UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INTUITIVE SURGICAL, INC.,

Petitioner,

v.

ETHICON, LLC,

Patent Owner.

Case IPR2018-01247
U.S. Patent No. 8,479,969

VOLUME I

DEPOSITION OF BRYAN KNODEL, PH.D.

April 3, 2019

9:00 a.m.

Fish & Richardson

One Marina Park Drive

Boston, Massachusetts

---- Reporter: Julie Thomson Riley, RDR, CRR ---

APPEARANCES:

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I N D E X

E X H I B I T S

MORNING SESSION

9:03 a.m.

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* * *

BRYAN D. KNODEL, PH.D.

having been satisfactorily identified and duly sworn by the Notary Public was examined and testified as follows:

DIRECT EXAMINATION

BY MR. DESAI:

Q. Could you state your name for the record.

A. Bryan Knodel.

Q. Dr. Knodel, would you mind -- you have a binder sitting in front of you. Would you mind just quickly reading off the exhibit numbers. I'm guessing they all start with the 100. If you could just read off the exhibit numbers that you have in that binder for the record.

A. Right. The first one does not have an exhibit number.

Q. Do you want to just read what it is then.

A. It is the '969 patent.

Q. Okay.

A. The second one is Exhibit 1004 in Knodel

declaration; the third is Exhibit 1007, Cooper; and then is 1008, Wallace; 1009, Tierney; 1010, Anderson; 1011, Timm; 1012, Knodel.

Q. Thank you.

Dr. Knodel, where are you currently employed?

A. I am a consultant. Self-employed.

Q. Is there any reason sitting here today you're unable to testify truthfully?

A. None.

Q. Okay. And you have been deposed before; is that right?

A. Yes.

Q. Was it just the one time before that you've been deposed?

A. Yes.

Q. All right. So I'll just refresh kind of the nature of a deposition quickly. The most important thing is if you don't understand a question I'm asking, just let me know, and I'll do my best to rephrase the question. Okay?

A. Okay.

Q. If you need to take a break, just let me know. We can take a break any time you want. Just if there's a question pending, just we'll -- just

answer the question and then take our break. Okay?
A. Okay.
Q. Your attorney is probably going to object to questions that I ask, and he'll state his objections for the record; but you're still required to answer the question unless he instructs you not to answer, which is typically only for privilege. Okay?
A. Okay.
Q. What did you do to prepare for the deposition today?
A. I reread my deposition and the supporting exhibits.
Q. You said "deposition." I think you probably meant declaration?
A. Declaration. Sorry.
Q. That's okay.
You reviewed the '969 patent?
A. I did.
Q. It's a big one.
A. Yesterday I was on a sailboat in Puerto Rico, so --
Q. All right.
A. It hasn't been a lot of time.
Q. Okay. How much time did you spend

preparing for the deposition today?
A. About six hours.
Q. Okay. On the sailboat?
A. No. Well, a little bit on the sailboat. It's so distracting. Mostly just yesterday on the flight, and once I got here.
Q. Okay. I got it.
Are there any corrections you feel like you need to make to your declaration?
A. There was a typo here and there I found, nothing of substance.
Q. Okay.
A. You know, a reference cited that was maybe it looked like a copy/paste error, things like that.
Q. Do you have a specific one in mind?
A. Oh, boy. Give me a moment.
Q. Sure.
A. There was a place where we said Anderson, when we -- it was clearly we were citing to Timm.
Q. I think I know what you're talking about.
A. Yeah, so I don't know that I could find it quickly. If it's important, I'll -- okay. I'll just -- I did find some things that were in reading it here six months later that I was like oh, gosh, I didn't catch that.

Q. You're talking about clerical errors basically?
A. Basically, yes.
Q. Yeah. Are there any substantive corrections you feel like you need to make to your declaration?
A. No.
Q. Okay. Why don't you go to paragraph 78 of your declaration.
In the first sentence, third line, it refers to a quick disconnect feature of Anderson, but the citation later is to Timm. Is this where you think --
A. Yeah.
Q. -- it should have referred to Timm?
A. Yes.
Q. Okay.
A. That's the one. You found it.
Q. Yeah. Got it.
And then we might encounter some others as we go through this today.
A. Okay.
Q. How long did you meet with the lawyers or lawyer for preparation?
A. Approximately five hours.

Q. Five hours.
And was it just Mr. Katz you met with?
A. That's correct.
Q. You've submitted declarations, by my count, in seven IPRs for Intuitive now; is that right?
A. I don't recall the number.
Q. Yeah.
A. It sounds about right.
Q. Okay. There was the group that were filed, I think, in early summer, late summer of last year, and then there was one that was just recently filed; is that right?
A. That seems to be what I recall, yes.
Q. Okay. And when did you start consulting for Intuitive on these IPRs?
A. I don't consult to Intuitive. I consult to Fish & Richardson.
Q. Sorry. When did you start consulting with Fish & Richardson on these IPRs?
A. I don't recall the exact date, but I believe it was -- I don't recall. Because we worked on them for a while. I would say -- I don't recall.
Q. That's fair enough.
A. I'd just be making something up.

Q. Okay. We don't want you to do that.
A. Yeah.
Q. How did you get involved in consulting with Fish & Richardson?
A. I received a phone call from someone from Fish & Richardson asking me about my background, my experience in staplers, and if I would be willing to consider being an expert witness. I remember it very clearly because it's kind of first I had ever heard of them, and I said, well, I don't know if I'm for you or against you; so, we started a conversation.
Q. All right. Okay. Had you ever consulted in a patent matter before this one?
A. Yes, one other.
Q. Okay. What was that about?
A. It was relative to an endoscope.
Q. Okay.
MR. KATZ: Oh, and I just want to just remind the witness this is going to be filed publicly. If there's any confidential information, just make sure to say that's confidential, and we'll take it up.
MR. DESAI: We'll figure that out.
THE WITNESS: Okay.
MR. KATZ: Yep.

BY MR. DESAI:

Q. Have you ever worked or consulted for Intuitive?

A. I have.

Q. Okay. When was -- when was that consulting?

A. Approximately 2012 to 2014, off and on, to the best of my recollection.

Q. Just during that time frame, not before or after?

A. It could have been before. It is a sporadic client of mine. They'd come in. They'd want me to look at something. I'd look at it. They were all very short duration. There was no products that I developed. They were more consulting on technical matters. So they were short, in and out. So it's hard for me to say specifically when those started.

Q. But you think it was roughly in the 2012 to 2014 time frame, roughly?

A. To the best of my recollection, that seems about right. I don't -- I don't recall the specifics of when that was.

Q. Okay. What was the nature of the work that you did with Intuitive?

A. As I mentioned, it was design considerations, one relative to it that I recall relative to a suction irrigation device, some things relative to cables, cable mountings and routings. Generally speaking, that type of consulting.

Q. Did you know for each of the consulting projects what tool or tools your work related to?

A. I would say sometimes it was some specific, like, in the suction irrigator; sometimes it was of a general nature, like cables. Minimizing cable stretch is a big deal and thinking about constructions that would help that, and things like that.

Q. What tools can you recall that you did provide consulting of for Intuitive?

A. Suction irrigation device.

Q. Any others?

A. Not specifically, not by a tool.

Q. Okay. Besides suction -- besides the work on suction irr -- the irrigation device, the cable work that you mentioned --

A. Mm-hmm.

Q. -- anything else that you did for Intuitive?

A. No. Like I say, I saw things, you know, they would show me designs, but nothing that I, you

know, that I contributed to that I recall.
Q. Okay. When you said that they showed you designs, what designs did they show you?
A. At the time -- at the time they were -- one of the designs that they were looking at was a stapler; so, I did see, oh, you're working on a stapler.
Q. When was that?
A. I don't recall. I would say approximately 2012.
Q. Okay. And when you say "stapler," can you be more specific what kind of device you're talking about?
A. It was an endoscopic linear stapler.
Q. A device that both cuts and staples or just staples?
A. It both cut and stapled.
Q. Okay.
A. Basically based on Power Medical, I think there was an acquisition. I'm going a little bit by old memory, but I think there was an acquisition. I think they got into a business relationship, and it was sort of a topic that was a buzz around when I was there doing other work.
Q. Okay.

A. Yep.
Q. Do you have any financial interests in Intuitive?
A. I own one share of stock.
Q. I don't know if that's a yes or a no.
A. It's virtually no.
Q. One whole share?
A. One whole share. It keeps going up.
Q. We're going to mark that as a yes. Just kidding. Just kidding.
Have you ever been involved in the design of a surgical tool for a robotic system?
A. Yes, in the sense -- yes, I have.
Q. And what was that involvement?
A. I can't disclose the clients or the products that I worked on.
Q. Do you have a time frame?
A. For confidentiality?
Q. No --
A. Oh, when I did it?
Q. Yeah, when you did it. Yeah.
A. I've worked on robotic-related projects for companies in 2015 through present.
Q. Okay. And so that involved designing a surgical tool for a robotic system?

A. It did.
Q. Okay. What kind of tool?
A. I can't discuss the nature of the tool.
Q. You can't even discuss the type of tool, like, what kind of tool it is? That's confidential?
A. I can tell you it's not a stapler.
Q. Okay.
A. It is actually confidential, yes. I have a nondisclosure that says don't disclose who I work for or the nature of the work I'm working on that I signed. It's pretty boilerplate for consultants like me.
Q. Okay. Aside from this one project that you just mentioned, is there other instances where you've designed a tool for a robotic system?
A. I have designed several tools for robotic systems --
Q. Okay.
A. -- in the last three to four years.
Q. Okay. Other than the work that you've done with designing tools for a robotic system in the last three to four years, is there other instances you can think of where you designed surgical tools for a robotic system?
A. Not that I recall.

Q. Okay. So is it fair to say that prior to 2015, you had never designed a tool for a robotic system?

A. No. I think I mentioned that I worked for -- prior to that for Intuitive on a suction irrigation device for a surgical robot.

Q. Okay. So your work with Intuitive on the suction irrigation device involved you designing that tool?

A. Aspects of it, yes.

Q. Okay.

A. The trumpet valve, how would you actuate the trumpet valve piece of -- it was a subset of a surgical instrument that's used on a robot.

Q. Okay. So prior to 2015, is it fair to say that the only instance where you worked on the design of a surgical tool for a robotic system was the work on the suction irrigation device with Intuitive?

A. No. What I'm saying is that I've consulted to Intuitive in the period of roughly 2012 through 2014, roughly, and I consulted on a number of aspects related to surgical -- robotically-controlled surgical tools.

Q. Okay. What other tools besides the

suction irrigation device?

A. They weren't specific in nature. They were surgical tools, but they weren't specific in nature.

Q. I don't understand.

A. As I mentioned, they were cable driven. They were dealing with high forces. They needed to minimize stretch. They wanted to think of lower cost ways to tension cables. They were four surgical devices, but they weren't related to -- to my recollection, they weren't related to a specific product.

Q. Okay. I got you.

A. Okay.

Q. Have you ever taken a hand-held laparoscopic tool and converted it for attachment to a robotic system?

A. I have not.

Q. I think your C.V. is at the back of your declaration; is that right?

A. It is.

Q. Yeah.

So you started working at Ethicon in 1990; right?

A. Yes.

Q. Okay. And from 1990 to 1992, you worked on the design of manufacturing equipment for production and packaging of surgical sutures; is that right?

A. That is correct.

Q. Okay. Did you work on anything else during this time frame, '90 to '92, or was that your focus?

A. It was my -- my focus was high speed -- trying to develop high speed automation for the assembly of and packaging of surgical sutures, yes.

Q. And then from '92 to '97, you were a principal engineer at Ethicon Endo-Surgery; is that right?

A. Yes.

Q. Okay.

A. At the end I was a principal engineer. I was promoted.

Q. Oh, okay. During that whole timeframe you were not a principal engineer?

A. Not during the whole time. That was where I ended up.

Q. That's where you ended up?

A. Yeah.

Q. Okay. And during this time frame, '92 to

'97, you were focused on development of an endoscopic linear cutter product line?

A. I did.

Q. Okay. Did you work on any other products during that time period?

A. I did.

Q. What other products?

A. Clip appliers, endoscopic rotating clip appliers. I did some trocar work related to IP around the seals. I did -- there's a wide variety of staplers that are not endoscopic that I consulted on internally as a technical design reviewer and an IP reviewer.

So my expertise specialty there was around the idea, around intellectual property, helping understand the landscape and helping them navigate designs that would not read on to the then titan US Surgical.

Q. Okay.

A. So that put me in front of a lot of different products for Ethicon.

Q. Okay. Trocar is T-R-O-C-A-R.

A. Sorry about that.

Q. No, that's okay.

And the focus of your C.V. description in

this time frame is the endoscopic linear cutter; right?

A. That was my -- that was my main job.

Q. All right.

A. Then there was all these peripheral activities that you would be drawn into because of my expertise.

Q. And it says you had -- it resulted in 14 product codes?

A. Mm-hmm.

Q. That means those were products that were commercially released?

A. That's correct.

Q. Did this endocutter have a trade name?

A. ETS.

Q. ETS. Just the Ethicon ETS or the Echelon?

A. ETS. Before Echelon.

Q. Before Echelon?

A. Yeah. So before Echelon, and then if you go all the way back to the ELC 30 and the ELC 60, everything in between there, that's what I did.

Q. And that was all referred to as ETS?

A. ETS. ATS was the articulating transecting stapler that came in 35, 45, and 60-millimeter lengths. Product codes also included the disposable

stapled -- the cartridges, so there were -- and there were iterations of those products, EZ, the EZ-35 came out, and, I think, that was supplanted by the ETS.

So marketing was changing names and changing features and changing things, but the construct of that product line was my responsibility.

Q. I understand.

A. Yeah.

Q. Was this the first -- so this was not the first endocutter that Ethicon had brought to market?

A. That is correct. The ELC-30 and the ELC-60 predated my arrival there.

Q. How did the architecture of the ETS endocutter differ from the previous version at a high level?

A. Yeah, in every way that's important.

Q. Okay.

A. The part count was radically reduced. They were -- at the time, Ethicon was losing money on every one they sold and trying to make profit on the reloads, cartridges.

When I did my redesign, we radically reduced the part count, which made them profitable, changed the manufacturing approach completely, and

even though I had never done it before, they sat me in a room, and I figured it out and did it.

Q. Why did you leave Ethicon in '97?

A. My wife's father had a stroke.

Q. So you had to move?

A. I needed to -- I needed to relocate and build ramps and put in hand grips, and he was in Tucson, and we were in Cincinnati.

Q. I understand.

Have you done any consulting for Ethicon since you left?

A. I have.

Q. Okay. Do you still consult for Ethicon?

A. No.

Q. No.

When did you stop consulting for Ethicon?

A. I think most of the consulting work I did with Ethicon was pretty much right on the heels of my departure, as I recall, so in that kind of 1999, 1998. I don't recall it going maybe even into 2000. It was pretty much associated with stuff that was -- I had some familiarity with, and they wanted me to keep contributing to what they were trying to do. I think there was a needle passer they were trying to develop and a new lower cost scissors and

graspers and a whole handheld product line that I consulted with them on, Ethicon Endo-Surgery.

Q. Okay. So it's been a pretty long time since you consulted with Ethicon; is that right?

A. It has been, yeah.

Q. You have a fairly lengthy list of medical device-related patents --

A. Yeah.

Q. -- in your C.V.?

A. There's a mistake in the beginning though they pointed out last time in case you didn't find it.

Q. I didn't.

A. So I made this -- I obviously created my C.V. a long time ago --

Q. Okay.

A. -- and I did a search of patents with the name "Knodel," and it turns out there was an engineer at Ethicon that had the last -- same last name, and so I ended up inadvertently listing his patents. I think it was the first three on my C.V.

Q. So the first three on the C.V. are not yours?

A. Yeah --

Q. Okay. That's fine.

A. -- I think those are not mine --
Q. Okay.
A. -- which is very nice of the last attorney pointed that out. Actually he pointed out the first one wasn't mine. I checked that and found the other two also.
Q. All right.
A. But I think there's -- yeah, there's still a substantial list, yeah.
Q. The list is still pretty long even with that.
Now, you've used the word "stapler" quite a few times since we've started this deposition, and the word stapler is used, you know, in a fair number of the titles of your patents here; right?
A. Yes. That is true.
Q. Okay.
A. I see that. I see stapler listed a lot.
Q. Yeah. Stapler does not necessarily refer to an endocutter; is that right?
A. It doesn't -- it doesn't have to, no, that's true.
Q. All right. So there are staplers that just staple. They don't cut and staple tissue; right?

A. The simple answer would be yes, but I want to clarify. Endoscopic -- endoscopic staplers, linear staplers, they're -- there's a subset, I believe, that some companies have that they call a no knife. But generally, devices that only staple aren't endoscopic. They look like a C-clamp. They're used in open procedures.

Q. Okay. So you're saying when somebody uses the word "stapler" in the context of an endoscopic device, it means a device that cuts and staples tissue?

A. No, I'm not saying that either.

Q. Okay.

A. No. There's endoscopic staplers that just apply a staple on the end of an endoscopic tube, for example.

Q. Okay. So then like I said, so then it's fair to say that the word stapler --

A. Yes.

Q. -- can mean a device that just applies a staple, and it can also sometimes mean a device that, you know, cuts and staples on both sides of the cut points?

A. It can mean both of those things, yes.

Q. Okay. And some of the patents you have

here in your list that are related to surgical stapling involve a device that just staples; right?

A. No. I don't believe so. I mean real quick, I believe, some of them don't clarify; for example, about ten down, endoscopic surgical stapler with compact profile. That actually would have nothing to -- wouldn't -- I don't think that that's necessarily tied to transecting. I don't recall it being tied to that. So cutting, but -- what was the question?

Q. That's okay.

A. I mean, I'm just trying to --

Q. So I said some of the patents you have here in your list that refer to surgical stapling involve a device that just staples without cutting?

A. I think that's -- I think that could be true.

Q. Yeah.

A. I'd have to look.

Q. I have an example.

A. Okay.

Q. Why don't we --

A. You do have an example? Okay.

MR. DESAI: Why don't we mark this as an exhibit.

Do you know where we should start exhibits?

We can just mark it Knodel Exhibit 1. We'll put a Bates stamp on it if we file it.

MR. KATZ: But I mean shouldn't it be a 2000?

MR. DESAI: Yeah, but we can do that when we file the exhibit.

MR. KATZ: Okay.

MR. DESAI: That's fine.

MR. KATZ: It's your deposition.

MR. DESAI: All right. I'm being lazy. Hold on.

MR. KATZ: I think the Board wants kind of you talking using the same exhibit numbers. There could be --

MR. DESAI: That's a fair point. That's a fair point.

MR. KATZ: Okay.

MR. DESAI: Give me a second. We're connected to the Internet. I can figure this out quickly.

MR. MARANDO: I'll figure it out.

MR. DESAI: I got it. No problem. I don't think we're in a rush today.

I know we don't have that many exhibits.
Okay. We can start with 2004.
(Document was marked Exhibit No. 2004 for identification.)
Q. Okay.
A. Oh, yes. I remember this.
Q. So this is a Patent No. US 7,473,258, that we've marked as Exhibit 2004, and it is in your C.V. in the list of patents. And you are the Bryan Knodel --
A. I am --
Q. -- on this patent?
A. -- in fact, that Bryan Knodel. I'm not sure if it's in my list. I may have forgot to put it in.
Q. It's on the second page, page 104.
A. Okay. Yes. I see it. Mm-hmm.
Q. Okay. And this is -- again, you were named an inventor on this patent; right?
A. Yes, I am.
Q. And this is an example of a stapler that is an endoscopic stapler; right?
A. It is. Mm-hmm.
Q. And this stapler just applied staples; correct?

A. That is correct.
Q. It does not cut tissue like an endocutter?
A. That is correct.
Q. Would you agree this is a vastly different device than an endocutter?
A. It is a vastly different device.
Q. Okay. And is it fair to say that this device that only staples requires fewer degrees of freedom than an instrument that both cuts and staples such as an endocutter?
A. It requires fewer degrees of freedom?
Q. Yeah.
A. I'd have to understand what you mean by "degrees of freedom."
Q. Okay.
A. This particular device is not designed to articulate.
Q. Okay.
A. But there are endoscopic linear staplers that also don't articulate.
Q. Correct.
A. So the degrees of freedom could be the same.
Q. Okay. Does this require clamping?
A. It does not.

Q. Okay. Do all endocutters require clamping?
A. Endocutters require clamping.
Q. And all endocutters require clamping and firing; right?
A. Yes.
Q. Yeah.
A. In order to transect the tissue and form the staples, they do an operation called firing --
Q. Okay.
A. -- and that follows always clamping. It's done, and then you unclamp. So they're always sequential.
Q. Okay. Explain to me how this stapler, for example, applies to staplers at a high level -- I'm sorry -- in Exhibit 2004?
A. Yes. So this staple you -- this stapler in this patent, you place it against the tissue. You actuate the trigger, and it takes a large -- there's a large form factor staple in there that's actually pre-closed. It opens it, applies it to the tissue, and then closes it again. So it's a similar action to a skin stapler or an EMS was what Ethicon's product code was for this.
Q. Okay. Do any staplers -- sorry. I have to be more clear.

Going forward, I think we should, just to be clear, I'm going to use the word "linear cutter" to refer to a device that -- or endocutter to refer to a device that both cuts and staples. Okay?

A. That will be fine.

Q. Okay. And when I'm referring to a device that just staples, I'll call it -- is there a term to use for that? Maybe staple applier, is that --

A. Yeah, staple applier would be nice.

Q. Okay. I'll use staple applier.

A. Okay.

Q. Are there staple appliers that require clamping?

A. I'm not -- I'm not aware of one. There may be, but I'm not aware of one.

Q. You've never come across a staple applier that requires clamping?

A. I personally am not aware of one.

Q. Okay.

A. I'm not saying they don't exist.

Q. Can you think of a reason why a staple applier would need to clamp?

A. If there's a stretcher -- I was actually contemplating in my mind like in a bariatric procedure where you may need to support the wall

that you're trying to staple. There may be a necessity to actually hold the tissue adjacent to the jaw when you're stapling it.

Q. But you're not aware of any device that does that?

A. Old mind. I can't recall. I can't recall one.

Q. Okay. Why don't you turn to the Anderson patent.

All right. And you agree that this is a patent directed to a harmonic tool for a robotic surgical system?

A. One of the embodiments of the Anderson patent is specific to a harmonic device, ultrasonic device.

Q. Harmonic tool and ultrasonic tool mean the same thing; is that right? At least that's my --

A. I think we can use that for today.

Q. Fair enough.

A. There may be some technical difference, but we'll go with it.

Q. Okay. Is there an embodiment in this patent that's not a harmonic tool?

A. I'm not sure. I haven't specifically looked for it, but I, and so I don't want to

preclude that there could be.

Q. Okay. Sitting here today, you're not aware of one though?

A. Not aware of one.

Q. Okay. You would agree that the focus of this patent is a harmonic tool?

A. I would agree that the abstract says that the surgical instrument for enhancing robotic surgery generally includes a shaft and an ultrasonic probe. An end effector or the distal end of the shaft --

THE COURT REPORTER: Hold on.

A. Sorry. I'm reading. I'll read it slowly. Let me start again at abstract. "A surgical instrument" --

Q. Are you going to read the whole abstract?

A. No, just the first part since there's some -- just to clarify what this patent is about.

-- "for enhancing robotic surgery generally includes an elongated shaft with an ultrasonic probe," and so it's generally about that and "an end effector at the distal end of the shaft and a base at the proximal end of the shaft."

So I'll just stop there.

Q. Okay.

A. So it's generally about an ultrasonic

probe.

Q. All right. My question was do you agree that the focus of this patent is a harmonic tool, and I guess do you disagree with that statement?

A. I guess I don't understand.

Q. The title is -- the title of the patent is "A Robotic Surgical Tool with Ultrasound Cauterizing and Cutting Instrument."

A. Right. I am just saying -- all I'm saying is that generally, the general nature of this, that's what they're -- that's what it's about, but the specifics of everything that's described and disclosed may be applicable to other things.

Q. That wasn't my question. My question was do you agree that the focus of this patent is a harmonic tool? And you seem hesitant to answer that.

A. I am hesitant to answer that.

Q. Okay. That's fine.

A. Because -- yes.

Q. Have you worked on a harmonic tool before?

A. In a technical advisory capacity.

Q. When was that?

A. At Ethicon.

Q. About what time frame?

A. They acquired Ultracision in, I think, 1996-ish.
Q. So are you familiar with the operation of a harmonic tool?
A. I am.
Q. Okay. At a high level how does a harmonic tool work?
A. There's a -- it attaches to a box that generates a vibrating impulse. It's connected to the device, and then that sets up a standing wave, so it's (indicating). The longitudinal component is actually vibrating. When it vibrates, it goes back and forth; it generates heat, and that heat is used for some function. It can -- they can do a lot of different things with it.
Q. Is that the general operation of the harmonic tool that's described in Anderson?
A. It doesn't really go into the harmonic nature of it. As a matter of fact, they discuss just using an OEM harmonic generator. They're not developing -- I guess, that's why I was hesitant to say it's not about ultrasonics. It's -- they actually talk about it's using an OEM ultrasonic probe that somebody else creates. This is --
Q. All right.

A. -- this is not an ultrasonic patent.
Q. Right. This is about the back end for an ultrasonic tool; right?
A. For an -- this is about an ultra -- it's about an ultrasonic tool in a very general sense.
Q. And, in your opinion, is a harmonic tool similar to an endocutter?
A. There can be similar functions. There's similarities and there are differences between an endocutter and a harmonic. I guess, for example, Ethicon contemplated replacing all endocutters with ultrasonic tools. So clearly they thought there was enough similarity to contemplate that, and that was in the late '90s when I was there.
Q. Did they end up doing that?
A. They did not.
Q. Why not?
A. It turns out they're not as similar as they thought, but they do coagulate. They do -- they can cut. They can cut, and they can stop blood flow, which is what an endocutter does.
Q. Okay.
A. It seals vessels, so they don't bleed, and it cuts. So in that sense, they are quite similar.
Q. In the end result?

A. The result that they're trying to achieve is very similar, yes.
Q. But the way they go about doing that is vastly different?
A. Quite a bit different, yeah.
Q. Can a harmonic end effector and endocutter end effector have the same drive system?
A. They can have similar drive elements but not identical, no.
Q. In other words, the drive system for a harmonic tool cannot be used to drive an endocutter?
A. You can't -- you can't unplug the end of one and immediately substitute the other. That is correct. It would take some skill to make that adjustment.
Q. In Anderson, the first few figures, I think it's Figures -- sorry. Let me try that again.
Figures 3 -- sorry. Let me start again.
Figures 4, 5, I think, 6, 7, 8, and 9 are illustrating a prior art handheld harmonic, is that right, tool?
A. The figures are labeled "Prior Art," so, yes, I would agree with that statement.
Q. And then figures -- starting at Figure 11A, do you see that?

A. Mm-hmm.
Q. That is, I'll call it, the back end of a harmonic tool that's going to be attached to a robotic system; is that right?
A. That is the back end, yes.
Q. So that's Figures 11A, B, and C?
A. C is not the back end.
Q. Sorry. Yeah, you're right. Figures 11A, 11B, also 12B, 12C, and 12A; right?
A. Those pictures, those figures depict the proximal end of the instrument of Anderson.
Q. Right. All of the back end figures of the robotic tool in Anderson are designed specifically to drive a harmonic; is that right?
A. This is an arrangement of components that can drive a harmonic. It can drive other things, but it is an arrangement that can actuate a harmonic.
Q. When you say "it can drive other things," what do you mean?
A. Well, this back end is designed to roll a shaft. So any device that wants to have a shaft rolled, you could use this. It's used to actuate a linear actuator, which could actuate a grasper. It could actuate a scissors. It could actuate -- so

this back end with the exception of where the ultrasonic probe plugs in is not -- is not specific to an ultrasonic device.

Q. Okay. I think I understand what you're saying.

A. Okay.

Q. So the back end here performs a function of shaft roll, which is applicable to other devices; is that right?

A. Mm-hmm. That is correct.

Q. And it also performs a function of gripping, which can be applicable to other devices?

A. It applies a linear actuation forward and backwards, this mechanism does.

Q. Right.

A. And it could be applied to other devices. It could be used to grip.

Q. Well, in this device, it is used to grip?

A. In this device it is used to grip, clamp.

Q. You think gripping and clamping are the same?

A. They're -- they can be used pretty interchangeably, but in my mind, they're slightly different, yeah.

Q. How are they different?

A. I generally think of clamping as bigger than gripping.
Q. Okay.
A. Like I can grip my bottle, but if I clamp this bottle, I'm going to crush it.
Q. The harmonic tool in Figure 10 has a gripper 82; right?
A. Figure 10?
Q. In Figure 10.
A. Sorry.
Q. Of Anderson?
A. I get all excited and -- it has a -- what did you call it?
Q. It's called gripper 82. You can check the patent if you want to see. I can point you to the right place if you want.
A. Yeah, that would be great.
Q. It would be quicker.
A. I just want to make sure it's called right -- that's what it's called. It could be called a jaw. It could be --
Q. It's called a gripper. Here I'll show you. It's on column 15, line 33.
A. Mm-hmm.
Thirty-three includes a shaft 84 covered

by a sheath.

Q. If you're saying it out loud, the court reporter has to record it, so.

A. Sorry. Yes. Gripper 82.

Q. Okay. Are you familiar with the magnitude of force required for this gripper in the harmonic tool?

A. It depends on the function of -- that you're trying to accomplish.

Q. In this harmonic tool?

A. I don't know.

Q. You don't know?

A. I don't know whether they're trying to seal tissue or cut tissue. The magnitude of force is much different for those two actions.

Q. Are you familiar with the magnitude of forces that are typically used in a gripper and a harmonic tool?

A. Generally.

Q. What are they?

A. Higher for -- higher for cutting, lower for coagulation. I don't know magnitudes.

Q. You don't know them?

A. Mm-mmm.

Q. Did you know them at some point in your

career?

A. I'm certain that in technical design reviews I may have been presented with the data as to what they were trying to do. It would be hard to imagine not having heard those numbers, but I don't recall them.

Q. All right. Do you know how the magnitude of the force required for a gripper in a harmonic tool compares to the magnitude of force required for clamping in an endocutter?

A. I think there's too many variables for me to comment on that.

Q. Did you consider that in forming your opinions in this case?

A. The -- I considered -- yes, the forces that are required to clamp an endocutter, I considered those. Endocutters come in different lengths, different widths, four rows, six rows, 60, 30, as you'll see, you know, there's endocutters that are very small; so, their magnitude of forces are radically different.

Q. Did you consider how they compared to a gripper in a harmonic tool?

A. They -- I considered the forces that were required to clamp, yes.

Q. Okay. I feel like you're not answering my question.
A. Okay. Let me try again.
Q. Did you consider how the forces for clamping of an endocutter compare to the forces required for a gripper in a harmonic tool in forming your opinions?
A. Yes.
Q. Okay. How did you do that if you don't know what the forces are for a harmonic tool?
A. Generally, so generally, I look at the mechanism and can the mechanism -- there's no -- there's no limitation implied in the art that I'm citing here. Anderson doesn't say how much force it is limited to produce or not produce. So there's no -- so I didn't read into this or try to make a limitation when no limitation was applied.
Q. So it's your opinion that because Anderson doesn't specifically specify the forces for the gripper, that they could be unlimited?
A. They -- it's -- they're within -- obviously within engineering limitations. I wouldn't say unlimited, but the mechanism, the device of Anderson does not have -- is not described in a way that limited its forces to a point that they would not be

able to be used in a stapler, endoscopic linear stapler.

Q. The gripping mechanism in this harmonic tool is cable driven; is that right?

A. Is there a particular figure you want to -- I believe it is not cable driven. Well, it's a combination of cables and mechanical.

Q. What do you mean by "mechanical"?

A. There are -- for example, if you look at Figure -- let's just pick a good one where it shows it pretty good.

Q. Probably Figure 13.

A. The gripping in Figure 13 is a mechanical in that element 104 is not a cable, and it swings about pivot 105 to affect clamping. So it's not cable driven in the sense that it's not all cables.

Q. 104 is pulled back and forth by cables; right?

A. 104 is -- 104 is moved in one embodiment by a, I guess, that's a cable.

Q. Where is the other embodiment that doesn't use the cable?

A. Let's see here. Yeah, my point was that it's a combination. It's not purely cable. It's a combination of cable and mechanism is what I'm

saying.

Q. Okay. But just -- sorry. I'm just going by your answers here --

A. Okay.

Q. -- and you said 104 is moved in one embodiment by, I guess, a cable. Okay. So --

A. By a cable, yes.

Q. So that implies that there's another embodiment -- at least in my view, your answer implies that there's another embodiment that doesn't use a cable; so, if that's your testimony, I'd like to know it.

A. Okay. So let me go back to the original question. The original question was is the clamping driven by a cable?

Q. No. That was not my question.

My question was the gripping.

A. Okay. Sorry. Is the gripping driven by a cable?

Q. Yes.

A. And the answer was ha-ha, it's actually a combination of, right, mechanical and cable. That's what I said.

Q. Okay.

A. And I showed you where the mechanical was,

and you can see where the cable is.

Q. Okay. Do you believe this cable and mechanical grip that's shown in Figure 13 would be able to produce forces sufficient to clamp an endocutter?

A. I think that it could be -- that the person of skill in the art could clamp an endocutter with the rotary drives of Anderson.

Q. That's not what I asked you.

I asked you if the mechanism for gripping that is shown in Anderson at Figure 13 would produce sufficient force to clamp an endocutter?

A. I don't think I have enough information from the figures to be able to make that determination.

Q. Okay. Do you have Wallace, Exhibit 1008?

A. Yes.

Q. Okay. Figure 2A and 2B illustrate two types of end effectors. One of them is -- the first one's 2A. It's a grasping jaw. And 2B is a cautery isolation effector. I think you can confirm that by looking at column 7, line 48 to 50.

A. 70 is the grasping jaws, and 72 is a cautery isolation effector, yes.

MR. DESAI: Can we go off the record for a

moment.

(Discussion off the record.)

(Short break taken.)

BY MR. DESAI:

Q. Dr. Knodel, when we stopped, we were on Wallace Figures 2A and 2B; is that right?

A. That is correct.

Q. Okay. And we had agreed that 2A is a grasping jaws, and 2B is a cautery isolation effector; right?

A. That's correct.

Q. Okay. What are the magnitude of forces required for the grasping jaws shown in Figure 2A?

A. I cannot tell from that figure.

Q. Are you familiar with a surgical tool, a grasping jaw surgical tool?

A. I am familiar with some grasping jaws as surgical tools, yes.

Q. What are the typical forces required of a grasping jaw surgical tool?

A. I haven't really thought about it.

Q. Okay. And what is a cautery isolation effector shown in Figure 2B?

A. I'm not sure what that is.

Q. Why don't you go to Figure 11A --

A. Mm-hmm.
Q. -- and 11B. Do you see that?
A. I do see them, yes.
Q. Okay. Do you know what kind of end effector that is?
A. It appears to be just a clevis.
Q. What is that?
A. A clevis, in general, is a U-shaped structure that you can mount something into through that -- do you see the hole up near the top?
Q. Mm-hmm.
A. From this image, just looking at the drawing, 58 appears to be a clevis. Do you want me to look up what it is called?
Q. Actually I'm taking a look right now. It looks like in the patent, 58 is referred to as a clevis, C-L-E-V-I-S.
A. Dude. Okay.
Q. Does a clevis include jaws that open and close?
A. Possibly.
Q. Does this one?
A. I don't see a jaw in this picture.
Q. Okay. And then if we look at -- just keep going through the figures here, if we go to Figure 17A

and 17B, I think that is also a clevis; is that right?

A. No, I don't think that's a clevis.

Q. Okay. Let's see. Let's see what 158 is referred to. It looks like it says in column 11 that 158 is a distal clevis.

A. Really?

Q. Yeah.

A. I don't know how it would actually ever function as a clevis, but that's what they called it.

Q. And then why do you think it wouldn't function as a clevis? I'm just curious.

A. Well, a clevis is -- I don't have a definition for a clevis. It just -- I think of a clevis as a U-shaped structure, and that is clearly not; so, it didn't from my -- in my world, I wouldn't necessarily have used that term, but I don't have a definition for clevis. So they may be perfectly correct in calling it that.

Q. Okay. Is a clevis similar in nature to an endocutter?

A. A clevis is a structure. Endocutters may or may not use a clevis structure in them.

Q. Are you familiar --

A. If you mounted -- you could mount a jaw across that clevis and use it in an endocutter.
Q. Have you ever seen something like that?
A. An endocutter with a clevis?
Q. (Nods.)
A. Have I ever seen an endocutter with a clevis? I'm not aware. I don't recall. I haven't thought really about that.
Q. Okay. Why don't you go to column 7 of Wallace.
A. Okay.
Q. And I focus you on the sentence that starts at line 50, and I'll read it when you're ready.
A. Okay.
Q. Okay. It says, "It may be appreciated however that any suitable end effector 66 may be used, such as DeBakey forceps, microforceps, Potts scissors, clip appliers, scalpels, or electrocautery probes, to name a few."
Do you see that?
A. I do see that sentence, yes.
Q. Okay. For the ones that are specifically identified there, are you familiar with the magnitude of forces required for those types of

tools?

A. Generally.

Q. How do those compare to forces required of an endocutter?

A. Generally they would be lower forces.

Q. How much lower?

A. It depends on the size of the endocutter and the size of the forceps. A 12-millimeter forceps that's 30 millimeters long, it has a lot of force on it, compared to a 5-millimeter forceps that's 10 millimeters long. You can't say by those words what the magnitude of forces are.

Q. So it's your opinion that those tools that are specifically mentioned could require the same forces of an endocutter?

A. Generally, these -- as I said before, generally the specific instruments on this list, in my opinion, would have lower forces than an endocutter generally.

Q. Okay. We also discussed how an endocutter has the two, I guess, motions that -- clamping and firing that are required; right?

A. We did discuss that, yes.

Q. Yeah. Do any of these tools have a similar requirement of clamping and firing?

A. Yes.
Q. Which one?
A. The clip applier.
Q. So a clip applier requires both clamping and firing?
A. It does.
Q. Okay.
A. Not in that sequence, but, yes. You fire out the clip, and then you clamp.
Q. Got it.
So the firing is different than an endocutter because in the clip applier, you're not cutting tissue; right?
A. No, but, so the firing in an endocutter deploys the fasteners; and the firing in a clip applier deploys the fastener.
Q. Does the firing in a clip applier involve cutting tissue?
A. There are clip appliers that were designed that did transect in between. They applied two clips, and they had a transection in between, yes.
Q. Okay. Do you recall the specific device you were talking about there, the name?
A. I don't recall the name. Ethicon actually was where it was being developed.

Q. Okay. So you're familiar with an Ethicon clip applier that could clamp tissue and transect tissue as well?
A. Could apply clips to clips and cut in between.
Q. To clips to clips and cut in between. Okay.
A. And I believe it was -- once, again, this -- we're going back now to 1998. So we're talking 20 years ago plus. There are designs of clip appliers that were being developed that combined both clip applying and cutting because that's very typical is to clip, clip, cut. Right? So they put it into a single device.
Q. Oh, are you -- do you know if there are patents describing this device?
A. I don't know.
Q. Okay.
A. I would be shocked if there are not.
Q. So would I.
And Wallace is primarily about a -- the focus of Wallace is about a wrist mechanism; is that right?
A. Yes.
Q. The word for that is a type of articulation

mechanism; right?

A. It is. Wrist is a type of articulation.

Q. You would agree that a significant consideration in the design of an articulation joint or mechanism are the magnitude of forces that need to be transmitted through the joint; right?

A. That is a design consideration, yes.

Q. Okay. And some articulation joint designs cannot be used to transmit high forces required of an endocutter; correct?

A. I haven't really thought about that, but I suspect that there are some articulation designs that may not be capable of doing that.

And, further, the articulation is just happening in air. There is no -- to articulate doesn't require force, just to be clear.

Q. Okay. Yeah, I don't think I was asking whether the articulation requires force.

A. Oh, okay.

Q. Right. Did you understand my question was about whether an articulation, you know, a design consideration for an articulation joint is the force that needs to be transmitted through the joint? You understood what I meant there?

A. Yeah. I just want to clarify, yeah,

the -- but the articulation joint and the forces that have to go through them, those can be quite decoupled.

Q. What do you mean?

A. I haven't -- you know, just conceptually, just thinking about it, if I'm pushing a hydraulic -- if I have a hydraulic hose going through an articulation joint in a mechanical system, I can bend that hose very easily, but that hydraulic hose can transmit a tremendous amount of force hydraulically, as an example of why articulation joints and the force that they're delivering can be massively decoupled. Okay.

Q. Let me go back to Anderson.

A. Okay.

Q. And in column 10, starting at line 40, there's a paragraph that is discussing a robotic surgical system. Do you see that?

A. I do.

Q. Okay. And it specifically mentions that one example of a robotic surgical system is the da Vinci system.

Do you see that?

A. I see that.

Q. Okay. And this is a patent that was filed

in 2002; right?

A. Yes, it is.

Q. Okay. So this is referring to -- there are variations of the da Vinci system today. Now there's the da Vinci X and Xi system. You know that; right?

A. I do not --

MR. KATZ: Objection. Beyond the scope.

A. -- know that.

Q. Oh, you don't know that.

MR. KATZ: Did you get my objection?

THE COURT REPORTER: (Nods.)

MR. KATZ: Okay.

BY MR. DESAI:

Q. Are you familiar with the da Vinci robotic systems that are available?

A. I am not -- I am not familiar with the names that they're called.

Q. Okay.

A. I know that there's a da Vinci robot that is used. My friend just had a surgical procedure done, a hernia repair done, with a da Vinci robot, but I don't know their names.

Q. Okay. I understand.

Are you familiar with the da Vinci system

that's referenced here in Anderson?

A. I'm familiar that Intuitive has a system they call the da Vinci that is a surgical robot, yes.

Q. Are you familiar with the specific da Vinci system that's referred to in Anderson that existed in this time frame, the 2002 time frame?

A. No. Not -- let me -- I'm familiar with that there was a da Vinci system, but I'm not familiar -- I don't know it intimately. I didn't design it. I've never operated it. I probably haven't even seen it.

Q. Okay.

A. I just know it existed, yes.

Q. All right. So paragraph 33 of your declaration --

A. Mm-hmm.

Q. -- there's a couple of things I want to unpack in this paragraph.

A. Okay.

Q. There's a sentence you say, "The surgical robot in Anderson is specifically designed to interface with a variety of surgical instruments such as surgical staplers."

Do you see that?

A. Yes.
Q. Okay. Do you believe the original da Vinci system was designed to interface with an endocutter?
MR. KATZ: Objection. Beyond the scope.
A. I do not know.
Q. Okay.
A. Did you say paragraph 30?
Q. Thirty-three of your declaration.
A. Thirty-three.
Q. Yeah. And when you say surgical staplers here, in your paragraph 33, are you referring to endocutters?
A. I'm referring to what the patent said in 7, 6 to 25.
Q. Okay.
A. What the patent said is "To reduce costs and for manufacturing convenience, the instrument may include OEM parts. For example, the instrument probe" --
Q. If you're going to read, you've got to read slow.
A. Oh, I'm sorry.
Q. Do you want to read the whole paragraph or are you -- do you want to just cite the line and paragraph number or column number?

A. So this in 6 to 25, it describes a device. The da Vinci robot was intended to be used with OEM medical systems, in other words, original equipment manufacturers medical systems, devices developed by other people for adaption to this, to this robot. That was what it was designed to do.

The breadth and how wide or long or whatever, it doesn't say. It just says that they intended for this to be used with other people's devices.

Q. Does it include endocutters here?

A. They give a list. Stapler probes is one of the listed items. It does not say specifically endocutters. It talks about cutting probes and stapling probes. "Likewise, the instrument probe assembly may combine one or more of these medical functions ..."

So it could be stapling and cutting by the sentence on line 25 -- 24 -- 23, 24, and 25.

Q. Do you have an opinion as to whether a person in the ordinary skill in the art would understand that the da Vinci system was incapable of driving an endocutter?

MR. KATZ: Objection. Beyond the scope.

MR. DESAI: I'm asking if he has an

opinion.

THE WITNESS: Can you rephrase the question.

BY MR. DESAI:

Q. Do you have an opinion as to whether a person of ordinary skill in the art would understand whether or not the da Vinci system that's mentioned in Anderson was capable or incapable of driving an endocutter?

A. I believe that a person of ordinary skill in the art would have to -- that there's nothing fundamental about that robot that would preclude it driving an endocutter.

Q. How do you know that?

A. Because robots do a lot of amazing things.

Q. But you're not specifically familiar with the da Vinci system that's referenced here, are you?

A. No.

Q. So if somebody at Intuitive said that it's incapable of doing it, you wouldn't have a reason to disagree, would you?

MR. KATZ: And I'll say objection. Beyond the scope.

You may answer.

A. I haven't thought about it.

Q. Okay. In your -- never mind.
You cite here column 11, lines 32 to 65 of Anderson, so why don't we turn to that --
A. Mm-hmm.
Q. -- that portion of Anderson and let me know when you're there.
A. I'm there.
Q. Okay. Towards, I think, around line 56, it mentions a single pivot wrist and a multi-pivot wrist. Do you see that?
A. Yes, I do see that.
Q. And it says they "may be included to provide additional operational degrees of freedom to the end effector"; right?
A. Yes, it does say that.
Q. Okay. Does that make it obvious in your opinion to use a single pivot wrist or a multi-pivot wrist with the harmonic end effector described in Anderson?
A. I haven't thought about it.
Q. If we look at your declaration again, paragraph 34.
A. Yes.
Q. Okay. And the sentence in this paragraph says that the figures of the '969 patent have a

striking resemblance to those of the prior Anderson reference and then you have a table with -- comparing the figures; right?

A. I do. Mm-hmm.

Q. Okay. I want to focus on the last comparison, which is Figure 26 of the '969 patent and Figure 2 of Anderson.

A. Mm-hmm.

Q. Okay. When you say "they have a striking resemblance," is it your opinion that Figure 2 of Anderson is disclosing an endocutter?

A. No. My opinion is that there are similarities in those two images.

Q. What are the similarities?

A. The handle -- the proximal end there connects to the robot, the elongated shaft, and an end effector.

Q. But the end effectors are completely different; correct?

A. The end effectors are different.

Q. Okay. And what's inside the box at the back end is completely different as well; right?

A. I can't tell. I can't see inside.

Q. Oh, really? Okay. Did you look at the other figures of the '969 patent and the other

figures of Anderson?

A. I did.

Q. Okay. And you couldn't tell?

A. I'm just talking about the image that you asked me to look at.

Q. Okay. So then you agree --

A. You asked me to look at Figure 2 and for Figures 26. The back ends do not look substantially different.

Q. Okay. But if we look at the figures that show what's inside of them, we know that they are substantially different; correct?

A. They are different, yes.

Q. So if you wanted to give the Board a complete description about whether these are similar devices or not, you would have been better off showing them what's inside the back end; right?

A. I was just comparing two images. I wasn't comparing what was inside. Just Figure 2 to Figure 26 have a lot of similarities.

Q. Okay.

A. That's what I said.

Q. So if we look at Figure 13 of the '969 patent and compare it to Figure 4 of Anderson, let me know when you have both of those together.

A. Figure 13 of '969.
Q. Yeah.
A. Okay.
Q. And Figure 4 of Anderson.
A. Yes.
Q. Okay. So applying your opinions with respect to the other figures in your paragraph 34, you would agree -- it would be your opinion that Figure 13 and Figure -- Figure 13 of the '969 patent and Figure 4 of Anderson have a striking resemblance; right?
MR. KATZ: Objection. Beyond the scope.
A. I haven't thought about it.
Q. But they have a handle. They have a shaft, and they have an end effector; right?
MR. KATZ: Objection. Beyond the scope.
A. I didn't put this Figure 13 and Figure 4 in my table of compared -- to compare figures that resembled one another; so, it must not have struck me as bearing a strong resemblance when I made my table.
Q. Okay. Sitting here today, do you think they have a striking resemblance?
MR. KATZ: Objection. Beyond the scope.
A. I haven't thought about it.

Q. All right. Okay. Paragraph 78 of your declaration, we had briefly touched on this paragraph earlier with the correction where you were replacing Anderson with Timm; right?

A. Right. Mm-hmm. I remember that.

Q. Okay.

A. Okay.

Q. What is the quick disconnect feature of Timm?

A. The -- let's just go to Timm 38.

Okay. 38, 25 through 33. "To facilitate" -- I'm going to skip down a little bit. "To facilitate quick detachment of a reload unit 4002 and reattachment of a new reload unit 4002, without the use of tools, a quick disconnect joint 4008 may be employed. As used here in the term 'quick disconnect,' refers to the ability to detach one component from another component without the use of tools."

Q. Okay. So this is referred to as a disposable reload unit that can be quickly disconnected; right?

A. That is what it is discussing.

Q. Right. Did you have familiarity with disposal reload units before working on this case?

A. Yes, I'm familiar with them.
Q. Right. And that's -- is that something in the commercially available endocutters that Covidien utilizes?
A. Yeah. They use a reload -- they call a SULU, Single Use Reload Unit, that is replaceable without the use of tools.
Q. Right.
So in your combination of Timm and Anderson, it's your opinion that somebody would utilize this disposable reload unit architecture?
A. You know, my opinion was that it may be advantageous, I think, is what I said.
In order to take advantage, that it may be -- "a person of skill in the art may have been motivated to use Timm's gear-driven closure mechanism, in combination with Anderson's system in order to take advantage of the quick disconnect feature of Anderson."
Q. You mean Timm?
A. And I meant Timm, yes. I still keep making the same mistake.
Q. So in your combination, the combination involves the use of the quick disconnect feature of Timm?

A. I -- a person of skill in the art may want to take advantage of that. They don't have -- I don't believe they have to, but they may choose to.
Q. In paragraph 92 of your declaration, let's go there.
A. Okay.
Q. Okay. And you say "Anderson teaches two distinct embodiments: one that is cable driven; and one that is gear driven but only depicts the former."
Do you see that?
A. Yes, I do.
Q. Okay. And I want to go through the cites here that you have. So why don't we start at column 15, lines 48 to 60.
A. Okay.
Q. Okay. And does column 15, lines 48 to 60 describe a gear-driven embodiment?
A. I have to read it.
Q. Go ahead.
(Pause.)
A. Okay. How far did that cite go to?
Q. Forty-eight to 60.
A. Okay. I'm done. It does not describe whether it's cables or gears. It doesn't say.
Q. Okay. So let's go to columns, the next

cite, columns 16, 62, to column 17, line 9. All right. Are you there?

A. I'm there.

Q. And the same question: Does this describe a gear-driven embodiment?

(Pause.)

A. Mm-hmm.

(Pause.)

A. Okay. Again, what's the question again?

Q. Did that portion you just read, column 16, line 62, to column 17, line 9 describe a gear-driven embodiment?

A. No.

Q. Okay. So let's go to the last citation in this string, and it's column 23, lines 25 to 36.

A. Okay.

Q. Okay. Take a moment to read that, and I'll ask you a question.

(Pause.)

A. Sorry. Could you give me the citation one more time.

Q. Yeah. Column 23, lines 25 to 36.

A. Okay.

(Pause.)

Q. Let me know when you're done reading it.

A. Yeah, I have to refer back to the figures, because I'm trying to make sure I understand exactly which part is turning which part.

(Pause.)

A. Okay.

Q. Okay.

A. To 26 to how far?

Q. Twenty-five to 36.

A. Okay. No, I'm not done.

Q. Okay.

(Pause.)

A. Okay. Now I'm ready.

Q. Okay. So my understanding here is at least with respect to lines 26 to 30 that it's referring to in Figure 21, you have this member 344. Do you see that?

Do you see number 344?

A. I do now.

Q. Okay.

A. Yes.

Q. And that is a member to which cables are affixed and is used to perform a shaft roll?

A. Yes.

Q. Okay. And the suggestion here in paragraph 23 -- sorry -- column 23 at lines 25 or 26

to 30 is you can replace that with a right-angled helical gear pair to perform a shaft roll; correct?

A. That is what it says. That's what Anderson says, yes.

Q. When you perform a shaft roll, is any component of the end effector moving relative to another component of the end effector?

A. I believe that when you roll the shaft, the components of the end effector would be moving together.

Q. Okay.

A. Although it's not strictly, in thinking about it further, I've seen mechanisms where you roll the shaft to actuate the distal end. So not necessarily. Sorry. I should never -- I should think about it --

Q. Okay.

A. So not necessarily.

Q. What example? What is it you're thinking of?

A. Well, I've seen a mechanism where the way they actuated the end, they had a barrel cam and so they rotated the tube, and the mechanism actuated.

Q. What was the device?

A. Oh, I don't recall. I'm just saying it's

technically possible to roll the shaft and actually for the purpose of actuating an end effector.

Q. I understand.

A. Okay.

Q. Was that device you're referring to an endocutter?

A. I don't recall.

Q. Have you ever seen an endocutter where you roll the shaft in order to actuate the endocutter?

A. You roll -- yes, there are these thread actuated -- threaded-actuated actuators for clamping. You see them in a number of devices.

Q. You're talking about rolling a drive shaft, not the -- I'm sorry. I'm talking about the main shaft to roll the end effector.

A. Oh, yeah, no, I haven't seen that in an endocutter.

Q. Okay. And then in the devices -- sorry -- the harmonic tool that's in Anderson, did the shaft roll actuate the end effector?

A. No, not in this device.

Q. Look at paragraph 104 of your declaration.

A. Yeah. Yes, I'm there.

Q. Okay. Do you have any corrections to make to this paragraph?

A. Yes. The references at the end of the paragraph should have cited to Timm, not to Anderson. That's a -- it looks like a cut/paste error. This is one of them that I was referring to earlier.

Q. Okay. Well, at the very end of the paragraph, you have a string cite to Anderson.

A. Anderson, mm-hmm.

Q. And you're saying all of those citations should actually be to Timm?

A. No. I'm saying if you look at about line 6, you see Anderson's cited right there.

Q. Mm-hmm.

A. If you look at -- if you compare those two strings, they're identical --

Q. Okay.

A. -- and I'm saying that is a typo.

Q. So what should those cites be?

A. Now they should cite to Timm. I haven't looked up to see what they should have been.

Q. So --

A. I just found this when I was reviewing this last night.

Q. Okay.

A. Yeah, I hadn't noticed it before.

Q. So sitting here today, you can't provide us with the citations to Timm that should be there?
A. I -- I would have to -- I'd have to spend some time and look at the section of Timm that talks about the proximal and distal spines, and, yes, that's correct.
MR. DESAI: Counsel, that seems to be a fairly substantive correction to the declaration. Do you have plans to file a motion to correct or anything like that to his declaration or are you -- I mean, what are we supposed to do about that?
MR. KATZ: You mean the fact that he's not providing a column line cite?
MR. DESAI: No, what I understand he's saying is that that last sentence there where you have a string cite to Anderson, that entire citation is wrong.
MR. KATZ: Well, I don't think he said the entire string. I think he said it's missing Timm's citations.
BY MR. DESAI:
Q. So the citations to Anderson, are those correct that are in that?
A. Yeah, the earlier citations to Anderson's

are correct.

Q. Okay. We're not on the same page or I'm confused.

A. Okay.

Q. So on page 61 of your declaration --

A. Yes.

Q. -- there's a beginning of paragraph 104, there's a string cite to Anderson; right?

A. That's correct.

Q. And that's fine. You have no changes to that?

A. That's correct.

Q. Okay. Now we go to the end of the paragraph, okay, and there is another string cite to Anderson; right?

A. That's correct.

Q. Okay. Should -- if this -- if you wanted to correct this, how would you do it?

A. Right.

Q. Would you delete the string cite to Anderson --

A. Yes.

Q. -- and replace it with a string cite to Timm?

A. I would delete the string cite to Anderson.

I'm not sure that I need a string cite -- what I write is accurate. I'm comfortable with what I wrote. There may be some citations to Timm that I would want to add to that, but I don't have them in mind right now.

Q. Okay. And then there's a reference to Prisco?

A. Oh, yeah.

Q. Okay.

A. That was the other typo I found.

Q. Okay. Well, what should that be?

A. It would be -- let me see. Let me think about it. I hadn't thought -- when I found this error when I was reading over it, I had in my mind whether it should be Timm or Anderson, but I have to rethink about it right now.

(Pause.)

A. It would be Timm, I believe.

Q. That's your testimony it should be Timm?

A. I'm going to think a little bit more about it now.

Q. Go ahead.

A. Thank you.

(Pause.)

A. Yeah, I'm sticking with Timm.

Q. Final answer. Locking it in.
A. I was going to phone a friend, but.
MR. DESAI: Why don't we take a quick break. I think we might be able to wrap up in the next session potentially.
MR. KATZ: Okay.
MR. DESAI: We'll see. Not have to hold through lunch.
MR. KATZ: Okay.
(Short break taken.)
BY MR. DESAI:
Q. So, Dr. Knodel, do you know what -- do you understand what passive articulation is?
A. I do.
Q. Okay. And column if you go to Timm. You have Timm; right?
A. I do.
Q. Let's go to column 30. There's a lot of figures.
A. Okay.
Q. Okay. Column 30, starting at line 44, that whole paragraph there, that includes a brief explanation of how a passive articulation joint works; right?
A. Let me read it just a little bit --

Q. Yeah. Go ahead.
A. -- I'll be able to confirm that.
(Pause.)
A. Yes. That's a good description of passive articulation.
Q. Okay. Have you ever used an endocutter that passively articulates?
A. I have held one in my hand and played with it.
Q. All right.
A. No surgeries.
Q. Do you understand that a surgeon having feedback is an essential part of using a passive articulation joint because it involves pressing against internal parts of the patient?
A. I haven't --
MR. KATZ: Wait. Hold on one second. Objection. Form. Beyond the scope.
Now you may answer.
A. I haven't thought about it.
Q. The passive articulation mechanism in Timm, as I think described briefly here, and possibly in the paragraph before, involves a locking trigger supported in the handle assembly that is activated by the clinician to hold the device, the

articulation joint in position once it's articulated by pressing against an internal part of the body; is that right?

MR. KATZ: Objection. Form. Beyond the scope.

You may answer.

A. I'd have to look at this because it mentions not just pressing against the body, also using an outer tool. It does seem to be able to be locked and unlocked, but I can't comment on exactly what you said.

Q. Did you consider when you were forming your opinions about Anderson and Timm the fact that Timm has the locking trigger that's used to lock the passive articulation joint?

A. I considered that Timm had articulation; that the ability for the articulation to be passive or active is not sort of -- in my mind, wasn't fundamental to Timm.

Q. Okay. My question is when you were considering Anderson or Timm, the combination, did you consider the locking trigger that's used for the passive articulation joint?

A. I wasn't -- no, I hadn't specifically focused on that aspect.

Q. Okay. Is Intuitive -- are you aware -- sorry. Strike that again.

Has Intuitive ever used a passive articulation joint on any of its robotic tools?

A. I don't know.

Q. Does the '969 patent describe a robotic endocutter with a passive articulation joint?

A. I don't recall it mentioning a passive articulation joint.

Q. Let me go to paragraph 123 of your declaration.

Are you there?

A. I am.

Q. Okay. And this is the part of your declaration that is addressing ground three, which is your combination of Anderson, Timm, and Wallace; right?

A. Yes, that's correct.

Q. Okay. And in this combination, as I understand it, you're using -- you would have Timm's end effector, which is the endocutter; a shaft that includes Wallace's wrist articulation; and then a back end tool mounting that would drive this, and attached to a robotic system; right?

A. Yes, the combination of Wallace's

articulation. It could be -- Wallace's articulation doesn't have to be a wrist. It can be one or two axes as we read earlier.

Q. You might want to confirm that for yourself, but --

A. Okay.

Q. -- I don't -- I think we were talking about Anderson with the single pivot and multi-pivot wrist, not Wallace.

A. Okay. But, yes, Wallace has an articulation joint. Wristed articulation joints have the ability to turn one way or the other or both.

Q. Right. So to clarify, your combination here in ground three involves Timm's endocutter end effector; Wallace's articulating wrist --

A. Right.

Q. -- and a back end tool mount that will drive all of that?

A. Yes.

Q. Okay. And here in paragraph 123, you talk about, at the end of the paragraph, Anderson's four transmission members; right?

A. Yes, I do. Yes. Uh-huh.

Q. And then you have the figure illustrating the back end of Wallace and the back end of Anderson;

right?

A. Yes, I do.

Q. And both of those have four -- both Wallace and Anderson have four transmission members in the back end; right?

A. They do. Mm-hmm.

Q. And that's because they're attaching to a robotic system that has four independent motors; right?

A. That is -- this system right here is configured to connect to a robot that has four driven elements, yes.

Q. Okay. And in your opinion here, in paragraph 123, the four transmission members would be used in the following fashion.

A. Mm-hmm.

Q. You would have one would perform shaft roll; right? What you call rotating the end effector; right?

A. Yes. Mm-hmm.

Q. And then one would open and close the endocutter; right?

A. The end effector. Uh-huh.

Q. Which is Timm's endocutter; right?

A. No, I don't say that. I say one would

open and close the end effector.

Q. Okay. So are you -- is opening and closing the end effector referring to Timm's endocutter or not?

A. So in the case of this claim, we're talking about a -- just a surgical tool; so, I didn't make a distinction. I'm just referring to a surgical tool here that it can open and close the end effector.

Q. Okay. But your combination is involving Timm's end effector; right?

A. I know, but it's not an ultrasonic probe either. Anderson, Timm, and Wallace, I'm saying, that combination, there's all different ways you could slice and dice it. What is the end effector? Is it the grasper or the -- you know, I'm just saying for this claim, we're talking about a surgical instrument. Right? So just reading the claim, the surgical tool of claim 24 we're in said "at least one gear-driven portion comprises an articulation system interfacing with said distal spine portion and said transmission assembly."

Q. So for this combination, I guess what you're saying to me is the end effector, it could be the harmonic; it could be the endocutter. It could

be -- let me finish before you answer -- the cautery isolation tool. Your picking any one of those is fine?

A. I'm saying -- yes, what I'm saying is that I wasn't trying to map this completely to an endocutter.

Q. Okay.

A. Right.

And I -- so I didn't call it the jaws of an endocutter. It's just an end effector.

Q. Okay. Let's suppose it was an endocutter, so one of the -- Timm's endocutter, one of the transmission members in Anderson would be used to open and close the endocutter; right?

A. Yes.

Q. Okay. And then you need two of those transmission members to drive the articulation of Wallace; right?

A. If you go with a full wrist, yes, that's correct.

Q. Okay. And if now we are talking about Timm's endocutter end effector, the analysis here would not account for the motion required for firing; correct?

A. If this was directed at a full endocutter,

then I would not have -- then this would not account for that.

Q. Okay. So in order to make this work for an endocutter, your combination would require modification to the robotic system to add a new transmission member?

A. Not necessarily.

Q. Okay. That would be one?

A. That's one possibility.

Q. That's one possibility.

Alternatively, the new design for this design would require -- it would require a new design, so that four transmission members could drive the five motions?

A. That's one possibility.

Q. Okay.

A. There's others.

Q. What's another possibility?

A. Well, you could use single degree articulation, which most articulating endocutters only -- that I'm familiar with only articulate in one direction. They don't articulate in two.

Q. Okay. But so you would then -- what you're saying is you would reduce Wallace's articulating wrist only do it in one direction?

A. Right. Wallace's articulation wrist can do this direction, and it can do this direction (indicating), but there's nothing about Wallace that requires it to do all.

And there's a third option.

Q. Okay. Go ahead.

A. Because opening and closing, as I mentioned earlier, are always sequential, it's possible that you can clamp and then continue to use that actuation to fire, retract the firing, and open, all using a single control.

Q. Would that work with Timm's end effector?

A. Timm's design, without any modification, wouldn't work that way, but I'm just saying in the broad scheme of things what could you do? These are things that someone of skill in the art could consider.

Q. Does Anderson, Timm, or Wallace describe a design for powering five motions with four transmission members?

A. Yes, actually.

Q. Where?

A. If you go to Anderson -- let me see where was that? About 11 -- no, sorry. Twelve, column 12.

Q. Yep.

A. If you look at line 20.
Q. Mm-hmm.
A. "Where more or fewer degrees of freedom are desired the number of spools may be decreased or increased."
Q. Okay. That's what we talked about earlier adding another transmission member to the robotic system; right?
A. Yeah. Yeah. So it does -- so Anderson discloses --
Q. Right.
A. -- that if you wanted -- if you needed another disk drive, go for it.
Q. No problem; right?
A. No problem.
Q. No problem for a POSITA?
A. Pardon me.
Q. No problem for a POSITA?
A. No, I don't see that as a problem.
Q. No, so my question, the other question was different which is is there a description in Anderson, Timm, or Wallace of powering five motions when you only have four transmission members?
A. No. The ability to extend four to five is not specifically covered in those references that

I'm aware of. I'll leave it open. I don't remember every word.

MR. DESAI: Can we just take a couple minute break.

MR. KATZ: Sure.

(Short break taken.)

MR. DESAI: We don't have any further questions.

MR. KATZ: I don't have any.

THE WITNESS: Okay.

MR. DESAI: So we'll see you tomorrow.

THE WITNESS: All right.

(Deposition concluded at 11:58 a.m.)

CERTIFICATE OF REPORTER

I, Julie Thomson Riley, RDR, CRR, do certify that the deposition of Bryan D. Knodel, Ph.D., in the matter of Intuitive Surgical, Inc., vs. Ethicon, LLC, on April 3, 2019, was stenographically recorded by me; that the witness provided satisfactory evidence of identification, as prescribed by Executive Order 455 (03-13), issued by the Governor of the Commonwealth of Massachusetts, before being sworn by me, a Notary Public in and for the Commonwealth of Massachusetts; that the transcript produced by me is a true and accurate record of the proceedings to the best of my ability; that I am neither counsel for, related to, nor employed by any of the parties to the above action; and further that I am not a relative or employee of any attorney or counsel employed by the parties thereto, nor financially or otherwise interested in the outcome of the action.

April 7, 2019

Julie Thomson Riley

Julie Thomson Riley, RDR, CRR

Notice Date: 04/08/2019

Deposition Date: 04/03/2019

Deponent: Bryan Knodel, Ph.D. Vol. I

Case Name: Intuitive Surgical v. Ethicon LLC

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CERTIFICATE OF DEPONENT

I hereby certify that I have read and examined the foregoing transcript, and the same is a true and accurate record of the testimony given by me. Any additions or corrections that I feel are necessary, I will attach on a separate sheet of paper to the original transcript.

_____

Signature of Deponent

I hereby certify that the individual representing himself/herself to be the above-named individual, appeared before me this _____ day of _____, 20__, and executed the above certificate in my presence.

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NOTARY PUBLIC IN AND FOR

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MY COMMISSION EXPIRES: