

August 12, 2019

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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

1     A P P E A R A N C E S

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

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

7  
8                                   EXAMINATION

9       BY MR. DESAI:

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

13           A.     Yes.

14           Q.     It's the 1247 and 1254 IPRs.

15           A.     Right.

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

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

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

1 recall if that was the Fengelman declaration?

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

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

6 All right. Did you do anything else besides  
7 that?

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

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

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

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

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

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

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

1       **thinking when I did the Anderson gee owe initial**  
2       **declarations.**

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

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

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

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

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

15           Q.       BY MR. DESAI: When was this?

16           **A.       In my consulting practice.**

17           Q.       Do you have a time frame?

18           **A.       Within the last ten years.**

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

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

23           Q.       Could you be more specific?

24           **A.       I cannot.**

25           Q.       What was the reason for your consideration of

1 the need for tactile feedback in robotic systems?

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

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

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

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

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

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

17 A. That's correct.

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

20 A. I don't recall.

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

24 A. They had both.

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



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

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

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

11 A. Right.

12 Q. And was this one consulting project?

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

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

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

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

1           **A.     For a robot, no.**

2           Q.     So you've never done that before?

3           **A.     No.**

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

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

11          Q.     Okay.

12          **A.     -- to the surgeon.**

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

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

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

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

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

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

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

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

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

10       Q.       Okay.

11       **A.       Okay.**

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

14       **A.       Okay.**

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

20       **A.       I understand that, yes.**

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

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

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

1 have?

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

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

12 Q. BY MR. DESAI: Okay.

13 A. Okay.

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

17 A. Right.

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

20 A. Okay.

21 Q. What kind of tools were they?

22 A. It's confidential.

23 Q. The kind of tool is confidential?

24 A. Yes.

25 Q. When was this?

1           **A.**     I've already answered that question.

2           **Q.**     No, not specifically these robotic tools.

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

7           **Q.**     Okay. When in the last ten years?

8           **A.**     I don't recall.

9           **Q.**     Was it in 2009?

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

12                   THE WITNESS: I don't know.

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

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

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

19           **A.**     No.

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

23           **A.**     I'm not aware.

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

1           **A.     No.**

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

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

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

8           **A.     Yeah.**

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

12          **A.     Yes.**

13          Q.     All right.

14          **A.     To the best of my recollection.**

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

20          **A.     Not power drives, yeah.**

21          Q.     Okay.

22          **A.     Not power drive systems.**

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

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

3           A.       Sorry. I have to think back.

4           Q.       Yeah.

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

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

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

17          Q.       What does that mean?

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

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

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

3           Q.     And that was at Ethicon?

4           A.     No.   It was at Cardica.

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

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

10          Q.     You have any understanding as to why not?

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

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

14          A.     Oh, yeah.

15          Q.     -- made it to market?

16          A.     Absolutely.

17          Q.     Okay.

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

20          Q.     Okay.

21          A.     That was CO2 powered.

22          Q.     Got it.

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

25          Q.     Have you ever discussed with any surgeons the



1 problems associated with removing a linear cutter from  
2 their hand?

3 **A. Removing a linear cutter from their hand?**

4 Q. Yeah.

5 **A. No.**

6 Q. Okay.

7 **A. Not that I recall.**

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

10 **A. Uh-huh.**

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

13 **A. I do.**

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

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

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

22 **A. (Witness reading.)**

23 **Yes, it is.**

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

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

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

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

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

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

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

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

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

17                   MR. KATZ: Thank you.

18                   THE WITNESS: This should just take a  
19     minute.

20          Q.     BY MR. DESAI: Yeah.

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

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

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

5           A.     Okay.

6           Q.     That has nothing to do with my question.

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

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

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

15          A.     Okay.

16          Q.     Take a look at figure 32.

17          A.     Uh-huh.

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

20          A.     It is.

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

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

25          Q.     Okay.

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

7           Q.     Okay.

8           A.     You have to look at the control.

9           Q.     In forming your opinions in this case about the  
10    '969 patent, did you gain an understanding of whether or  
11    not the '969 patent discloses passive articulation  
12    joints?

13          A.     I don't recall whether --

14          Q.     You never looked for that?

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

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

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

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

24          A.     No, I have not.

25          Q.     Have you ever conducted an analysis of a

1 passive articulating tool?

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

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

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

13 Q. Okay. That's fine.

14 A. Sorry.

15 Q. Have you ever used a passively articulating  
16 tool?

17 A. Yes.

18 Q. When was that?

19 A. When they handed me a prototype at Ethicon.

20 Q. Any idea the time frame?

21 A. I don't recall.

22 Q. Okay.

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

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

4 A. That is absolutely true.

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

7 A. No.

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

11 A. Uh-huh.

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

14 A. I don't --

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

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

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

25 A. I don't believe so.

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

2 A. Okay.

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

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

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

13 A. Right.

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

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

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

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

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

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

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

3 A. I don't recall.

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

7 A. Uh-huh.

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

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

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

21 A. Uh-huh.

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

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



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

3 A. I don't know.

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

6 A. Uh-huh.

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

10 MR. KATZ: Objection to form.

11 THE WITNESS: I was not aware of that.

12 (Exhibit 1018 was marked for  
13 identification.)

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

15 MR. KATZ: Thank you.

16 THE WITNESS: I think --

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

19 A. I'm sorry.

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

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

1 Q. Right.

2 A. I recall that now.

3 Q. Did you review this Exhibit 2018? Did you read  
4 it?

5 A. No.

6 Q. Okay. You can put it aside.

7 All right. Why don't we take a look at  
8 paragraph 15. And here you are referencing the Anderson  
9 reference. Is that right?

10 A. Yes, I am.

11 Q. Here it is. You can have that.

12 A. Thank you.

13 Q. And give me one second. You cite to two  
14 portions of Anderson. Right? Column 16, lines 14 to 24.

15 A. Uh-huh.

16 Q. And then column 6, line 33 to 37. Right?

17 A. Yes, that's what I'm referring to.

18 Q. Okay. First of all, you agree that Anderson  
19 does not disclose a passive articulation joint. Right?

20 A. Yes, I believe that is correct.

21 Q. Okay.

22 A. Anderson does not have a passive articulation  
23 joint. Right.

24 Q. So then you also agree that Anderson does not  
25 disclose tactile feedback for passive articulation.

1 Right?

2 **A. Not that I recall. Right.**

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

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

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

13 **A. Right. Uh-huh.**

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

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

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

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

1           A.     Yes.

2           Q.     Okay.

3           A.     But I --

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

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

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

11          A.     Okay.

12          Q.     First sentence talks about rotatable bodies.  
13 Right?

14          A.     Uh-huh.

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

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

21          Q.     I'm asking if you understand what the rotatable  
22 interface body is that's being referred to here in column  
23 6 of Anderson.

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

1 Q. So just take a moment. Let's go to column 6.

2 Let's try and focus this a little bit.

3 A. Okay.

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

6 A. Yes, I believe I do.

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

10 A. Okay.

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

18 A. Yes.

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

23 A. Uh-huh.

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

1 impart the motion for one of these degrees of freedom.

2 Right?

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

5 Q. Yes.

6 **A. Yes.**

7 Q. Okay.

8 **A. Uh-huh.**

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

12 **A. Right, uh-huh.**

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

15 **A. Right, uh-huh.**

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

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

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

23 MR. KATZ: Objection. Form.

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

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

4 A. Uh-huh.

5 Q. And it has a passive articulation joint.

6 A. Uh-huh.

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

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

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

14 A. Uh-huh.

15 Q. -- that's one way?

16 A. Yes.

17 Q. So what's another way?

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

20 Q. I'm asking for one more.

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

23 THE WITNESS: I haven't thought about it.

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

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

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

10 Q. Okay. And another way --

11 A. Would be to move the device.

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

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

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

20 A. Okay.

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

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

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



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

4 A. Uh-huh.

5 Q. Okay?

6 A. Uh-huh.

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

9 MR. KATZ: Objection to form.

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

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

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

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

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

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

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

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

13          A.     I have not.

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

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

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

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

1       **problems from an engineering standpoint.**

2           Q.     Have you ever dealt with those problems?

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

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

7           A.     **Not that I recall.**

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

14          A.     **Right. I recall -- I recall this specific**  
15      **reference, yes.**

16          Q.     Yeah. Give me a second.

17          A.     **Uh-huh.**

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

21                   MR. KATZ: Thanks.

22                   THE WITNESS: Okay.

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

1           **A.     Okay.**

2           Q.     And then that application issued as US  
3           6,132,368 which is what I just handed you. Right? It's  
4           all mentioned in paragraph 16 and 17 of your declaration.

5           **A.     I see it, yes.**

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

7           **A.     Okay.**

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

10          **A.     Uh-huh.**

11          Q.     For a robotic tool?

12          **A.     It is called a wrist mechanism.**

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

15          **A.     It is an actively articulated wrist, yes.**

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

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

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

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

25          Q.     Well, you said Wallace discloses tactile

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

3 **A. Yeah, I understand.**

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

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

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

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

20 **A. Okay.**

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

22 **A. Okay.**

23 Q. I want to understand --

24 **A. Does Wallace mention passive articulation?**

25 Q. Yeah.

1           **A.       It does? Okay.**

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

3           **A.       I don't --**

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

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

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

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

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

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

19          Q.       Right.

20          **A.       Okay.**

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

22          **A.       Cooper.**

23          Q.       Yeah.

24          **A.       Uh-huh.**

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

1 another proceeding, so let's -- we'll just call this the  
2 '368 patent.

3 **A. Okay.**

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

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

8 **A. Yes.**

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

14 **A. Yeah, let me just check that.**

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

19 **A. So 3 is just talking about title presence.**

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

23 **A. Yes.**

24 Q. -- "may also be employed."

25 Do you see that sentence?

1           **A.     Yes, I do.**

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

4           **A.     Right.**

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

6           **A.     Okay.**

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

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

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

13          **A.     Okay.**

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

18                   Do you see that?

19          **A.     I do see it, uh-huh.**

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



1           **A.       Okay. Uh-huh.**

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

4           **A.       Right.**

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

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

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

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

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

18                   MR. KATZ: Objection to form.

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

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

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

1       **system.**

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

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

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

10           MR. KATZ: Objection to form.

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

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

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

20           Q.     What's the basis for that?

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

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

25           MR. KATZ: Object to the form.

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

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

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

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

11 A. Just my own expertise.

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

14 A. I have not done that.

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

16 A. Okay.

17 (A recess was held off the record.)

18 MR. DESAI: No more questions for you.

19 THE WITNESS: Thank you.

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

1 (Exhibit 1018 was marked for  
2 identification.)

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

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

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

8 MR. KATZ: So this deposition involves  
9 two --

10 MR. DESAI: Yeah.

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

13 MR. DESAI: Okay.

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

16 MR. DESAI: We'll fix that.

17

18 EXAMINATION

19 BY MR. KATZ:

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

23 A. I did.

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

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

2           Q.     Declaration?

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

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

11                    MR. DESAI:  Got it.

12                    THE WITNESS:  Okay.

13                    MR. KATZ:  I have no further questions.

14                    MR. DESAI:  Thank you.

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

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

19                    (Whereupon the proceedings ended at  
20    10:39 a.m.)

21

22

23

24

25

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.

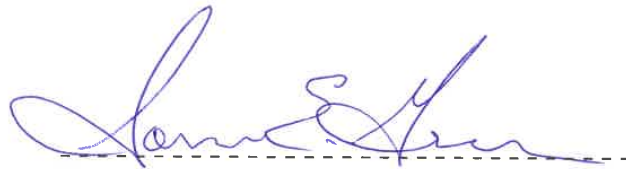
CERTIFICATE OF REPORTER

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 Desai 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.



Sommer E. Greene, RPR, CRR  
Certified Reporter 50622

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