Okay. And you understand that Intuitive's robotic systems don't provide tactile feedback. Right?

A. I'm not super familiar with Intuitive's robotic

system.

Q. Are you aware of -- you're aware that it's -- are you aware of any robotic systems on the market that provide tactile feedback?

A. I am not aware of any that provide tactile feedback.

Q. Okay. So certainly if -- if tactile feedback was something simple for POSITA to add to a robotic system, it would have been done. Right?

MR. KATZ: Objection to form.

THE WITNESS: I wouldn't be able to make that -- there's lots of reasons why you would include or not include something. The fact that it's not included doesn't mean that it's hard to do. It may be other factors that decide -- that made them decide not to do it.

Q. BY MR. DESAI: Do you think it's simple to do?

A. I don't think it's that particularly difficult, no.

Q. What's the basis for that?

A. Just -- I don't know. I have three engineering degrees, including a doctorate degree.

Q. So for someone like you, it would be easy to do?

MR. KATZ: Object to the form.

THE WITNESS: I could do that I believe, yes.

Q. BY MR. DESAI: What about for someone who was at POSITA, three years of experience?

A. I think that feedback -- force feedback -- getting feedback from a motor, whether you're sensing torque and turning that into an impulse on your hand, I do not think that that is technically beyond what a POSITA could do.

Q. Okay. And what's your basis for that?

A. Just my own expertise.

Q. Did you examine the state of the art in 2011 with respect to tactile feedback?

A. I have not done that.

Q. Let's take a quick break. Okay?

A. Okay.

(A recess was held off the record.)

MR. DESAI: No more questions for you.

THE WITNESS: Thank you.

MR. KATZ: Hold on. I just have one or two follow-ups. First of all, I would like you to mark the patent you were just looking at, US patent 6,132,638, as Exhibit 1018, that's 1-0-1-8. And this is just for the record. So Exhibit 1018 was filed in the 0254 -- sorry, let me refer to it.

(Exhibit 1018 was marked for identification.)

MR. DESAI: We'll file it when we submit the deposition transcript.

MR. KATZ: Okay. Well, I'm just clarifying.

MR. DESAI: To the extent it wasn't already, which one, it was.

MR. KATZ: So this deposition involves two --

MR. DESAI: Yeah.

MR. KATZ: -- proceedings. It is already filed as Exhibit 1018 in the 01254 case.

MR. DESAI: Okay.

MR. KATZ: I'm not sure why it wasn't filed in the 2167.

MR. DESAI: We'll fix that.

EXAMINATION

BY MR. KATZ:

Q. Just one question, Dr. Knodel. You have identified, I believe, a typo in your declaration in paragraph 8.

A. I did.

Q. Can you explain to me whether there is a typo there or not and correct it on the record?

A. Yes. On the record in my deposition --

Q. Declaration?

A. Supplemental declaration, paragraph 8, I believe, they -- it reads, "Accordingly passive articulation is not a necessity and is not critical in the proposed combination of Timm with a surgical robot because Timm expressly discloses passive articulation."

That obviously makes no sense. It should read, "Accordingly tactile feedback is not a necessity and it not critical," et cetera, et cetera.

MR. DESAI: Got it.

THE WITNESS: Okay.

MR. KATZ: I have no further questions.

MR. DESAI: Thank you.

MR. PEPE: I'm going to need a final tomorrow.

MR. DESAI: Yeah, for those, everything, that would be great.

(Whereupon the proceedings ended at 10:39 a.m.)

ACKNOWLEDGMENT OF DEPONENT

I,_____, 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.

_____ _____
(Date) BRYAN KNODEL, Ph.D.

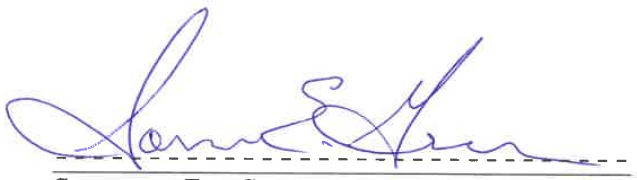
CERTIFICATE OF REPORTER

I, Sommer E. Greene, Registered Professional Reporter in and for the State of Arizona, County of Maricopa, the officer before whom the proceedings were taken, do hereby certify that the foregoing transcript is a true and accurate record of these proceedings; that said proceedings were taken in Stenotype note by me on the 12th day of August, 2019, commencing at 9:41 a.m. and ending at 10:39 a.m..

I further certify that present on behalf of the Petitioner was Steven R. Katz of Fish & Richardson and on behalf of the Patent Owner, Ethicon, LLC, Christopher Pepe and Anish Desal of Weil, Gotshal and Manges, LLP.

I further certify that I am not related to nor associated with any of the parties or their attorneys, nor do I have any disqualifying interest, personal or financial, in the actions within.

IN WITNESS WHEREOF, I have hereunto set my hand on this 13th day of August 2019.



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Certified Reporter 50622