Transcript of Troy L. Thornton

Date: March 19, 2025
Case: Imperative Care, Inc. -v- Inari Medical, Inc. (PTAB)

Planet Depos
Phone: 888.433.3767 | **Email:** transcripts@planetdepos.com
www.planetdepos.com
Michigan #8598 | Nevada #089F | New Mexico #566

INARI-2006
Imperative Care, Inc. v Inari Medical, Inc. IPR2025-00989

1

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

IMPERATIVE CARE, INC., :
Petitioner, :
versus : CASE: IPR2024-01157
: PATENT NO: 11,697,011B2
INARI MEDICAL, INC., :
Patent Owner. :

VIDEOTAPED DEPOSITION OF
TROY L. THORNTON

9:03 a.m.
March 19, 2025

KNOBBE MARTENS OLSON & BEAR, LLP
333 Bush Street
21st Floor
San Francisco, California

Job No.: 575710
Pages: 1 - 216

Stenographically Reported By:
Susan DiFilippantonio, RPR, RMR, California CSR 14383

2

APPEARANCES:

On Behalf of the Petitioner, IMPERATIVE CARE, INC.:

KNOBBE MARTENS OLSON & BEAR, LLP
BY: Joshua J. Stowell
Elizabeth Do
333 Bush Street
21st Floor
San Francisco, CA 94101
415.954.4114
joshua.stowell@knobbe.com
elizabeth.do@knobbe.com

On Behalf of the Patent Owner, INARI MEDICAL, INC.:

PERKINS COIE LLP
BY: Joseph P. Hamilton
1888 Century Park East
Suite 1700
Los Angeles, CA 90067-1721
310.788.3271
jhamilton@perkinscoie.com

Also Present: Philip Astor, videographer

3

I N D E X

WITNESS/EXAMINATION	PAGE
TROY L. THORNTON	4
EXAMINATION BY MR. HAMILTON	5
DISCLOSURE	210
CERTIFICATE OF REPORTER	214
SIGNATURE OF DEPONENT	216

E X H I B I T S

Exhibit 2006, US Patent Number 7,682,380 82, dated March 23,2010 (s4) KTNK-RESISTANT BIFURCATED	199

4

(Wednesday, March 19, 2025 9:03 a.m.)

THE VIDEOGRAPHER: Here begins Media Number 1 in the videotaped deposition of Troy Thornton in the matter of Imperative Care, Inc. v. Inari Medical, Inc. in the United States Patent and Trademark Office before the Patent Trial and Appeal Board, Case Number IPR202401157.

Today's date is March 19, 2025. The time on the video monitor is 9:03. The videographer today is Philip Astor, representing Planet Depos. This video deposition is taking place at Knobbe Martens Olson & Bear, San Francisco, California.

Would counsel please voice-identify themselves and state whom they represent.

MR. HAMILTON: This is Joseph Hamilton from Perkins Coie, representing the patent owner.

MR. STOWELL: Joshua Stowell of Knobbe Martens, representing the petitioner, Imperative Care, and the witness.

THE VIDEOGRAPHER: The Court Reporter today is Susan DiFilippantonio, representing Planet Depos. The witness will now be sworn.

THE REPORTER: This is Susan DiFilippantonio, California CSR Number 14383.

TROY L. THORNTON,

5

1 called as a witness at the instance of the Patent Owner,
2 being first duly sworn, was examined and deposed as
3 follows:
4 EXAMINATION
5 BY MR. HAMILTON:
6 Q. Mr. Thornton, have you been deposed before?
7 **A. Yes.**
8 Q. How many times?
9 **A. Excuse me. I believe two times.**
10 Q. There's a couple ground rules. I'm sure you're
11 familiar with some of them. I'm just going to go over
12 them again.
13 You understand you're under oath?
14 **A. I do.**
15 Q. At the conclusion of the deposition, sometime
16 after, you'll be given a transcript, with an opportunity
17 to correct errors. Do you understand that any
18 substantive changes may be commented upon and may affect
19 your credibility?
20 **A. Can you repeat that?**
21 Q. If you change your testimony after the
22 deposition, do you understand that might affect your
23 credibility?
24 **A. Yes.**
25 Q. I'm going to be asking questions. There's a

6

1 Court Reporter taking down everything. If I could ask,
2 to make it easier on her, that we not spoke over each
3 other. I'll try to wait until you're finished with your
4 answer before I ask the next question. If you could
5 wait until I finish my question to answer.
6 Can you do that for me?
7 **A. Yes.**
8 Q. Great.
9 If there's anything that's unclear in my
10 question, please ask for clarification, definition,
11 explanation, and any issue you have with the question.
12 If you don't ask, we're going to assume you understand
13 the question.
14 Is that fair?
15 **A. Yes.**
16 Q. Because everything is taken down via the Court
17 Reporter, if you could give an audible answer, as
18 opposed to a head nod. So a yes or no. Do you
19 understand that?
20 **A. Yes.**
21 Q. Are you on any medications or have any health
22 conditions that might affect your ability to testify
23 truthfully here today?
24 **A. No.**
25 Q. Is there any reason you cannot give your

7

1 complete and full truthful testimony here today?
2 **A. No.**
3 Q. If you need a break, please just ask. My only
4 request is we don't take a break while the question is
5 pending. Occasionally I'll be in a line of questioning
6 and I'll want to finish that up, as well, but -- but
7 please feel free to ask if you need a break.
8 Did you bring any documents with you here today?
9 **A. Not in here, no.**
10 Q. And when you say "not in here," you mean you
11 brought some to this office?
12 **A. I have a binder in the other room.**
13 Q. Does that binder relate to this case?
14 **A. Yes.**
15 Q. And -- and what's in that binder?
16 **A. Several documents, including my declaration.**
17 Q. Are there any notes in that binder, on those
18 documents?
19 **A. I don't think so.**
20 Q. Are there any notes in that binder at all?
21 **A. I don't believe so.**
22 Q. So the binder you have are documents from this
23 case. And are they limited to documents from this case?
24 **A. Yes.**
25 Q. And is it your understanding those documents are

8

1 marked as exhibits in this case?
2 **A. There were some exhibits, yes.**
3 Q. Is there anything besides exhibits in that
4 binder?
5 **A. No.**
6 Q. I'm going to hand you what has been marked
7 previously as Exhibit 1003.
8 (Tendered.)
9 MR. HAMILTON: For some of these I have
10 an extra copy. Would you like it?
11 MR. STOWELL: Thanks, John.
12 MR. HAMILTON: As many as I can get rid
13 of.
14 MR. STOWELL: Yeah, right. You don't
15 want to take them back. I get it.
16 BY MR. HAMILTON:
17 Q. Okay. Do you -- do you recognize Exhibit 1003?
18 **A. Yes.**
19 Q. And what is Exhibit 1003?
20 **A. It's a Declaration of Troy L. Thornton in**
21 **Support of Petition for Inter Partes Review of U.S.**
22 **Patent Number 11,697,011.**
23 Q. Is this the declaration you submitted in
24 connection with the interference for which we're --
25 you're testifying here today?

9

1 MR. STOWELL: Objection. Form.
2 THE WITNESS: Yes.
3 BY MR. HAMILTON:
4 Q. I noticed you turned to the last page, 133. Is
5 that your signature on page 133?
6 **A. My electronic signature, yes.**
7 Q. And do you see in the paragraph above your
8 signature, 186, an oath that your declaration is
9 truthful? Do you see that?
10 **A. Yeah. Paragraph 186?**
11 Q. Yes.
12 **A. Yes.**
13 Q. Since signing your declaration on July 8, 2024,
14 have you reviewed your declaration?
15 **A. Yes.**
16 Q. Have you found anything that's not truthful in
17 your declaration?
18 **A. No.**
19 Q. Have you found anything that is an error or
20 incorrect in your declaration?
21 **A. Not that I've noticed.**
22 Q. Is there anything you want to change in your
23 declaration as you sit here today?
24 **A. No.**
25 Q. Let's take a look at paragraph 16.

10

1 **A. (Complying.)**
2 Q. And that's on page 5. Let me know when you're
3 there.
4 **A. Yes.**
5 Q. Does paragraph 16 state that you've considered
6 the materials identified in the attached list of
7 exhibits to your declaration?
8 **A. Yes.**
9 Q. And is that -- if you go to page -- it's going
10 to be a couple pages in, titled "Table of Exhibits." Is
11 that your list of exhibits that you're referring to in
12 paragraph 16?
13 **A. Yes.**
14 Q. Is this everything that you considered in
15 preparing your declaration?
16 **A. I believe there were other patents that we also**
17 **looked at and considered.**
18 Q. And -- and just before I get into a line of
19 questioning, when I say "declaration" today, I'm going
20 to refer to Exhibit 1003. I understand you've done some
21 declarations in other IPRs. So is it -- is it -- is it
22 fair that we define, when I say "declaration" or you say
23 "declaration," we're referring to this Exhibit 1003?
24 **A. Yes.**
25 Q. Okay. Great.

11

1 What other patents did you review?
2 **A. I don't recall.**
3 Q. Did you rely on anything that's not in this
4 table of exhibits in forming your opinions in the
5 declaration?
6 **A. I don't believe so.**
7 Q. Why did you look at those other patents?
8 **A. One always looks at a wide range of patents to**
9 **decide which ones are most appropriate to consider.**
10 Q. And you determined everything in the list on the
11 table of exhibits were most appropriate; is that
12 correct?
13 **A. We determined that these were appropriate to**
14 **include.**
15 Q. You just said "we." What do you mean, "we"?
16 **A. Working with counsel.**
17 Q. So you and counsel together determined that this
18 was the list of exhibits you should -- you should
19 include as what you considered; is that right?
20 **A. Yes.**
21 Q. Did counsel provide all these exhibits to you?
22 **A. Yes.**
23 Q. Did you go find any of these exhibits on your
24 own?
25 **A. I don't believe so.**

12

1 Q. Did you go look for other material related to
2 the subject matter of this case on your own?
3 **A. I did some other searches, yes.**
4 Q. And did you find anything that changed your
5 opinions in this matter?
6 **A. No.**
7 Q. Did you rely on everything in the table of
8 exhibits of Exhibit 1003 in forming your opinions in
9 this matter?
10 **A. Can you repeat the question?**
11 Q. So there's -- there's a list of exhibits here.
12 And in paragraph 16 you said, "In preparing this
13 declaration, I have considered the materials referenced
14 in the declaration and identified in the attached list
15 of exhibits."
16 So in preparing your declaration, you considered
17 everything listed in that attached list of exhibits; is
18 that correct?
19 **A. Yes.**
20 Q. Are you sure?
21 **A. Yes.**
22 Q. And let's -- let's just look at that list of
23 exhibits. If you take a look, you can see Exhibit 1003.
24 **A. (Complying.)**
25 Q. What's Exhibit 1003 in that list of exhibits?

13

1 **A. I would have to see the document to be able to**
2 **answer that.**
3 Q. Is -- this is your declaration, isn't it?
4 **A. Sorry. I thought this was 001, so...**
5 **Yes, this is Exhibit 1003.**
6 Q. So in the list of exhibits, you reference
7 Exhibit 1003, which is -- which is your declaration --
8 **A. Yes.**
9 Q. -- as being considered in preparing that
10 declaration; is that right?
11 MR. STOWELL: Objection. Form.
12 THE WITNESS: So maybe that wasn't
13 appropriate, to say it was used in the paragraph
14 16. Maybe it wasn't appropriate to say I've
15 considered the materials referenced in this
16 declaration and identified them in the list of the
17 exhibits, because it wasn't prepared at the time
18 that the declaration was prepared.
19 BY MR. HAMILTON:
20 Q. Okay. So in this paragraph 16, you say that in
21 preparing the declaration, you considered the material
22 in the identified -- excuse me -- the attached list of
23 exhibits. And what you're telling me here today is you
24 - you didn't consider Exhibit 1003 because this is
25 Exhibit 1003; is that right?

14

1 MR. STOWELL: Objection. Misstates
2 testimony.
3 THE WITNESS: It wasn't completed at the
4 time that the declaration was completed, so it was
5 probably a mistake to list it as a -- or to say
6 that this was considered -- that this was one of
7 the materials considered and referenced in this
8 declaration.
9 BY MR. HAMILTON:
10 Q. Okay. So for -- for paragraph 16, this isn't
11 correct, at least with respect to Exhibit 1003; is that
12 right?
13 MR. STOWELL: Objection. Misstates
14 testimony. Form.
15 THE WITNESS: Yes; 0 -- 1003 possibly
16 should not be in this list.
17 BY MR. HAMILTON:
18 Q. You had said there were earlier versions of
19 Exhibit 1003. Did you rely on those versions in
20 preparing your declaration? Is that what you meant by
21 paragraph 16?
22 MR. STOWELL: Objection. Misstates
23 testimony.
24 THE WITNESS: I don't believe I said
25 there were earlier versions that were included

15

1 here.
2 BY MR. HAMILTON:
3 Q. Were there earlier versions?
4 **A. Yes. There were several drafts during**
5 **preparing -- during the preparation of this document.**
6 Q. Did you rely on those drafts in preparing your
7 declaration?
8 MR. STOWELL: Objection. Form.
9 THE WITNESS: No.
10 BY MR. HAMILTON:
11 Q. If you look at the next paragraph, paragraph
12 17 -- you can take a moment just to read that.
13 **A. Yes.**
14 Q. Do you see the last clause in that paragraph
15 "field of the '011 Patent"?
16 What did you mean by the "field of the '011
17 Patent"?
18 **A. Field relates to hemostasis valves.**
19 Q. So the field of the '011 Patent is hemostasis
20 valves; is that right?
21 **A. If I can get a copy of the '011 Patent, I can**
22 **confirm that.**
23 Q. You bet.
24 So I'm going to hand you what's been previously
25 marked as Exhibit 1001.

16

1 (Tendered.)
2 And, you know, if -- if it's helpful, I'll also
3 refer you to paragraph 26 of your declaration, where you
4 also discuss the field, and that might help you
5 articulate what the field is, if -- if you'd like to
6 look at that.
7 **A. So your question again?**
8 Q. So my question is, what is the field of the '011
9 Patent?
10 **A. As I reference in paragraph 26 of the**
11 **declaration, hemostasis valves were used during**
12 **intravascular procedures.**
13 Q. So is it fair to say, then, the field of the
14 invention of the '011 patent is what's set forth here on
15 -- on paragraph 26, "hemostasis valves for use during
16 intravascular procedures"?
17 Is that the field of the invention of the '011
18 Patent?
19 **A. That's my understanding, "hemostasis valves for**
20 **use during intravascular procedures."**
21 Q. Does the field of the invention of the '011
22 Patent include anything else?
23 And the reason I ask is in paragraph 26, you say
24 "e.g." I just want to make sure that's not just an
25 example of one of the fields of the invention. I want

17

1 to -- I want to -- I want to clarify what the actual
2 field of the invention of the '011 Patent is.
3 **A. That's my understanding of the field that's**
4 **focused on with this '011 Patent.**
5 Q. And when you say "focused on," what do you mean
6 by focused on?
7 **A. That the main thrust of the entire patent is**
8 **focused on sealing -- is focused on hemostasis valves**
9 **for use during intravascular procedures.**
10 Q. Okay. What -- what -- what is a hemostasis
11 valve?
12 **A. It's a valve used on the proximal end of a**
13 **catheter to prevent leakage of blood from the patient.**
14 Q. Is that your complete answer?
15 **A. Yes.**
16 Q. When you say "on the proximal end of a
17 catheter," are hemostasis valves only used with
18 catheters?
19 **A. In my experience, they are used with**
20 **intravascular catheters.**
21 Q. Are you aware of hemostasis valves being used in
22 any other application that doesn't involve intravascular
23 catheters?
24 MR. STOWELL: Objection. Form.
25 THE WITNESS: Well, the word "hemo"

18

1 implies blood. So in my experience, they're always
2 used in a patient's vascular system.
3 BY MR. HAMILTON:
4 Q. In your definition, you also said "to prevent
5 leakage of blood from the patient." Do hemostasis
6 valves have any other use other than to prevent leakage
7 of blood from the patient?
8 **A. They also are there to prevent entrainment of**
9 **air into the patient.**
10 Q. Is it fair to say air or -- or any other foreign
11 substance or particle, things like that? Is that fair
12 to say?
13 **A. In my experience, it's to prevent air**
14 **introduction into the patient.**
15 Q. Okay. So hemostasis valves prevent leakage of
16 blood and they prevent air into a patient during an
17 intravascular procedure; is that right?
18 **A. Based on my experience, that's what I would say.**
19 Q. When you say based on your experience, have you
20 ever designed a hemostasis valve?
21 **A. I have hired engineers who design hemostasis**
22 **valves, yes.**
23 Q. Have you ever designed a hemostasis valve?
24 **A. I was involved with the design in working with**
25 **the engineer who reported to me.**

19

1 Q. So when you say you were involved with the
2 design in working with the engineer who reported to you,
3 is that the only time you've been involved in the design
4 of a hemostasis valve?
5 **A. I've been involved in speccing out hemostasis**
6 **valves that we purchased for other applications.**
7 Q. Okay. So just to be clear, the experience in
8 designing was with one engineer for one valve; is that
9 right?
10 MR. STOWELL: Objection. Misstates
11 testimony.
12 THE WITNESS: For the most recent product
13 that I was responsible for, there were three
14 hemostasis valves on three different catheters.
15 BY MR. HAMILTON:
16 Q. When you say three valves, three different types
17 of valves or three of the same valve?
18 **A. Three different types of valves.**
19 Q. Were all -- those all used at the same time?
20 **A. During the same procedure, there were three**
21 **catheters used, and all three were used at some points**
22 **during the procedure.**
23 Q. So in this project that you worked on with the
24 engineer, the result of that project was three different
25 types of hemostasis valves; is that right?

20

1 **A. Yes.**
2 Q. And other than that project and -- and working
3 with this engineer on three different types of
4 hemostasis valves, have you been involved in the design
5 of any other hemostasis valve?
6 **A. On an earlier project there were two hemostasis**
7 **valves on two different components of the system.**
8 Q. And you designed those two valves in that
9 earlier project?
10 **A. In that project I believe we specced out**
11 **off-the-shelf valves. We were able to find more**
12 **standard off-the-shelf valves to use.**
13 Q. And what does that mean, specced out?
14 **A. We set out the design requirements to the**
15 **vendors.**
16 Q. Specced out mean anything else besides setting
17 out the design requirements to the vendors?
18 **A. Not really.**
19 Q. Okay. So there are many types of hemostasis
20 valves; is that correct?
21 MR. STOWELL: Objection. Form.
22 THE WITNESS: I am familiar with several
23 types of hemostasis valves.
24 BY MR. HAMILTON:
25 Q. And so in this project that we were just

21

1 discussing, you went to a vendor and said, These are our
2 requirements for the hemostasis valve. And that's what
3 you mean by spec'd out; is that right?
4 A. For the valves that we specced out that were
5 readily available from vendors, yes, we gave them the
6 design requirements, we made sure that they functioned
7 as they were supposed to.
8 Q. And -- and how do you figure out what the design
9 requirements were in that project?
10 A. We needed to -- sorry. We required a certain
11 diameter of device to fit within the valve.
12 Q. Uh-huh.
13 A. Can you repeat the question?
14 Q. How did you -- how did you determine what the
15 design requirements were for the hemostasis valve in
16 that project?
17 A. How did we determine it?
18 Q. Yes.
19 A. We're engineers trying to solve the problem.
20 Q. So did you have to figure out what the procedure
21 was?
22 A. We were developing a procedure.
23 Q. Uh-huh.
24 A. We knew the requirements for the size of
25 catheter would need to go through with the valve.

22

1 Q. So different procedures would require different
2 hemostasis valves; is that right?
3 MR. STOWELL: Objection. Misstates
4 testimony.
5 THE WITNESS: For the projects I'm
6 discussing, these were different size catheters,
7 different sized valves. They had different
8 requirements.
9 BY MR. HAMILTON:
10 Q. So as an engineer trying to figure out what
11 hemostasis valve to use with a particular procedure, you
12 would need to know what the procedure is first, wouldn't
13 you?
14 MR. STOWELL: Objection. Form.
15 THE WITNESS: We did know the procedure
16 we were developing; yes.
17 BY MR. HAMILTON:
18 Q. And you would choose a hemostasis valve that was
19 particularly suited for that procedure; is that right?
20 A. We would choose the hemostasis valve based on
21 the needs of what had to go through it, what the size
22 was, what the frictional requirements might be.
23 Q. Are those design requirements you just listed --
24 so what went through it, the frictional requirements,
25 are those -- is that what you mean by design

23

1 requirements?
2 A. Those are some examples of design requirements.
3 Q. What other design requirements are there for a
4 hemostasis valve?
5 A. We had requirements for the ability to seal
6 around whatever device is going through it, at given
7 pressures or vacuums.
8 Q. Anything else?
9 A. Those are the ones I can think of at this
10 moment.
11 Q. Okay. So I've heard four: The diameter, what
12 goes through the valve, the friction requirements, and
13 the ability to seal at a pressure or a vacuum. Other
14 than those four, as you sit here today, can you think of
15 any other design requirements in selecting a hemostasis
16 valve for a particular procedure?
17 A. We also had to consider what it was attaching
18 to, so the attachment component; if we were buying an
19 off-the-shelf component, how it would attach to our
20 catheter, let's say.
21 Q. Any others?
22 A. Those are the ones I can think of offhand at
23 this moment.
24 Q. And all these design requirements are driven by
25 the particular procedure; is that right?

24

1 MR. STOWELL: Objection. Form.
2 THE WITNESS: It was driven by the needs
3 of the procedure.
4 BY MR. HAMILTON:
5 Q. So then is it fair to say, in selecting a
6 hemostasis valve for use with a procedure, to determine
7 the design requirements for the hemostasis valve, you
8 would need to understand the needs of the procedure?
9 MR. STOWELL: Objection. Form.
10 THE WITNESS: I think, as engineers, we
11 always design to the needs of the physician, the
12 procedure, the environment, the sterilization plan,
13 which was another design requirement I just thought
14 of.
15 BY MR. HAMILTON:
16 Q. And all those requirements relate to the needs
17 from the procedure; is that right?
18 MR. STOWELL: Objection. Form.
19 THE WITNESS: Needs from the physician,
20 the needs of the procedure, the needs of the
21 patient.
22 BY MR. HAMILTON:
23 Q. And do different procedures have different needs
24 or requirements?
25 MR. STOWELL: Objection. Form.

25

1 THE WITNESS: Of course.
2 BY MR. HAMILTON:
3 Q. And is it fair to say that --
4 **A. Excuse me. My phone was ringing. I forgot to**
5 **turn it off.**
6 Q. Is it fair to say, then, that different designs
7 of hemostasis valves will satisfy different design
8 requirements depending on the procedure?
9 MR. STOWELL: Objection to form.
10 THE WITNESS: We certainly had different
11 hemostasis valves for the different catheters
12 because they had different needs and requirements.
13 BY MR. HAMILTON:
14 Q. So one hemostasis valve design isn't going to
15 satisfy every need and every medical procedure; is that
16 right?
17 **A. Certainly for the examples I'm familiar with,**
18 **that is -- different -- different hemostasis valves were**
19 **important to have for the different aspects of the**
20 **system.**
21 Q. Why is -- why is diameter an important design
22 requirement?
23 MR. STOWELL: Objection. Form.
24 THE WITNESS: For some hemostasis valves,
25 only a guide wire needed to go through. For some

26

1 hemostasis valves, a 20 French catheter needed to
2 go through. So diameter would be pretty important.
3 BY MR. HAMILTON:
4 Q. You said "20 French catheter." Is that a large
5 catheter?
6 MR. STOWELL: Objection. Vague.
7 BY MR. HAMILTON:
8 Q. A large-diameter catheter? Let me clarify.
9 MR. STOWELL: Same objection.
10 THE WITNESS: It depends on the
11 procedure. There are larger catheters used in
12 medical procedures that I'm familiar with, and
13 smaller catheters used.
14 BY MR. HAMILTON:
15 Q. So the size of the catheter generally depends on
16 the specific procedure; is that right?
17 **A. It depends on the procedure and depends on the**
18 **vessel you're going through.**
19 Q. If the size of the catheter was, let's say,
20 relatively small compared to the vas- -- vasculature,
21 would the diameter of the hemostasis valve -- would a
22 design requirement be to have the diameter of the
23 hemostasis valve as close to that small size as
24 possible?
25 MR. STOWELL: Objection. Vague.

27

1 THE WITNESS: I'm not sure.
2 BY MR. HAMILTON:
3 Q. If you were just going to put a guide wire in,
4 would you choose a hemostasis valve that was 24 French,
5 for example?
6 MR. STOWELL: Objection. Vague.
7 THE WITNESS: For example, the catheters
8 I worked on, when a guide wire was going through,
9 it was a relatively small hemostasis valve designed
10 to fit the guide wire.
11 BY MR. HAMILTON:
12 Q. And why would you choose a relatively small
13 hemostasis valve designed to fit the guide wire, as
14 opposed to a bigger valve, in that instance?
15 **A. It just makes sense from an engineering**
16 **standpoint.**
17 Q. And what do you mean by "makes sense from an
18 engineering standpoint"? What about it makes sense?
19 **A. It wouldn't make sense to have a huge valve if**
20 **you were only trying to seal against a small-diameter**
21 **guide wire. So --**
22 Q. Why not -- oh, you had more to say. Sorry.
23 **A. Hemostasis valves to go around guide wires are**
24 **very readily available off the shelf, so it wouldn't**
25 **have made sense to design your own extra large valve,**

28

1 **which were less available at the time of my -- these**
2 **projects I'm talking about.**
3 Q. So other than availability, is that the only
4 reason you choose a smaller hemostasis valve if you're
5 just inserting a guide wire?
6 **A. Just makes sense from an engineering standpoint.**
7 Q. What about blood loss? Wouldn't you have more
8 risk of blood loss if you chose a larger-diameter
9 hemostasis valve?
10 MR. STOWELL: Objection. Form.
11 BY MR. HAMILTON:
12 Q. One that was much larger than the needs of
13 what's being inserted?
14 MR. STOWELL: Same objection.
15 THE WITNESS: Even if it were designed to
16 be much larger, the doctor wouldn't open it up much
17 larger than the guide wire, so I'm not sure it
18 would make much difference for blood loss.
19 BY MR. HAMILTON:
20 Q. So is it your testimony that a person of skill
21 in the art, in choosing a hemostasis valve for a
22 procedure that's just inserting a catheter, could choose
23 a 24 French hemostasis valve or a much smaller
24 hemostasis valve and it doesn't make much difference?
25 Is that your testimony?

29

1 **A. Can you repeat the question?**
2 Q. Is it your testimony that a person of skill in
3 the art choosing a hemostasis valve for a procedure that
4 includes just inserting a catheter would choose a 24
5 French hemostasis valve or a much smaller hemostasis
6 valve and it doesn't make much difference for blood
7 loss?
8 **A. I haven't really considered that.**
9 Q. Why would someone choosing a hemostasis valve
10 for insertion of just a catheter choose a 24 French
11 hemostasis valve?
12 MR. STOWELL: Objection. Vague.
13 THE WITNESS: Just a catheter? What size
14 catheter are you talking about?
15 BY MR. HAMILTON:
16 Q. Excuse me. The guide wire. Pardon me.
17 **A. Can you repeat the question, then?**
18 Q. Why would someone selecting a hemostasis valve
19 for insertion of just a guide wire select a 24 French
20 hemostasis valve? Why would that not make much
21 difference?
22 **A. I don't believe a typical engineer would select**
23 **a large hemostasis valve if you were trying to seal just**
24 **against the guide wire.**
25 Q. So it would make a difference, then; is that

30

1 right?
2 MR. STOWELL: Objection. Misstates
3 testimony.
4 THE WITNESS: I just don't think it would
5 make sense to design a huge hemostasis valve if you
6 were only trying to seal against a guide wire.
7 BY MR. HAMILTON:
8 Q. Let's -- let's just be clear. When you say
9 "huge hemostasis valve," what do you mean by huge?
10 **A. I believe you said 24 French. That's on the**
11 **large side.**
12 Q. 20 French on the large side?
13 **A. Difficult to say. There are a range of**
14 **catheters out there now from very tiny to 35 French for**
15 **some procedures.**
16 Q. Compared to insertion of a guide wire, is 20
17 French huge?
18 MR. STOWELL: Objection. Vague.
19 THE WITNESS: I would characterize that
20 as being larger than necessary to seal against a
21 guide wire.
22 BY MR. HAMILTON:
23 Q. And would one of the reasons you wouldn't select
24 a hemostasis valve that is larger than necessary -- the
25 risk of more blood loss with a regular hemostasis valve,

31

1 was that a consideration?
2 **A. I've never really considered that as a**
3 **consideration for the valves that I've worked on.**
4 Q. So the amount of blood loss based on the size of
5 the valve is not a design consideration for anything
6 that you've worked on; is that right?
7 **A. For the devices I've worked on, it was -- always**
8 **made the most sense to design a valve that was the right**
9 **size for the device going through it, and that's what we**
10 **did.**
11 Q. So it made sense to match the size of the
12 hemostasis valve to the device going through it in every
13 project you've worked on; is that right?
14 **A. In all the valves that I worked on, the size of**
15 **the valve was closely matched to the size of the**
16 **catheter or guide wire going through it, yes.**
17 Q. And would a POSITA designing a -- and when I say
18 "POSITA," a person of ordinary skill in the art, as
19 you've used the term in your declaration -- match the
20 size of the hemostasis valve to the device going through
21 it, just like you did in every project you've worked on?
22 MR. STOWELL: Objection. Vague.
23 Misstates testimony.
24 THE WITNESS: Certainly I and the
25 engineers I worked with, that was how we typically

32

1 designed the hemostasis valves, for the size of the
2 device going through it.
3 BY MR. HAMILTON:
4 Q. And what about for a person of ordinary skill in
5 the art?
6 **A. I and those engineers would have been people of**
7 **ordinary skill in the art.**
8 Q. So a person of ordinary skill in the art would
9 match the size of the hemostasis valve to the device
10 going through it --
11 MR. STOWELL: Objection. Misstates the
12 testimony.
13 BY MR. HAMILTON:
14 Q. -- when designing a hemostasis valve for a
15 particular application; is that correct?
16 MR. STOWELL: Objection. Misstates the
17 testimony.
18 THE WITNESS: I would say that's what we
19 did; we matched the size of the valve closely to
20 the device going through it.
21 BY MR. HAMILTON:
22 Q. Do you have an opinion on what a person of
23 ordinary skill in the art would do in that circumstance?
24 **A. I think they would do the same thing.**
25 Q. Let's turn to page 81 of your declaration,

33

1 Exhibit 1003.
2 **A. (Complying.)**
3 Q. Actually, before we do that, let's just clarify
4 something. Paragraph 35 of your declaration, if you
5 could turn to that. It's on page 12.
6 **A. (Complying.)**
7 Q. Page 12, paragraph 35.
8 **A. Oh, I'm sorry.**
9 Q. No problem. I'll try to be consistent when I
10 say it.
11 Does paragraph 35 set forth the definition of a
12 person of ordinary skill in the art as you've applied it
13 in your declaration?
14 **A. Yes.**
15 Q. Is that your complete definition of a person of
16 ordinary skill in the art?
17 **A. Yes.**
18 Q. Is anything missing from that definition in
19 paragraph 35 that you'd like to include?
20 **A. No.**
21 Q. Okay. So when I say "a person of ordinary skill
22 in the art" or "POSITA," your understanding is that it's
23 this definition in paragraph 35; is that fair? Do we
24 have that understanding?
25 **A. Yeah, this is my definition of POSITA for**

34

1 **this -- related to the '011 Patent.**
2 Q. And you've applied that definition in rendering
3 all your opinions in your declaration; is that right?
4 **A. Yes.**
5 Q. I want to clarify one other thing. So is there
6 a particular time period for the POSITA that you applied
7 in your declaration? A POSITA as of a particular date?
8 **A. Yes. September 6th, 2017.**
9 Q. And how did you choose that date?
10 **A. This is the relevant priority date from the '011**
11 **Patent.**
12 Q. So the perspective of a POSITA as you've applied
13 it in your declaration is someone who has the
14 qualifications in paragraph 35 -- and nothing more,
15 nothing less -- as of the date you just specified; is
16 that right?
17 MR. STOWELL: Objection. Form.
18 THE WITNESS: As of the date 2017, yes.
19 BY MR. HAMILTON:
20 Q. Is that your complete answer?
21 **A. The two to four years of product design or**
22 **engineering experience, I suppose one could have more**
23 **than that number of years of product design or**
24 **engineering experience.**
25 Q. So someone with more product design and

35

1 engineering experience would still be a person of skill
2 in the art, under your definition?
3 **A. I believe so.**
4 Q. So in applying your definition of a person of
5 ordinary skill in the art, what's set forth in paragraph
6 35 says two to four years, but actually the definition
7 that you applied is someone that could have more
8 experience than two to four years; is that right?
9 MR. STOWELL: Objection. Misstates
10 testimony.
11 THE WITNESS: Certainly I think if
12 someone had more than four years, they would be a
13 person of skill in the art also.
14 BY MR. HAMILTON:
15 Q. They would have more experience than a person of
16 ordinary skill in the art, wouldn't they?
17 **A. They would have at least this requirement, yes.**
18 Q. What if they have 30 years of experience; would
19 they be a person of ordinary skill in the art?
20 **A. If they had the other requirements, yes.**
21 Q. So the definition of a person of ordinary skill
22 in the art that you applied in rendering your opinions
23 is someone that could have anywhere from two to
24 four years of experience, up to an unlimited amount of
25 experience in the field; is that right?

36

1 MR. STOWELL: Objection. Misstates
2 testimony.
3 THE WITNESS: I think two to four years
4 would be an appropriate range, but if someone had
5 more experience, that could also be a person of
6 ordinary skill.
7 BY MR. HAMILTON:
8 Q. And you've applied that definition in rendering
9 your opinions in this declaration; is that right?
10 **A. I've applied the two to four years in rendering**
11 **the opinion.**
12 Q. Are you a person of ordinary skill in the art?
13 **A. I believe I do meet the definition of this with**
14 **more than two to four years of experience.**
15 Q. So your opinions in this matter, for example,
16 are -- are -- when you say a person of ordinary skill in
17 the art would think this or do this, you mean someone
18 just like you?
19 MR. STOWELL: Objection. Misstates
20 testimony.
21 THE WITNESS: No. I mean someone just
22 like I wrote in paragraph 35, with two to
23 four years of product design or engineering
24 experience.
25 BY MR. HAMILTON:

37

1 Q. Okay. Let's go to -- what did I say, paragraph
2 81?
3 **A. (Complying.)**
4 **Okay.**
5 Q. Do you understand what is shown in the image in
6 paragraph 81?
7 **A. Let me read the section.**
8 **Okay. Can you repeat the question?**
9 Q. Sure.
10 Do you understand what is shown in the image in
11 paragraph 81?
12 **A. Yes.**
13 Q. What's depicted in the image in paragraph 81?
14 **A. U-shaped -- U-shaped actuating members in**
15 **orange; the interventional tool shown in the center in**
16 **red; and the -- and the cylindrical diaphragm in green.**
17 **It's labeled as "lumen," which is really the interior of**
18 **the cylindrical diaphragm.**
19 Q. And those components you just referenced, are
20 those components from an embodiment in the Shafer
21 publication?
22 **A. This section is talking about Shaffer's U-shaped**
23 **members, yes.**
24 Q. So is this a depiction of what you believe
25 happens when Shaffer's U-shaped members are used --

38

1 MR. STOWELL: Objection.
2 BY MR. HAMILTON:
3 Q. -- in a hemostasis valve?
4 MR. STOWELL: Objection. Form.
5 MR. HAMILTON: Withdraw the question.
6 BY MR. HAMILTON:
7 Q. So does this figure show what you believe
8 happens in the hemostasis valve disclosed in Shafer?
9 **A. Not necessarily. I think Shafer would seal very**
10 **well most of the time. It's possible, if it didn't seal**
11 **well, that gaps could form as shown in the -- in the**
12 **image on page 56, Section 81.**
13 Q. Why would Shafer seal very well most of the
14 time?
15 **A. Because it's designed to seal as a hemostasis**
16 **valve.**
17 Q. And it would accomplish that goal, right?
18 MR. STOWELL: Objection. Vague.
19 THE WITNESS: The patent states that it
20 does seal against when tools are inside or with no
21 tool inside.
22 BY MR. HAMILTON:
23 Q. And do you have any reason to doubt that
24 statement in Shafer?
25 **A. I do believe it seals well, given the design**

39

1 **that's shown in the patent.**
2 Q. When you say you do believe it seals well, you
3 mean you do believe it doesn't form these gaps as shown
4 in the image on page 81?
5 MR. STOWELL: Objection. Misstates
6 testimony.
7 THE WITNESS: I think it depends on the
8 materials of the lumen, the materials of the
9 actuators, the size of the tool going through. The
10 other aspects, like the spring force, would all
11 vary and may seal very well if it's designed
12 appropriately.
13 BY MR. HAMILTON:
14 Q. So if you take the design of Shafer, including
15 all those things you mentioned, like the materials of
16 the lumen, the materials of the actuators, the size of
17 the tool, et cetera, as disclosed in Shafer, these gaps
18 would not form; is that right?
19 MR. STOWELL: Objection. Vague,
20 misstates testimony.
21 THE WITNESS: It's unclear if they would
22 or would not form, because many of those details
23 are not provided in Shafer.
24 BY MR. HAMILTON:
25 Q. So what you say here in paragraph 81 is, "A

40

1 person of ordinary skill in the art would have
2 recognized that if a tool did not fit the size of
3 Shafer's U-shaped members, small gaps could form between
4 the tool and the valve's lumen."
5 Is that a true statement?
6 **A. I'd like to see a copy of Shafer.**
7 Q. What do you need to see in Shafer?
8 **A. The components, the materials, the additional**
9 **information.**
10 Q. And that's not mentioned in your figure there?
11 **A. This is a simple graphic.**
12 Q. So I'm going to hand you what's been previously
13 marked as Exhibit 1005.
14 (Tendered.)
15 Is 1005 the Shafer we were just referring to and
16 that's referred to in paragraph 81?
17 **A. Yes.**
18 Q. So when I refer to Shafer, is it fair that we
19 both understand I'm referring to Exhibit 1005?
20 **A. I believe there's another Shafer in my table of**
21 **exhibits which has better images, Exhibit 1009.**
22 Q. So you want to include Exhibit 1009 and, when we
23 refer to Shafer, includes both those exhibits? Is that
24 -- is that what you're saying?
25 **A. I'd like to see 1009.**

41

1 Q. Is it -- is it 1009? Are you sure that's what
2 it is?
3 Does this look like it? Is this what you're
4 referencing, or are you referencing something else?
5 **A. Sorry. 1008, the drawings submitted during**
6 **prosecution.**
7 Q. All right. I'll just give you that,
8 Exhibit 1008, previously marked.
9 **A. Yes.**
10 Q. Sorry, I don't have an extra copy of that, I
11 don't believe.
12 So when you refer to Shafer, you're referring to
13 both these exhibits, is that right, in your declaration?
14 **A. Yes.**
15 Q. And you used Exhibit 1008 to understand the
16 disclosure of Exhibit 1005; is that right?
17 **A. Yes. They were better images of the -- of**
18 **certain figures, specifically Figures 30 through 34,**
19 **that had used from 1008.**
20 Q. When you say "better images," you can see
21 features in the images in 1008 that you can't see in
22 1005; is that right?
23 MR. STOWELL: Objection. Vague.
24 THE WITNESS: The images seem to be
25 almost photographs and were unclear for certain

42

1 features in 1005.
2 BY MR. HAMILTON:
3 Q. And for those features that were unclear, you
4 looked at Exhibit 1008; is that right?
5 **A. Yes.**
6 Q. So when you refer to Shafer in your declaration,
7 you're referring to Exhibit 1005 and Exhibit 1008; is
8 that right?
9 **A. Yes.**
10 Q. Okay. So with that, let's go back to the
11 question. And you said you wanted to understand and see
12 a copy of Shafer to answer the question, so I'm just
13 going to read back the question to you.
14 **A. Okay.**
15 Q. So when you say here in paragraph 81, "A person
16 of ordinary skill in the art would have recognized that
17 if a tool did not fit the size of Shafer's U-shaped
18 members, small gaps could form between the tool and the
19 valve's lumen," is that a true statement?
20 **A. Which sentence are you reading?**
21 Q. It's the last sentence prior to the image in
22 paragraph 81.
23 **A. The first sentence says, "Second, a person of**
24 **ordinary skill in the art would have recognized that**
25 **Hartley's flexible string may better seal the valve than**

43

1 **Shafer's metallic/plastic U-shaped actuating members,"**
2 **and continued on with the sentence you read: "A person**
3 **of ordinary skill in the art would have recognized that**
4 **if a tool did not fit the size of the Shafer's U-shaped**
5 **member, that small gaps could form between the tool and**
6 **the valve's lumen, as illustrated below."**
7 Q. So let me just jump back. Earlier you had said
8 Shafer has -- Shafer does seal well in some embodiments;
9 is that right?
10 MR. STOWELL: Objection. Misstates
11 testimony.
12 THE WITNESS: Shafer shows in Figure 32
13 that it seals well with no tool inside.
14 BY MR. HAMILTON:
15 Q. So with no tool, Shafer doesn't have the gap
16 problem; is that right?
17 **A. Shafer also discusses sealing well with tools**
18 **inside.**
19 Q. So Shafer -- this embodiment of Shafer -- and
20 let's just be clear, the embodiment we're talking about
21 is the embodiment that's shown in Figures 30 through
22 34 -- seals well when there's nothing inside the lumen
23 and when there's tools inside the lumen; is that right?
24 MR. STOWELL: Objection. Misstates
25 testimony.

44

1 THE WITNESS: Let me look at Shafer to
2 see how they describe sealing.
3 Well, I'll just point to the abstract on
4 page 1 that says "a valve for blocking the flow of
5 gas or fluid, with or without an instrument in
6 place, within the gas fluid path. The valve
7 includes the seal module having a proximal end,
8 distal end and a lumen side to allow passage of
9 fluids or gases."
10 BY MR. HAMILTON:
11 Q. So when this says a valve -- what you just read
12 in the abstract, "a valve for blocking the flow of gas"
13 -- "gas or fluid, with or without an instrument in
14 place, within the gas fluid path," that's referring to
15 an instance where gap -- gaps are not formed as shown in
16 81; is that -- is that right? Am I understanding that
17 correctly?
18 MR. STOWELL: Objection. Vague.
19 THE WITNESS: It's certainly designed to
20 block the flow of gas or fluid with or without an
21 instrument in place.
22 BY MR. HAMILTON:
23 Q. So the gaps that you show in paragraph 81,
24 that's not what -- that -- that's -- is not happening
25 when -- with -- for a valve that blocks the flow of gas

45

1 or fluid with or without an instrument in place within
2 the gas fluid path; is that correct?
3 MR. STOWELL: Objection. Form.
4 THE WITNESS: It's designed to seal with
5 or without a tool in place.
6 BY MR. HAMILTON:
7 Q. So when it -- when it seals with or without a
8 tool in place, these gaps that you show in 81 are not
9 formed; is that right?
10 And let me just finish. And then if it doesn't
11 seal well, that's because these gaps are formed; is that
12 correct?
13 MR. STOWELL: Objection. Form.
14 THE WITNESS: That's what I'm describing
15 here, that if it weren't sealing well, then there
16 may be gaps formed.
17 BY MR. HAMILTON:
18 Q. Okay. So Shafer discloses a valve that seals
19 well so no gaps are formed, with or without a tool; is
20 that correct?
21 MR. STOWELL: Objection. Misstates
22 testimony.
23 THE WITNESS: Certainly Shafer's designed
24 to block the flow of gas or fluid with or without
25 an instrument.

46

1 BY MR. HAMILTON:
2 Q. And does Shafer accomplish that design goal?
3 **A. I believe it could accomplish that goal with**
4 **appropriate materials and design features.**
5 Q. Well, what about the materials and design
6 features shown with respect to Figures 30 through 34;
7 would that accomplish that goal?
8 **A. I believe it would.**
9 Q. So let's just make sure our -- our -- we're
10 using the same language. So for a complete seal or
11 seals well, that would mean there's no gaps when I say
12 that. And then if -- if it doesn't seal well or if it's
13 not a complete seal -- seal, then there are gaps as
14 shown in 81. Is -- is that a fair characterization of
15 those terms?
16 MR. STOWELL: Objection to form.
17 THE WITNESS: I think that's fair.
18 BY MR. HAMILTON:
19 Q. Okay. You -- a moment ago you pointed to Figure
20 32 of Exhibit 1008. Can you take a look at that?
21 **A. Yes.**
22 Q. And -- and does that show a complete seal,
23 meaning no gaps, when nothing is inserted in the -- in
24 the lumen?
25 **A. Yes. There's no instrument inserted or tool**

47

1 **inserted in the lumen in this figure.**
2 Q. And when no tool is inserted, there are no gaps
3 in the lumen; is that correct?
4 **A. That's what figure 32 is showing.**
5 Q. And so for Figure 32, when you have this image
6 of gaps in figure 81, there's -- that wouldn't occur,
7 right? There's no tool, there's no gaps, you have a
8 complete seal in Figure 32; is that right?
9 MR. STOWELL: Objection. Vague.
10 THE WITNESS: Figure 32 is showing a
11 sealed lumen with no tool in place.
12 BY MR. HAMILTON:
13 Q. And when you say "a sealed lumen," that means
14 the lumen is completely closed? Is that what you mean?
15 **A. It means no air or fluid could pass, so they're**
16 **in contact with each other.**
17 Q. And is another way to -- to phrase that
18 "completely closed"?
19 MR. STOWELL: Objection. Vague.
20 THE WITNESS: A portion of it is
21 completely closed, where it's touching each other.
22 BY MR. HAMILTON:
23 Q. Okay. Now, let's -- let's focus on 81 and the
24 figure in 81 and the gaps. And what I want to
25 understand is, in what instance would gaps be formed in

48

1 this embodiment of Shafer, Figures 30 through 34?
2 **A. In the instance that if -- if the tool did not**
3 **fit the size of the U-shaped members and small gaps**
4 **formed, then small gaps could form.**
5 Q. And what do you mean by "not fit the size"?
6 **A. If certain tools were of a different shape or**
7 **size that wasn't compatible with the design of the --**
8 **design and materials of the actuated members, the**
9 **compression -- the tube, the springs, then small gaps**
10 **could form between the tool and the valve lumen.**
11 Q. So I'm looking at the tool that you have
12 depicted in paragraph 81. It looks like a circle to me,
13 and it looks pretty dang close to the circle that's
14 formed by the two actuating members, but that's not --
15 that doesn't fit the size of the U-shaped members. Is
16 that -- is that -- is that right?
17 **A. I'm just saying that it may not work in all**
18 **cases, depending on the materials chosen and the size**
19 **and diameter -- size and shape of the tool. And in that**
20 **case, a person of ordinary skill in the art would have**
21 **recognized that a flexible string may seal better around**
22 **the valve.**
23 Q. Okay. So let's talk about the U-shaped members
24 that are shown in 81. And to form these gaps, would
25 those U-shaped members have to be rigid?

49

1 **A. I don't know what level of rigidity you're**
2 **suggesting.**
3 Q. More rigid than a string; how about that?
4 **A. Not necessarily.**
5 Q. So if the U-shaped members were strings, you
6 would still get these gaps; is that right?
7 **A. I believe a string may seal better depending on**
8 **the characteristics of the string, depending on the**
9 **characteristics of the U-shaped members, depending on**
10 **the other material choices and dimensions for these**
11 **different components.**
12 Q. So in this paragraph you talk about replacing
13 the U-shaped members with strings, and I'm trying to
14 figure out why these U-shaped members don't seal and
15 form the gaps and why a string would. Can you explain
16 why that would be?
17 **A. It could occur depending if -- depending on the**
18 **size and shape and material properties of the U-shaped**
19 **members and depending on the tool inserted.**
20 Q. Size, shape and material properties of the
21 U-shaped members; what do you mean by that?
22 **A. Exactly what I said.**
23 Q. So let's take material properties. What do you
24 -- what did you mean by the material properties? What
25 properties?

50

1 **A. The relative flexibility of the U-shaped**
2 **members.**
3 Q. And if the relative flexibility was too rigid
4 such that the gaps would form -- I'll withdraw that
5 question.
6 Relative flexibility to what?
7 **A. To something more flexible or less flexible.**
8 Q. What about to the -- to the lumen? Would that
9 be a good way to think of the relative flexibility?
10 MR. STOWELL: Objection. Vague.
11 THE WITNESS: I'm not sure.
12 BY MR. HAMILTON:
13 Q. If the U-shaped members were less flexible than
14 the material that made up the lumen, these gaps would
15 form, wouldn't they?
16 **A. Haven't really considered it relative to the**
17 **lumen material.**
18 Q. So what did you consider it relative to?
19 MR. STOWELL: Objection. Vague.
20 THE WITNESS: I just considered there
21 could be cases where if it were not designed
22 appropriately, perfectly for every indication, for
23 every type of tool to go through, for instance,
24 that adjustments to the flexibility of the actuated
25 members could -- could be beneficial.

51

1 BY MR. HAMILTON:
2 Q. So you said "not designed appropriately,
3 perfectly for every indication, for every type of tool
4 to go through." Does that mean if it's -- if a tool is
5 inserted that it wasn't designed for? Is that what you
6 mean by that?
7 **A. Can you repeat the question?**
8 Q. I'm trying to understand what you meant by "not
9 designed appropriately, perfectly for every indication,
10 for every type of tool." What did you mean by that?
11 **A. Just what I said.**
12 Q. The U-shaped actuating members were not designed
13 for the tool that is being inserted through the lumen;
14 is that what that means?
15 **A. If it weren't working appropriately for a range**
16 **of tools that the -- were necessary for the procedure,**
17 **then some adjustments might have to be made to the**
18 **actuating members or the lumen material or the spring**
19 **force, maybe other parameters also.**
20 Q. And if an engineer knew the procedure, they
21 could design a hemostasis valve with actuating members
22 so that the gaps wouldn't form; isn't that correct?
23 MR. STOWELL: Objection. Form.
24 THE WITNESS: It would certainly be the
25 goal to create a valve that sealed around a variety

52

1 of tools used for that procedure.
2 BY MR. HAMILTON:
3 Q. And one of skill in the art could do that with
4 the valve that's disclosed in Shafer such that gaps are
5 not formed; is that correct?
6 MR. STOWELL: Objection. Form.
7 THE WITNESS: I believe they could.
8 BY MR. HAMILTON:
9 Q. And that would be by matching the U-shaped
10 members to fit the size of the tool? Is that how they
11 would do that?
12 **A. I think they would adjust whatever needed to be**
13 **adjusting to seal well against a tool or the tools being**
14 **used in the procedure and when no tool was present.**
15 Q. And if you're designing a hemostasis valve for a
16 procedure, do you know what tools are going to be used?
17 **A. Not necessarily all the time.**
18 Q. I'll withdraw the question.
19 If you know which tools are going to be used,
20 can you design Shafer's actuating members such that gaps
21 are not formed?
22 **A. I would think a person of ordinary skill in the**
23 **art could do so.**
24 Q. So what's the difference between Shafer's
25 U-shaped members and Hartley's string in terms of

53

1 flexibility?
2 MR. STOWELL: Objection. Vague.
3 THE WITNESS: It's not clear in the
4 patent or the patents considered what material
5 properties were -- would be of a string or the --
6 necessarily the U-shaped members. So they could be
7 very similar or they could be somewhat different.
8 MR. STOWELL: Joe, we have been going for
9 about an hour and a half, so when you reach a good
10 breaking time, let's take a break.
11 MR. HAMILTON: Okay.
12 BY MR. HAMILTON:
13 Q. So taking this image in -- in paragraph 81, if
14 Hartley's strings -- string was used in place of each of
15 Shafer's U-shaped members, so you've got two springs --
16 strings --
17 **A. Sorry, I think I went to the wrong page. You**
18 **said --**
19 Q. Paragraph 81, same paragraph that we've been
20 talking about.
21 **A. Yeah, I -- I switched pages. There we go.**
22 Q. So if you replaced each of Shafer's U-shaped
23 members with a string like the string in Hartley, would
24 these gaps form?
25 MR. STOWELL: Objection. Outside the

54

1 scope.
2 THE WITNESS: Well, as I say here,
3 "Hartley's flexible string may better conform to
4 the varying diameters than Shafer's U-shaped
5 members."
6 BY MR. HAMILTON:
7 Q. So if you replaced Shafer's -- each of the
8 Shafer's U-shaped members with a string, so a U-shaped
9 string, would these gaps form?
10 MR. STOWELL: Objection. Asked and
11 answered.
12 THE WITNESS: As I say below in paragraph
13 81, "Hartley's string encircles and, depending on
14 the materials, may conform to the size and shape of
15 a wider range of tools used with the valve."
16 BY MR. HAMILTON:
17 Q. So does that -- does that mean the gaps would
18 not form if you replaced Shafer's U-shaped members, each
19 of those, with a string from Hartley?
20 MR. STOWELL: Objection. Asked and
21 answered.
22 THE WITNESS: Or with a single string
23 that loops around, as disclosed later, on page 59.
24 BY MR. HAMILTON:
25 Q. You said "or with a single string." So let's

55

1 talk about those two instances. One is a single string
2 that loops around, and one is where each U-shaped member
3 is replaced by a separate string. In both those
4 instances, would the -- these gaps form?
5 MR. STOWELL: Objection. Outside the
6 scope.
7 BY MR. HAMILTON:
8 Q. Or in neither of those instances?
9 **A. Well, I really haven't considered two strings of**
10 **Hartley's. I really considered a single string, as**
11 **Hartley discloses in their -- in their patent**
12 **application.**
13 Q. Can you answer the question?
14 **A. I haven't really considered that option.**
15 Q. Can you consider it?
16 MR. STOWELL: Objection. Argumentative.
17 Asked and answered.
18 THE WITNESS: It's not something I
19 considered when putting this together.
20 BY MR. HAMILTON:
21 Q. So as you sit here today, if each of Shafer's
22 U-shaped members was replaced by a string, do you know
23 if gaps would be formed or not?
24 **A. I don't know. It would also depend on the**
25 **material properties of the string and the U-shaped**

56

1 **actuating members.**
2 Q. So let's take -- so let's take the instance
3 where a single string is looped around the lumen. In
4 that instance, is it your testimony that gaps would not
5 be formed?
6 **A. Yeah, as I state below the image on page 56,**
7 **"Hartley's string encircled and, depending on the**
8 **materials, may conform to the size and shape of a wider**
9 **range of tools used with the valve."**
10 Q. So if you chose a material that didn't conform,
11 then Hartley's string wouldn't, when it encircles,
12 eliminate the gaps; is that correct?
13 **A. Can you repeat the question?**
14 Q. You're just making a point of saying "depending
15 on the materials." So there could be a string from
16 Hartley that you'll loop around the lumen in this figure
17 and the gaps are still formed; is that your testimony?
18 MR. STOWELL: Objection. Misstates the
19 testimony.
20 THE WITNESS: I think it does depend on
21 the characteristics of the string, the diameter of
22 the string, the stiffness.
23 BY MR. HAMILTON:
24 Q. So just to be clear, is it your testimony that a
25 person of skill in the art could take a string of

57

1 Hartley, loop it around the lumen as shown -- not as
2 shown, but loop it around the lumen -- for example, the
3 lumen in the figure in 81 -- and gaps would still be
4 formed? Is that correct?
5 **A. No. I believe Hartley's string encircling the**
6 **lumen may conform to the size and shape of a wider range**
7 **of tools used with the valve.**
8 Q. And does that depend on what material the string
9 is made of?
10 **A. I'm not sure.**
11 Q. You say right here "depending on the materials."
12 What did you mean by that?
13 **A. There could be poor material choices for a very**
14 **large-diameter metallic cable that may not conform very**
15 **well to this diameter required.**
16 Q. And would a person of skill in the art -- art
17 choose a poor material? Is that something a person of
18 skill in the art would do?
19 **A. Probably not.**
20 Q. Okay. So let's take the material that would --
21 would eliminate the gaps within an encircled lumen,
22 okay? You got that material in your head?
23 **A. Yes.**
24 Q. If you took that material and formed two -- used
25 that material for two strings, one for each of Shafer's

58

1 U-shaped members, would gaps form as shown in the figure
2 in paragraph 81 of your declaration?
3 MR. STOWELL: Objection. Outside the
4 scope.
5 THE WITNESS: Yeah, I don't know. I
6 haven't really considered that option in my
7 declaration.
8 BY MR. HAMILTON:
9 Q. Are you able to consider that option as we sit
10 here today?
11 **A. No. I would need to consider it separately.**
12 Q. So you don't know as you sit here today whether
13 or not gaps would form if each of Shafer's U-shaped
14 members were replaced by a string from Hartley that
15 otherwise would eliminate the gaps if it was completely
16 looped around the lumen; is that correct?
17 **A. I don't know for sure.**
18 Q. And you say you don't know for sure. You mean
19 you don't know, or -- or do you think something would
20 happen?
21 MR. STOWELL: Objection. Asked and
22 answered.
23 THE WITNESS: I don't know. I haven't
24 considered that option.
25 BY MR. HAMILTON:

59

1 Q. So as we sit here today, you don't know if gaps
2 would form in that scenario; is that correct?
3 **A. That's correct.**
4 Q. Is it possible in that scenario that the gaps
5 would be eliminated?
6 **A. I'll speculate that it is possible.**
7 Q. What do you mean by "speculate"?
8 **A. I haven't really considered it or analyzed that**
9 **option.**
10 Q. So you're just guessing?
11 **A. You asked me to -- can you read back how you**
12 **phrased it last time?**
13 Q. Is it possible in that scenario that the gaps
14 would be eliminated?
15 **A. I think it is possible.**
16 Q. And that's based on your experience as an expert
17 in this field; is that right?
18 **A. Yes.**
19 Q. So you're not speculating, you're not just
20 randomly guessing; is that right?
21 MR. STOWELL: Objection. Asked and
22 answered. Misstates testimony.
23 THE WITNESS: My prior answer is fine.
24 BY MR. HAMILTON:
25 Q. So let's take the two scenarios we just talked

60

1 about: Same material for the string, one, it encircles
2 the lumen, the other one you have two U-shaped strings.
3 Okay. Do you have that in your head?
4 **A. Yes.**
5 Q. Your declaration does not have an opinion as to
6 whether or not gaps would form with respect to the two
7 U-shaped strings; is that correct?
8 MR. STOWELL: Objection. Form.
9 THE WITNESS: I did not include that
10 option or consideration in this declaration.
11 BY MR. HAMILTON:
12 Q. And in the modification in your declaration,
13 it's not just replacing Shafer's U-shaped members with
14 strings, it's using a single string to encircle the
15 lumen; is that correct?
16 **A. A single string to encircle the lumen is what I**
17 **discuss and show in the image on page 59.**
18 Q. And that's the modification you're proposing one
19 of skill in the art would do when replacing Shafer's
20 U-shaped members with the string of Hartley; is that
21 right?
22 **A. Yes. I state in Section 80 -- paragraph 80, "A**
23 **person of ordinary skill in the art would have been**
24 **motivated to replace Shafer's U-shaped actuating members**
25 **with Hartley's string/flexible member for several**

61

1 **reasons."**
2 Q. And when you say "Hartley's string," you mean a
3 single string that encircles the lumen; is that right?
4 **A. That's the option that I considered there, yes.**
5 Q. And you didn't consider in your declaration the
6 option of replacing each actuator with a separate
7 string?
8 MR. STOWELL: Objection. Form.
9 BY MR. HAMILTON:
10 Q. Is that correct?
11 MR. STOWELL: Objection. Form.
12 THE WITNESS: I don't believe I included
13 that in the declaration.
14 MR. HAMILTON: Why don't we take a break?
15 THE VIDEOGRAPHER: Please stand by.
16 We are going off the record at 10:43.
17 (Recess.)
18 THE VIDEOGRAPHER: We are back on the
19 record at 10:55.
20 BY MR. HAMILTON:
21 Q. Do you understand you're still under oath?
22 **A. Yes.**
23 Q. Did you discuss your testimony during the break
24 with anybody?
25 **A. No.**

62

1 Q. Did you look at any documents?
2 **A. No.**
3 Q. If you could take a look at Exhibit 1005.
4 That's Shafer.
5 **A. (Complying.)**
6 Q. If you could turn to paragraph 77. And I'm
7 going to ask you about a sentence in the portion of that
8 paragraph that's on the top of the second column on that
9 page. Let me know when you're there.
10 **A. Yeah, I'm looking at it. I haven't read it yet.**
11 Q. All right. So the sentence that begins after
12 the 20 -- 1, 2, 3, 4 -- 5 lines down, if you could just
13 take a moment to read that.
14 **A. (Complying.)**
15 Q. So I see you're looking at Exhibit 1008. Why is
16 that?
17 **A. Because this paragraph starting with 66 --**
18 **starting with paragraph 75 refers to Figures 30 through**
19 **34.**
20 Q. And you need Exhibit 1008 to understand those
21 figures; is that right?
22 MR. STOWELL: Objection. Vague.
23 THE WITNESS: I've read the section you
24 asked me to read now.
25 BY MR. HAMILTON:

63

1 Q. Why did you look at Exhibit 1008?
2 **A. Because many of the references for the different**
3 **components are shown in Figures 31 through 34.**
4 Q. So you're relying on Figures 31 through 34 in
5 Exhibit 1008 to understand this embodiment in these
6 paragraphs that we're going -- about to discuss; is that
7 right?
8 MR. STOWELL: Objection. Vague.
9 THE WITNESS: It may be helpful. I don't
10 know.
11 BY MR. HAMILTON:
12 Q. What does the term "forcibly disengage" mean in
13 the -- in the sixth line down in the paragraph I
14 referenced before, paragraph 77? So six lines -- sixth
15 line down from the top of the second column on page 6.
16 **A. I read that sentence of "such movement allows**
17 **each engaged actuating member 55 to forcibly disengage**
18 **opposing outer walls 27 of the seal module 100, allowing**
19 **the portion 108 of the containment structure 160 to**
20 **retract to an uncollapsed configuration."**
21 **So can you ask the question again?**
22 Q. What does "forcibly disengage" mean in that
23 sentence?
24 **A. It means moving -- forcibly compressing the**
25 **buttons to compress the spring, which allows the**

64

1 **U-shaped actuating members 55 to move in opposite**
2 **directions so that the seal module can expand.**
3 Q. When you say "move in opposite directions," how
4 do those actuating members move in opposite directions?
5 **A. When one presses on the buttons to compress the**
6 **spring, they're moving toward the center, opposite**
7 **direction to each other.**
8 Q. And is that because those actuating members have
9 some level of rigidity?
10 **A. Let me back up. They're moving away from the**
11 **center. I said toward the center. Sorry.**
12 Q. And the actuating members move -- let's just --
13 let's just clarify. So when you say "away from the
14 center," the U-shaped portion of those members or the
15 curved portion moves away from the center; is that
16 right?
17 **A. Yes.**
18 Q. But the arms actually are heading towards the
19 center of each curved portion?
20 **A. Yes. The buttons are being compressed toward**
21 **the center, which allows the U-shaped members to move**
22 **away from the center.**
23 Q. And is that because the non-curved portion of
24 each U-shaped member is of a sufficient rigidity to push
25 the curved portion away from the center?

65

1 MR. STOWELL: Objection. Form.
2 THE WITNESS: It depends on the
3 flexibility of the U-shaped members. It's
4 certainly relieving the tension that those U-shaped
5 members are creating around the seal as you
6 compress the buttons.
7 BY MR. HAMILTON:
8 Q. And it's relieving the tension because the
9 U-shaped members forcibly disengage from the lumen; is
10 that right?
11 **A. The force is being applied to the buttons in**
12 **order to relieve the tension on those actuating members,**
13 **is how I understand the design to work.**
14 Q. So if you look at that sentence, it says -- it
15 says "the actuating members to forcibly disengage." So
16 it's not talking about the force on the buttons --
17 that's -- that is the initiating force -- but it's
18 saying "the actuating members to forcibly disengage."
19 How do the actuating members forcibly disengage?
20 MR. STOWELL: Objection. Form.
21 THE WITNESS: My understanding is you're
22 applying a force to the buttons, and that allows
23 expansion of the resilient member because there's
24 less tension on the actuating members.
25 BY MR. HAMILTON:

66

1 Q. So if I'm understanding you, you -- you read
2 "forcibly disengage" to mean the tension is released on
3 the actuating members. That's what that means to you?
4 **A. What I just said is what I meant.**
5 Q. Does "forcibly disengage" mean release the
6 tension?
7 **A. That's how I understand it for this design.**
8 Q. Okay. So this sentence -- all this sentence
9 means to you is the tension is released on the actuating
10 members when the buttons are depressed; is that right?
11 MR. STOWELL: Objection. Misstates
12 testimony.
13 THE WITNESS: I think you were forcibly
14 releasing -- forcibly actuating the buttons to
15 release the tension on the actuators, allowing the
16 central member to expand.
17 BY MR. HAMILTON:
18 Q. So what happens to the actuators is release of
19 tension; is that right?
20 **A. You're releasing the tension on the seal module**
21 **100.**
22 Q. So your understanding of forcibly disengage
23 means -- that means the force applied to the buttons?
24 **A. That's how I understand it.**
25 Q. And let's go back to the example we talked about

67

1 before with respect to paragraph 81 in that figure. Do
2 you remember that from your declaration?
3 **A. Paragraph 81, yes.**
4 Q. And if you had a string that encircled the lumen
5 that had the -- a material that allowed the lumen to be
6 compressed so no gaps are formed, would that -- a string
7 made of that mate- -- material forcibly disengage as
8 that term is used in Shafer?
9 **A. If it were a single loop as I show in -- on page**
10 **59, by forcibly compressing the buttons, it would**
11 **decrease the tension on that suture or string, allowing**
12 **the central seal member to open up.**
13 Q. And that would be the actuating member forcibly
14 disengaging; is that right?
15 **A. I think that term is appropriate for this design**
16 **also, the design I'm referring to on Shafer, plus**
17 **Hartley's string on page 59.**
18 Q. And when you say the term is appropriate for
19 this design that you just referenced on page 59 -- and
20 that's page 59 of your declaration; is that right?
21 **A. Of my declaration, yes.**
22 Q. That term is appropriate because it means that
23 the tension on the string has been released; is that
24 right?
25 **A. Yes. You're forcibly compressing the buttons,**

68

1 **which releases the tension on the string to allow the**
2 **seal member to expand.**
3 Q. Okay. And when you say "seal member," what do
4 you mean?
5 **A. Seal module 100 as shown in Figure 34.**
6 Q. And that seal module as shown in Figure 34
7 includes third seal member 165; is that right?
8 And I'll just point you to the last sentence of
9 the paragraph we were just referring to in -- in -- on
10 page 26, paragraph 77 of Shafer, if that's helpful.
11 **A. I see 165 in the -- in paragraph 77. I'm**
12 **looking for it on the figures.**
13 **Figure 34 that we were just discussing shows the**
14 **item 27, the outer walls of the seal module. I don't**
15 **see 165 on this Figure 34.**
16 Q. Are you finished with your answer?
17 **A. Yes.**
18 Q. So are you saying that 165 is not found in the
19 embodiment that's shown in Figure 34?
20 **A. Unless I missed it, I don't see it listed there.**
21 Q. Okay. So you don't see 165 labeled on Figure
22 34. That's -- that's -- that's what you're looking at
23 right now; is that right?
24 **A. Correct; I don't see 165 labeled here.**
25 Q. But if you look at the paragraph 77 in the

69

1 document that you just said referred to the embodiments
2 from 30 to 34, it discusses third seal member 65?
3 **A. Yes, at the end of that sentence.**
4 Q. And despite that discussion at the end of the
5 sentence, it's your testimony that Figure 4 [sic] does
6 not include third seal member 165?
7 **A. I don't see it labeled here.**
8 Q. Does the embodiment shown in Figure 34 as it's
9 described in the specification as -- as it's described
10 in Exhibit 1005, Shafer, include seal member 165?
11 MR. STOWELL: Objection. Asked and
12 answered.
13 THE WITNESS: Can you repeat the
14 question?
15 BY MR. HAMILTON:
16 Q. Does the embodiment shown in Figure 4 -- Figure
17 34 -- excuse me -- include seal member 165?
18 **A. I don't see it labeled here.**
19 Q. Okay. So you don't see it labeled. Does the
20 embodiment include 165?
21 **A. I'd have to look into the patent more deeply to**
22 **look at seal -- third seal member 165.**
23 Q. Let's look at paragraph 77, the last sentence.
24 That paragraph is referring to the embodiment in 30
25 through 34, correct?

70

1 **A. Yes, I believe so.**
2 Q. And that paragraph mentions third seal member
3 165, correct?
4 **A. It does.**
5 Q. So does that mean that the embodiment of Figures
6 30 through 34, despite the fact that it's not labeled in
7 the figures itself, includes third seal member 165?
8 MR. STOWELL: Objection. Calls for a
9 legal conclusion.
10 THE WITNESS: Yeah, I don't know. I'd
11 have to look in more detail of what 165 -- how 165
12 is described in other areas of the patent.
13 BY MR. HAMILTON:
14 Q. Well, let's look how it's described right here.
15 That doesn't tell you whether or not 165 is part of the
16 embodiments of 30 through 34?
17 MR. STOWELL: Objection. Asked and
18 answered.
19 THE WITNESS: I'm not sure, since they're
20 not labeled on these figures.
21 BY MR. HAMILTON:
22 Q. So it's your testimony today that because it's
23 not labeled in the figure, you don't know if seal member
24 165 is included in the embodiments 30 through -- of
25 Figures 30 through 34?

71

1 MR. STOWELL: Objection. Misstates
2 testimony.
3 THE WITNESS: I would have to look in
4 more detail for what these -- what this seal member
5 165 is referring to.
6 BY MR. HAMILTON:
7 Q. Do you have an understanding what third seal
8 member 165 is as you sit here today?
9 **A. I would need to look in more detail on the**
10 **patent.**
11 Q. Is that a yes or a no?
12 MR. STOWELL: Objection. Asked and
13 answered.
14 THE WITNESS: I would need to look at
15 more detail in the patent.
16 BY MR. HAMILTON:
17 Q. Okay. Let's look at paragraph 75.
18 **A. Of the declaration?**
19 Q. No, of 1005, Shafer, the document you have in
20 front of you.
21 **A. Which paragraph?**
22 Q. 75.
23 **A. (Complying.)**
24 **Okay.**
25 Q. Do you see that statement "the seal module 100

72

1 is formed of one or more seal members"?
2 **A. Yes.**
3 Q. Does that mean the seal module includes at least
4 one or more seal members?
5 **A. Yes, is formed from one or more seal members.**
6 Q. And that's referring to seal module 100,
7 correct?
8 **A. Yes.**
9 Q. And then if you look at Figure 34, do you see
10 100 listed there?
11 **A. Yes.**
12 Q. Is that identified?
13 **A. Yes.**
14 Q. Okay. So Figure 34 includes a seal module; is
15 that right?
16 **A. Yes.**
17 Q. And that seal module includes one or more seal
18 members; is that right?
19 **A. Yes.**
20 Q. Okay. Now let's go to paragraph 77, that last
21 sentence.
22 **A. (Complying.)**
23 Q. That refers to seal module and third seal member
24 165?
25 **A. Yes.**

73

1 Q. So that paragraph -- excuse me. That sentence
2 indicates that seal module 100, which is labeled in
3 Figure 34, includes seal member 165; is that right?
4 MR. STOWELL: Objection. Form. Asked
5 and answered.
6 THE WITNESS: Paragraph 75 doesn't list
7 165 as being one of the -- as being the third seal
8 member, so I would have to look in more detail
9 elsewhere to confirm 165 as part of seal module
10 100.
11 BY MR. HAMILTON:
12 Q. Whether -- whether 165 is -- is a seal member,
13 is that -- is that your issue with it?
14 **A. It's just not clear from the drawings where 165**
15 **would be located.**
16 Q. And what about from that sentence at the end of
17 paragraph 77; is it clear from that sentence where 165
18 is located?
19 **A. Paragraph 75?**
20 Q. Paragraph 77, the sentence we were just
21 referring to.
22 **A. It doesn't discuss a first seal member or a**
23 **second seal member, so I'm not sure where the third seal**
24 **member is without looking in more detail at the patent**
25 **at this point.**

74

1 Q. And I think you're right, it doesn't discuss a
2 first or second. But it does discuss a third seal
3 member, 165, right?
4 **A. Yes.**
5 Q. And what does that third seal member do in that
6 sentence? What does it say about it?
7 **A. It's able to retract to an unsealed**
8 **configuration.**
9 Q. What does that mean to you?
10 **A. That means that once the tension is released on**
11 **the actuators, on the U-shaped actuators, that the seal**
12 **member is able to retract to an unsealed position.**
13 Q. Does that indicate where the third seal member
14 is in figure 34?
15 **A. I can presume it's related -- it's in the area**
16 **where the U-shaped actuators are located.**
17 Q. Let's take a look at paragraph 59 of that same
18 document, Exhibit 1005.
19 **A. (Complying.)**
20 Q. And you can just take a moment to read that
21 paragraph.
22 **A. (Complying.)**
23 **59?**
24 Q. 59, yes.
25 May I ask you what paragraph you're reading now?

75

1 **A. I'm up to 69.**
2 Q. 69?
3 **A. 59, sorry.**
4 Q. You're on 59?
5 **A. Starting with 59. I had to read the background**
6 **before.**
7 Q. Okay. And let me know when you're finished.
8 **A. Uh-huh. Okay.**
9 Q. Is paragraph 69 describing the third seal member
10 165?
11 **A. And 166 is also in that paragraph.**
12 Q. And what is 166?
13 **A. "The third central seal member 165 includes**
14 **material 166 that is highly elastic, deformable,**
15 **compliant, yet virtually noncompressible material 166**
16 **include modified vinyl, silicone, polyurethane or a**
17 **combination thereof."**
18 Q. So 166 is the material that makes up the -- the
19 seal member 165; is that right?
20 **A. That's how it's described here.**
21 Q. And what does highly elastic, deformable,
22 compliant and yet virtually noncompressible mean?
23 **A. It means very elastic, very deformable,**
24 **compliant. Noncompressible would mean that it's not**
25 **permanently compressed.**

76

1 Q. What's the purpose of seal member 165?
2 MR. STOWELL: Objection. Vague.
3 THE WITNESS: In paragraph 60 it says,
4 "The highly compliant third central seal member 165
5 seals around a variety of profile shapes 192 and
6 diameters 194 of the lumen 193 when one side of
7 compressive force 67 is exerted upon the central
8 region."
9 BY MR. HAMILTON:
10 Q. So does that mean the seal member allows the
11 device of Shafer to seal around vari- -- various shapes
12 and diameters of tools?
13 **A. It says it's to seal around a variety of profile**
14 **shapes and diameters when a force is exerted on it.**
15 Q. So let's keep that -- keep that page in front of
16 you, on that paragraph, and let's go back to your
17 declaration, paragraph 81.
18 **A. (Complying.)**
19 Q. Paragraph 81, page 56.
20 So if what's depicted in the figure in -- in
21 paragraph 81 included seal member 165, these gaps would
22 not be formed; is that correct?
23 MR. STOWELL: Objection. Form.
24 THE WITNESS: I don't know.
25 BY MR. HAMILTON:

77

1 Q. Isn't that the point of seal member 165, to fill
2 in the gaps?
3 **A. That's the goal of this design, is to prevent**
4 **gaps, yes.**
5 Q. Okay. And so if that seal member 165 was
6 included as either part of the lumen or inside the lumen
7 around the tool, these gaps would not be formed; is that
8 correct?
9 MR. STOWELL: Objection. Form.
10 THE WITNESS: I don't know.
11 BY MR. HAMILTON:
12 Q. But that is the point of 165, to eliminate those
13 gaps?
14 **A. The point of the design as a whole is to**
15 **eliminate those gaps.**
16 Q. And the way the design does that is through seal
17 member 165; is that right?
18 MR. STOWELL: Objection. Vague.
19 THE WITNESS: I actually think this
20 paragraph 59 and 165, when we talk about extremely
21 soft, highly elastic materials, is referring to a
22 different design embodiment, though shown, I think,
23 in Figures 12 through 15.
24 BY MR. HAMILTON:
25 Q. Okay. So these paragraphs here are referring

78

1 to -- not referring to embodiments 30 through 34 -- or
2 Figures 30 through 34; is that right?
3 **A. On paragraph 54 they start with references to**
4 **Figure 5 through 22.**
5 Q. Okay.
6 **A. Which are different embodiments from the 30**
7 **through 34 which are represented by the image on page 56**
8 **of my declaration.**
9 Q. Okay. So let's assume 165 is not included in
10 the embodiment 30 through 34. If you included 165 in
11 your image shown in paragraph 81 of your declaration,
12 would that eliminate the gaps?
13 MR. STOWELL: Objection. Outside the
14 scope. Form.
15 THE WITNESS: I don't know. It wasn't
16 the description of the material used for the
17 sealing lumen for the later embodiments.
18 BY MR. HAMILTON:
19 Q. I'm sorry, what did you mean by that?
20 **A. Figures 30 through 34 describe a different seal**
21 **module.**
22 Q. Is that right? So -- so Figures 30 through 34
23 refer to the 165, but you think it's a different seal --
24 seal member 165 a -- different from seal member 165 in
25 paragraph 59 and 60? Is that your testimony?

79

1 **A. Let me look at the Shafer patent a bit more.**
2 Q. So you're not looking at the Shafer patent. I
3 see you're looking at your declaration.
4 MR. STOWELL: Objection. Argumentive.
5 THE WITNESS: To find a reference that
6 would refer me to the Shafer patent.
7 BY MR. HAMILTON:
8 Q. Okay.
9 If you need a little time, why don't we go off
10 the record and --
11 MR. STOWELL: No, no. Let's stay on the
12 record. There is a question pending and the
13 witness has said that he needs to review the
14 materials.
15 MR. HAMILTON: Yeah, I'm -- I'm not going
16 to waste my time as the witness reads through his
17 declaration.
18 BY MR. HAMILTON:
19 Q. Can you answer the question?
20 MR. STOWELL: For the record, the witness
21 has said he needs to review the materials to answer
22 the question, and counsel is not letting him answer
23 the question or review the materials.
24 BY MR. HAMILTON:
25 Q. Do you know what the question is?

80

1 **A. I'm looking for the seal module description**
2 **that's used for the later embodiments 30 through 34.**
3 Q. The seal module description used for the later
4 embodiments 30 through 34 in Shafer; is that right?
5 **A. Yes.**
6 Q. And you're looking at your declaration, you're
7 not looking at Shafer; is that right?
8 **A. I'm looking at my declaration to see the**
9 **reference of where I can find it more quickly in the**
10 **Shafer patent.**
11 Q. Wouldn't it be simpler just to look at Shafer
12 where it mentions seal member 165?
13 **A. I thought this would be faster.**
14 Q. Let me see if I can help you out. Why don't you
15 look at paragraph 81 of Shafer.
16 **A. (Complying.) Okay.**
17 Q. Is that the same description of the materials
18 that form the seal member 165 found in paragraph 59?
19 Ask when I say in that, I am referring to
20 paragraph 81. Isn't that referring to the same seal
21 member 165?
22 **A. It says, "In one option, the third seal member**
23 **includes materials 166 that's highly elastic,**
24 **deformable, compliant." They also go on to say, "The**
25 **basic materials are in one option modified by**

81

1 **compounding them with waxes and/or oils or un-" -- "or**
2 **un-cross-linked modifiers," and then they give a range**
3 **of Shore hardness examples from 5 to 15, another option**
4 **of 15 to 20 Shore hardness on the 00 scale.**
5 Q. Okay. Now compare that to paragraph 59. Isn't
6 that the exact same description of seal member 165?
7 **A. Paragraph 59? The difference is in paragraph**
8 **59, after it talks about Shore hardness in the range**
9 **between 15 to 20 on the Shore -- 15 to 20 Shore on the**
10 **00 scale, "this provides material that is extremely soft**
11 **and compliant and intrinsically sticky."**
12 Q. So let me stop you there. So that's describing
13 the material that's just described right above it, isn't
14 it?
15 **A. In paragraph 59.**
16 Q. Yep.
17 So the material that's described in paragraph
18 59, its property is -- excuse me.
19 It -- the paragraph 59 says, "This provides a
20 material that is extremely soft, compliant and
21 intrinsically sticky." That's referring to the material
22 that is just set forth right above that sentence in
23 paragraph 59, correct?
24 **A. Yes.**
25 Q. And that material is the same material and the

82

1 same description as paragraph 81 for the seal member 165
2 in embodiments 30 through 34 -- excuse me -- Figures 30
3 through 34; is that correct?
4 **A. It's the same material and Shore hardness, but**
5 **they doesn't mention the sticky -- intrinsically sticky**
6 **attribute.**
7 Q. So do you believe it wouldn't be sticky, have
8 that intrinsically sticky attribute?
9 **A. I'm not that familiar with the soft materials**
10 **and whether they would be sticky or not.**
11 Q. Okay. So there's some material described in
12 paragraph 59 and then it talks about the properties of
13 that material after, at the bottom of paragraph 59,
14 correct?
15 **A. Right. These are given as examples, and it says**
16 **"for illus-" -- "illustrative purposes only, the nature**
17 **of the material of the third central seal member 165 can**
18 **be compared to a gelatinous substance. Material 166 is**
19 **of a self-closing nature in that it sticks occlusively**
20 **to itself, formally a nearly" -- "nearly fluid/gas tight**
21 **seal under very light compression."**
22 Q. So that's referring to the material that's
23 described 166 at the beginning of that paragraph, right?
24 **A. Yes.**
25 Q. Those are the properties of that material?

83

1 **A. Yes.**
2 Q. And that same material is described in paragraph
3 81, isn't it?
4 **A. It is described in paragraph 81, but they don't**
5 **talk about the self-closing nature and the gelatinous**
6 **attributes of the material.**
7 Q. Okay. So we've got the same material that's
8 described in paragraph 59 as in paragraph 81. You just
9 don't know the properties of -- of the material in 81
10 because it's not laid out in 81; is that right?
11 **A. They don't give those descriptors of being**
12 **sticky and gelatinous.**
13 Q. Okay. So if one skilled in the art took that
14 material 165 in -- from paragraph 59 and put it in the
15 figure of 81 of your declaration, these gaps would not
16 be formed; is that correct?
17 MR. STOWELL: Objection. Outside the
18 scope.
19 THE WITNESS: I'm not sure if they would
20 be formed or not. What I do know is that it
21 probably wouldn't reopen, which the -- you know, as
22 we were reading before in paragraph 77, when the
23 actuating members are forcibly disengaged -- sorry
24 -- when they disengage opposing outer walls of the
25 seal module 100, allowing -- allowing portion 108

84

1 of the containment structure 160 to retract to an
2 uncollapsed configuration where gases and fluids
3 can pass through.
4 So if the material was chosen to be
5 extremely soft and sticky, then I don't believe it
6 would retract and open once the tension is
7 released, once the buttons are forcibly disengaged.
8 BY MR. HAMILTON:
9 Q. So let's focus on before the buttons are
10 disengaged. Before the buttons are disengaged, that
11 material would fill these gaps, so gaps would not be
12 formed, correct?
13 MR. STOWELL: Objection. Form. Outside
14 the scope.
15 THE WITNESS: I think it's possible.
16 BY MR. HAMILTON:
17 Q. You don't know?
18 **A. It depends on the material properties of that**
19 **seal member. It depends on the U-shaped actuator**
20 **members that are compressing it. It depends on the tool**
21 **that's going inside.**
22 Q. The purpose of that material is to seal around a
23 variety of profile shapes and diameters as shown in
24 paragraph 60, but you don't know if it would actually do
25 that. Is that -- is that your testimony?

85

1 **A. It certainly would be designed to do that. I**
2 **also think it would be -- a person of skill in the art**
3 **wouldn't use a sticky material for the designs shown in**
4 **Figure 30 through 34 because it wouldn't reopen once the**
5 **tension is released on the actuators or suture line.**
6 Q. What if the material was highly elastic,
7 deformable, compliant, and yet virtually
8 noncompressible; would it open in that instance?
9 **A. It's hard to say what those meaning -- what**
10 **those definitions are.**
11 Q. You don't understand what those words mean?
12 **A. Those all have a range of mechanical parameters**
13 **that could be widely varying.**
14 Q. And a person of skill in the art could pick a
15 material that had those parameters that would open,
16 correct?
17 **A. I'm not sure, given the hardness ranges, if that**
18 **would be true or not.**
19 Q. So 165 is referred to as a third seal member.
20 What are the other two seal members? If it's helpful,
21 I'll point you to paragraph 51.
22 **A. Well, in paragraph 64 the seal model 100**
23 **includes, in one option, for seal member 170 having a**
24 **first material, the second seal member 180 having a**
25 **second material, and a third seal member 165 having a**

86

1 **third material. So as shown on Figures 12 through 15,**
2 **that delineates the first, second and third seal members**
3 **for this embodiment.**
4 Q. So the first seal member is 170?
5 **A. 1-7-0.**
6 Q. So the second seal member is 180?
7 **A. Yes.**
8 Q. And the third seal member is 165, correct?
9 **A. Yes.**
10 Q. Do you understand what seal member 170 does, how
11 it operates?
12 **A. Relating to Figures 12 through 15?**
13 Q. Sure. We can take those figures.
14 **A. Yeah, so in paragraph 65, the back pressure from**
15 **retrograde flow 270 forces the first seal member 170 to**
16 **move distally, to the right in the case of these**
17 **figures, toward the second seal member 180 under the**
18 **influence of pressure from the gas or fluid. The third**
19 **seal member is compressed. However, since the seal --**
20 **since the material 166 of the third central seal member**
21 **165 is essentially noncompressible, the lumen 193 of the**
22 **third seal member 165 collapses upon itself**
23 **circumferentially.**
24 Q. Okay. So that -- that -- let's look at Figure
25 13. Is that shown in Figure 13?

87

1 **A. Figure 13 shows the pressure 1 -- pressure 270**
2 **moving seal member 170 and compressing seal member 165,**
3 **collapsing it to seal.**
4 Q. Would you -- would you describe that -- would it
5 be fair to say that that would be a passive hemostasis
6 valve?
7 **A. Yeah. This embodiment does not include any**
8 **exterior members that are compressing the seal module,**
9 **so it -- I think it could be considered a passive valve.**
10 Q. Would you -- would you -- what -- what would
11 that term mean to you, passive -- a passive hemostasis
12 valve?
13 **A. That it's able to seal on its own without**
14 **additional manipulation or buttons being pushed or a**
15 **rotator being rotated on a rotating hemostasis valve.**
16 Q. And then let's contrast that to an active
17 hemostasis valve. What would an active hemostasis valve
18 be?
19 **A. Something like a rotating hemostatic valve,**
20 **which is commonly used in medical procedures.**
21 Q. So something that requires an active -- an
22 action from -- from a user, like a medical practitioner,
23 push the buttons, rotate the dial?
24 **A. Or pinch the valve, yes.**
25 Q. Let's go back to paragraph 59 of Exhibit 1005.

88

1 **A. (Complying.)**
2 Q. Scratch that. Paragraph 63. This is the --
3 this is the embodiments we were just talking about.
4 First sentence says "the use of a seal module 100 that
5 requires no compressive load for use in sealing the
6 stasis valve."
7 Is that a description of a passive valve, as we
8 just discussed?
9 **A. Yes, I would consider this a description of a**
10 **passive valve.**
11 Q. Paragraph 65, last sentence -- I'm sorry.
12 Do you see the sentence that begins "In one
13 option, at least one of the first and second materials
14 have a higher durometer than the third material"?
15 Paragraph 65, last sentence that's on the next page.
16 **A. Yes.**
17 Q. What does that mean, the higher durometer?
18 **A. That it's a harder plastic and less able to**
19 **deform under, in this case, blood pressure, I guess.**
20 Q. So does that mean that the first or second
21 material won't deform, while the third material will?
22 **A. That's my understanding of this design, where**
23 **you can see in Figure 13, 170 has moved to the right,**
24 **given the pressure 270 exerted on it, and causes only**
25 **165, the third seal member, to collapse on itself. The**

89

1 **other two, 170 and 180, have not collapsed inwardly on**
2 **themselves.**
3 Q. Do you recall earlier this morning we were
4 discussing design considerations when designing a
5 hemostasis valve?
6 **A. Yes.**
7 Q. Would ease of manufacture ability be a design
8 consideration when designing a hemostasis valve?
9 **A. I think the ability to manufacture is always a**
10 **good consideration to use when designing anything, yes.**
11 Q. All right. What about durability; would that be
12 a design consideration in designing a hemostasis valve?
13 **A. Certainly the valve -- a valve would have to be**
14 **durable enough to be used during the procedure, but I**
15 **don't typically think of durability as being an issue**
16 **with hemostasis valves.**
17 Q. And -- and is that because they're used one
18 time? Is that -- is that why you don't really consider
19 durability?
20 **A. The ones I've worked on have been single-use**
21 **devices, used for a single procedure.**
22 Q. Okay. So let's define durability as durable
23 enough for that single procedure. Would that be a
24 design consideration?
25 **A. Yes. It has to work during the entire**

90

1 **procedure.**
2 Q. Okay. Let's go -- I'm going to change gears a
3 little bit.
4 Did I give you Exhibit 1001? Do you have that?
5 That's the -- the patent at issue.
6 **A. Yes.**
7 Q. Okay. Let's take a look at that. I want to
8 point you to column 13, starting at line 9.
9 **A. (Complying.)**
10 Q. If you could read that sentence, line 9 to 12.
11 **A. (Complying.)**
12 Q. Let me know when you're ready for the question.
13 **A. Okay.**
14 Q. What does that mean, "in embodiments in which
15 the filament comprises multiple filaments"?
16 What does that sentence mean to you -- or that
17 phrase?
18 MR. STOWELL: Objection. Vague.
19 THE WITNESS: I believe what you're
20 referring to, Figure 7, 8 and 9, which have
21 multiple filaments.
22 BY MR. HAMILTON:
23 Q. When you say -- what do you mean by multiple
24 filaments?
25 **A. More than one.**

91

1 Q. So multiple filaments -- each of the more than
2 one filament is a single continuous piece; is that
3 right?
4 MR. STOWELL: Objection. Form.
5 THE WITNESS: The patent described it as
6 the at least one filament. So two or more
7 filaments could be acting together to compress the
8 central member.
9 BY MR. HAMILTON:
10 Q. And when you say "two or more filaments," you
11 mean two or more single continuous pieces, correct?
12 **A. As shown in Figures 7 and 8, there are two**
13 **separate filaments.**
14 Q. So going back to this phrase, Column 13,
15 starting at line 9, "in embodiments in which the
16 filament 150 comprises multiple filaments," the question
17 was, multiple filaments in that sentence means
18 individual continuous filaments --
19 MR. STOWELL: Objection.
20 BY MR. HAMILTON:
21 Q. -- correct?
22 MR. STOWELL: Objection. Calls for a
23 legal conclusion.
24 THE WITNESS: It doesn't say
25 "continuous," but it's shown in Figures 6 and 7 as

92

1 two individual filaments.
2 BY MR. HAMILTON:
3 Q. And this sentence is -- is getting at when the
4 filament in total, so made up of multiple filaments,
5 in -- in which the filament 150 comprises multiple
6 filaments. So you have a filament that can be made up
7 of many individual filaments, correct? That's what that
8 means?
9 **A. Yes. It can be -- it can comprise multiple**
10 **filaments.**
11 Q. And let's -- let's try to make it more clear,
12 because we're using the word "filament" a lot. So I'm
13 just going to substitute -- one -- one example of a
14 filament, I think, is a string in the patent.
15 **A. Cord --**
16 Q. Let's use cord.
17 **A. -- certainly --**
18 Q. Let's use cord.
19 So in embodiments in which the cord comprises
20 multiple cords, what's that's referring to is the
21 filament in total, the cord in total, can have multiple
22 individual continuous cords; is that correct?
23 **A. Yeah, I believe that's how I read it.**
24 Q. Okay. And then the next phrase, "each of those
25 multiple continuous cords can have a first end and a

93

1 second end," what does that mean?
2 **A. Well, as it says, each can have a first end and**
3 **a second end. It goes on to say that the first and**
4 **second filaments 150-A and 150-B can be coupled to the**
5 **actuator 142.**
6 Q. So let's focus on that. "Each of the multiple
7 filaments," that's each of -- each of the individual
8 cords, single continuous individual cords, correct?
9 MR. STOWELL: Objection. Calls for a
10 legal conclusion.
11 THE WITNESS: Well, what I can say is the
12 figure that's referring to the first and second
13 ends, 700 and 702, which are the left end of Figure
14 7, the left two ends and the right two ends are --
15 are considered the second end of the combined
16 filament.
17 BY MR. HAMILTON:
18 Q. Okay. So you just referred to Figures 8 and 9;
19 is that right?
20 **A. 7, I believe. Figure 7.**
21 Q. So Figure 7 -- what's the first end and second
22 end of Figure 7?
23 **A. First end is 700 and the second end of 702 of**
24 **one or more of the multiple filaments of the multiple**
25 **filaments, and it goes on to say those ends can be**

94

1 **coupled to the housing or other portion of the valve.**
2 Q. Okay. So look at Figure 7.
3 **A. Uh-huh.**
4 Q. Each individual single continuous piece has a
5 first end and a second end in that figure, correct?
6 **A. They're both labeled 700 as a first end, so I**
7 **think they're combining them as together they form the**
8 **filament. When you have more than one filament, it's --**
9 **the entire grouping is called filament 150.**
10 Q. So what I'm trying to figure out is, this
11 sentence on line 11 -- this phrase starting at line 10,
12 it says "each of the multiple filaments," not together.
13 And each of the multiple filaments can have a first end
14 and second end. Do you see that?
15 **A. I see that.**
16 Q. And what you're telling me is the figure shows
17 something different from that; is that right?
18 MR. STOWELL: Objection. Misstates
19 testimony.
20 THE WITNESS: I'm saying that the way the
21 patent is written, when there are multiple
22 filaments, they consider the first end 700 and the
23 second end 702 to be the same. They're both
24 labeled 700 on the left side. They're both labeled
25 702 on the right side.

95

1 BY MR. HAMILTON:
2 Q. So collectively they're the same; is that -- is
3 that -- is that what you mean?
4 **A. They are both labeled the same as a first end**
5 **versus a second end.**
6 Q. They are.
7 But this statement says each of the multiple
8 filaments has a first end and second end. That doesn't
9 mean collectively they have a first end and second end;
10 it means each of them does, doesn't it?
11 MR. STOWELL: Objection. Form. Asked
12 and answered.
13 THE WITNESS: Yeah, I don't know. It
14 appears that each one has a first end and a second
15 end.
16 BY MR. HAMILTON:
17 Q. What -- what -- when you say "each one," what
18 are -- what were you looking at there?
19 **A. Figure 7 is what we're referring to.**
20 Q. So -- so in Figure 7, each one of the individual
21 continuous filaments has a first end and second end,
22 correct?
23 **A. They're both labeled the same, as 700. So I**
24 **believe they're combining them together as part of the**
25 **multiple filaments.**

96

1 Q. So in Figure 7, each continuous individual
2 filament has a first end and second end, correct?
3 MR. STOWELL: Objection. Asked and
4 answered.
5 THE WITNESS: It has an end labeled 700,
6 each of the individual strands. Together they form
7 the filament 150 when there's multiple filaments,
8 is how I would interpret it.
9 BY MR. HAMILTON:
10 Q. So in Figure 7, each individual filament has a
11 first end and second end, correct?
12 MR. STOWELL: Objection. Asked and
13 answered.
14 THE WITNESS: I think I've answered it.
15 BY MR. HAMILTON:
16 Q. And then collectively together, the first end
17 and second end of each of those filaments is on the same
18 side; is that right?
19 **A. The first end is 700 on the left side. The 7 --**
20 **the -- the second end is 702 on the right side.**
21 Q. And there's two second ends and two first ends
22 in that figure, correct?
23 **A. Yes.**
24 Q. Okay. Now turn to Figure 8 and 9.
25 **A. (Complying.)**

97

1 Q. Figure 8 and 9 is different, isn't it?
2 MR. STOWELL: Objection. Vague.
3 BY MR. HAMILTON:
4 Q. In Figure 8 and 9, each continuous piece has two
5 first ends or two second ends; is that right? Two of
6 the same ends; is that correct?
7 **A. Well, the first end is labeled 700, of the**
8 **composite or -- you know, the composite of multiple**
9 **filaments, they're labeling the left side as 700 versus**
10 **the right side of 702.**
11 Q. So the composite of multiple filaments --
12 scratch that.
13 So now let's focus on one of the individual
14 single continuous filaments shown in Figures 8 and 9.
15 You can pick either one. That single continuous
16 filament either has two -- it has -- has two first ends
17 or two second ends?
18 That's an awkwardly worded question.
19 There's two filaments there, so let's just --
20 let's just pick one. Let's say 150-A. Do you see
21 150-A?
22 **A. Yes.**
23 Q. So 150-A is a single continuous filament,
24 correct?
25 MR. STOWELL: Objection. Vague.

98

1 THE WITNESS: It is one single wire or
2 filament material, yes.
3 BY MR. HAMILTON:
4 Q. Okay. So I -- let's just call it a single --
5 single member. A single continuous member. Is that
6 fair?
7 **A. Yes.**
8 Q. And then 150-B is a single continuous member; is
9 that right?
10 **A. Yes.**
11 Q. Collectively, those two single continuous
12 members make up the filament in Figure 8, correct?
13 **A. Yes. In some embodiments, a filament can**
14 **comprise multiple filaments, as shown in Figures 7**
15 **through 9.**
16 Q. Okay.
17 **A. So collectively they're forming the filament.**
18 Q. And each of those single continuous members
19 shown in Figure 8 -- let's -- let's just talk about --
20 let's just focus on one. Member 150-A, that single
21 continuous member, has two first ends in Figure 8,
22 doesn't it?
23 **A. It has two ends. They're labeled as 700, the**
24 **first end.**
25 Q. So does it have two first ends?

99

1 **A. It has two ends. And from the standpoint of**
2 **this patent, they're considered together to comprise a**
3 **single filament, the left side of which is the first end**
4 **of the, I'd say, composite filament.**
5 Q. I kind of -- I think I see your confusion. It
6 doesn't make any sense to say a single continuous member
7 has two first ends, does it, because they have a first
8 end and a second end; isn't that right?
9 MR. STOWELL: Objection. Misstates the
10 testimony.
11 THE WITNESS: I think the patent language
12 is clear that when they're combined together,
13 they're considering it a first end of the multiple
14 filaments.
15 BY MR. HAMILTON:
16 Q. And when they're not combined together, how does
17 the patent consider the ends?
18 MR. STOWELL: Objection. Outside the
19 scope.
20 THE WITNESS: When it's a single
21 filament?
22 BY MR. HAMILTON:
23 Q. No. When you have two filaments but you're
24 referring to one of the single -- excuse me. Let's
25 stick with our language, members.

100

1 When you have two members, like 150-A and 150-B
2 how does the patent refer to the ends of -- of each of
3 those members?
4 **A. Collectively as the first end.**
5 Q. So let's take one of them. How does it refer to
6 the ends of one of those members?
7 MR. STOWELL: Objection. Outside the
8 scope.
9 THE WITNESS: It refers to 700 and 700
10 for each of the two ends of a single member 150-A.
11 BY MR. HAMILTON:
12 Q. As a first end or -- or as a first and second
13 end?
14 **A. As a first end, 700 is labeled on each end of**
15 **150-A member.**
16 Q. So each end of 150-A, that single continuous
17 member, is labeled in Figure 8 as a first end; is that
18 right?
19 **A. Yes.**
20 Q. And each end of the single continuous member
21 150-B in that same figure is -- is labeled as a second
22 end; is that right?
23 **A. Yes.**
24 Q. Okay. Now let's look back at the language
25 describing that figure that says each -- this is column

101

1 13, line 10 -- "each of the multiple filaments" -- so
2 we'll say members -- "can have a first end and a second
3 end."
4 This language says that each of the individual
5 members has a first end and second end, not a single
6 member having two first ends. This is different from
7 the figure, isn't it?
8 MR. STOWELL: Objection. Form.
9 THE WITNESS: I think it's just written
10 as when you have multiple filaments, which are
11 going to get connected to a button on one end, that
12 they're considering that the first end.
13 BY MR. HAMILTON:
14 Q. So what does each of the multiple filaments
15 mean? Isn't that referring to a single member, either
16 150-A or 150-B?
17 **A. I'm not sure.**
18 Q. You don't know?
19 **A. I'm not sure.**
20 Q. You don't know what that's referring to?
21 **A. It's referring to everything we're talking**
22 **about.**
23 Q. Each of the multiple filaments, does that refer
24 to 150-A by itself or 150-B by itself?
25 MR. STOWELL: Objection. Asked and

102

1 answered. Form.
2 THE WITNESS: Yes, I think so.
3 BY MR. HAMILTON:
4 Q. And then that language says each can have a
5 first end and a second end; is that right?
6 **A. That's what it says.**
7 Q. And that is not what's shown in Figures 8 and 9,
8 correct?
9 MR. STOWELL: Objection. Asked and
10 answered.
11 THE WITNESS: I believe the figure is
12 really showing when it's a composite, when it's
13 comprised of multiple filaments, and they wanted to
14 make clear to label the first end of the composite
15 such that that end would be attached to one
16 actuating member and the other end attached to the
17 other actuating member.
18 BY MR. HAMILTON:
19 Q. So the figure is different from what's described
20 in this sentence on column 13 starting at line 9, ending
21 at line 11 -- line 12, correct?
22 MR. STOWELL: Objection.
23 THE WITNESS: I'm not sure it's
24 different.
25 BY MR. HAMILTON:

103

1 Q. What's a loop?
2 MR. STOWELL: Objection. Form.
3 THE WITNESS: As defined by which patent?
4 BY MR. HAMILTON:
5 Q. In the field of the invention of the '011
6 Patent, what does the term "loop" mean?
7 **A. Let me see how they define it.**
8 Q. I want to withdraw the question.
9 Earlier you discussed the field of the invention
10 as hemostasis valve for intravascular catheters. Do you
11 recall that?
12 Let me -- let me just make sure I get it right.
13 I really -- I don't want -- I don't want to change the
14 field as set forth in your declaration. And that was, I
15 believe, paragraph 26.
16 "Hemostasis valves for use during intravascular
17 procedures."
18 Do you see that?
19 **A. Yes. In paragraph 26 of the declaration, my**
20 **declaration.**
21 Q. In that field, what does the term "loop" mean --
22 withdraw that question.
23 Does the term "loop" have a --
24 THE VIDEOGRAPHER: Be careful with your
25 microphone.

104

1 BY MR. HAMILTON:
2 Q. -- a well-understood meaning in that field?
3 **A. That's not a term I would have been familiar**
4 **with before reviewing these patents and these designs.**
5 Q. So from the perspective of a person of ordinary
6 skill in the art, that person would not be familiar with
7 a particular definition for the term "loop" in this
8 field; is that -- is that your testimony?
9 **A. I'm saying that I had not seen a hemo- --**
10 **hemostatic valve that involved a loop mechanism prior to**
11 **working on this project and reviewing these patents.**
12 Q. And you're here to testify today about the
13 understanding from the perspective of a person of
14 ordinary skill in the art; is that correct?
15 **A. Yes.**
16 Q. What is that person's understanding of the term
17 "loop" in the field hemostasis valves for use during
18 intravascular procedures?
19 MR. STOWELL: Objection. Asked and
20 answered. Form.
21 THE WITNESS: I would need to look at how
22 they define loop in this patent to fully answer the
23 question.
24 BY MR. HAMILTON:
25 Q. So as you sit here today, you're not aware of a

105

1 specific meaning for the term "loop" in the field of
2 hemostasis valves for use during intravascular
3 procedures; is that correct?
4 **A. I'm saying I wasn't familiar with that term**
5 **because I wasn't familiar with loops being used for**
6 **hemostatic valves before this time.**
7 Q. And you were familiar with the field of
8 hemostasis valves for use during intravascular
9 procedures before this matter, weren't you?
10 **A. Yes.**
11 Q. So now let's focus on as the term "loop" as used
12 in the '011 Patent.
13 What does the term "loop" mean in the '011
14 Patent?
15 **A. So the first reference I see -- it may not be**
16 **the first reference in here, but the first reference to**
17 **loop that I can find here is column 13, line 29, "The**
18 **filament 150 can be arranged in a variety of**
19 **configurations. In some embodiments, the filament 150**
20 **can be configured to form a single loop 604 that can**
21 **extend around the elongate member 132 and/or through**
22 **which the elongate member 132 can be received as shown**
23 **in Figure 6."**
24 Q. So you just read a sentence from the -- the
25 specification. Do you remember the question?

106

1 **A. Yeah, what's the definition of a loop.**
2 Q. So what's a loop?
3 MR. STOWELL: Objection. Asked and
4 answered.
5 THE WITNESS: It's a filament that can
6 extend around an elongate member as shown in Figure
7 6, is one example shown.
8 BY MR. HAMILTON:
9 Q. A loop is a filament? Is that your testimony?
10 **A. It says "the filament 150 can be configured to**
11 **form a single loop."**
12 Q. Okay. So form a loop --
13 **A. So for --**
14 Q. What shape it is a loop -- I'll withdraw the
15 question.
16 Does loop denote a shape?
17 **A. Not necessarily a given shape.**
18 Q. That sentence says "form a loop." In that
19 sentence, does loop denote a shape?
20 **A. I think what it's -- what it's wrapping around**
21 **delineates a shape.**
22 Q. What it's wrapping around -- what do you mean
23 "it"? What is "it" in that sentence?
24 **A. If, theoretically, the elongate member were**
25 **oval, the loop would loop around an oval shape, so the**

107

1 **shape would be ovalized instead of round. So a loop on**
2 **its own doesn't necessarily have a given shape; it also**
3 **depends on what it's looping around.**
4 Q. And if I understand what you're saying, the loop
5 has to extend around the entire shape, is that right, to
6 be a loop?
7 MR. STOWELL: Objection. Misstates
8 testimony.
9 THE WITNESS: The example they give is
10 Figure 6, which loops around in a circle.
11 BY MR. HAMILTON:
12 Q. So in the example, the loop extends around the
13 entire shape; is that right?
14 **A. Yes.**
15 Q. So does the term "loop" mean that whatever is
16 forming the loop extends around the entire shape?
17 **A. Not necessarily.**
18 Q. So a loop doesn't have to extend around a shape?
19 A loop -- a loop, in your opinion, could be a U-shaped
20 member?
21 **A. Possibly.**
22 Q. Do you see column 13, line 44?
23 Do you see the term "bite"?
24 **A. Yes.**
25 Q. You see a definition for that term?

108

1 **A. Yes.**
2 Q. What's the definition of a bite?
3 **A. The bite refers to a U-shaped section between**
4 **the two ends of the filament 150 as depicted in Figures**
5 **8 and 9.**
6 Q. Is that U-shaped section ever described as a
7 loop in the '011 Patent?
8 **A. I don't believe so.**
9 Q. So the examples in the '01- -- '011 Patent use
10 the term "loop" -- all the examples for a loop in the
11 '011 Patent, the material forming the loop extends
12 entirely around some object; is that correct?
13 **A. I'm not sure if all of the embodiments, but**
14 **certainly Figure 6 does.**
15 Q. And Figure 7?
16 **A. Yes, I would consider that a loop.**
17 Q. Figures 8 and 9?
18 **A. As defined by the patent, they would be a bite.**
19 Q. Are they loops?
20 **A. I would say together they act as -- could act as**
21 **a loop, but individually they're defined as a bite.**
22 Q. When you say "could act as a loop," are the --
23 is the form shown in Figures 8 and 9 a loop?
24 **A. The form of each member would be considered a**
25 **bite, based on the description in the patent. Acting**

109

1 **together, they could act similar to a loop.**
2 Q. Are they a loop?
3 **A. They're defined as a bite.**
4 Q. Okay. Let's take a look at column 9.
5 MR. STOWELL: We've been going for
6 another over -- over an hour and a half, so when
7 you get a chance, let's take a break.
8 MR. HAMILTON: This -- I'm going to
9 change -- change gears, so why don't we -- why
10 don't -- do you want to take a lunch break?
11 MR. STOWELL: Yeah, that's fine.
12 THE VIDEOGRAPHER: Please stand by.
13 We are going off the record at 12:29.
14 (Recess.)
15 THE VIDEOGRAPHER: We are back on the
16 record at 1312.
17 BY MR. HAMILTON:
18 Q. Mr. Thornton, you -- you understand you're still
19 under oath?
20 **A. Yes.**
21 Q. Did you discuss your testimony with anybody
22 during the break?
23 **A. No.**
24 Q. Did you read any documents during the break?
25 **A. No.**

110

1 Q. If you could turn to Exhibit 1003 -- that's your
2 declaration -- page 69, paragraph 94.
3 **A. (Complying.)**
4 Q. Let me know when you're there and I can ask you
5 a question about it.
6 **A. Okay.**
7 Q. So in the first line, paragraph 94, starting at
8 the end of the first line "A" -- "A person of ordinary
9 skill in the art would have recognized that Ellers' wire
10 member may provide more flexibility than Shafer's
11 metallic plastic U-shaped actuating members when
12 constricting the valve lumen."
13 Do you see that?
14 **A. Yes.**
15 Q. How would a person of ordinary skill in the art
16 have recognized that Ellers' wire member may provide
17 more flexibility than Shafer's metallic plastic U-shaped
18 actuating member?
19 **A. I think they would have been motivated in the**
20 **case -- if -- if it weren't sealing well, if the**
21 **U-shaped actuating members -- the materials that they**
22 **happened to chose weren't sealing around a wide enough**
23 **range of tools, a wire member may provide more**
24 **flexibility to seal better.**
25 Q. So the question is, how does one skilled in art

111

1 know that the Ellers' wire member may provide more
2 flexibility than Shafer's U-shaped actuating members?
3 What is it about U -- Shafer's members and Shafer that
4 tells you that those members are less flexible than
5 Ellers' wire member?
6 MR. STOWELL: Objection. Form.
7 THE WITNESS: It may conform better. It
8 just depends on the materials chosen for the
9 sealing member or the U-shaped actuating members,
10 depending on the flexibility of the wire as it
11 compared to the flexibility of the U-shaped
12 actuating members.
13 BY MR. HAMILTON:
14 Q. So is Ellers' wire member more flexible than
15 Shafer's metallic plastic U-shaped actuating members?
16 **A. It's not very clear in the patents because they**
17 **don't talk about material properties of flexibility.**
18 Q. So what did you mean by that when you said that?
19 **A. I meant that it could be an option that it may**
20 **provide more flexibility, if -- if needed, to optimize**
21 **the design.**
22 Q. So you -- you -- it's possible that one would
23 not need to optimize the design of Shafer; is that -- is
24 that correct?
25 **A. I think it's possible.**

112

1 Q. And that's because Shafer can conform -- can
2 form a complete seal?
3 MR. STOWELL: Objection. Form.
4 THE WITNESS: That is the design intent
5 of the Shafer design, to form a complete seal with
6 nothing inside and with tools inside.
7 BY MR. HAMILTON:
8 Q. So what is it about Shafer's metallic plastic
9 U-shaped actuating members as disclosed in Shafer leads
10 you to believe that they are less flexible than Ellers'
11 wire member?
12 MR. STOWELL: Objection. Misstates
13 testimony.
14 THE WITNESS: Right, it's not clear if
15 they are more flexible or less flexible, but if
16 the, I'll say, metallic U-shaped actuating members
17 were not performing as desired, then the engineers
18 would optimize it with making changes to the design
19 of the actuating members or other components, or
20 could consider using a different material, like
21 Ellers' wire member, to optimize the design.
22 BY MR. HAMILTON:
23 Q. So someone designing the valve, if they had an
24 issue with Shafer's valve, there would be a lot of
25 options to -- to optimize that valve and deal with

113

1 sealing issues like the gaps we previously discussed in
2 paragraph 81 of your declaration; is that right?
3 **A. I think there would be multiple parameters that**
4 **could be adjusted to optimize any of these designs, but**
5 **the Shafer design, yes.**
6 Q. And are some of those options disclosed in
7 Shafer?
8 **A. I'd have to look at Shafer in more detail.**
9 Q. Let's -- let's talk about the one we've already
10 discussed, sealing member 165. Including seal member
11 165 in the embodiment that you're discussing here in
12 Shafer would deal with the sealing issue, wouldn't it?
13 MR. STOWELL: Objection. Form.
14 THE WITNESS: It's unclear because the --
15 you have a range of material properties. They
16 don't give dimensions of the sealing member. It's
17 not clear that it would --
18 BY MR. HAMILTON:
19 Q. Do you believe --
20 **A. -- work.**
21 Q. -- Shafer discloses at least one sealing member
22 165 that would eliminate the gaps formed in the Shafer
23 device as disclosed in paragraph 81 of your declaration?
24 MR. STOWELL: Objection. Asked and
25 answered.

114

1 THE WITNESS: Yeah, I don't know if it
2 would or not.
3 Excuse me.
4 BY MR. HAMILTON:
5 Q. Okay. If you could just move down a little
6 farther in that same paragraph, 94.
7 **A. (Complying.)**
8 Q. The line beginning "compliant constricting
9 mechanism," do you see that?
10 **A. Yes.**
11 Q. So that sentence reads, "However, a more
12 compliant constricting mechanism" -- what does more
13 compliant constricting mechanism mean?
14 **A. The filament.**
15 Q. More compliant constricting mechanism means
16 filament?
17 **A. It could mean the filament plus the**
18 **spring-actuated buttons in this case.**
19 Q. And -- and how is a more compliant constricting
20 mechanism helpful in creating a complete seal?
21 **A. It could be helpful as an option if the Shafer**
22 **U-shaped actuating -- actuating members weren't**
23 **performing as desired.**
24 Q. So if Shafer didn't complete a -- didn't form a
25 complete seal, then Ellers' more compliant constricting

115

1 mechanism might be useful; is that right?
2 **A. It may be able to accommodate a wider range of**
3 **tools and devices, like I said in that paragraph.**
4 Q. What does that mean, could conform to the size
5 and shape of a wider range of tools?
6 **A. If the Shafer U-shaped actuating members weren't**
7 **conforming well to a certain size or shape, then it's**
8 **possible that a wire member that was more compliant**
9 **might conform better to those sizes and shapes.**
10 Q. So, essentially, Ellers' wire is more flexible
11 than Shafer's actuating members, such that it could
12 conform to the size and shape of a wider range of tools;
13 is that right? Is that your testimony?
14 MR. STOWELL: Objection. Misstates
15 testimony.
16 THE WITNESS: The material properties of
17 the U-shaped actuating members are not clearly
18 defined in the Shafer application. They could be
19 quite flexible. They could be more -- somewhat
20 more rigid, somewhat stiffer, somewhat more
21 flexible. It's not clear. They don't provide
22 material properties for the U-shaped actuating
23 members.
24 BY MR. HAMILTON:
25 Q. So let's take the instance that Shafer's

116

1 U-shaped actuating members are quite flexible such that
2 a complete seal is formed in the embodiment of Shafer
3 Figures 30 through 34. Okay? Are you with me? If that
4 was the case, there would be no reason to include
5 Ellers' wire member, would there?
6 MR. STOWELL: Objection. Form.
7 THE WITNESS: Well, as I said before,
8 flexibility of the components is one aspect of
9 those. U-shaped components is one aspect. The
10 sealing member, the spring force, the dimensions
11 used for those members all have -- all play in
12 together. So it's certainly possible that Shafer's
13 U-shaped members would form a seal really well
14 around multiple tools. And if it did not, then
15 there could be other options, like Ellers' --
16 Hartley's string or Ellers' wire member.
17 BY MR. HAMILTON:
18 Q. So if Shafer's U-shaped members formed a
19 complete seal around multiple tools, there would be no
20 reason to include Ellers' wire member or Hartley's
21 string in Shafer; isn't that correct?
22 MR. STOWELL: Objection. Misstates
23 testimony.
24 THE WITNESS: If it worked perfectly for
25 all the range of tools, then there probably

117

1 wouldn't be a need to make adjustments and move to
2 a string-type member.
3 BY MR. HAMILTON:
4 Q. All right. Let's take a look at Exhibit 1001.
5 And you can put that away. I'm finished with that for
6 now.
7 **A. (Complying.)**
8 Q. That's the -- that's the patent at issue here,
9 the '011 Patent?
10 **A. Yes.**
11 Q. And if you could go to column 9, first paragraph
12 in column 9, starting at line 10.
13 **A. (Complying.)**
14 Q. Let me know when you're ready for some
15 questions.
16 **A. Yes.**
17 Q. Does the term "filament" have a well-understood
18 meaning to a person of skill in the art in the field of
19 hemostasis valves for use during intravascular
20 procedures?
21 MR. STOWELL: Objection. Outside the
22 scope.
23 THE WITNESS: I would say the term
24 "filament" meaning is explained in the patent. For
25 instance, toward the end it says, "In some

118

1 embodiments the filament can be" -- "can comprise
2 one or several threads, lines, cords, ropes,
3 ribbon, flat wire, sheet or tape."
4 BY MR. HAMILTON:
5 Q. Okay. So let's talk about, not the patent, but
6 the field of hemostasis valves for use during
7 intravascular procedures. You with me?
8 **A. Yes.**
9 Q. Does the term "filament" have a well-understood
10 meaning to a person of skill in the art in that field?
11 MR. STOWELL: Objection. Outside the
12 scope.
13 THE WITNESS: I'm not familiar with
14 filaments being used in hemostasis -- hemostasis
15 valves before getting involved with this project.
16 I would say for this -- purposes of this patent, it
17 really is the section I read earlier at the end of
18 this column 9, rows -- the last few rows to row 20.
19 BY MR. HAMILTON:
20 Q. Does the term "filament" have a well-understood
21 meaning to a person of ordinary skill in the art in
22 medical devices in general?
23 **A. I certainly use the term "filament" in my**
24 **experience with pull wires, pull lines for steerable**
25 **catheters. That was a term that was used for the lines**

119

1 **themselves.**
2 Q. So you -- you've used the term "filament" in
3 your career in the medical field; is that right?
4 **A. Yes.**
5 Q. And you've used that to describe different
6 components of -- of devices in the medical field; is
7 that right?
8 **A. The example I'm thinking about was for pull**
9 **lines, pull wires that were used for steerable**
10 **catheters.**
11 Q. What's a pull line?
12 **A. So if you want to curve the distal end of a**
13 **catheter, there would be a lumen in which a filament or**
14 **cable or flat wire might be used to attach to the distal**
15 **end. It's then attached to a handle end so that when**
16 **the doctor actuates and pulls on that filament, then the**
17 **tip will curve.**
18 Q. So in that -- for that filament you just
19 described, that filament runs through a catheter; is
20 that right?
21 **A. Yes. It's through a lumen of the catheter.**
22 Q. A lumen of the catheter. Sorry.
23 And the catheter is in the vasculature of a
24 patient when it's used; is that right?
25 **A. The example I'm thinking about, it is in the**

120

1 **patient when it's used.**
2 Q. And does it have lots of curves and bends, the
3 catheter -- the lumen of the catheter, in that example?
4 **A. The steerable catheters I worked on were going**
5 **in the venous side, all the way into the heart, which is**
6 **a fairly straight access, so not a lot of curves in the**
7 **vasculature to get there.**
8 Q. Are there any curves?
9 **A. Yes.**
10 Q. Would the filament you just described have to be
11 flexible enough to navigate through the lumen of the
12 catheter through those curves?
13 **A. It's much more of an issue of the catheter**
14 **itself in navigating, not the filament itself. It's --**
15 **doesn't add a lot of stiffness to the catheters that**
16 **I've worked on.**
17 Q. So the filament in that example is very
18 flexible; is that -- is that a fair characterization?
19 MR. STOWELL: Objection. Vague.
20 THE WITNESS: We use different filaments
21 of different sizes. Some were more flexible than
22 others.
23 BY MR. HAMILTON:
24 Q. Were they -- did they all have some degree of
25 flexibility?

121

1 MR. STOWELL: Objection. Vague.
2 THE WITNESS: I think every material has
3 some degree of flexibility.
4 BY MR. HAMILTON:
5 Q. Were those filaments machine parts? Were they
6 made by machine -- machining?
7 **A. The filaments I'm thinking about were typically**
8 **braided wire or braided Vectran -- maybe that's the**
9 **trade name for a polymer that's braided into a strong --**
10 **actually strong filament.**
11 Q. What do you mean by "actually strong"?
12 **A. It had to withstand a fair amount of tension in**
13 **order to curve the distal end of the catheter.**
14 Q. Have you ever use the term "filament" in a
15 publication?
16 **A. I don't believe so.**
17 Q. What about a patent? Do you have any patents
18 that use the term "filament"?
19 **A. I don't recall the term that was used in the**
20 **steerable guide patents that I've -- that I'm familiar**
21 **with.**
22 Q. So as you sit here today, you don't recall using
23 the term "filament" in any of your patents?
24 **A. I don't recall if we used the term "filament" or**
25 **"pull wire" or some other nomenclature.**

122

1 Q. Would it surprise you to learn that you used the
2 term "filament" in your patents to describe something
3 that is flexible, like a string or a thread?
4 **A. I don't understand the question.**
5 Q. Would it surprise you to learn that in one of
6 your patents, you equated the term "filament" with a
7 thread-like material?
8 **A. Not necessarily.**
9 Q. Because that's a common understood meaning of
10 the term "filament," isn't it?
11 MR. STOWELL: Objection. Form.
12 THE WITNESS: I'm not sure what the
13 common understanding is for filament.
14 BY MR. HAMILTON:
15 Q. You don't know what the common meaning of
16 filament is; is that right? Is that your testimony?
17 **A. I think the meaning of filament is -- as it**
18 **relates to that patent is what's important and related**
19 **to the -- my disclosure.**
20 Q. And unrelated to the patent, you don't
21 understand what the term "filament" means; is that
22 right?
23 MR. STOWELL: Objection. Outside the
24 scope.
25 THE WITNESS: I think filament as it

123

1 relates to this patent is what's important.
2 BY MR. HAMILTON:
3 Q. And outside of this patent, you don't have an
4 understanding of what the term "filament" means; is that
5 correct?
6 MR. STOWELL: Objection. Outside the
7 scope. Asked and answered.
8 THE WITNESS: Well, I just described
9 filaments, pull wires that I've used in the past,
10 so I have some understanding of using that term in
11 my past projects.
12 BY MR. HAMILTON:
13 Q. Okay. Let's look at column 9 of Exhibit 1001,
14 line 10 -- starting at line 10.
15 **A. (Complying.)**
16 Q. That line explains that the filament of the '011
17 Patent can be made from a variety of materials. Do you
18 see that?
19 **A. Yes.**
20 Q. Now I'm going to ask you about each of those
21 materials.
22 So the first one is a polymer. Is it possible
23 to make a filament out of a polymer that's sufficiently
24 flexible to loop around, say, a lumen?
25 MR. STOWELL: Objection. Outside the

124

1 scope.
2 THE WITNESS: It depends on the lumen
3 size, but I have seen and used polymer -- braided
4 polymer filaments in the example I just provided to
5 you.
6 BY MR. HAMILTON:
7 Q. So the fact that the filament's made from a
8 polymer doesn't tell you how rigid or flexible a
9 filament is; isn't that correct?
10 **A. One would need to know other aspects of the**
11 **filament or -- and material properties of the polymer to**
12 **determine flexibility.**
13 Q. What other aspects?
14 **A. Dimension, diameter of the individual strands,**
15 **overall diameter, material properties.**
16 Q. Okay. So let's talk about the next one, a
17 synthetic. Do you see that? Do you understand what
18 that is?
19 **A. Not completely clear what they're referring to**
20 **as a synthetic. It seems similar to a polymer to me.**
21 Q. So then if synthetic, in your understanding, is
22 similar to a polymer, the fact that a filament is made
23 out of a synthetic doesn't tell you how flexible or
24 rigid the filament is, as well, correct?
25 **A. Not without knowing the other aspects of the**

125

1 **filament.**
2 Q. And then let's look at the last material, metal.
3 The fact that a filament is made out of metal or not --
4 excuse me -- made out of metal doesn't tell a person of
5 skill in the art how flexible or rigid that filament is;
6 is that correct?
7 **A. One would need to know the dimensions and the**
8 **material properties to determine flexibility.**
9 Q. So the fact that the filament is made -- can be
10 made from these three materials doesn't tell you whether
11 the filament is flexible or rigid, correct, or how
12 flexible or how rigid it is, correct?
13 MR. STOWELL: Objection. Form.
14 THE WITNESS: The relative flexibility or
15 the relative stiffness or rigidity is not clear
16 from those three materials without knowing much
17 more information.
18 BY MR. HAMILTON:
19 Q. All right. I'm going to ask the same question,
20 and maybe we can make it a little simpler for the next
21 sentence. There's some more materials listed: Nylon,
22 stainless steel, Nitinol, silicone or the like.
23 Do you see that?
24 **A. Yes.**
25 Q. The fact that the filament is made from any one

126

1 of those materials doesn't tell a person of skill in the
2 art how flexible or how rigid the filament is; isn't
3 that correct?
4 **A. By just knowing the material, probably not.**
5 Q. What does the word "strand" mean to you?
6 **A. Well, I'm familiar with it as a -- metal cables,**
7 **typically they're composed of multiple strands. I think**
8 **the term is the individual strands that form a filament.**
9 Q. Do you see the next line, starting at 13, "In
10 some embodiments the filament can comprise a single
11 strand, such as, for example, a monofilament"?
12 **A. Yes.**
13 Q. The fact -- the fact that the filament is a
14 single strand, does that tell you whether it's flexible
15 or rigid?
16 **A. Not necessarily.**
17 Q. Is a strand a long, thin piece?
18 MR. STOWELL: Objection. Form.
19 THE WITNESS: I think that would be a
20 common usage of the term.
21 BY MR. HAMILTON:
22 Q. And would one of skill in the art typically
23 think that strands are flexible, they're on the flexible
24 side of the spectrum?
25 MR. STOWELL: Objection. Outside the

127

1 scope.
2 THE WITNESS: Rel- -- relative to what,
3 is the --
4 BY MR. HAMILTON:
5 Q. You just described the strands you're aware of
6 as strands in a metal cable and they're woven into the
7 cable; is that right? Or braided?
8 **A. Braided, typically, yes.**
9 Q. And wouldn't that mean that they're flexible in
10 that instance?
11 **A. It depends on the size.**
12 Q. Could you braid something that's not flexible?
13 **A. I think the Golden Gate Bridge uses a pretty**
14 **large braided metal cable to support the bridge, so that**
15 **gets pretty inflexible, I think.**
16 Q. So it depends on the -- the overall dimensions,
17 right? That's the important part; isn't that right?
18 MR. STOWELL: Objection. Form.
19 THE WITNESS: I think it depends on the
20 material, the dimensions, the number of strands
21 that are woven together, all have an impact on
22 whether it's relatively more flexible or relatively
23 less flexible.
24 BY MR. HAMILTON:
25 Q. In the example you gave of the Golden Gate

128

1 Bridge, the point of having those metal cables is to add
2 flexibility to the bridge; isn't that right?
3 Depends on the application, doesn't it?
4 MR. STOWELL: Objection. Form.
5 THE WITNESS: It depends on the
6 application.
7 BY MR. HAMILTON:
8 Q. If you look at the next line, starting at 15:
9 "The filament can comprise a plurality of strands that
10 can be, for example, twisted, woven, grouped, and/or
11 fused to form the filament."
12 Do you see that?
13 **A. Yes.**
14 Q. Does the fact that the filament can comprise a
15 plurality of strands that can be twisted, woven,
16 grouped, and/or fused to form a filament tell one of
17 skill in the art whether or not the filament is rigid or
18 flexible?
19 **A. It's not clear what rigid or flexible means, but**
20 **relatively more flexible or relatively more rigid, you**
21 **would need to know more information than just whether it**
22 **was twisted, woven, grouped or fused.**
23 Q. So let's use flexibility to mean flexible enough
24 to be looped around a lumen; in this application, a
25 hemostasis valve. The fact that the filament can

129

1 comprise a plurality of strands that can be, for
2 example, twisted, woven, grouped, and/or fused to form a
3 filament doesn't tell you whether or not the filament is
4 flexible enough to be wrapped around a lumen or too
5 rigid to be wrapped around a lumen; is that correct?
6 MR. STOWELL: Objection. Form. Outside
7 the scope.
8 THE WITNESS: I mean, it depends on the
9 material and the processing and the diameter you're
10 trying to wrap around. It also depends on the
11 force you're exerting by the spring mechanism on
12 the buttons.
13 BY MR. HAMILTON:
14 Q. And then let's look at the last sentence: "In
15 some embodiments, the filament can comprise one or
16 several threads, lines, cords, rope, button" -- excuse
17 me -- "rope, ribbon, flat wire, sheet or tape."
18 Do you see that?
19 Can ever --
20 **A. Yes.**
21 Q. Yes. Okay. Sorry.
22 Can every one of those forms be constructed in a
23 way such that the filament is flexible enough to be
24 wrapped around a lumen -- looped around a lumen? Excuse
25 me.

130

1 **A. It depends on the materials, the size, the**
2 **construction of the filament.**
3 Q. So depending on those things, every one of those
4 forms of a filament could be sufficiently flexible to be
5 wrapped around a lumen; isn't that right?
6 MR. STOWELL: Objection. Form.
7 THE VIDEOGRAPHER: Counsel, please watch
8 the microphone.
9 THE WITNESS: It could be sufficiently
10 flexible to wrap around the sizes discussed -- the
11 sizes assumed for the hemostasis valve in this
12 patent, depending on the size of the valve itself
13 and the, yeah, size of the rope or ribbon, for
14 instance.
15 BY MR. HAMILTON:
16 Q. And so for any size of any of those things, one
17 of skill in the art could select the proper materials
18 and the proper form of any of those forms to make it
19 sufficiently flexible to be wrapped around a lumen;
20 isn't that right?
21 MR. STOWELL: Objection. Outside the
22 scope.
23 THE WITNESS: Can you ask the question
24 again?
25 BY MR. HAMILTON:

131

1 Q. So one skilled in the art could select the
2 proper material from any of this list of materials and
3 the proper form from any of these forms identified here
4 in this section on column 9 that we're just discussing
5 and create a filament that is sufficiently flexible to
6 be wrapped around a lumen of any size for a hemostasis
7 valve; isn't that correct?
8 MR. STOWELL: Objection. Form.
9 THE WITNESS: Not lumen of any size. It
10 depends on the size you're trying to wrap around.
11 BY MR. HAMILTON:
12 Q. So I said a size of the hemo- -- to be used in a
13 hemostasis valve. Does that tell you a range of sizes?
14 **A. If it's a size in a hemostasis valve as being**
15 **discussed here, yes.**
16 Q. And for those sizes, one skilled in the art
17 could construct a filament out of any of those
18 materials, in any of those forms -- threads, lines,
19 cords, rope, ribbon, flat wire, sheet or tape -- that
20 would be sufficiently flexible to loop around a lumen in
21 a hemostasis valve; isn't that correct?
22 **A. As long as other elements, like the tube itself**
23 **and the springs to actuate the filament, were part of**
24 **the design process, then, I think, yes.**
25 Q. So the fact that the filament is made from any

132

1 of the materials identified in this section we just
2 discussed in column 9 or any of the forms set forth in
3 this section in column 9 doesn't tell one of skill in
4 the art how flexible or rigid the filament is, does it?
5 MR. STOWELL: Objection. Misstates
6 testimony.
7 THE WITNESS: I think that's what I said
8 earlier, that you would need to know more details
9 about the material and the dimensions and the
10 construction of those materials to be able to
11 quantify or compare relative flexibility of one
12 element versus another.
13 BY MR. HAMILTON:
14 Q. Will you turn to column 11.
15 **A. (Complying.)**
16 Q. Line 42. If you want to read that paragraph,
17 I'm going to ask you a question about the word "circum-"
18 -- "circumferentially" on line 42.
19 **A. Line 42?**
20 Q. Yes.
21 **A. Column 12?**
22 Q. Column 11.
23 **A. Column 11. Sorry.**
24 **Okay.**
25 Q. What does the word "circumferentially" mean in

133

1 that sentence?
2 MR. STOWELL: Objection. Outside the
3 scope.
4 THE WITNESS: Well, they're applying an
5 adhesive to the elongate member to attach it
6 completely around to the reinforcement structure
7 320.
8 BY MR. HAMILTON:
9 Q. So the adhesive is applied circumferentially; is
10 that right?
11 **A. That's what I'm reading here. "The adhesive can**
12 **be applied circumferentially to the reinforcement**
13 **structure and/or elongate member in an adhesive ring**
14 **that can have a length of" such and such.**
15 Q. So does that mean the term "circumferentially"
16 means completely around?
17 **A. That's what it means in this description for**
18 **applying an adhesive to attach two components together.**
19 Q. That's what the word "circumferentially" means
20 in that description; is that right?
21 **A. That's what I said.**
22 Q. If you could turn to column 2.
23 **A. (Complying.)**
24 Q. The first line in column 2, "constrict, collapse
25 and/or seal." And what I am going to ask you is, what

134

1 do those words mean?
2 **A. Okay.**
3 Q. What does constrict mean in that statement?
4 MR. STOWELL: Objection. Outside the
5 scope.
6 THE WITNESS: Well, as it says, "the
7 filament interacts and the tu-" -- "tubular member
8 to constrict the tubular member via manipulation of
9 the tensioning mechanism." So it's compressing,
10 constricting the sealing member or tubular member.
11 BY MR. HAMILTON:
12 Q. So you said compress, constricting. Is there a
13 difference between compressing and constricting?
14 **A. I don't know.**
15 Q. Can one compress something without constricting
16 it?
17 MR. STOWELL: Objection. Outside the
18 scope.
19 THE WITNESS: I think in this design you
20 could partially compress it and it doesn't fully
21 constrict in order to fully seal the tubular
22 member.
23 BY MR. HAMILTON:
24 Q. So does constrict mean fully seal?
25 MR. STOWELL: Out- -- objection. Outside

135

1 the scope.
2 THE WITNESS: I think here they're using
3 it as a verb, to constrict and/or seal the tubular
4 member.
5 BY MR. HAMILTON:
6 Q. So does constrict mean fully seal?
7 MR. STOWELL: Objection. Asked and
8 answered.
9 THE WITNESS: I think you can constrict
10 something, you can compress something without fully
11 sealing. But the purpose of this filament is to
12 seal the tubular member.
13 BY MR. HAMILTON:
14 Q. Does constrict mean to apply -- to apply a force
15 around the outside of something to constrict it? Is
16 that a fair definition of constrict?
17 MR. STOWELL: Objection. Outside the
18 scope.
19 THE WITNESS: I think the way it's
20 written here for this purpose, it's discussing
21 constricting the outside of the tubular member.
22 BY MR. HAMILTON:
23 Q. And when you're constricting the outside of the
24 tubular member, what direction is the force applied?
25 MR. STOWELL: Objection. Outside the

136

1 scope.
2 THE WITNESS: I haven't really thought
3 about it.
4 BY MR. HAMILTON:
5 Q. Can you think about it now?
6 **A. Yes.**
7 Q. Will you?
8 MR. STOWELL: Objection. Outside the
9 scope.
10 THE WITNESS: The force is being applied
11 from the outside in order to collapse or constrict
12 the tubular member.
13 BY MR. HAMILTON:
14 Q. So would it be fair to say that to constrict a
15 tubular member, you would apply a force in the direction
16 of the diameter of the tubular member, from the outside,
17 towards the center?
18 MR. STOWELL: Objection. Outside the
19 scope. Form.
20 THE WITNESS: Well, not necessarily. It
21 depends on how it's constricting.
22 BY MR. HAMILTON:
23 Q. What -- what ways can it constrict?
24 **A. If the constriction were occurring by Figure 6,**
25 **then it would be constricting around the circumference,**

137

1 **towards the center.**
2 Q. So in the example you just gave, Figure 6, that
3 would be the -- the filament is applying a force that is
4 constricting in the direction of the diameter of the
5 lumen, correct, towards -- from the outside, towards the
6 center?
7 MR. STOWELL: Objection. Vague. Outside
8 the scope.
9 THE WITNESS: Well, it's constricting
10 from the outside towards the middle, yeah.
11 BY MR. HAMILTON:
12 Q. So the direction of the force applied is along
13 the diameter of the lumen or whatever is encircled;
14 isn't that correct?
15 MR. STOWELL: Objection. Form.
16 THE WITNESS: Well, in Figure 6 the force
17 is being applied to the first end and second end of
18 the filament.
19 BY MR. HAMILTON:
20 Q. And applying a force to the first end and second
21 end of the filament causes the filament to shrink in
22 diameter, doesn't it?
23 MR. STOWELL: Objection. Form.
24 THE WITNESS: It's changing diameter to
25 collapse the tu- -- the tubular member in order to

138

1 create a seal.
2 BY MR. HAMILTON:
3 Q. It's not getting a larger diameter, is it? It's
4 getting a smaller diameter and is shrinking in diameter,
5 correct?
6 **A. Shrinking in its circumference. I'm not sure it**
7 **would be a diameter -- a true circle, but...**
8 Q. So shrinking in its circumference?
9 **A. Yes.**
10 Q. So in Figure 6 the force that's being applied by
11 the filament to whatever's -- the filament is looped
12 around -- so we'll say a lumen -- that force is along
13 the diameter of the lumen; isn't that correct?
14 MR. STOWELL: Objection. Asked and
15 answered. Form.
16 THE WITNESS: I think I've said it's
17 constricting the diameter and the forces are
18 applied towards the center.
19 BY MR. HAMILTON:
20 Q. Do the terms "compress" and "constrict" --
21 withdraw that.
22 Is there a difference between the terms
23 "compress" and "constrict" as used in the '011 Patent?
24 **A. I haven't evaluated that in my disclosure. I**
25 **haven't looked in detail for where the -- those two**

139

1 **words are used and if they're used in the same way.**
2 Q. In your experience in the medical field, do you
3 have an understanding what those two words mean, if
4 they're different or the same?
5 **A. I think in the medical field I could think of**
6 **examples where you could compress someone's artery,**
7 **let's say, but not constrict. So I can take my pulse;**
8 **I'm not necessarily constricting the vein, but I'm**
9 **compressing it.**
10 Q. So the -- when you say you're compressing it,
11 the vein is -- the cross-section of the vein is getting
12 smaller or not?
13 MR. STOWELL: Objection. Form.
14 THE WITNESS: It's flattening.
15 BY MR. HAMILTON:
16 Q. Changing shape?
17 **A. Changing shape.**
18 Q. So the total area for the cross-section stays
19 the same in that example you just gave?
20 **A. I think when you have a circular tube with fluid**
21 **through it and you compress it to a, let's say,**
22 **elliptical shape, then the cross-sectional area does**
23 **change.**
24 Q. The total area or just the shape of the
25 cross-sectional area?

140

1 **A. The cross-sectional area of the tube decreases**
2 **as it's compressed.**
3 Q. So the -- the amount of blood that could flow
4 through that tube, would that also decrease, then?
5 **A. If I constrict my blood vessel, then it stops**
6 **the flow.**
7 Q. You -- we were just talking about compress, and
8 you said you could compress without constricting. I'm
9 just trying to figure out the difference between those
10 two terms.
11 So would constrict require reducing what -- the
12 amount of something that could flow through a vessel,
13 for example, versus compress would be just changing the
14 shape? Is that -- is that the difference?
15 MR. STOWELL: Objection. Form. Outside
16 the scope.
17 THE WITNESS: In the example I gave,
18 taking my pulse, I think that's true. For fluid
19 flow through pipes, there can be constrictions that
20 change the flow rates but don't completely stop the
21 flow through a pipe, let's say.
22 BY MR. HAMILTON:
23 Q. So a constriction doesn't have to completely
24 stop the flow, it just has to alter the potential flow
25 rate; is that right?

141

A. In a general sense, I think that's true.
Q. And maybe a -- maybe a -- if we're not talking in the context of flow rate, there's -- I don't know all the specifics, but there are differences depending on laminar flow, et cetera. But let's just say area that flow -- that flow could go through. It constricts the area of the tube, for example -- or a constriction of the area of the tube would lessen the total area of the tube; is that right?
MR. STOWELL: Objection. Form. Outside the scope.
THE WITNESS: Changes the -- it would change the cross-sectional area at that point.
BY MR. HAMILTON:
Q. If you could turn to column 22.
A. (Complying.)
Q. Let's look at line 24.
A. (Complying.)
Okay.
Q. So is it your position that the term "filament" as recited on line 24 -- so this is within Claim 1 of the '011 Patent -- can include one or more individual single continuous filaments?
A. Claim says "at least one filament," so I believe it could include more than one filament.

142

Q. So what does at least one filament mean to you?
A. One or more filaments.
Q. And that at least one filament -- let me -- let me -- let me -- let me withdraw that question.
So the claim recites "a constricting mechanism including at least one filament." You see that?
A. Yes.
Q. And at least one filament, to you, means one or more filaments; is that right?
A. Yes.
Q. And then the next line says "and an actuator coupled to the filament."
What does "the filament" referring to?
A. The at least one filament.
Q. So when the claim recites the filament, that refers to one of the one or more single continuous filaments; is that right?
MR. STOWELL: Objection. Misstates testimony. Calls for a legal conclusion.
THE WITNESS: Not necessarily.
BY MR. HAMILTON:
Q. It's referring to the at least one filament?
A. I believe when they use the term "filament," they are referring to the at least one filament.
Q. And does at least one filament mean a single

143

continuous member or does that include multiple single continuous members?
MR. STOWELL: Objection. Form.
THE WITNESS: I think, as it says, it includes at least one filament.
BY MR. HAMILTON:
Q. And can that at least one filament be satisfied by multiple single continuous members?
MR. STOWELL: Objection. Calls for a legal conclusion. Outside the scope.
THE WITNESS: Yeah, I'm not a lawyer. These are the claim terms, so that's --
BY MR. HAMILTON:
Q. I -- I don't want to confuse you. Let me see if I can make it easier.
So let's look at Figure 8, for example. If you -- if you want to go to Figure 8 and then just keep the claim there, because I want to compare the two.
A. I've got Figure 8 on my -- in my disclosure here too.
Q. And that -- when you say you're looking at Figure 8 in your disclosure, what page are you looking at?
A. Page 48.
Q. And there's a -- what you believe is a

144

reproduction of the Figure 8 from the '011 Patent; is that right?
A. Yes, with additional labels of first end of filament 700 on the left side, the second end of filament 702 on the right side.
Q. So is the -- is the two single individual members shown in Figure 8 -- we already discussed this earlier today -- 150-B and 150-A -- together, do those -- are those at least one filament or are each of those at least one filament?
MR. STOWELL: Objection. Form.
THE WITNESS: I believe together they form the filament.
BY MR. HAMILTON:
Q. Okay. And then is 150-A by itself at least one filament?
A. It is part of the plurality of filaments that are in this embodiment.
Q. Okay. So let's say that that language was interpreted to mean -- the at least one filament was interpreted to mean one single continuous member, so either one of 150-A or 150-B, okay. Are you with me?
A. It's a hypothetical.
Q. It is. It is a hypothetical. Do you understand the hypothetical?

145

A. I don't think it relates to what we're talking about here.
Q. Okay. But do you understand it?
A. Rephrase it, please.
Q. So the "at least one filament" as recited in Claim 1, let's say the board in this case construes that to mean one continuous member. Okay?
A. Hypothetically.
Q. Hypothetically, yes.
And then do you see "an actuator coupled to the filament" in the next line?
A. Yes.
Q. In that instance, that one continuous member would have to be coupled to an actuator, right?
MR. STOWELL: Objection. Outside the scope.
THE WITNESS: I haven't considered this hypothetical in my disclosure, so I really can't answer that.
BY MR. HAMILTON:
Q. What is "the filament" referring to?
MR. STOWELL: Objection. Asked and answered.
THE WITNESS: It's referring to the at least one filament in the line above.

146

BY MR. HAMILTON:
Q. Okay. And then in our hypothetical, we've said that at least one filament means a single continuous member. So if we substitute that into the filament, which it's referring to, then the actuator must be coupled to the single continuous member; is that right?
MR. STOWELL: Objection. Outside the scope.
THE WITNESS: I haven't considered that option.
BY MR. HAMILTON:
Q. What do you mean you haven't considered that option?
A. I haven't considered that hypothetical that you proposed.
Q. Are you having trouble understanding it?
A. I haven't considered it in my deposition.
Q. So I'm asking you to consider it now. Can you consider it now?
A. I can't consider it now.
Q. Okay. Let's -- let's do this maybe a little differently. If you could take a look at either Exhibit 1005 or 1008. Your choice. We're going to look at the figures. And we will just go to Figure 33.
A. (Complying.)

147

Figure 33?
Q. Yes.
Are you ready for the question?
A. Yes.
Q. So you see the actuating members 55 in Figure 33?
A. Yes.
Q. There's two actuating members, aren't there?
A. Yes.
Q. And each one of those actuating members is a single continuous piece, correct? A single continuous member; is that right?
MR. STOWELL: Objection. Form.
THE WITNESS: They are separate, you know, components that together comprise the filament in this case.
BY MR. HAMILTON:
Q. And each one of them is U-shaped, correct?
A. That's how they're described in the patent and shown here.
Q. And each one of them -- each one of those U-shaped actuating members has two ends, correct?
MR. STOWELL: Objection. Vague.
THE WITNESS: Taken on its own, each of the actuator members could be considered to have

148

two ends.
BY MR. HAMILTON:
Q. Do they have two ends? What do you mean, "could be considered"?
A. When it's assembled here, they're acting together as a -- more than one filament -- at least one filament.
Q. Okay. So let's take them each individually. Each individual actuating member here has two ends, right?
MR. STOWELL: Objection. Outside the scope. And vague.
THE WITNESS: They each have a -- they each have two ends if you consider the components separately.
BY MR. HAMILTON:
Q. Okay. So I'm going to ask you to consider them separately. The two ends of one of those actuating members -- each one has two ends. The two ends of one of them is attached to one actuating button, correct?
MR. STOWELL: Objection. Form. Outside the scope.
THE WITNESS: They are attached to the actuating button.
BY MR. HAMILTON:

149

1 Q. So both ends of a single actuating member is
2 attached to the same button; is that correct?
3 MR. STOWELL: Objection. Vague.
4 THE WITNESS: Yes.
5 BY MR. HAMILTON:
6 Q. And then for the other actuating member, the two
7 ends of that actuating member attach to a different --
8 are attached to a different button, correct?
9 **A. They are.**
10 Q. So this -- these two actuating members in Figure
11 33 -- I'll withdraw the question. Let me start that
12 over.
13 So Figure 33 does not disclose a single
14 one-piece member that attaches to two different buttons,
15 does it?
16 MR. STOWELL: Objection. Vague.
17 THE WITNESS: It shows two actuating
18 members 55 in Figure 33.
19 BY MR. HAMILTON:
20 Q. And each of those are attached to different
21 buttons. We just established that, right?
22 **A. Each of them is attached to a different button,**
23 **yes.**
24 Q. Figure 33 does not show a single continuous
25 member attached to both buttons, correct?

150

1 MR. STOWELL: Objection. Vague.
2 THE WITNESS: It shows two separate
3 members attached to each button.
4 BY MR. HAMILTON:
5 Q. Let's turn to Exhibit 1005. This is the Shafer
6 reference.
7 **A. (Complying.)**
8 Q. If you look at paragraph 82 on page 27 of
9 Exhibit 1005, you see the sentence, "The actuating
10 member 55 and the actuating button 261 is machined from
11 aluminum."
12 Do you see that?
13 **A. I see that it starts out by saying "in one**
14 **option is made from" -- that the -- "the stasis valve 10**
15 **in one option is made from machining preexisting amounts**
16 **of metals and/or plastics."**
17 Q. Okay. And then we're focusing on the next line:
18 "The actuating member 55 and the actuating button 261 is
19 machined from aluminum."
20 Do you see that?
21 **A. Yes.**
22 Q. What does that mean?
23 **A. That in an option, those members could be**
24 **machined from aluminum.**
25 Q. What does "machined from aluminum" mean?

151

1 **A. Generally, it would be machined from a piece --**
2 **piece of aluminum to create the part that you want.**
3 Q. And would that result in a rigid part?
4 MR. STOWELL: Objection. Vague.
5 THE WITNESS: It depends how -- it
6 depends what the dimensions are of the components
7 in question.
8 BY MR. HAMILTON:
9 Q. Are you familiar with machining aluminum?
10 **A. Somewhat. I'm not a machinist, but I've had**
11 **components made out of aluminum.**
12 Q. Would a person of skill in the art generally
13 create parts that are meant to be flexible from -- by
14 machining aluminum?
15 **A. Depends on how flexible it would need to be.**
16 Q. Let's say flexible enough to conform in the
17 Shafer patent to the shape of the lumen around which the
18 U-shaped member is placed.
19 MR. STOWELL: Objection. Vague.
20 THE WITNESS: Can you repeat the
21 question?
22 BY MR. HAMILTON:
23 Q. Let's say flexible enough to conform to the
24 shape of the lumen around which the U-shaped member is
25 placed.

152

1 MR. STOWELL: Same objection.
2 THE WITNESS: Difficult to say without
3 knowing the dimensions and how it was processed and
4 what type of aluminum it is. Aluminum can be quite
5 flexible. I have aluminum wire in my garage that's
6 quite flexible material.
7 BY MR. HAMILTON:
8 Q. And -- and is it your understanding that
9 aluminum wire can be made by machining aluminum?
10 **A. Typically it would not be.**
11 Q. I'm going to hand you what's been marked as
12 Exhibit 1011.
13 **A. Can I go back and add one thing to my last**
14 **answer?**
15 Q. Sure.
16 **A. I wanted to point to paragraph 81 that states**
17 **the actuating members and/or actuating button 261 in one**
18 **option includes aluminum, which means other materials**
19 **could be used, and aluminum is provided as an option.**
20 Q. So I'm looking at that statement, "the actuating
21 member 55 and the actuating button 261 is machined from
22 aluminum." I don't see "in one option." Where are you
23 getting "in one option"?
24 **A. It's in paragraph 81, the prior page. The first**
25 **line -- the second line says "in one option includes**

153

1 **aluminum."**
2 Q. And that line doesn't say how it's manufactured,
3 does it?
4 **A. I believe they just talk about material choices**
5 **here.**
6 Q. Material.
7 And then when you look at page 82 -- excuse me
8 -- paragraph 82, how it is manufactured is by machining,
9 correct?
10 MR. STOWELL: Objection. Form.
11 Misstates the document.
12 THE WITNESS: Well, once again, line --
13 paragraph 82 starts with "the stasis valve in one
14 option is made from machining preexisting amounts
15 of metal and/or plastics." So it's provided as an
16 option.
17 BY MR. HAMILTON:
18 Q. Does it give any other examples?
19 **A. Not that I recall.**
20 Q. In the next line, does it start with "in another
21 example"? You see that?
22 **A. Yes.**
23 Q. And in that other example, it's also machining,
24 isn't it?
25 **A. Machined from plastic.**

154

1 Q. Yeah. Different material, but machined. Those
2 are the two options set forth in paragraph 82, correct?
3 **A. Yes.**
4 Q. Are you aware of any other option set forth in
5 Exhibit 1005 for making the actuating members 55?
6 **A. I don't believe they provide other options, but**
7 **a person of ordinary skill in the art would know when**
8 **there would be multiple ways to manufacture these types**
9 **of components.**
10 Q. Okay. Is your previous answer complete now?
11 **A. Yes.**
12 Q. Great.
13 Now let's look at Exhibit 1011.
14 **A. (Complying.)**
15 Q. Do you recognize Exhibit 1011?
16 **A. Yes.**
17 Q. What is acute ischemic -- ischemic stroke?
18 Did I pronounce that right?
19 **A. Acute ischemic stroke is when a blood clot**
20 **blocks a vessel in the brain.**
21 Q. What does "acute" mean to that phrase?
22 **A. That it occurs relatively quickly. The symptoms**
23 **occur relatively quickly.**
24 Q. Does that -- does that indicate one way or
25 another whether treatment is required quickly or not?

155

1 **A. I think every stroke is probably considered**
2 **important to treat as quickly as possible.**
3 Q. What does "ischemic" mean in that statement?
4 **A. I'm not a doctor, but I believe it means causing**
5 **ischemia or lack of blood flow to certain tissues.**
6 Q. What -- any particular tissues?
7 **A. With regard to stroke, it's related to brain**
8 **tissue.**
9 Q. So ischemia could be lack of blood flow to any
10 tissue, and stroke tells you that it -- that -- that
11 this statement is referring to brain tissue; is that
12 right?
13 **A. Yes. You can have ischemia in your legs and**
14 **other places.**
15 Q. If you could take a look at paragraph 7. And
16 that's on page 38 of the document.
17 **A. (Complying.)**
18 Q. And if you want to look at it for a minute, take
19 your time. My question is going to be, what does --
20 what -- what does cerebral and intracranial art- --
21 arteries mean?
22 **A. Refers to arteries that provide blood flow to**
23 **the brain.**
24 Q. What does relatively short transcartoid --
25 excuse me -- transcarotid --

156

1 **A. Carotid. Carotid.**
2 Q. Carotid. Thank you.
3 **A. Sorry to interrupt.**
4 Q. Access to the -- what does relatively short
5 transcarotid access mean?
6 MR. STOWELL: Objection. Outside the
7 scope.
8 THE WITNESS: So it's not -- this is not
9 related to things I covered in the disclosure, so
10 I'm not sure I can talk about this in great detail.
11 BY MR. HAMILTON:
12 Q. You reviewed this Garrison reference in relation
13 to your declaration, didn't you?
14 **A. I have.**
15 Q. Do you have an understanding of what that term
16 means as you sit here today?
17 **A. Transcarotid access means putting an access**
18 **sheath in the carotid artery.**
19 Q. What does -- what does the "relatively short"
20 part of it mean?
21 **A. You're not very far from the brain.**
22 Q. If you could take a look at -- well, no.
23 Actually, before we do that, let's look at Figure --
24 Figures 2 and 3 on page 3.
25 **A. (Complying.)**

157

1 Q. Do you understand what's depicted in Figures 2
2 and 3?
3 **A. Yes.**
4 Q. Is that depicting transcarotid access into a
5 patient?
6 **A. Yes. It appears to be access into the common**
7 **carotid artery, labeled CCA.**
8 Q. And then do you see item 10 in those two
9 figures? It's up at the top.
10 **A. Yes.**
11 Q. What is item 10? Do you have an understanding
12 of what that is?
13 **A. I'd have to look in more detail how they**
14 **describe it, but in my own words, I believe it's the**
15 **thrombotic material that is attempted to be treated,**
16 **removed.**
17 Q. Would -- would that be an occlusion?
18 **A. Occlusion to me implies complete occlusion.**
19 **Sometimes that could be a partial occlusion and cause**
20 **symptoms.**
21 Q. And where is that item 10 located in those
22 Figures 1 and 2 -- excuse me -- 2 and 3?
23 MR. STOWELL: Objection. Outside the
24 scope.
25 THE WITNESS: One of the arteries in the

158

1 brain.
2 BY MR. HAMILTON:
3 Q. Would that be a part of the cerebral
4 vasculature?
5 **A. Cerebral or intracranial.**
6 Q. Okay. So that item 10 is -- is in the cerebral
7 or intracranial vasculature; is that right?
8 **A. I'd have to look at the patent in more detail if**
9 **we want to go into detail of the nomenclature that is**
10 **used in the location of the -- for Figure 3.**
11 Q. Is -- is that somewhere near the brain? Is that
12 what that is? Is that reasonable?
13 **A. Within the brain.**
14 Q. Within the brain. Okay.
15 And -- and your -- your issue in not answering
16 the previous question is what does cerebral or
17 intracranial vasculature mean -- vasculature mean? Was
18 that -- was that the problem with my previous question?
19 MR. STOWELL: Objection. Form.
20 THE WITNESS: Yeah. I'm just not sure of
21 the anatomy that they're showing here.
22 BY MR. HAMILTON:
23 Q. But you are sure it's somewhere in the brain?
24 **A. Occlusions can occur before it gets to the**
25 **brain, but I think this depiction is in the brain.**

159

1 Q. If you could take a look at page 39, paragraph
2 42.
3 **A. (Complying.)**
4 Q. First line of paragraph 42: "Interventions in
5 the cerebral or intracranial vasculature often have
6 special access challenges."
7 Do you understand what that means?
8 **A. Yes.**
9 Q. And what does that mean?
10 **A. That it can be difficult to access the more**
11 **distal vessels because of tortuosity and small diameters**
12 **of the vessels in those locations.**
13 Q. Do you have an understanding for what size
14 catheter would be used for interventions in cerebral or
15 intracranial vasculature?
16 **A. I'd have to look through the patent to see what**
17 **they -- what they describe.**
18 Q. Would you use a 24 French catheter?
19 MR. STOWELL: Objection. Outside the
20 scope.
21 THE WITNESS: To get to the cerebral or
22 intracranial vascular, no. That's much too big.
23 BY MR. HAMILTON:
24 Q. I'll just point you to paragraph 63. This might
25 be helpful. In paragraph 63 they mention 6 French and 8

160

1 French. Is that consistent with your understanding of
2 what size catheters would be used in interventions in
3 the cerebral or intracranial vasculature?
4 **A. Because it does not relate to the hemostasis**
5 **valve, I haven't looked at it in great detail. It seems**
6 **like a reasonable size for the vessel size, in my**
7 **opinion.**
8 Q. And we can go to the -- the paragraph just above
9 that, 62. And I'm going to want to ask you about --
10 about middle of the page, there's a sentence that begins
11 "the hemostasis valve 226 can be," and it lists a couple
12 things. And I want to ask you what those things are.
13 **A. Yes.**
14 Q. What's a static seal-type passive valve?
15 And to be clear, the sentence begins "the
16 hemostasis valve can be," and then it describes this.
17 So in the context of a hemostasis valve, what's a static
18 seal-type passive valve?
19 MR. STOWELL: Objection. Outside the
20 scope.
21 THE WITNESS: I would say a static
22 seal-type passive valve is a very commonly used,
23 readily available valve that's used on many
24 introducer sheaths. It has a rubber material or
25 other elastomeric material, possibly with a slit

161

1 through it, so that seals around the devices, but
2 through it with or without a device in it.
3 BY MR. HAMILTON:
4 Q. And is that your understanding, that it's called
5 static because it seals without intervention by a user,
6 as we discussed the term "static" earlier today?
7 **A. Yes. There is no rotating or pinching required**
8 **to open or close the valve.**
9 Q. Sorry. I said static. I meant passive. It's a
10 passive valve, no opening and closing?
11 **A. Yeah, passive valve wouldn't require any**
12 **movement by the operator to open or close the valve.**
13 Q. What does the static part mean? Do you know?
14 **A. I think it's just description of a passive**
15 **sealing valve.**
16 Q. Okay. Let's talk about the next one,
17 "adjustable opening valve, such as a Tuohy Borst valve."
18 What's a Tuohy Borst valve?
19 **A. It's a rotating hemostatic valve where the**
20 **physician would rotate counterclockwise to open the seal**
21 **and insert or remove devices, and then rotate clockwise**
22 **to reseal against the devices or close the valve,**
23 **whether there was a device inside or not.**
24 Q. And then what about rotating hemostasis valve,
25 RHV; what is that?

162

1 **A. In my experience, that's the same as a Tuohy**
2 **Borst valve. Tuohy Borst was just a trade name for one**
3 **of the companies.**
4 Q. So then that would be a Tuohy Borst valve made
5 by somebody else; is that -- I'll withdraw the question.
6 **A. To me, they're the same thing.**
7 Q. Okay. I don't want you to say that someone is
8 infringing somebody else's something.
9 If you could turn to paragraph 45.
10 **A. (Complying.)**
11 **Exhibit 1101 still?**
12 Q. Yes.
13 And what I'm going to want to ask you is the
14 last sentence, unfortunately. And I want to understand
15 what delicate anatomy and access challenges mean, and
16 the need for rapid intervention means.
17 MR. STOWELL: Objection. There is not a
18 question pending. Objection. Outside the scope.
19 THE WITNESS: Okay.
20 BY MR. HAMILTON:
21 Q. Why don't we start --
22 **A. Okay.**
23 Q. Why don't we start with delicate anatomy. What
24 does that mean with respect to treatment of acute
25 ischemic stroke?

163

1 MR. STOWELL: Objection. Outside the
2 scope.
3 THE WITNESS: I haven't really considered
4 that for this declaration.
5 BY MR. HAMILTON:
6 Q. Do you understand what it means?
7 **A. I have an understanding.**
8 Q. And what is that understanding?
9 **A. As you get farther and farther into the**
10 **vasculature, the vessels become thinner and smaller and**
11 **more difficult to access and more prone to injury.**
12 Q. So would it be fair to say the -- it's more
13 delicate and prone to perforation?
14 **A. I think perforation could occur, among other**
15 **complications, I believe.**
16 Q. And other complications meaning other injuries,
17 not necessarily perforation but -- is that right?
18 **A. Dissection, I think, can occur.**
19 Q. Okay. The next phrase, "access challenges," do
20 you have an understanding what that means with respect
21 to treatment of acute ischemic stroke?
22 MR. STOWELL: Objection. Outside the
23 scope.
24 THE WITNESS: Yeah, I haven't considered
25 that in the declaration because it's not relevant

164

1 to the hemostasis valve in the declaration.
2 BY MR. HAMILTON:
3 Q. Do you have an understanding of what that means
4 in that sentence? "Access challenges."
5 MR. STOWELL: Same objection.
6 THE WITNESS: As I said earlier, the
7 vasculature gets small in diameter and can be quite
8 tortuous as you get farther and deeper into the
9 anatomy, which -- which would provide challenges to
10 access.
11 BY MR. HAMILTON:
12 Q. And then what about the need for rapid
13 intervention? What does that mean with respect to
14 treatment of acute ischemic stroke?
15 MR. STOWELL: Objection. Outside the
16 scope.
17 THE WITNESS: What this whole paragraph
18 is saying is that there are cerebral protection
19 devices -- filters, let's say -- that are used for
20 carotid artery surgery, but in cases of stroke,
21 they typically do not use those types of systems.
22 BY MR. HAMILTON:
23 Q. And then this last sentence, unfortunately,
24 explains some of the reasons why those aren't used,
25 correct?

165

1 **A. Right. Partly for the delicate anatomy and need**
2 **to go quickly, they may not take the time or have the**
3 **right filter devices to use.**
4 Q. And so need to go quick quickly, that's need for
5 rapid intervention; is that right?
6 **A. Yes.**
7 Q. And why is there a need for rapid intervention
8 in treatment of acute ischemic stroke?
9 **A. I think the neurointerventional radiologists say**
10 **time is brain.**
11 Q. Does that mean the longer you wait to -- to
12 provide intervention, the more brain injury can occur?
13 **A. The higher risk for complications from the**
14 **stroke.**
15 Q. So for treatment of acute ischemic stroke, you
16 want to do it as quickly as possible; is that right?
17 MR. STOWELL: Objection. Form.
18 THE WITNESS: My understanding is that
19 most treatment is still drug delivery to the site,
20 but that too should start as quickly as possible.
21 Whether it's drug delivery or they use an
22 interventional procedure as disclosed in this
23 patent, it's certainly good to do things quickly.
24 BY MR. HAMILTON:
25 Q. Okay. If you could -- have I given you Exhibit

166

1 1006? Do you have that over there? That is Hartley.
2 **A. I don't believe so.**
3 Q. If you can find that.
4 MR. HAMILTON: How long have we been
5 going?
6 THE WITNESS: I could use a break if
7 you're switching --
8 MR. HAMILTON: We're switching. That
9 would be -- that would be just fine.
10 THE VIDEOGRAPHER: We're going off the
11 record at 1449.
12 (Recess.)
13 THE VIDEOGRAPHER: We are back on the
14 record at 1459.
15 BY MR. HAMILTON:
16 Q. Do you understand you're still under oath?
17 **A. Yes.**
18 Q. Did you discuss your testimony today with
19 anybody during the break?
20 **A. No.**
21 Q. Look at any documents?
22 **A. No.**
23 Q. So I know I had said I was going to move to
24 something else, but let's just go back. A couple more
25 questions on 1011. That's the Garrison reference. And

167

1 if we could look at paragraph 62, the sentence that
2 identified the valves, the hemostasis valves.
3 **A. Yes.**
4 Q. So this first static seal-type passive valve,
5 are there any advantages to using that type of valve in
6 treating acute ischemic stroke?
7 MR. STOWELL: Objection. Outside the
8 scope.
9 THE WITNESS: Yeah, I don't know. I
10 haven't considered that.
11 BY MR. HAMILTON:
12 Q. What about a Tuohy Borst valve? Any advantages
13 or disadvantages in using that valve to treat acute
14 ischemic stroke?
15 MR. STOWELL: Same objection.
16 THE WITNESS: I haven't considered that
17 question for the deposition -- or the declaration.
18 BY MR. HAMILTON:
19 Q. Are you able to answer the question?
20 **A. I haven't really thought about it. No.**
21 Q. Does that mean, as you sit here today, you can't
22 answer the question?
23 **A. It's not obvious to me that there are any**
24 **advantages or disadvantages because they work very**
25 **similarly, with a simple one-handed operation.**

168

1 Q. Okay. You can set that aside.
2 **A. (Complying.)**
3 Q. I had promised Hartley, 1006.
4 **A. Thank you.**
5 Q. Do you recognize Exhibit 1006?
6 **A. Yes.**
7 Q. Is this the Hartley referred to in your
8 declaration?
9 **A. Yes.**
10 Q. If you could turn to Figure 1.
11 **A. (Complying.)**
12 Q. Do you understand what's depicted in Figure 1?
13 **A. Yes.**
14 Q. What is item 4 in that figure?
15 **A. "Catheter body" is how they describe it in the**
16 **patent.**
17 Q. So would that be the end of the catheter?
18 **A. Yes.**
19 Q. And does that connect to the valve shown in
20 Figure 1?
21 **A. Yes.**
22 Q. How is it connected?
23 MR. STOWELL: Objection. Vague.
24 THE WITNESS: I'm not sure without
25 looking in more detail at the patent, but there are

169

1 many ways to connect a catheter tube, catheter
2 body, to a valve.
3 BY MR. HAMILTON:
4 Q. Does the -- the image in Figure 1 depict any
5 particular way to connect a catheter to a valve? Do you
6 recognize it?
7 **A. It appears to be an outwardly extending radial**
8 **flange which is clamped against the end of the catheter**
9 **by means of the cylindrical housing 6.**
10 Q. Is that a common way to connect catheters in the
11 field?
12 MR. STOWELL: Objection. Vague.
13 THE WITNESS: I think it's one of many
14 ways to connect catheters to other components.
15 BY MR. HAMILTON:
16 Q. Is there -- is there a common way to connect
17 catheters to other components? And by "other
18 components," let's just -- let's not say other
19 components. Let's just say hemostasis valves.
20 **A. It depends on the designs. I think they are**
21 **frequently built in together, and I've also worked on**
22 **designs where we purchased a hemostasis valve with a**
23 **luer connection that attached to the component we were**
24 **designing.**
25 Q. What's a luer connection?

170

1 **A. It's a standard medical connection to connect**
2 **plastic parts usually -- plastic or metal parts.**
3 Q. And is it -- is it a well-understood type of
4 connection with respect to, for example, catheters and
5 hemostasis valves?
6 **A. I would say it's very well understood and very**
7 **commonly used for syringes, all types of components that**
8 **are being connected by the physician.**
9 Q. And that Figure 1 we just discussed, does that
10 appear to be a luer connection?
11 **A. In Figure 1?**
12 Q. Uh-huh.
13 **A. No, I don't think it was described as a luer**
14 **connection.**
15 Q. Okay. If you could turn over to Figures 3 and
16 4.
17 **A. (Complying.)**
18 Q. And let's -- let's focus on Figure 3 first. Do
19 you see item 36 in Figure 3?
20 **A. Yes.**
21 Q. What is -- what is -- what is 36?
22 **A. I believe they call it a detent.**
23 Q. And what is the purpose of the detents in Figure
24 3 -- let's say the purpose -- purpose of item 36 -- the
25 two item 36s in Figure 3?

171

1 **A. Paragraph 33 at the end says "the rotary**
2 **actuator may be rotated in either direction to cause**
3 **constriction of the constriction valve, and the detents**
4 **provide tactile feel, the action of the valve."**
5 Q. So what does that mean, "provide tactile feel,
6 the action of the valve"?
7 **A. I believe that's so the physician knows whether**
8 **he's going one click in the open direction or one click**
9 **in the closed direction in that example, because there**
10 **are two detents.**
11 Q. And let's -- let's -- if you compare Figures 3
12 and 4, there's actually three detents. It's just you
13 can't see one in Figure 3, but you can see it in Figure
14 4; isn't that right?
15 **A. Yes. In Figure 3 the detent is not labeled**
16 **because the component 28 is within the detent.**
17 Q. And you said the detents provide tactile feel,
18 the action of the valve?
19 **A. That's how it's written here. Written poorly,**
20 **but that's how it's written.**
21 Q. Probably meant tactile feel for the action of
22 the valve; is that fair?
23 **A. Yes.**
24 Q. Or of the action of the valve?
25 **A. Yes.**

172

1 Q. And does that mean how far the valve is closed
2 in one direction or open in the other direction?
3 **A. That's how I understand the patent.**
4 Q. Can the detents be used to hold the valve in a
5 particular configuration; so a particular size opening,
6 for example?
7 **A. So I do think the detents could provide stops**
8 **and hold it in position, depending on the size of the**
9 **detents, the strength of the spring, the amount of**
10 **resistance that it is trying to overcome.**
11 Q. Excuse me.
12 Does Hartley include a single rotary actuator?
13 **A. Yes. They discuss a rotary actuator 12. It's a**
14 **-- one component.**
15 Q. Did you do any preparation for your depo today?
16 **A. Today, no.**
17 Q. Did you do any prepara- -- preparation at any
18 time for the deposition that is occurring today?
19 **A. Yes.**
20 Q. And when did you prepare?
21 **A. Yesterday and the day before.**
22 Q. And what did you do in that preparation?
23 **A. I reviewed documents on my own. I met with**
24 **counsel part of yesterday.**
25 Q. Other than part of yesterday, did you meet with

173

1 anybody else?
2 **A. I did not.**
3 Q. And part of yesterday, you said you met with
4 counsel. Who did you meet with?
5 **A. Josh. And Lizzie was there too.**
6 Q. Anybody else?
7 **A. No.**
8 Q. Other than those two days, did you do any other
9 preparation for this deposition?
10 **A. I'd have to look back at my time sheet. There**
11 **might have been a couple hours before that, earlier in**
12 **the week.**
13 Q. And you said you reviewed documents in
14 preparation for your deposition today?
15 **A. I did not review them today.**
16 Q. Let me rephrase it.
17 You said you reviewed documents in preparation
18 for your deposition; is that correct?
19 **A. I did.**
20 Q. What documents did you review?
21 **A. My declaration, some of the other exhibits.**
22 Q. Do you recall any specific exhibits?
23 **A. Probably most of them on the exhibit list.**
24 Q. Did you review anything that's not on the
25 exhibit list in preparation for your deposition?

174

1 **A. No.**
2 Q. Do you consider yourself a professional expert?
3 **A. I'm not sure what the definition would be of**
4 **professional expert.**
5 Q. What does professional expert mean to you?
6 **A. I don't know.**
7 Q. It doesn't have any meaning to you?
8 MR. STOWELL: Objection. Asked and
9 answered.
10 THE WITNESS: I don't know if there's a
11 legal generally accepted term. I'm not familiar
12 with professional expert.
13 BY MR. HAMILTON:
14 Q. Do you derive money acting as an expert?
15 **A. This is my first experience as an expert**
16 **witness.**
17 Q. And when you say "this," you mean this IPR?
18 **A. I think this was the first IPR, and there was**
19 **some work after that with Knobbe Martens.**
20 Q. So you've been retained in connection with this
21 IPR and related IPRs and related litigation; is that
22 correct?
23 **A. Yes.**
24 Q. And that's the only matter in which you've acted
25 as an expert; is that correct?

175

1 **A. Yes.**
2 Q. Have you ever act -- acted as an expert for any
3 other litigation?
4 **A. No.**
5 Q. Who first contacted you to be an expert in this
6 matter?
7 **A. I'm not sure.**
8 Q. Was it a lawyer?
9 **A. It was a lawyer for Knobbe Martens.**
10 Q. Have you ever been retained by Knobbe prior to
11 this, let's say, collection of matters that are all
12 related?
13 **A. No.**
14 Q. Does Knobbe pay you for your work on this
15 matter?
16 **A. I am reimbursed for my time, yes.**
17 Q. And who writes those checks?
18 **A. Knobbe Martens.**
19 Q. Do you ever receive any payment from Imperative?
20 **A. I have not.**
21 Q. Have you ever consulted for Imperative?
22 **A. I have not.**
23 Q. When did you first hear of Imperative?
24 **A. Many years ago.**
25 Q. And how did you come to hear of Imperative?

176

1 **A. I know some people that work there.**
2 Q. Did you ever work with Imperative or those
3 people?
4 **A. I never worked with Imperative.**
5 Q. But you've worked with those people who went to
6 Imperative after you worked with them or before?
7 MR. STOWELL: Objection. Form.
8 THE WITNESS: There are a couple of
9 people at or that were at Imperative that I used to
10 work with at former companies.
11 BY MR. HAMILTON:
12 Q. Are you friends with those individuals?
13 **A. Not particularly.**
14 Q. Have you stayed in touch with those individuals
15 since working with them?
16 **A. Not closely.**
17 Q. And when you say "not closely," what does that
18 mean? Not on an annual basis?
19 **A. Not annually either.**
20 Q. When did you first hear of Inari Medical?
21 **A. Some years ago.**
22 Q. And how did you first hear about Inari Medical?
23 **A. When I was working for Abbott Ventures, the**
24 **venture capital part of Abbott Vascular, we met with**
25 **some of the folks at the incubator company that started**

177

1 **Inari.**
2 Q. Do you recall what year that was?
3 **A. I don't.**
4 Q. Do you know or have -- have you ever met any
5 inventor of the '011 Patent? That's the patent at issue
6 for Inari in this case.
7 **A. Paul Lubock, I have met.**
8 Q. And how do you meet Paul Lubock?
9 **A. During the meetings with -- when I was with**
10 **Abbott Ventures.**
11 Q. And about what year was that?
12 MR. STOWELL: Objection. Asked and
13 answered.
14 THE WITNESS: I can look at my resume to
15 confirm. Oh, it's in -- it's an attachment. It's
16 an exhibit there.
17 BY MR. HAMILTON:
18 Q. It may be.
19 **A. Exhibit 1004.**
20 Q. So I'm going to hand you what's been previously
21 marked Exhibit 1004.
22 (Tendered.)
23 **A. So between June 2012 and December 2014, I was**
24 **working as a program director at Abbott Ventures, so it**
25 **probably would have been during that time when I met**

178

1 **with Paul's incubator company, whose name escapes me.**
2 Q. And that name -- that company was not Inari;
3 it's a different company?
4 **A. It's a different company. I believe they spun**
5 **off Inari as its own company.**
6 Q. Did you meet Benjamin Merritt or John Thress?
7 **A. I don't remember meeting those people, no.**
8 Q. Have you ever worked with, for or against Inari
9 Medical in any capacity?
10 **A. I have not.**
11 Q. When were you first retained in this collection
12 of matters?
13 **A. I don't recall exactly.**
14 Q. Do you recall roughly?
15 **A. This was executed -- "this" meaning the**
16 **declaration -- on July 8, 2024, so it was likely a**
17 **number of months before that date.**
18 Q. Six months?
19 **A. Could have been around that time frame. I don't**
20 **remember.**
21 Q. Do you know how many hours you have spent on
22 this particular IPR?
23 **A. I do not.**
24 Q. Do you have a rough estimate?
25 **A. I do not. This was nine or ten months ago now.**

179

1 **I don't remember.**
2 Q. Do you recall how many hours you spent preparing
3 your declaration?
4 **A. That's what I was referring to.**
5 Q. So you don't recall how many hours you spent
6 preparing your declaration. Was it more than 100?
7 **A. Less.**
8 Q. More than 50?
9 **A. Less.**
10 Q. More than 25?
11 **A. Probably.**
12 Q. Did you write the declaration?
13 **A. I worked with counsel to write, edit, and modify**
14 **it over the period we were working on it.**
15 Q. In preparation of your declaration, did you meet
16 with, speak with, or otherwise communicate with anybody
17 at Imperative?
18 **A. I did not.**
19 Q. Did you meet with, speak with, or otherwise
20 communicate with anybody other than lawyers at Knobbe
21 Martens?
22 **A. No.**
23 Q. If you want to grab your declaration, let's go
24 back to -- I believe it's paragraph 35.
25 **A. (Complying.)**

180

1 Q. And this paragraph identifies the qualifications
2 of someone of ordinary skill in the art, correct? Do
3 you remember discussing that this morning?
4 **A. Yes.**
5 Q. What I want to understand is, what does two to
6 four years of product design or engineering experience
7 mean?
8 **A. Two to four years of designing products or**
9 **working as an engineer in some other capacity.**
10 Q. Is that designing any products?
11 **A. I've certainly hired engineers that came from**
12 **other fields besides medical devices.**
13 Q. Would you consider a person of ordinary skill in
14 the art to be someone who has no experience designing
15 hemostasis valves?
16 **A. Yes. I don't think you would have to have**
17 **experience designing hemostasis valves in order to**
18 **design one, if you had mechanical engineering or related**
19 **engineering experience.**
20 Q. What about medical experience at all; not just
21 hemostasis valves, but any experience designing medical
22 devices? Would a person of ordinary skill in the art
23 need to have some sort of experience designing medical
24 devices?
25 **A. Not necessarily.**

181

1 Q. If you can go to paragraph 21 of your
2 declaration.
3 **A. (Complying.)**
4 Q. And in that first sentence, you say someone may
5 redefine a claim term. What do you mean by "redefine"?
6 **A. Meaning to define a claim term to have a meaning**
7 **that is different from the plain and ordinary meaning.**
8 Q. And when you say "plain and ordinary meaning" in
9 that sentence you just used, what did you mean?
10 **A. I meant the plain and ordinary meaning that**
11 **would be generally understood.**
12 Q. And generally understood by a person of ordinary
13 skill in the art or anybody?
14 **A. Yeah, I'm not sure.**
15 Q. And let's go to the 1001 exhibit. That's the
16 '011 Patent.
17 **A. Uh-huh.**
18 Q. And I want you to turn to column 22. That's on
19 the second-to-last page.
20 I want to talk about Claim 1 a little bit.
21 **A. (Complying.)**
22 **Column 17?**
23 Q. Column 22.
24 **A. Claim 1? Oh.**
25 Q. In preparing your declaration, you came to an

182

1 understanding of what Claim 1 means, didn't you?
2 **A. Yes.**
3 Q. You see a couple lines down from the beginning
4 of Claim 1, so line 24, "an actuator"?
5 **A. Yes.**
6 Q. Do you understand what an actuator is?
7 **A. As it applies to this '011 Patent, I believe so.**
8 Q. When you see the term "actuator" in the claim,
9 does that make you think of any particular structures?
10 **A. It makes me think of the structures that are**
11 **defined and delineated in the patent.**
12 Q. Any other structures?
13 **A. No.**
14 Q. Earlier we talked about the rotating actuary in
15 -- actuator in Hartley. Do you recall that?
16 **A. Yes.**
17 Q. Is that a common type of actuator in hemostasis
18 valves?
19 MR. STOWELL: Objection. Form. Outside
20 the scope.
21 THE WITNESS: I think it's one type of
22 actuator for a rotating hemostasis valve.
23 BY MR. HAMILTON:
24 Q. When you think of actuators in hemostasis
25 valves, what other type of actuators are there?

183

1 MR. STOWELL: Objection. Vague. Outside
2 the scope.
3 BY MR. HAMILTON:
4 Q. Let me -- let me rephrase that.
5 What other types of actuators immediately come
6 to mind?
7 MR. STOWELL: Objection. Vague. Outside
8 the scope.
9 THE WITNESS: The type of actuators that
10 we're discussing in '011.
11 BY MR. HAMILTON:
12 Q. You had experience with hemostasis valves prior
13 to seeing the '011 Patent, correct?
14 **A. Yes.**
15 Q. And do those -- did those hemostasis valves --
16 any of those hemostasis valves have actuators?
17 MR. STOWELL: Objection. Calls for a
18 legal conclusion. Form.
19 THE WITNESS: I think one can call the
20 rotating hemostatic valve an actuator, as they did
21 in Hartley. There's also a pinch valve I -- that
22 we prototyped that would have been considered an
23 active pinch mechanism.
24 BY MR. HAMILTON:
25 Q. So prior to seeing the '011 Patent, you were --

184

1 he were aware of many actuators in the field of
2 hemostasis valves, correct?
3 MR. STOWELL: Objection.
4 BY MR. HAMILTON:
5 Q. Although least those two?
6 MR. STOWELL: Objection. Misstates
7 testimony. Calls for legal conclusions.
8 THE WITNESS: I was familiar with a pinch
9 valve and the rotating hemostatic valve as a means
10 to actuate the valve.
11 BY MR. HAMILTON:
12 Q. Any other actuators with respect to hemostasis
13 valves?
14 MR. STOWELL: Objection. Misstates
15 testimony. Calls for a legal conclusion.
16 THE WITNESS: None that I can think of at
17 this moment.
18 BY MR. HAMILTON:
19 Q. If you go down to line 38, same column, 22.
20 **A. (Complying.)**
21 Q. You see the phrase "a biasing system configured
22 to bias," et cetera?
23 **A. "And a biasing system configured to bias the**
24 **first member and the second member to the first**
25 **position."**

185

1 Q. Do you understand what a bias -- biasing system
2 is?
3 **A. In the patent, it was the spring attached to the**
4 **actuator.**
5 Q. Would one of skill in the art understand that
6 other structures could be a biasing system in the field
7 of hemostasis valves?
8 MR. STOWELL: Objection. Outside the
9 scope.
10 THE WITNESS: I think in this patent
11 that's the only type of biasing system they
12 disclose.
13 BY MR. HAMILTON:
14 Q. Are you aware of any other biasing systems with
15 respect to hemostasis valves?
16 MR. STOWELL: Objection. Outside the
17 scope. Calls for a legal conclusion.
18 THE WITNESS: The one I can think of is
19 Ellers had a -- they disclosed a torsion spring
20 that was bias the -- their actuator to a closed
21 position.
22 BY MR. HAMILTON:
23 Q. So it might sound silly: Is a torsion spring a
24 spring?
25 **A. It's a type of spring.**

186

1 Q. What other types of springs are there?
2 **A. Many types of springs: Leaf spring, compression**
3 **spring, opposite of compression -- sorry -- extension**
4 **spring would be opposite of a compression spring.**
5 **Probably several others I'm not recalling.**
6 Q. So all those types of springs you just
7 mentioned, those are all springs; is that right?
8 **A. I consider them springs.**
9 Q. If you could take a look at Exhibit 1005.
10 That's Shafer.
11 **A. (Complying.)**
12 Q. And then turn to page 21, paragraph 7.
13 **A. (Complying.)**
14 Q. And let me know when you're ready for a
15 question.
16 **A. Okay.**
17 Q. So you see the first sentence: "Thus, the
18 problems are complex and involve a balance between
19 closing force, opening force, friction, compression and
20 durability."
21 Do you see that?
22 **A. Yes.**
23 Q. So earlier today we were talking about design
24 considerations that a person of skill in the art would
25 take into account when designing a hemostasis valve.

187

1 And the way I read that, the problem is essentially --
2 those are essentially design considerations. Is that --
3 is that a fair understanding?
4 **A. Those are some of the design considerations that**
5 **-- some of which I mentioned earlier.**
6 Q. Okay. So we talked about some design
7 considerations earlier, and then this lists some that
8 might be overlapping or related, but it lists a couple
9 design considerations for design -- for designing a
10 hemostasis valve; is that correct?
11 **A. Yes, these are design considerations.**
12 Q. What does that mean, "balance between closing
13 force, opening force" -- let's -- actually, let's -- let
14 me withdraw that.
15 What does closing force mean in that statement?
16 **A. Could mean a couple different things. One is**
17 **the action of the doctor to close the valve. It could**
18 **also mean force that closes down on the -- how much**
19 **force is exerted on the catheter that's inside the**
20 **valve.**
21 Q. And why is the amount of force exerted on the
22 catheter inside the valve a problem or a design
23 consideration?
24 MR. STOWELL: Objection. Form.
25 THE WITNESS: Well, I think as the -- as

188

1 this patent says, if the valve is too tight, soft,
2 flexible instrumentation such as a flat-tip guide
3 wire and others it lists could be damaged by
4 excessive compression or insertion force.
5 BY MR. HAMILTON:
6 Q. And what about opening force? Why is that a
7 design consideration?
8 **A. I think that's more related to user, the**
9 **difficulty -- the force required for the user to open**
10 **the valve, whether it's pinching two actuator buttons or**
11 **rotating a hemostasis valve. It's probably a**
12 **user-related design requirement.**
13 Q. So that kind of goes towards making the -- the
14 device easy for the user to use?
15 **A. Yes.**
16 Q. Or even more control for the user? Be a balance
17 of those two things?
18 **A. Possibly.**
19 Q. And what about friction; why is that a problem
20 or a design consideration?
21 **A. For many procedures, the doctor wants to be able**
22 **to feel, have tactile feedback to the catheter in his**
23 **hand, and in that case you don't want too much friction**
24 **for the portion that's -- might be sliding through the**
25 **valve.**

189

1 Q. And what about compression; why is that a design
2 consideration?
3 **A. This patent is not so clear on these terms, but**
4 **my understanding in general, it is probably talking**
5 **about a design requirement for a compression on the**
6 **device that's inside. So a thin-walled catheter could**
7 **collapse if there's too much compression from the valve.**
8 Q. Okay. And I think a minute ago, when we talked
9 about closing force, you said that was similar, that
10 would -- that could damage, maybe crush a catheter
11 that's going through the valve. And, really, it's
12 because there's too much compression force; is that --
13 is that the issue?
14 And what I'm getting at is, maybe closing force
15 means the effort or the force needed to -- to close the
16 valve in the first place, as opposed to how much
17 compression force is applied. Or they might be related.
18 MR. STOWELL: Objection. Form.
19 THE WITNESS: Yeah, I think closing force
20 and opening -- I think opening force is most likely
21 a design requirement related to physician use.
22 Closing force, I think, is probably most related to
23 having enough force to seal around the members but
24 not too much force to damage the catheter inside.
25 BY MR. HAMILTON:

190

1 Q. So -- so very similar to compression, the
2 compression design consideration; is that -- is that
3 fair?
4 **A. I think it's similar to compression requirement.**
5 Q. And then durability; why is that a design
6 requirement or problem when designing a hemostasis
7 valve?
8 **A. Well, it would be a design requirement such that**
9 **it could be opened and closed multiple times during the**
10 **procedure and still function adequately.**
11 Q. If you could look at the first page of
12 Exhibit 1005. That's Shafer that you have in front of
13 you.
14 **A. (Complying.)**
15 Q. Are you familiar with the assignee listed on
16 that page, Medamicus?
17 **A. I'm not.**
18 Q. You've never heard that name before?
19 **A. I have not.**
20 Q. Are you familiar with any of the inventors
21 listed: David Shafer, Michael Shafer or Brian Fisher?
22 **A. I am not.**
23 Q. We talked about this generally, but specifically
24 with respect to Shafer, did you find Shafer in
25 connection with your work on this matter or was Shafer

191

1 provided to you by Knobbe?
2 **A. I believe Shafer was provided by Knobbe.**
3 Q. If you could turn back to Exhibit 1006.
4 **A. (Complying.)**
5 **Hartley?**
6 Q. Yes. And I want to point you to the first page,
7 the title, "Access Valve."
8 Do you understand what access valve means in
9 that title?
10 **A. On the abstract, they state "an access valve for**
11 **laparoscopic device or an intraluminal deployment**
12 **device."**
13 Q. Does access valve mean hemostasis valve?
14 **A. I believe this is focused on hemostasis.**
15 Q. Could access valve mean anything other than a
16 hemostasis valve?
17 **A. Laparoscopic procedures would also use an access**
18 **device like this.**
19 Q. And why wouldn't an access device like this for
20 a laparoscopic procedure not be considered a hemostasis
21 valve?
22 MR. STOWELL: Objection. Form.
23 THE WITNESS: Can you repeat the
24 question?
25 BY MR. HAMILTON:

192

1 Q. Why would an access valve for use with a
2 laparoscopic procedure not be considered a hemostasis
3 valve?
4 **A. "Hemo" implies blood, and "intraluminal" in**
5 **their abstract implies to me to be in the lumen of a**
6 **blood vessel.**
7 Q. So Hartley discloses valves that are more broad
8 than hemostasis valves; is that correct?
9 MR. STOWELL: Objection. Form.
10 THE WITNESS: I don't know if it's more
11 broad, but laparoscopic procedures can and do use
12 valves on the proximal end of their access devices.
13 BY MR. HAMILTON:
14 Q. What's the purpose of a valve in a laparoscopic
15 procedure?
16 **A. Well, it wasn't the focus of my disclosure. I'm**
17 **not that familiar with laparoscopic procedures. And my**
18 **understanding is that they frequently inflate the**
19 **abdomen. For certain procedures they use CO2, I**
20 **believe, to expand the abdominal cavity to perform some**
21 **of these laparoscopic procedures. So in that case, they**
22 **want to keep the air that they're injecting in the**
23 **patient.**
24 Q. So that would be to -- to prevent something
25 other than blood from flowing out of the patient; and in

193

1 the example you just gave, it's air?
2 **A. I think it's CO2 or another gas that they're**
3 **injecting.**
4 Q. Are you aware of any other use of an access --
5 or other reason to use an access valve for a
6 laparoscopic procedure, other than to prevent the escape
7 of CO2?
8 **A. I'm sure there are many other laparoscopic**
9 **procedures I'm not familiar with. I'm not really an**
10 **expert in laparoscopic procedures.**
11 Q. And so in those procedures, the -- the valve
12 would be used to prevent the escape of some sort of
13 fluid, whether it be liquid or air, or the introduction
14 of some fluid, whether it be liquid or -- or air; is
15 that fair to say?
16 **A. I think I answered it before. So whatever I**
17 **said before, I think, answers the question.**
18 Q. I think you're probably right.
19 Let me ask you this: Are there reasons a person
20 of skill in the art would select -- and let's -- let's
21 use your -- the way you had termed it, speccing out a
22 hemostasis valve -- would -- would select the valve of
23 Hartley versus the valve of Shafer in a certain
24 application?
25 MR. STOWELL: Objection. Outside the

194

1 scope.
2 THE WITNESS: Yeah, I'm not -- I'm not
3 sure.
4 BY MR. HAMILTON:
5 Q. What are the advantages of using the valve of
6 Hartley?
7 **A. I'm not sure.**
8 Q. So as you sit here today, if you were speccing
9 out a hemostasis valve for a particular procedure, is
10 there any reason you would choose the valve of Shafer or
11 the valve of Hartley?
12 MR. STOWELL: Objection. Incomplete
13 hypothetical. Form.
14 THE WITNESS: There could be, but I have
15 not really considered those options in my
16 declaration.
17 BY MR. HAMILTON:
18 Q. Would it depend on the particular procedure?
19 **A. It would depend on the procedure and the devices**
20 **going through the procedure -- through the valve, and**
21 **several of the other aspects that I think I discussed**
22 **earlier.**
23 Q. Fair enough.
24 If we could go to your declaration, Exhibit
25 1003. And if you -- if you need to, you can use

195

1 Exhibit 1004, as well. That's the -- the resume. And
2 what I want to figure out is in which matter listed
3 either in your declaration or the resume is the matter
4 that you described earlier where you had an engineer and
5 worked with an engineer to design a hemostasis valve.
6 Is that matter listed either --
7 **A. Yes.**
8 Q. -- on your resume -- it is?
9 Okay. Which matter is it on your resume?
10 **A. For the 2000 to 2012, I was vice president of**
11 **R&D at Evalve, and that is the time when we developed**
12 **the MitraClip device, which had -- we utilized four**
13 **different hemostasis valves on that product.**
14 **At Prograft, the company before that, I recall**
15 **at least two hemostasis valves that we used on the**
16 **devices there.**
17 Q. So for Prograft, that would be the -- the
18 devices that you referred to earlier today as where you
19 specced them out for a particular application; is that
20 right?
21 **A. I believe one of those was a custom sheath with**
22 **a hemostasis valve on that we worked with the vendor to**
23 **develop a custom sheath for us. So I guess we specced**
24 **it out, worked with the vendor to develop that sheath.**
25 Q. So earlier today -- I'm going to put it in kind

196

1 of two big -- two broad categories. One is a project
2 where you had an engineer design some valves and then a
3 project where you specced out valves. The design is --
4 in your declaration that happened with respect to number
5 -- paragraph 9 in your declaration your work at Evalve;
6 is that fair?
7 **A. Evalve was the one that we -- the one valve I**
8 **can recall that we really designed from scratch**
9 **internally.**
10 Q. Is Evalve a -- a hemostasis valve?
11 **A. No. That was the name of the company that**
12 **developed the MitraClip device that was acquired by**
13 **Abbott.**
14 Q. And the MitraClip device included a hemostasis
15 valve; is that correct?
16 **A. A little confusing -- the MitraClip device is**
17 **the actual implant that's implanted on the leaflets of**
18 **the mitral valve. The MitraClip system consisted of**
19 **three different catheters and a dilator. All three of**
20 **those catheters and the dilator had a hemostasis valve,**
21 **one of which was designed from scratch -- I would say at**
22 **least one of which was designed from scratch. I can't**
23 **remember if the other one was also an internal design or**
24 **not.**
25 Q. Okay. Other than those two instances you just

197

1 identified -- so that's in figure -- excuse me --
2 paragraph 9 at Evalve and paragraph 10 at Prograft, is
3 it fair to say you have not been involved in the design
4 of any other hemostasis valves?
5 **A. During my time at Guidant, '89 to '95 --**
6 **Advanced Cardiovascular Systems, later Guidant -- I**
7 **worked on catheters that also had a hemostasis valve,**
8 **but my recollection is that those devices used**
9 **off-the-shelf components, typically a rotating**
10 **hemostatic valve.**
11 Q. Were you involved in the selection of the
12 rotating hemostatic valve in that project?
13 **A. I believe so.**
14 Q. And do you recall why you selected a rotating
15 hemostatic valve in that project?
16 **A. They were readily available. They were being**
17 **used on other similar devices to seal around the guide**
18 **wire of the size that we were using at the time.**
19 Q. Do you recall the size you were using at the
20 time?
21 **A. I was usually working on 018 -- 0 -- 0.018-inch**
22 **guide-wire-type devices.**
23 Q. Good memory.
24 **A. Pretty standard still.**
25 MR. HAMILTON: Okay. Why don't we take a

198

1 break. Let's see if I've got anything else. I
2 think I'm getting close.
3 THE WITNESS: Okay.
4 THE VIDEOGRAPHER: We are going off the
5 record at 1601.
6 (Recess.)
7 THE VIDEOGRAPHER: We are back on the
8 record at 1617.
9 BY MR. HAMILTON:
10 Q. Do you understand you're still under oath?
11 **A. Yes.**
12 Q. Did you discuss your deposition with anybody
13 during the last break?
14 **A. No.**
15 Q. Review any documents during the last break?
16 **A. No.**
17 Q. Okay. If you could -- you have your declaration
18 in front of you, Exhibit 1003. If you could turn to
19 page 1, paragraph 4.
20 **A. (Complying.)**
21 Q. It says you're being compensated at your
22 customary hourly rate. At what rate are you can
23 compensated for this matter?
24 **A. $500 per hour.**
25 Q. And has that been since the inception of the

199

1 matter?
2 **A. Yes.**
3 Q. Okay. If you could, I am going to hand you a
4 new exhibit. I've affixed 2006 to it.
5 (Tendered.)
6 (Exhibit 2006, US Patent Number 7,682,380
7 82, dated March 23,2010 (s4) KTNK-RESISTANT
8 BIFURCATED, was marked for identification.)
9 BY MR. HAMILTON:
10 Q. Do you recognize Exhibit 2006?
11 **A. I've certainly have seen it before, but I have**
12 **not reviewed this in a long time.**
13 Q. Where have you seen it before?
14 **A. Well, I'm an inventor on this patent.**
15 Q. So --
16 **A. So I would have reviewed it during its**
17 **prosecution.**
18 Q. When you say you would have reviewed it, do you
19 recall reviewing it during its prosecution?
20 **A. Yes. It looks familiar.**
21 Q. Do you recall signing an oath or a declaration
22 during prosecution that the statements in the disclosure
23 are true and correct?
24 **A. I probably did. I don't really recall that**
25 **specific document.**

200

1 Q. Would you put something in your own patent that
2 you thought wasn't true or correct?
3 **A. I would not.**
4 Q. Do you have any reason to doubt that this is a
5 true and correct copy of a patent in which you're an
6 inventor?
7 **A. I haven't looked at it to confirm all the pages**
8 **are there, but certainly it would appear that it is the**
9 **full patent.**
10 Q. And, generally, what's the invention disclosed
11 in this patent -- let me -- let me rephrase that. I
12 don't want to trip you up on saying what invention you
13 have or what you don't.
14 So what's -- what's the general subject matter
15 of this patent?
16 **A. It's an endoluminal prosthesis for placement at**
17 **a bifurcation site within the body.**
18 Q. Would you consider this a medical device?
19 **A. It is a stent graft for treating abdominal**
20 **aortic aneurysms.**
21 Q. Okay. You can set that aside.
22 **A. (Complying.)**
23 Q. And if you would pull up Exhibit 1005.
24 **A. (Complying.)**
25 Q. And if we could go to Figure 27.

201

A. (Complying.)
Q. It's going to be page 14 of the exhibit. And if you want, we can use the other figures if something is not clear in that figure that you don't understand.
A. No, this figure is probably fine.
Q. Do you see any items in this figure that would apply compressive or constrictive force to the lumen shown in this figure?
MR. STOWELL: Objection. Form. Outside the scope.
THE WITNESS: The description of Figure 27 illustrates a perspective view of a stasis valve and external mechan- -- mechanism assembly in accordance with one embodiment.
BY MR. HAMILTON:
Q. For the record can you identify what paragraph you're reading there?
A. Paragraph 37.
Q. Are there any items in Figure 27 that apply a compressive or constricting force to the lumen shown in 27?
A. Looking in the patent to see how they -- what they call the different components here.
Q. If it's helpful, I'll point you to paragraph 74.
A. So item 300 shown in Figure 27, they're

202

referring to it as a separate tool or device, such as a clamp, forceps, hemostat or combination thereof.
Q. And is there anything in that item 300 that applies a compressive force --
A. Yes, I --
Q. -- to item 100?
A. Yes. I believe the components above and below the member 110, the seal module 100 act to compress that seal module.
Q. Are those members that act to compress the seal module filaments?
A. I wouldn't call them filaments. They are a separate tool or device, such as a clamp, forceps or hemostat.
Q. And why wouldn't you call those filaments?
A. Because it's represented as a clamp or a forceps or a hemostat.
Q. And would the two arms of the clamp be rigid relative to the item in -- that those two arms are applying a compressive force to?
MR. STOWELL: Objection. Form.
THE WITNESS: For this type of valve -- a pinch valve is what I might call it -- the members doing the pinching or squeezing would typically be a forceps or hemostat, which would have a fair

203

amount of rigidity relative to the tube that it's compressing.
BY MR. HAMILTON:
Q. And is that one of the reasons you wouldn't call those two items that do the compressing a filament?
MR. STOWELL: Objection. Form.
THE WITNESS: I would call it a clamp, not a filament.
BY MR. HAMILTON:
Q. Okay. If you could turn to Figures 16 through 19 on page 11.
A. (Complying.)
Q. Do you understand what's depicted in Figures 16 through 19?
A. I'll have to confirm that these are related to Figures 12 through 15.
Q. If you want to look at paragraph 60, that might help.
A. (Complying.) 12.
Can you repeat the question?
Q. Do you understand what's depicted in Figures 16 through 19?
A. Yes.
Q. Do Figures 16 through 19 show what happens to a sealing member when a compressive force is applied to a

204

lumen, including the sealing member?
And let me just be clear: Sealing member 165.
A. Well, as the patent says in Section 60, paragraph 60, with reference to Figures 10-A, 10-B, 16 through 19, "highly compliant third central seal member 165 seals around a variety of profile shapes 192 and diameters 194 of the lumen 193 when at least one side of compressive force 67 is exerted upon the central region 195 with respect to the central portion 110 of the containment structure."
Q. So does Figures 16 through 19 show what happens to a sealing member within a lumen -- let's say sealing member supposition 165 because that's the sealing member shown in those figures -- when a compressive force is applied to the lumen?
MR. STOWELL: Objection. Form.
THE WITNESS: When a compression force is applied -- sorry. Back up.
When at least one side of compressive force is exerted upon the central region, that's what it's depicting in 16 through 19.
BY MR. HAMILTON:
Q. So does Figures 16 through 19 show how sealing member 165 completely seals a lumen when a compressive force is applied to the outside of the lumen?

205

1 MR. STOWELL: Objection. Asked and
2 answered. Form.
3 THE WITNESS: The figures aren't that
4 clear, but Figure 17 would appear to be completely
5 closed, with no instrument inside.
6 BY MR. HAMILTON:
7 Q. Then what about Figure 18?
8 **A. I think they're trying to show a variety of**
9 **different profile shapes 192. So in Figure 18 it's a**
10 **somewhat triangular lumen remaining.**
11 Q. And -- and it's a somewhat triangular lumen
12 because the tool inserted in Figure 18 is somewhat
13 triangular? Is that the -- is that what Figure 18 is
14 trying to show?
15 MR. STOWELL: Objection. Misstates the
16 document.
17 THE WITNESS: Well, it's a bit unclear to
18 me because 190 in Figure 16 is said to be the
19 lumen, not an instrument placed inside.
20 BY MR. HAMILTON:
21 Q. So what about 192 in Figure 18?
22 **A. It shows sealing around a variety of pro- --**
23 **profile shapes 192.**
24 Q. So what would cause that profile shape 192 in
25 Figure 18? Would that be a tool of that shape within

206

1 the lumen?
2 MR. STOWELL: Objection. Form.
3 THE WITNESS: Potentially.
4 BY MR. HAMILTON:
5 Q. It could be anything in the lumen, couldn't it?
6 **A. Could be a tool in the lumen. It's not well**
7 **described in the patent, I would say.**
8 Q. Okay. So with that understanding, if you look
9 at Figures 19, 18 and 16, you have a variety of sizes,
10 19 being small, 16 being larger, and you have a shape --
11 different shape, 18. So do those three figures show how
12 the sealing member seals around a variety of sizes and
13 shapes when a compression force is applied to the lumen?
14 **A. Yes, that's what it's showing.**
15 Q. And then 17 is when nothing is in -- inside the
16 lumen, it completely seals the lumen; is that right?
17 **A. That's my assumption.**
18 Q. If you could look at -- we better use the other
19 figures. Let me start with these. Let's look at Figure
20 33.
21 **A. (Complying.)**
22 Q. And if you need to and Figure 33 doesn't show
23 much -- you have the other figure already. Okay.
24 Is the actuator shown in Figure 33 a movable
25 actuator?

207

1 **A. Yes. The two U-shaped actuators move relative**
2 **to the seal module.**
3 Q. And let's -- let's just make sure we're clear
4 here. I've got my other figures. Don't see it in that.
5 So the U-shaped items are actuating members,
6 aren't they?
7 **A. I believe those are considered the actuators.**
8 Q. I'll just point you to paragraph 76, which
9 refers to two circular actuators 50 in this figure.
10 What are the two circular actuators 50 in this figure?
11 **A. I don't see 50 denoted on Figure 33.**
12 Q. Do you want to look at Figure 32? Well,
13 actually, Figure 33 -- 50 - 50 is the top right, just
14 above what I believe is a button.
15 **A. Oh.**
16 Q. Is that -- does that tell you what circulator --
17 circular actuator 50 is?
18 **A. Yes.**
19 Q. What is circular actuator 50 in Figure 33?
20 **A. It's referring to the assembly of the circular**
21 **actuator 50 together with the U-shaped actuator members**
22 **55.**
23 Q. And is that actuator 50 movable in this
24 embodiment?
25 **A. Yes. They're compressed inward to release**

208

1 **tension on the valve.**
2 Q. And is the way those actuators move in this
3 embodiment by sliding?
4 **A. They're pushed inward manually, so they are**
5 **sliding within the housing.**
6 MR. HAMILTON: All right. Why don't we
7 take another quick break? I think I might be done.
8 THE VIDEOGRAPHER: We are going off the
9 record at 1643.
10 (Recess.)
11 THE VIDEOGRAPHER: We are back on the
12 record at 1648.
13 BY MR. HAMILTON:
14 Q. Are you aware that patent owner Inari submitted
15 a declaration by Paul Zalesky in this matter?
16 **A. Yes.**
17 Q. Have you read that declaration?
18 **A. Did review it briefly last night.**
19 Q. Was that the first time you've seen that
20 declaration?
21 **A. Yes.**
22 Q. Have you -- in reviewing it, did you see
23 Mr. Zalesky's credentials or background and experience?
24 **A. I breezed through that portion, but I saw some**
25 **of it.**

209

1 Q. Did you see any reason to doubt that Mr. Zalesky
2 should be qualified as an expert in this matter?
3 **A. No.**
4 Q. Do you believe Mr. Zalesky is an expert in this
5 matter?
6 **A. I don't have an opinion on that.**
7 MR. HAMILTON: All right. I have no
8 further questions.
9 MR. STOWELL: I have no questions for
10 Mr. Thornton either.
11 THE VIDEOGRAPHER: All right. Please
12 stand by.
13 This marks the end of the deposition of
14 Troy Thornton. We are going off the record at
15 1649.
16 (The deposition was concluded at 4:49
17 p.m.)
18
19
20
21
22
23
24
25

210

1 DISCLOSURE
2 Pursuant to Article 10.B of the Rules and
3 Regulations of the Board of Court Reporting of the
4 Judicial Council of Georgia which states: Each
5 court reporter shall tender a disclosure form at
6 the time of the taking of the deposition stating
7 the arrangements made for the reporting services of
8 the certified court reporter, by the certified
9 court reporter, the court reporter's employer or
10 the referral source for the deposition, with any
11 party to the litigation, counsel to the parties, or
12 other entity. Such form shall be attached to the
13 deposition transcript, I make the following
14 disclosure: I am a Georgia Certified Court
15 Reporter. I am here as a representative of Planet
16 Depos.
17 Planet Depos, was
18 contacted to provide court reporting services for
19 the deposition. Planet Depos, will not be taking
20 this deposition under any contract that is
21 prohibited by O.C.G.A. 9-11-28(c). Planet Depos,
22 has no contract/agreement to provide reporting
23 services with any party to the case, any counsel in
24 the case, or any reporter or reporting agency from
25 whom a referral might have been made to cover this

211

1 deposition. Planet Depos, will charge its usual
2 and customary rates to all parties in the case, and
3 a financial discount will not be given to any party
4 to this litigation.
5
6 Susan DiFilippantonio
Susan DiFilippantonio, Notary Public
7 and Registered Professional Reporter
Commission Expires 10-22-2028
8 Georgia Certificate Number 2125
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

212

1 STATE OF GEORGIA:
2 COUNTY OF FULTON:
3 I hereby certify that the foregoing transcript was
4 reported, as stated in the caption, and the questions
5 and answers thereto were reduced to typewriting under my
6 direction; that the foregoing pages represent a true,
7 complete, and correct transcript of the evidence given
8 upon said hearing, and I further certify that I am not
9 of kin or counsel to the parties in the case; am not in
10 the employ of counsel for any of said parties; nor am I
11 in any way interested in the result of said case.
12
13 Susan DiFilippantonio
Susan DiFilippantonio, Notary Public
14 and Registered Professional Reporter
Commission Expires 10-22-2028
15 Georgia Certificate Number 2125
16
17
18
19
20
21
22
23
24
25

213

CAPTION

The Deposition of TROY THORNTON, taken in the matter, on the date, and at the time and place set out on the title page hereof.

It was requested that the deposition be taken by the reporter and that same be reduced to typewritten form.

It was agreed by and between counsel and the parties that the Deponent will read and sign the transcript of said deposition.

214

CERTIFICATE OF REPORTER

STATE OF GEORGIA

COUNTY OF FULTON

Before me, this day, personally appeared, TROY THORNTON, who, being duly sworn, states that the foregoing transcript of his deposition, taken in the matter, on the date, and at the time and place set out on the title page hereof, constitutes a true and accurate transcript of said deposition.

If no changes need to be made on the following two pages, place a check here ____, and return only this signed page.

215

DEPOSITION ERRATA SHEET

Assignment No.: 575710

Case Caption: IMPERATIVE CARE, INC. -vs- INARI MEDICAL, INC.

Witness: TROY THORNTON

DECLARATION UNDER PENALTY OF PERJURY I declare under penalty of perjury that I have read the entire transcript of my deposition taken in the captioned matter or the same has been read to me, and the same is true and accurate, save and except for changes and/or corrections, if any, as indicated by me on the DEPOSITION ERRATA SHEET hereof, with the understanding that I offer these changes as if still under oath.

_____ There are no changes noted.

_____ The following changes are noted:

Page No.___Line No.___
Should read:
_____
Reason for Change:_____

Page No.___Line No.___
Should read:
_____
Reason for Change:_____

Page No.___Line No.___
Should read:
_____
Reason for Change:_____

Page No.___Line No.___
Should read:
_____
Reason for Change:_____

216

Page No.___Line No.___
Should read:
_____
Reason for Change:_____

Page No.___Line No.___
Should read:
_____
Reason for Change:_____

SIGNATURE OF DEPONENT

_____

TROY THORNTON

Sworn to and subscribed before me this ____ day of _____, _____.

A

abbott
176:23, 176:24, 177:10, 177:24, 196:13
abdomen
192:19
abdominal
192:20, 200:19
ability
6:22, 23:5, 23:13, 89:7, 89:9
able
13:1, 20:11, 58:9, 74:7, 74:12, 87:13, 88:18, 115:2, 132:10, 167:19, 188:21
about
27:18, 28:2, 28:7, 29:14, 32:4, 37:22, 43:20, 46:5, 48:23, 49:3, 49:12, 50:8, 53:9, 53:20, 55:1, 60:1, 62:7, 63:6, 65:16, 66:25, 73:16, 74:6, 77:20, 81:8, 82:12, 83:5, 88:3, 89:11, 98:19, 101:22, 104:12, 110:5, 111:3, 111:17, 112:8, 113:9, 118:5, 119:8, 119:25, 121:7, 121:17, 123:20, 124:16, 132:9, 132:17, 136:3, 136:5, 140:7, 145:2, 153:4, 156:10, 160:9, 160:10, 161:16, 161:24, 164:12, 167:12, 167:20, 176:22, 177:11, 180:20, 181:20, 182:14, 186:23, 187:6, 188:6, 188:19, 189:1, 189:5, 189:9, 190:23, 205:7, 205:21
above
9:7, 81:13, 81:22, 145:25, 160:8, 202:7, 207:14
abstract
44:3, 44:12, 191:10, 192:5
accepted
174:11
access
120:6, 156:4, 156:5, 156:17, 157:4, 157:6, 159:6, 159:10, 162:15, 163:11, 163:19, 164:4, 164:10, 191:7, 191:8, 191:10, 191:13, 191:15, 191:17, 191:19, 192:1, 192:12, 193:4, 193:5
accommodate
115:2
accomplish
38:17, 46:2, 46:3, 46:7
accordance
201:14
account
186:25
accurate
214:9, 215:10
acquired
196:12
act
108:20, 108:22, 109:1, 175:2, 202:8, 202:10
acted
174:24, 175:2
acting
91:7, 108:25, 148:5, 174:14
action
87:22, 171:4, 171:6, 171:18, 171:21, 171:24, 187:17
active
87:16, 87:17, 87:21, 183:23
actual
17:1, 196:17
actually
33:3, 35:6, 64:18, 77:19, 84:24, 121:10, 121:11, 156:23, 171:12, 187:13, 207:13
actuary
182:14
actuate
131:23, 184:10
actuated
48:8, 50:24
actuates
119:16
actuating
37:14, 43:1, 48:14, 51:12, 51:18, 51:21, 52:20, 56:1, 60:24, 63:17, 64:1, 64:4, 64:8, 64:12, 65:12, 65:15, 65:18, 65:19, 65:24, 66:3, 66:9, 66:14, 67:13, 83:23, 102:16, 102:17, 110:11, 110:18, 110:21, 111:2, 111:9, 111:12, 111:15, 112:9, 112:16, 112:19, 114:22, 115:6, 115:11, 115:17, 115:22, 116:1, 147:5, 147:8, 147:10, 147:22, 148:9, 148:18, 148:20, 148:24, 149:1, 149:6, 149:7, 149:10, 149:17, 150:9, 150:10, 150:18, 152:17, 152:20, 152:21, 154:5, 207:5
actuator
61:6, 84:19, 93:5, 142:11, 145:10, 145:14, 146:5, 147:25, 171:2, 172:12, 172:13, 182:4, 182:6, 182:8, 182:15, 182:17, 182:22, 183:20, 185:4, 185:20, 188:10, 206:24, 206:25, 207:17, 207:19, 207:21, 207:23
actuators
39:9, 39:16, 66:15, 66:18, 74:11, 74:16, 85:5, 182:24, 182:25, 183:5, 183:9, 183:16, 184:1, 184:12, 207:1, 207:7, 207:9, 207:10, 208:2
acute
154:17, 154:19, 154:21, 162:24, 163:21, 164:14, 165:8, 165:15,

167:6, 167:13
add
120:15, 128:1, 152:13
additional
40:8, 87:14, 144:3
adequately
190:10
adhesive
133:5, 133:9, 133:11, 133:13, 133:18
adjust
52:12
adjustable
161:17
adjusted
113:4
adjusting
52:13
adjustments
50:24, 51:17, 117:1
advanced
197:6
advantages
167:5, 167:12, 167:24, 194:5
affect
5:18, 5:22, 6:22
affixed
199:4
after
5:16, 5:21, 62:11, 81:8, 82:13, 174:19, 176:6
again
5:12, 16:7, 63:21, 130:24, 153:12
against
27:20, 29:24, 30:6, 30:20, 38:20, 52:13, 161:22, 169:8, 178:8
agency
210:24
ago
46:19, 175:24, 176:21, 178:25, 189:8
agreed
213:8
agreement
210:22
air
18:9, 18:10, 18:13, 18:16, 47:15, 192:22, 193:1, 193:13, 193:14
all
7:20, 11:21, 19:19, 19:21, 23:24, 24:16, 31:14, 34:3, 39:10, 39:15, 41:7, 48:17, 52:17, 62:11, 66:8, 85:12, 89:11, 108:10, 108:13, 116:11, 116:25, 117:4, 120:5, 120:24, 125:19, 127:21, 141:3, 170:7, 175:11, 180:20, 186:6, 186:7, 196:19, 200:7, 208:6, 209:7, 209:11, 211:2
allow
44:8, 68:1
allowed
67:5
allowing
63:18, 66:15, 67:11, 83:25
allows
63:16, 63:25, 64:21, 65:22, 76:10
almost
41:25
along
137:12, 138:12
already
113:9, 144:7, 206:23
also
2:21, 10:16, 16:2, 16:4, 18:4, 18:8, 23:17, 35:13, 36:5, 43:17, 51:19, 55:24, 67:16, 75:11, 80:24, 85:2, 107:2, 129:10, 140:4, 153:23, 169:21, 183:21, 187:18, 191:17, 196:23, 197:7
alter
140:24
although
184:5
aluminum
150:11, 150:19, 150:24, 150:25, 151:2, 151:9, 151:11, 151:14, 152:4, 152:5, 152:9, 152:18, 152:19, 152:22, 153:1
always
11:8, 18:1, 24:11, 31:7, 89:9
among
163:14
amount
31:4, 35:24, 121:12, 140:3, 140:12, 172:9, 187:21, 203:1
amounts
150:15, 153:14
analyzed
59:8
anatomy
158:21, 162:15, 162:23, 164:9, 165:1
aneurysms
200:20
angeles
2:17
annual
176:18
annually
176:19
another
24:13, 40:20, 47:17, 81:3, 109:6, 132:12, 153:20, 154:25, 193:2, 208:7
answer
6:4, 6:5, 6:17, 13:2, 17:14, 34:20, 42:12, 55:13, 59:23, 68:16, 79:19, 79:21, 79:22, 104:22, 145:19, 152:14, 154:10, 167:19, 167:22
answered
54:11, 54:21, 55:17, 58:22, 59:22, 69:12, 70:18, 71:13, 73:5, 95:12, 96:4, 96:13, 96:14, 102:1, 102:10, 104:20, 106:4, 113:25, 123:7, 135:8, 138:15, 145:23, 174:9, 177:13, 193:16, 205:2
answering
158:15
answers
193:17, 212:5
any
5:17, 6:11,

6:21, 6:25, 7:8, 7:17, 7:20, 11:23, 17:22, 18:6, 18:10, 20:5, 23:15, 23:21, 38:23, 62:1, 87:7, 99:6, 109:24, 113:4, 120:8, 121:17, 121:23, 125:25, 130:16, 130:18, 131:2, 131:3, 131:6, 131:9, 131:17, 131:18, 131:25, 132:2, 153:18, 154:4, 155:6, 155:9, 161:11, 166:21, 167:5, 167:12, 167:23, 169:4, 172:15, 172:17, 173:8, 173:22, 174:7, 175:2, 175:19, 177:4, 178:9, 180:10, 180:21, 182:9, 182:12, 183:16, 184:12, 185:14, 190:20, 193:4, 194:10, 197:4, 198:15, 200:4, 201:6, 201:19, 209:1, 210:10, 210:20, 210:23, 210:24, 211:3, 212:10, 212:11, 215:11
anybody
61:24, 109:21, 166:19, 173:1, 173:6, 179:16, 179:20, 181:13, 198:12
anything
6:9, 8:3, 9:16, 9:19, 9:22, 11:3, 12:4, 16:22, 20:16, 23:8, 31:5, 33:18, 89:10, 173:24, 191:15, 198:1, 202:3, 206:5
anywhere
35:23
aortic
200:20
appeal
1:2, 4:6
appear
170:10, 200:8, 205:4
appearances
2:1
appeared
214:4
appears
95:14, 157:6, 169:7
application
17:22, 32:15, 55:12, 115:18, 128:3, 128:6, 128:24, 193:24, 195:19
applications
19:6
applied
33:12, 34:2, 34:6, 34:12, 35:7, 35:22, 36:8, 36:10, 65:11, 66:23, 133:9, 133:12, 135:24, 136:10, 137:12, 137:17, 138:10, 138:18, 189:17, 203:25, 204:15, 204:18, 204:25, 206:13
applies
182:7, 202:4
apply
135:14, 136:15, 201:7, 201:19
applying
35:4, 65:22, 133:4, 133:18, 137:3, 137:20, 202:20
appropriate
11:9, 11:11, 11:13, 13:13, 13:14, 36:4, 46:4, 67:15, 67:18, 67:22
appropriately
39:12, 50:22, 51:2, 51:9, 51:15
area
74:15, 139:18, 139:22, 139:24, 139:25, 140:1, 141:5, 141:7, 141:8, 141:13
areas
70:12
aren't
147:8, 164:24, 205:3, 207:6
argumentative
55:16
argumentive
79:4
arms
64:18, 202:18, 202:19
around
23:6, 27:23, 48:21, 51:25, 54:23, 55:2, 56:3, 56:16, 57:1, 57:2, 58:16, 65:5, 76:5, 76:11, 76:13, 77:7, 84:22, 105:21, 106:6, 106:20, 106:22, 106:25, 107:3, 107:5, 107:10, 107:12, 107:16, 107:18, 108:12, 110:22, 116:14, 116:19, 123:24, 128:24, 129:4, 129:5, 129:10, 129:24, 130:5, 130:10, 130:19, 131:6, 131:10, 131:20, 133:6, 133:16, 135:15, 136:25, 138:12, 151:17, 151:24, 161:1, 178:19, 189:23, 197:17, 204:6, 205:22, 206:12
arranged
105:18
arrangements
210:7
art
28:21, 29:3, 31:18, 32:5, 32:7, 32:8, 32:23, 33:12, 33:16, 33:22, 35:2, 35:5, 35:13, 35:16, 35:19, 35:22, 36:12, 36:17, 40:1, 42:16, 42:24, 43:3, 48:20, 52:3, 52:23, 56:25, 57:16, 57:18, 60:19, 60:23, 83:13, 85:2, 85:14, 104:6, 104:14, 110:9, 110:15, 110:25, 117:18, 118:10, 118:21, 125:5, 126:2, 126:22, 128:17, 130:17, 131:1, 131:16, 132:4, 151:12, 154:7, 155:20, 180:2, 180:14, 180:22, 181:13, 185:5, 186:24, 193:20

arteries
155:21, 155:22, 157:25
artery
139:6, 156:18, 157:7, 164:20
article
210:2
articulate
16:5
aside
168:1, 200:21
asked
54:10, 54:20, 55:17, 58:21, 59:11, 59:21, 62:24, 69:11, 70:17, 71:12, 73:4, 95:11, 96:3, 96:12, 101:25, 102:9, 104:19, 106:3, 113:24, 123:7, 135:7, 138:14, 145:22, 174:8, 177:12, 205:1
asking
5:25, 146:18
aspect
116:8, 116:9
aspects
25:19, 39:10, 124:10, 124:13, 124:25, 194:21
assembled
148:5
assembly
201:13, 207:20
assignee
190:15
assignment
215:2
assume
6:12, 78:9
assumed
130:11
assumption
206:17
astor
2:21, 4:10
attach
23:19, 119:14, 133:5, 133:18, 149:7
attached
10:6, 12:14, 12:17, 13:22, 102:15, 102:16, 119:15, 148:20, 148:23, 149:2, 149:8, 149:20, 149:22, 149:25, 150:3, 169:23, 185:3, 210:12
attaches
149:14
attaching
23:17
attachment
23:18, 177:15
attempted
157:15
attribute
82:6, 82:8
attributes
83:6
audible
6:17
availability
28:3
available
21:5, 27:24, 28:1, 160:23, 197:16
aware
17:21, 104:25, 127:5, 154:4, 184:1, 185:14, 193:4, 208:14
away
64:10, 64:13, 64:15, 64:22, 64:25, 117:5
awkwardly
97:18

B

b
93:4, 98:8, 100:1, 100:21, 101:16, 101:24, 144:8, 144:22, 204:4
b2
1:10
back
8:15, 42:10, 42:13, 43:7, 59:11, 61:18, 64:10, 66:25, 76:16, 86:14, 87:25, 91:14, 100:24, 109:15, 152:13, 166:13, 166:24, 173:10, 179:24, 191:3, 198:7, 204:18, 208:11
background
75:5, 208:23
balance
186:18, 187:12, 188:16
based
18:18, 18:19, 22:20, 31:4, 59:16, 108:25
basic
80:25
basis
176:18
bear
1:22, 2:3, 4:12
because
6:16, 13:17, 13:24, 25:12, 38:15, 39:22, 45:11, 62:17, 63:2, 64:8, 64:23, 65:8, 65:23, 67:22, 70:22, 83:10, 85:4, 89:17, 92:12, 99:7, 105:5, 111:16, 112:1, 113:14, 122:9, 143:18, 159:11, 160:4, 161:5, 163:25, 167:24, 171:9, 171:16, 189:12, 202:16, 204:13, 205:12, 205:18
become
163:10
been
5:6, 8:6, 15:24, 19:3, 19:5, 20:4, 32:6, 40:12, 53:8, 53:19, 60:23, 67:23, 89:20, 104:3, 109:5, 110:19, 152:11, 166:4, 173:11, 174:20, 175:10, 177:20, 177:25, 178:19, 183:22, 197:3, 198:25, 210:25, 215:9
before
1:2, 4:6, 5:6, 6:4, 10:18, 33:3, 63:14, 67:1, 75:6, 83:22, 84:9, 84:10, 104:4, 105:6, 105:9, 116:7, 118:15, 156:23, 158:24, 172:21, 173:11, 176:6, 178:17, 190:18, 193:16, 193:17, 195:14, 199:11, 199:13, 214:4, 216:16
beginning
82:23, 114:8, 182:3
begins
4:2, 62:11, 88:12, 160:10, 160:15
behalf
2:2, 2:12

being
5:2, 13:9, 17:21, 28:13, 30:20, 51:13, 52:13, 64:20, 65:11, 73:7, 83:11, 87:14, 87:15, 89:15, 105:5, 118:14, 131:14, 136:10, 137:17, 138:10, 170:8, 197:16, 198:21, 206:10, 214:5
believe
5:9, 7:21, 10:16, 11:6, 11:25, 14:24, 20:10, 29:22, 30:10, 35:3, 36:13, 37:24, 38:7, 38:25, 39:2, 39:3, 40:20, 41:11, 46:3, 46:8, 49:7, 52:7, 57:5, 61:12, 70:1, 82:7, 84:5, 90:19, 92:23, 93:20, 95:24, 102:11, 103:15, 108:8, 112:10, 113:19, 121:16, 141:24, 142:23, 143:25, 144:12, 153:4, 154:6, 155:4, 157:14, 163:15, 166:2, 170:22, 171:7, 178:4, 179:24, 182:7, 191:2, 191:14, 192:20, 195:21, 197:13, 202:7, 207:7, 207:14, 209:4
below
43:6, 54:12, 56:6, 202:7
bends
120:2
beneficial
50:25
benjamin
178:6
besides
8:3, 20:16, 180:12
bet
15:23
better
40:21, 41:17, 41:20, 42:25, 48:21, 49:7, 54:3, 110:24, 111:7, 115:9, 206:18
between
40:3, 42:18, 43:5, 48:10, 52:24, 81:9, 108:3, 134:13, 138:22, 140:9, 177:23, 186:18, 187:12, 213:8
bias
184:22, 184:23, 185:1, 185:20
biasing
184:21, 184:23, 185:1, 185:6, 185:11, 185:14
bifurcated
3:13, 199:8
bifurcation
200:17
big
159:22, 196:1
bigger
27:14
binder
7:12, 7:13, 7:15, 7:17, 7:20, 7:22, 8:4
bit
79:1, 90:3, 181:20, 205:17
bite
107:23, 108:2, 108:3, 108:18, 108:21, 108:25, 109:3
block
44:20, 45:24
blocking
44:4, 44:12
blocks
44:25, 154:20
blood
17:13, 18:1, 18:5, 18:7, 18:16, 28:7, 28:8, 28:18, 29:6, 30:25, 31:4, 88:19, 140:3, 140:5, 154:19, 155:5, 155:9, 155:22, 192:4, 192:6, 192:25
board
1:2, 4:7, 145:6, 210:3
body
168:15, 169:2, 200:17
borst
161:17, 161:18, 162:2, 162:4, 167:12
both
40:19, 40:23, 41:13, 55:3, 94:6, 94:23, 94:24, 95:4, 95:23, 149:1, 149:25
bottom
82:13
braid
127:12
braided
121:8, 121:9, 124:3, 127:7, 127:8, 127:14
brain
154:20, 155:7, 155:11, 155:23, 156:21, 158:1, 158:11, 158:13, 158:14, 158:23, 158:25, 165:10, 165:12
break
7:3, 7:4, 7:7, 53:10, 61:14, 61:23, 109:7, 109:10, 109:22, 109:24, 166:6, 166:19, 198:1, 198:13, 198:15, 208:7
breaking
53:10
breezed
208:24
brian
190:21
bridge
127:13, 127:14, 128:1, 128:2
briefly
208:18
bring
7:8
broad
192:7, 192:11, 196:1
brought
7:11
built
169:21
bush
1:23, 2:6
button
101:11, 129:16, 148:20, 148:24, 149:2, 149:8, 149:22, 150:3, 150:10, 150:18, 152:17, 152:21, 207:14

buttons
63:25, 64:5, 64:20, 65:6, 65:11, 65:16, 65:22, 66:10, 66:14, 66:23, 67:10, 67:25, 84:7, 84:9, 84:10, 87:14, 87:23, 114:18, 129:12, 149:14, 149:21, 149:25, 188:10
buying
23:18

C

ca
2:8, 2:17
cable
57:14, 119:14, 127:6, 127:7, 127:14
cables
126:6, 128:1
california
1:25, 1:36, 4:12, 4:24
call
98:4, 170:22, 183:19, 201:23, 202:12, 202:15, 202:23, 203:4, 203:7
called
5:1, 94:9, 161:4
calls
70:8, 91:22, 93:9, 142:19, 143:9, 183:17, 184:7, 184:15, 185:17
came
180:11, 181:25
can't
41:21, 145:18, 146:20, 167:21, 171:13, 196:22
cannot
6:25
capacity
178:9, 180:9
capital
176:24
caption
212:4, 213:1, 215:3
captioned
215:8
cardiovascular
197:6
care
1:5, 2:2, 4:4, 4:19, 215:3
career
119:3
careful
103:24
carotid
156:1, 156:2, 156:18, 157:7, 164:20
case
1:8, 4:7, 7:13, 7:23, 8:1, 12:2, 48:20, 86:16, 88:19, 110:20, 114:18, 116:4, 145:6, 147:16, 177:6, 188:23, 192:21, 210:23, 210:24, 211:2, 212:9, 212:11, 215:3
cases
48:18, 50:21, 164:20
categories
196:1
catheter
17:13, 17:17, 21:25, 23:20, 26:1, 26:4, 26:5, 26:8, 26:15, 26:19, 28:22, 29:4, 29:10, 29:13, 29:14, 31:16, 119:13, 119:19, 119:21, 119:22, 119:23, 120:3, 120:12, 120:13, 121:13, 159:14, 159:18, 168:15, 168:17, 169:1, 169:5, 169:8, 187:19, 187:22, 188:22, 189:6, 189:10, 189:24
catheters
17:18, 17:20, 17:23, 19:14, 19:21, 22:6, 25:11, 26:11, 26:13, 27:7, 30:14, 103:10, 118:25, 119:10, 120:4, 120:15, 160:2, 169:10, 169:14, 169:17, 170:4, 196:19, 196:20, 197:7
cause
157:19, 171:2, 205:24
causes
88:24, 137:21
causing
155:4
cavity
192:20
cca
157:7
center
37:15, 64:6, 64:11, 64:14, 64:15, 64:19, 64:21, 64:22, 64:25, 136:17, 137:1, 137:6, 138:18
central
66:16, 67:12, 75:13, 76:4, 76:7, 82:17, 86:20, 91:8, 204:5, 204:8, 204:9, 204:20
century
2:15
cerebral
155:20, 158:3, 158:5, 158:6, 158:16, 159:5, 159:14, 159:21, 160:3, 164:18
certain
21:10, 41:18, 41:25, 48:6, 115:7, 155:5, 192:19, 193:23
certainly
25:10, 25:17, 31:24, 35:11, 44:19, 45:23, 51:24, 65:4, 85:1, 89:13, 92:17, 108:14, 116:12, 118:23, 165:23, 180:11, 199:11, 200:8
certificate
3:8, 211:10, 212:17, 214:1
certified
210:8, 210:14
certify
212:3, 212:8
cetera
39:17, 141:5, 184:22
challenges
159:6, 162:15, 163:19, 164:4, 164:9
chance
109:7
change
5:21, 9:22, 90:2, 103:13, 109:9, 139:23,

140:20, 141:13
change:_
215:19, 215:24, 215:28, 215:33, 216:4
change:__
216:9
changed
12:4
changes
5:18, 112:18, 141:12, 214:11, 215:10, 215:13, 215:14, 215:15
changing
137:24, 139:16, 139:17, 140:13
characteristics
49:8, 49:9, 56:21
characterization
46:14, 120:18
characterize
30:19
charge
211:1
check
214:12
checks
175:17
choice
146:23
choices
49:10, 57:13, 153:4
choose
22:18, 22:20, 27:4, 27:12, 28:4, 28:22, 29:4, 29:10, 34:9, 57:17, 194:10
choosing
28:21, 29:3, 29:9
chose
28:8, 56:10, 110:22
chosen
48:18, 84:4, 111:8
circle
48:12, 48:13, 107:10, 138:7
circular
139:20, 207:9, 207:10, 207:17, 207:19, 207:20
circulator
207:16
circum
132:17
circumference
136:25, 138:6, 138:8
circumferentially
86:23, 132:18, 132:25, 133:9, 133:12, 133:15, 133:19
circumstance
32:23
claim
141:21, 141:24, 142:5, 142:15, 143:12, 143:18, 145:6, 181:5, 181:6, 181:20, 181:24, 182:1, 182:4, 182:8
clamp
202:2, 202:13, 202:16, 202:18, 203:7
clamped
169:8
clarification
6:10
clarify
17:1, 26:8, 33:3, 34:5, 64:13
clause
15:14
clear
19:7, 30:8, 43:20, 53:3, 56:24, 73:14, 73:17, 92:11, 99:12, 102:14, 111:16, 112:14, 113:17, 115:21, 124:19, 125:15, 128:19, 160:15, 189:3, 201:4, 204:2, 205:4, 207:3
clearly
115:17
click
171:8
clockwise
161:21
close
26:23, 48:13, 161:8, 161:12, 161:22, 187:17, 189:15, 198:2
closed
47:14, 47:18, 47:21, 171:9, 172:1, 185:20, 190:9, 205:5
closely
31:15, 32:19, 176:16, 176:17
closes
187:18
closing
161:10, 186:19, 187:12, 187:15, 189:9, 189:14, 189:19, 189:22
clot
154:19
co2
192:19, 193:2, 193:7
coie
2:13, 4:16
collapse
88:25, 133:24, 136:11, 137:25, 189:7
collapsed
89:1
collapses
86:22
collapsing
87:3
collection
175:11, 178:11
collectively
95:2, 95:9, 96:16, 98:11, 98:17, 100:4
column
62:8, 63:15, 90:8, 91:14, 100:25, 102:20, 105:17, 107:22, 109:4, 117:11, 117:12, 118:18, 123:13, 131:4, 132:2, 132:3, 132:14, 132:21, 132:22, 132:23, 133:22, 133:24, 141:15, 181:18, 181:22, 181:23, 184:19
com
2:10, 2:11, 2:19
combination
75:17, 202:2
combined
93:15, 99:12, 99:16
combining
94:7, 95:24
come
175:25, 183:5
commented
5:18
commission
211:9, 212:16
common
122:9, 122:13, 122:15, 126:20, 157:6, 169:10, 169:16, 182:17

commonly
87:20, 160:22, 170:7
communicate
179:16, 179:20
companies
162:3, 176:10
company
176:25, 178:1, 178:2, 178:3, 178:4, 178:5, 195:14, 196:11
compare
81:5, 132:11, 143:18, 171:11
compared
26:20, 30:16, 82:18, 111:11
compatible
48:7
compensated
198:21, 198:23
complete
7:1, 17:14, 33:15, 34:20, 46:10, 46:13, 46:22, 47:8, 112:2, 112:5, 114:20, 114:24, 114:25, 116:2, 116:19, 154:10, 157:18, 212:7
completed
14:3, 14:4
completely
47:14, 47:18, 47:21, 58:15, 124:19, 133:6, 133:16, 140:20, 140:23, 204:24, 205:4, 206:16
complex
186:18
compliant
75:15, 75:22, 75:24, 76:4, 80:24, 81:11, 81:20, 85:7, 114:8, 114:12, 114:13, 114:15, 114:19, 114:25, 115:8, 204:5
complications
163:15, 163:16, 165:13
complying
10:1, 12:24, 33:2, 33:6, 37:3, 62:5, 62:14, 71:23, 72:22, 74:19, 74:22, 76:18, 80:16, 88:1, 90:9, 90:11, 96:25, 110:3, 114:7, 117:7, 117:13, 123:15, 132:15, 133:23, 141:16, 141:18, 146:25, 150:7, 154:14, 155:17, 156:25, 159:3, 162:10, 168:2, 168:11, 170:17, 179:25, 181:3, 181:21, 184:20, 186:11, 186:13, 190:14, 191:4, 198:20, 200:22, 200:24, 201:1, 203:12, 203:19, 206:21
component
23:18, 23:19, 169:23, 171:16, 172:14
components
20:7, 37:19, 37:20, 40:8, 49:11, 63:3, 112:19, 116:8, 116:9, 119:6, 133:18, 147:15, 148:14, 151:6, 151:11, 154:9, 169:14, 169:17, 169:18, 169:19, 170:7, 197:9, 201:23, 202:7
composed
126:7
composite
97:8, 97:11, 99:4, 102:12, 102:14
compounding
81:1
compress
63:25, 64:5, 65:6, 91:7, 134:12, 134:15, 134:20, 135:10, 138:20, 138:23, 139:6, 139:21, 140:7, 140:8, 140:13, 202:8, 202:10
compressed
64:20, 67:6, 75:25, 86:19, 140:2, 207:25
compressing
63:24, 67:10, 67:25, 84:20, 87:2, 87:8, 134:9, 134:13, 139:9, 139:10, 203:2, 203:5
compression
48:9, 82:21, 186:2, 186:3, 186:4, 186:19, 188:4, 189:1, 189:5, 189:7, 189:12, 189:17, 190:1, 190:2, 190:4, 204:17, 206:13
compressive
76:7, 88:5, 201:7, 201:20, 202:4, 202:20, 203:25, 204:8, 204:14, 204:19, 204:24
comprise
92:9, 98:14, 99:2, 118:1, 126:10, 128:9, 128:14, 129:1, 129:15, 147:15
comprised
102:13
comprises
90:15, 91:16, 92:5, 92:19
concluded
209:16
conclusion
5:15, 70:9, 91:23, 93:10, 142:19, 143:10, 183:18, 184:15, 185:17
conclusions
184:7
conditions
6:22
configuration
63:20, 74:8, 84:2, 172:5
configurations
105:19
configured
105:20, 106:10, 184:21, 184:23
confirm
15:22, 73:9, 177:15, 200:7, 203:15
conform
54:3, 54:14, 56:8, 56:10, 57:6, 57:14, 111:7, 112:1, 115:4, 115:9, 115:12, 151:16, 151:23
conforming
115:7
confuse
143:14

confusing
196:16
confusion
99:5
connect
168:19, 169:1, 169:5, 169:10, 169:14, 169:16, 170:1
connected
101:11, 168:22, 170:8
connection
8:24, 169:23, 169:25, 170:1, 170:4, 170:10, 170:14, 174:20, 190:25
consider
11:9, 13:24, 23:17, 50:18, 55:15, 58:9, 58:11, 61:5, 88:9, 89:18, 94:22, 99:17, 108:16, 112:20, 146:18, 146:19, 146:20, 148:14, 148:17, 174:2, 180:13, 186:8, 200:18
consideration
31:1, 31:3, 31:5, 60:10, 89:8, 89:10, 89:12, 89:24, 187:23, 188:7, 188:20, 189:2, 190:2
considerations
89:4, 186:24, 187:2, 187:4, 187:7, 187:9, 187:11
considered
10:5, 10:14, 10:17, 11:19, 12:13, 12:16, 13:9, 13:15, 13:21, 14:6, 14:7, 29:8, 31:2, 50:16, 50:20, 53:4, 55:9, 55:10, 55:14, 55:19, 58:6, 58:24, 59:8, 61:4, 87:9, 93:15, 99:2, 108:24, 145:17, 146:9, 146:12, 146:14, 146:17, 147:25, 148:4, 155:1, 163:3, 163:24, 167:10, 167:16, 183:22, 191:20, 192:2, 194:15, 207:7
considering
99:13, 101:12
consisted
196:18
consistent
33:9, 160:1
constitutes
214:8
constrict
133:24, 134:3, 134:8, 134:21, 134:24, 135:3, 135:6, 135:9, 135:14, 135:15, 135:16, 136:11, 136:14, 136:23, 138:20, 138:23, 139:7, 140:5, 140:11
constricting
110:12, 114:8, 114:12, 114:13, 114:15, 114:19, 114:25, 134:10, 134:12, 134:13, 134:15, 135:21, 135:23, 136:21, 136:25, 137:4, 137:9, 138:17, 139:8, 140:8, 142:5, 201:20
constriction
136:24, 140:23, 141:7, 171:3
constrictions
140:19
constrictive
201:7
constricts
141:6
construct
131:17
constructed
129:22
construction
130:2, 132:10
construes
145:6
consulted
175:21
contact
47:16
contacted
175:5, 210:18
containment
63:19, 84:1, 204:10
context
141:3, 160:17
continued
43:2
continuous
91:2, 91:11, 91:18, 91:25, 92:22, 92:25, 93:8, 94:4, 95:21, 96:1, 97:4, 97:14, 97:15, 97:23, 98:5, 98:8, 98:11, 98:18, 98:21, 99:6, 100:16, 100:20, 141:23, 142:16, 143:1, 143:2, 143:8, 144:21, 145:7, 145:13, 146:3, 146:6, 147:11, 149:24
contract
210:20, 210:22
contrast
87:16
control
188:16
copy
8:10, 15:21, 40:6, 41:10, 42:12, 200:5
cord
92:15, 92:16, 92:18, 92:19, 92:21
cords
92:20, 92:22, 92:25, 93:8, 118:2, 129:16, 131:19
correct
5:17, 11:12, 12:18, 14:11, 20:20, 32:15, 45:2, 45:12, 45:20, 47:3, 51:22, 52:5, 56:12, 57:4, 58:16, 59:2, 59:3, 60:7, 60:15, 61:10, 68:24, 69:25, 70:3, 72:7, 76:22, 77:8, 81:23, 82:3, 82:14, 83:16, 84:12, 85:16, 86:8, 91:11, 91:21, 92:7, 92:22, 93:8, 94:5, 95:22, 96:2, 96:11, 96:22, 97:6, 97:24, 98:12, 102:8, 102:21, 104:14, 105:3,

108:12, 111:24, 116:21, 123:5, 124:9, 124:24, 125:6, 125:11, 125:12, 126:3, 129:5, 131:7, 131:21, 137:5, 137:14, 138:5, 138:13, 147:11, 147:18, 147:22, 148:20, 149:2, 149:8, 149:25, 153:9, 154:2, 164:25, 173:18, 174:22, 174:25, 180:2, 183:13, 184:2, 187:10, 192:8, 196:15, 199:23, 200:2, 200:5, 212:7
corrections
215:11
correctly
44:17
couldn't
206:5
council
210:4
counsel
4:13, 11:16, 11:17, 11:21, 79:22, 130:7, 172:24, 173:4, 179:13, 210:11, 210:23, 212:9, 212:10, 213:8
counterclockwise
161:20
county
212:2, 214:3
couple
5:10, 10:10, 160:11, 166:24, 173:11, 176:8, 182:3, 187:8, 187:16
coupled
93:4, 94:1, 142:12, 145:10, 145:14, 146:6
course
25:1
court
4:20, 6:1, 6:16, 210:3, 210:5, 210:8, 210:9, 210:14, 210:18
cover
210:25
covered
156:9
create
51:25, 131:5, 138:1, 151:2, 151:13
creating
65:5, 114:20
credentials
208:23
credibility
5:19, 5:23
cross-section
139:11, 139:18
cross-sectional
139:22, 139:25, 140:1, 141:13
crush
189:10
csr
1:36, 4:24
curve
119:12, 119:17, 121:13
curved
64:15, 64:19, 64:25
curves
120:2, 120:6, 120:8, 120:12
custom
195:21, 195:23
customary
198:22, 211:2
cylindrical
37:16, 37:18, 169:9

D

damage
189:10, 189:24
damaged
188:3
dang
48:13
date
4:8, 34:7, 34:9, 34:10, 34:15, 34:18, 178:17, 213:3, 214:7
dated
3:12, 199:7
david
190:21
day
172:21, 214:4, 216:17
days
173:8
deal
112:25, 113:12
december
177:23
decide
11:9
declaration
7:16, 8:20, 8:23, 9:8, 9:13, 9:14, 9:17, 9:20, 9:23, 10:7, 10:15, 10:19, 10:22, 10:23, 11:5, 12:13, 12:14, 12:16, 13:3, 13:7, 13:10, 13:16, 13:18, 13:21, 14:4, 14:8, 14:20, 15:7, 16:3, 16:11, 31:19, 32:25, 33:4, 33:13, 34:3, 34:7, 34:13, 36:9, 41:13, 42:6, 58:2, 58:7, 60:5, 60:10, 60:12, 61:5, 61:13, 67:2, 67:20, 67:21, 71:18, 76:17, 78:8, 78:11, 79:3, 79:17, 80:6, 80:8, 83:15, 103:14, 103:19, 103:20, 110:2, 113:2, 113:23, 156:13, 163:4, 163:25, 164:1, 167:17, 168:8, 173:21, 178:16, 179:3, 179:6, 179:12, 179:15, 179:23, 181:2, 181:25, 194:16, 194:24, 195:3, 196:4, 196:5, 198:17, 199:21, 208:15, 208:17, 208:20, 215:6
declarations
10:21
declare
215:6
decrease
67:11, 140:4
decreases
140:1
deeper
164:8
deeply
69:21
define
10:22, 89:22, 103:7, 104:22, 181:6
defined
103:3, 108:18, 108:21, 109:3, 115:18, 182:11

definition
6:10, 18:4, 33:11, 33:15, 33:18, 33:23, 33:25, 34:2, 35:2, 35:4, 35:6, 35:21, 36:8, 36:13, 104:7, 106:1, 107:25, 108:2, 135:16, 174:3
definitions
85:10
deform
88:19, 88:21
deformable
75:14, 75:21, 75:23, 80:24, 85:7
degree
120:24, 121:3
delicate
162:15, 162:23, 163:13, 165:1
delineated
182:11
delineates
86:2, 106:21
delivery
165:19, 165:21
denote
106:16, 106:19
denoted
207:11
depend
55:24, 56:20, 57:8, 194:18, 194:19
depending
25:8, 48:18, 49:7, 49:8, 49:9, 49:17, 49:19, 54:13, 56:7, 56:14, 57:11, 111:10, 130:3, 130:12, 141:4, 172:8
depends
26:10, 26:15, 26:17, 39:7, 65:2, 84:18, 84:19, 84:20, 107:3, 111:8, 124:2, 127:11, 127:16, 127:19, 128:3, 128:5, 129:8, 129:10, 130:1, 131:10, 136:21, 151:5, 151:6, 151:15, 169:20
depict
169:4
depicted
37:13, 48:12, 76:20, 108:4, 157:1, 168:12, 203:13, 203:21
depicting
157:4, 204:21
depiction
37:24, 158:25
deployment
191:11
depo
172:15
deponent
3:9, 213:9, 216:11
depos
4:10, 4:22, 210:16, 210:17, 210:19, 210:21, 211:1
deposed
5:2, 5:6
deposition
1:17, 4:3, 4:11, 5:15, 5:22, 146:17, 167:17, 172:18, 173:9, 173:14, 173:18, 173:25, 198:12, 209:13, 209:16, 210:6, 210:10, 210:13, 210:19, 210:20, 211:1, 213:2, 213:5, 213:10, 214:6, 214:9, 215:1, 215:8, 215:12
depressed
66:10
derive
174:14
describe
44:2, 78:20, 87:4, 119:5, 122:2, 157:14, 159:17, 168:15
described
69:9, 70:12, 70:14, 75:20, 81:13, 81:17, 82:11, 82:23, 83:2, 83:4, 83:8, 91:5, 102:19, 108:6, 119:19, 120:10, 123:8, 127:5, 147:19, 170:13, 195:4, 206:7
describes
160:16
describing
45:14, 75:9, 81:12, 100:25
description
78:16, 80:1, 80:3, 80:17, 81:6, 82:1, 88:7, 88:9, 108:25, 133:17, 133:20, 161:14, 201:11
descriptors
83:11
design
18:21, 18:24, 19:2, 19:3, 20:4, 20:14, 20:17, 21:6, 21:8, 21:15, 22:23, 22:25, 23:2, 23:3, 23:15, 23:24, 24:7, 24:11, 24:13, 25:7, 25:14, 25:21, 26:22, 27:25, 30:5, 31:5, 31:8, 34:21, 34:23, 34:25, 36:23, 38:25, 39:14, 46:2, 46:4, 46:5, 48:7, 48:8, 51:21, 52:20, 65:13, 66:7, 67:15, 67:16, 67:19, 77:3, 77:14, 77:16, 77:22, 88:22, 89:4, 89:7, 89:12, 89:24, 111:21, 111:23, 112:4, 112:5, 112:18, 112:21, 113:5, 131:24, 134:19, 180:6, 180:18, 186:23, 187:2, 187:4, 187:6, 187:9, 187:11, 187:22, 188:7, 188:12, 188:20, 189:1, 189:5, 189:21, 190:2, 190:5, 190:8, 195:5, 196:2, 196:3, 196:23, 197:3
designed
18:20, 18:23, 20:8, 27:9, 27:13, 28:15, 32:1, 38:15, 39:11, 44:19, 45:4, 45:23, 50:21, 51:2, 51:5, 51:9, 51:12, 85:1, 196:8, 196:21,

196:22
designing
19:8, 31:17, 32:14, 52:15, 89:4, 89:8, 89:10, 89:12, 112:23, 169:24, 180:8, 180:10, 180:14, 180:17, 180:21, 180:23, 186:25, 187:9, 190:6
designs
25:6, 85:3, 104:4, 113:4, 169:20, 169:22
desired
112:17, 114:23
despite
69:4, 70:6
detail
70:11, 71:4, 71:9, 71:15, 73:8, 73:24, 113:8, 138:25, 156:10, 157:13, 158:8, 158:9, 160:5, 168:25
details
39:22, 132:8
detent
170:22, 171:15, 171:16
detents
170:23, 171:3, 171:10, 171:12, 171:17, 172:4, 172:7, 172:9
determine
21:14, 21:17, 24:6, 124:12, 125:8
determined
11:10, 11:13, 11:17
develop
195:23, 195:24
developed
195:11, 196:12
developing
21:22, 22:16
device
21:11, 23:6, 31:9, 31:12, 31:20, 32:2, 32:9, 32:20, 76:11, 113:23, 161:2, 161:23, 188:14, 189:6, 191:11, 191:12, 191:18, 191:19, 195:12, 196:12, 196:14, 196:16, 200:18, 202:1, 202:13
devices
31:7, 89:21, 115:3, 118:22, 119:6, 161:1, 161:21, 161:22, 164:19, 165:3, 180:12, 180:22, 180:24, 192:12, 194:19, 195:16, 195:18, 197:8, 197:17, 197:22
dial
87:23
diameter
21:11, 23:11, 25:21, 26:2, 26:21, 26:22, 48:19, 56:21, 57:15, 124:14, 124:15, 129:9, 136:16, 137:4, 137:13, 137:22, 137:24, 138:3, 138:4, 138:7, 138:13, 138:17, 164:7
diameters
54:4, 76:6, 76:12, 76:14, 84:23, 159:11, 204:7
diaphragm
37:16, 37:18
difference
28:18, 28:24, 29:6, 29:21, 29:25, 52:24, 81:7, 134:13, 138:22, 140:9, 140:14
differences
141:4
different
19:14, 19:16, 19:18, 19:24, 20:3, 20:7, 22:1, 22:6, 22:7, 24:23, 25:6, 25:7, 25:10, 25:11, 25:12, 25:18, 25:19, 48:6, 49:11, 53:7, 63:2, 77:22, 78:6, 78:20, 78:23, 78:24, 94:17, 97:1, 101:6, 102:19, 102:24, 112:20, 119:5, 120:20, 120:21, 139:4, 149:7, 149:8, 149:14, 149:20, 149:22, 154:1, 178:3, 178:4, 181:7, 187:16, 195:13, 196:19, 201:23, 205:9, 206:11
differently
146:22
difficult
30:13, 152:2, 159:10, 163:11
difficulty
188:9
difilippantonio
1:36, 4:21, 4:24, 211:7, 212:14
dilator
196:19, 196:20
dimension
124:14
dimensions
49:10, 113:16, 116:10, 125:7, 127:16, 127:20, 132:9, 151:6, 152:3
direction
64:7, 135:24, 136:15, 137:4, 137:12, 171:2, 171:8, 171:9, 172:2, 212:6
directions
64:2, 64:3, 64:4
director
177:24
disadvantages
167:13, 167:24
disclose
149:13, 185:12
disclosed
38:8, 39:17, 52:4, 54:23, 112:9, 113:6, 113:23, 165:22, 185:19, 200:10
discloses
45:18, 55:11, 113:21, 192:7
disclosure
3:7, 41:16, 122:19, 138:24, 143:19, 143:22, 145:18, 156:9, 192:16, 199:22, 210:1, 210:5, 210:14
discount
211:3
discuss
16:4, 60:17, 61:23, 63:6, 73:22, 74:1, 74:2, 109:21, 166:18, 172:13,

198:12
discussed
88:8, 103:9, 113:1, 113:10, 130:10, 131:15, 132:2, 144:7, 161:6, 170:9, 194:21
discusses
43:17, 69:2
discussing
21:1, 22:6, 68:13, 89:4, 113:11, 131:4, 135:20, 180:3, 183:10
discussion
69:4
disengage
63:12, 63:17, 63:22, 65:9, 65:15, 65:18, 65:19, 66:2, 66:5, 66:22, 67:7, 83:24
disengaged
83:23, 84:7, 84:10
disengaging
67:14
dissection
163:18
distal
44:8, 119:12, 119:14, 121:13, 159:11
distally
86:16
do@knobbe
2:11
doctor
28:16, 119:16, 155:4, 187:17, 188:21
document
13:1, 15:5, 69:1, 71:19, 74:18, 153:11, 155:16, 199:25, 205:16
documents
7:8, 7:16, 7:18, 7:22, 7:23, 7:25, 62:1, 109:24, 166:21, 172:23, 173:13, 173:17, 173:20, 198:15
doing
202:24
done
10:20, 208:7
doubt
38:23, 200:4, 209:1
down
6:1, 6:16, 62:12, 63:13, 63:15, 114:5, 182:3, 184:19, 187:18
drafts
15:4, 15:6
drawings
41:5, 73:14
driven
23:24, 24:2
drug
165:19, 165:21
duly
5:2, 214:5
durability
89:11, 89:15, 89:19, 89:22, 186:20, 190:5
durable
89:14, 89:22
during
15:4, 15:5, 16:11, 16:15, 16:20, 17:9, 18:16, 19:20, 19:22, 41:5, 61:23, 89:14, 89:25, 103:16, 104:17, 105:2, 105:8, 109:22, 109:24, 117:19, 118:6, 166:19, 177:9, 177:25, 190:9, 197:5, 198:13, 198:15, 199:16, 199:19, 199:22
durometer
88:14, 88:17

E

e
16:24
each
6:2, 47:16, 47:21, 53:14, 53:22, 54:7, 54:18, 55:2, 55:21, 57:25, 58:13, 61:6, 63:17, 64:7, 64:19, 64:24, 91:1, 92:24, 93:2, 93:6, 93:7, 94:4, 94:12, 94:13, 95:7, 95:10, 95:14, 95:17, 95:20, 96:1, 96:6, 96:10, 96:17, 97:4, 98:18, 100:2, 100:10, 100:14, 100:16, 100:20, 100:25, 101:1, 101:4, 101:14, 101:23, 102:4, 108:24, 123:20, 144:9, 147:10, 147:18, 147:21, 147:24, 148:8, 148:9, 148:13, 148:14, 148:19, 149:20, 149:22, 150:3, 210:4
earlier
14:18, 14:25, 15:3, 20:6, 20:9, 43:7, 89:3, 103:9, 118:17, 132:8, 144:8, 161:6, 164:6, 173:11, 182:14, 186:23, 187:5, 187:7, 194:22, 195:4, 195:18, 195:25
ease
89:7
easier
6:2, 143:15
east
2:15
easy
188:14
edit
179:13
effort
189:15
either
77:6, 97:15, 97:16, 101:15, 144:22, 146:22, 171:2, 176:19, 195:3, 195:6, 209:10
elastic
75:14, 75:21, 75:23, 77:21, 80:23, 85:6
elastomeric
160:25
electronic
9:6
element
132:12
elements
131:22
eliminate
56:12, 57:21, 58:15, 77:12, 77:15, 78:12, 113:22
eliminated
59:5, 59:14

elizabeth
2:5, 2:11
ellers
110:9, 110:16, 111:1, 111:5, 111:14, 112:10, 112:21, 114:25, 115:10, 116:5, 116:15, 116:16, 116:20, 185:19
elliptical
139:22
elongate
105:21, 105:22, 106:6, 106:24, 133:5, 133:13
else
16:22, 20:16, 23:8, 41:4, 162:5, 166:24, 173:1, 173:6, 198:1
else's
162:8
elsewhere
73:9
embodiment
37:20, 43:19, 43:20, 43:21, 48:1, 63:5, 68:19, 69:8, 69:16, 69:20, 69:24, 70:5, 77:22, 78:10, 86:3, 87:7, 113:11, 116:2, 144:18, 201:14, 207:24, 208:3
embodiments
43:8, 69:1, 70:16, 70:24, 78:1, 78:6, 78:17, 80:2, 80:4, 82:2, 88:3, 90:14, 91:15, 92:19, 98:13, 105:19, 108:13, 118:1, 126:10, 129:15
employ
212:10
employer
210:9
encircle
60:14, 60:16
encircled
56:7, 57:21, 67:4, 137:13
encircles
54:13, 56:11, 60:1, 61:3
encircling
57:5
end
17:12, 17:16, 44:7, 44:8, 69:3, 69:4, 73:16, 92:25, 93:1, 93:2, 93:3, 93:13, 93:15, 93:21, 93:22, 93:23, 94:5, 94:6, 94:13, 94:14, 94:22, 94:23, 95:4, 95:5, 95:8, 95:9, 95:14, 95:15, 95:21, 96:2, 96:5, 96:11, 96:16, 96:17, 96:19, 96:20, 97:7, 98:24, 99:3, 99:8, 99:13, 100:4, 100:12, 100:13, 100:14, 100:16, 100:17, 100:20, 100:22, 101:2, 101:3, 101:5, 101:11, 101:12, 102:5, 102:14, 102:15, 102:16, 110:8, 117:25, 118:17, 119:12, 119:15, 121:13, 137:17, 137:20, 137:21, 144:3, 144:4, 168:17, 169:8, 171:1, 192:12, 209:13
ending
102:20
endoluminal
200:16
ends
93:13, 93:14, 93:25, 96:21, 97:5, 97:6, 97:16, 97:17, 98:21, 98:23, 98:25, 99:1, 99:7, 99:17, 100:2, 100:6, 100:10, 101:6, 108:4, 147:22, 148:1, 148:3, 148:9, 148:14, 148:18, 148:19, 149:1, 149:7
engaged
63:17
engineer
18:25, 19:2, 19:8, 19:24, 20:3, 22:10, 29:22, 51:20, 180:9, 195:4, 195:5, 196:2
engineering
27:15, 27:18, 28:6, 34:22, 34:24, 35:1, 36:23, 180:6, 180:18, 180:19
engineers
18:21, 21:19, 24:10, 31:25, 32:6, 112:17, 180:11
enough
89:14, 89:23, 110:22, 120:11, 128:23, 129:4, 129:23, 151:16, 151:23, 189:23, 194:23
entire
17:7, 89:25, 94:9, 107:5, 107:13, 107:16, 215:7
entirely
108:12
entity
210:12
entrainment
18:8
environment
24:12
equated
122:6
errata
215:1, 215:12
error
9:19
errors
5:17
escape
193:6, 193:12
escapes
178:1
essentially
86:21, 115:10, 187:1, 187:2
established
149:21
estimate
178:24
et
39:17, 141:5, 184:22
evaluated
138:24
evalve
195:11, 196:5, 196:7, 196:10, 197:2
even
28:15, 188:16
ever
18:20, 18:23,

108:6, 121:14, 129:19, 175:2, 175:10, 175:19, 175:21, 176:2, 177:4, 178:8
every
25:15, 31:12, 31:21, 50:22, 50:23, 51:3, 51:9, 51:10, 121:2, 129:22, 130:3, 155:1
everything
6:1, 6:16, 10:14, 11:10, 12:7, 12:17, 101:21
evidence
212:7
exact
81:6
exactly
49:22, 178:13
examination
3:2, 3:5, 5:4
examined
5:2
example
16:25, 27:5, 27:7, 36:15, 57:2, 66:25, 92:13, 106:7, 107:9, 107:12, 119:8, 119:25, 120:3, 120:17, 124:4, 126:11, 127:25, 128:10, 129:2, 137:2, 139:19, 140:13, 140:17, 141:7, 143:16, 153:21, 153:23, 170:4, 171:9, 172:6, 193:1
examples
23:2, 25:17, 81:3, 82:15, 108:9, 108:10, 139:6, 153:18
except
215:10
excessive
188:4
excuse
5:9, 13:22, 25:4, 29:16, 69:17, 73:1, 81:18, 82:2, 99:24, 114:3, 125:4, 129:16, 129:24, 153:7, 155:25, 157:22, 172:11, 197:1
executed
178:15
exerted
76:7, 76:14, 88:24, 187:19, 187:21, 204:8, 204:20
exerting
129:11
exhibit
3:11, 8:7, 8:17, 8:19, 10:20, 10:23, 12:8, 12:23, 12:25, 13:5, 13:7, 13:24, 13:25, 14:11, 14:19, 15:25, 33:1, 40:13, 40:19, 40:21, 40:22, 41:8, 41:15, 41:16, 42:4, 42:7, 46:20, 62:3, 62:15, 62:20, 63:1, 63:5, 69:10, 74:18, 87:25, 90:4, 110:1, 117:4, 123:13, 146:23, 150:5, 150:9, 152:12, 154:5, 154:13, 154:15, 162:11, 165:25, 168:5, 173:23, 173:25, 177:16, 177:19, 177:21, 181:15, 186:9, 190:12, 191:3, 194:24, 195:1, 198:18, 199:4, 199:6, 199:10, 200:23, 201:2
exhibits
8:1, 8:2, 8:3, 10:7, 10:10, 10:11, 11:4, 11:11, 11:18, 11:21, 11:23, 12:8, 12:11, 12:15, 12:17, 12:23, 12:25, 13:6, 13:17, 13:23, 40:21, 40:23, 41:13, 173:21, 173:22
expand
64:2, 66:16, 68:2, 192:20
expansion
65:23
experience
17:19, 18:1, 18:13, 18:18, 18:19, 19:7, 34:22, 34:24, 35:1, 35:8, 35:15, 35:18, 35:24, 35:25, 36:5, 36:14, 36:24, 59:16, 118:24, 139:2, 162:1, 174:15, 180:6, 180:14, 180:17, 180:19, 180:20, 180:21, 180:23, 183:12, 208:23
expert
59:16, 174:2, 174:4, 174:5, 174:12, 174:14, 174:15, 174:25, 175:2, 175:5, 193:10, 209:2, 209:4
expires
211:9, 212:16
explain
49:15
explained
117:24
explains
123:16, 164:24
explanation
6:11
extend
105:21, 106:6, 107:5, 107:18
extending
169:7
extends
107:12, 107:16, 108:11
extension
186:3
exterior
87:8
external
201:13
extra
8:10, 27:25, 41:10
extremely
77:20, 81:10, 81:20, 84:5

F

fact
70:6, 124:7, 124:22, 125:3, 125:9, 125:25, 126:13, 128:14, 128:25, 131:25
fair
6:14, 10:22, 16:13, 18:10, 18:11, 24:5, 25:3, 25:6,

33:23, 40:18, 46:14, 46:17, 87:5, 98:6, 120:18, 121:12, 135:16, 136:14, 163:12, 171:22, 187:3, 190:3, 193:15, 194:23, 196:6, 197:3, 202:25
fairly
120:6
familiar
5:11, 20:22, 25:17, 26:12, 82:9, 104:3, 104:6, 105:4, 105:5, 105:7, 118:13, 121:20, 126:6, 151:9, 174:11, 184:8, 190:15, 190:20, 192:17, 193:9, 199:20
far
156:21, 172:1
farther
114:6, 163:9, 164:8
faster
80:13
features
41:21, 42:1, 42:3, 46:4, 46:6
feedback
188:22
feel
7:7, 171:4, 171:5, 171:17, 171:21, 188:22
few
118:18
field
15:15, 15:16, 15:18, 15:19, 16:4, 16:5, 16:8, 16:13, 16:17, 16:21, 17:2, 17:3, 35:25, 59:17, 103:5, 103:9, 103:14, 103:21, 104:2, 104:8, 104:17, 105:1, 105:7, 117:18, 118:6, 118:10, 119:3, 119:6, 139:2, 139:5, 169:11, 184:1, 185:6
fields
16:25, 180:12
figures
41:18, 43:21, 46:6, 48:1, 62:18, 62:21, 63:3, 63:4, 68:12, 70:5, 70:7, 70:20, 70:25, 77:23, 78:2, 78:20, 78:22, 82:2, 86:1, 86:12, 86:13, 86:17, 91:12, 91:25, 93:18, 97:14, 98:14, 102:7, 108:4, 108:17, 108:23, 116:3, 146:24, 156:24, 157:1, 157:9, 157:22, 170:15, 171:11, 201:3, 203:10, 203:13, 203:16, 203:21, 203:24, 204:4, 204:11, 204:14, 204:23, 205:3, 206:9, 206:11, 206:19, 207:4
filament's
124:7
filaments
90:15, 90:21, 90:24, 91:1, 91:7, 91:10, 91:13, 91:16, 91:17, 91:18, 92:1, 92:4, 92:6, 92:7, 92:10, 93:4, 93:7, 93:24, 93:25, 94:12, 94:13, 94:22, 95:8, 95:21, 95:25, 96:7, 96:17, 97:9, 97:11, 97:14, 97:19, 98:14, 99:14, 99:23, 101:1, 101:10, 101:14, 101:23, 102:13, 118:14, 120:20, 121:5, 121:7, 123:9, 124:4, 141:23, 142:2, 142:9, 142:17, 144:17, 202:11, 202:12, 202:15
fill
77:1, 84:11
filter
165:3
filters
164:19
financial
211:3
find
11:23, 12:4, 20:11, 79:5, 80:9, 105:17, 166:3, 190:24
fine
59:23, 109:11, 166:9, 201:5
finish
6:5, 7:6, 45:10
finished
6:3, 68:16, 75:7, 117:5
first
5:2, 22:12, 42:23, 73:22, 74:2, 85:24, 86:2, 86:4, 86:15, 88:4, 88:13, 88:20, 92:25, 93:2, 93:3, 93:12, 93:21, 93:23, 94:5, 94:6, 94:13, 94:22, 95:4, 95:8, 95:9, 95:14, 95:21, 96:2, 96:11, 96:16, 96:19, 96:21, 97:5, 97:7, 97:16, 98:21, 98:24, 98:25, 99:3, 99:7, 99:13, 100:4, 100:12, 100:14, 100:17, 101:2, 101:5, 101:6, 101:12, 102:5, 102:14, 105:15, 105:16, 110:7, 110:8, 117:11, 123:22, 133:24, 137:17, 137:20, 144:3, 152:24, 159:4, 167:4, 170:18, 174:15, 174:18, 175:5, 175:23, 176:20, 176:22, 178:11, 181:4, 184:24, 186:17, 189:16, 190:11, 191:6, 208:19
fisher
190:21
fit
21:11, 27:10, 27:13, 40:2, 42:17, 43:4, 48:3, 48:5, 48:15, 52:10
flange
169:8

flat
118:3, 119:14, 129:17, 131:19
flat-tip
188:2
flattening
139:14
flexibility
50:1, 50:3, 50:6, 50:9, 50:24, 53:1, 65:3, 110:10, 110:17, 110:24, 111:2, 111:10, 111:11, 111:17, 111:20, 116:8, 120:25, 121:3, 124:12, 125:8, 125:14, 128:2, 128:23, 132:11
flexible
42:25, 48:21, 50:7, 50:13, 54:3, 60:25, 111:4, 111:14, 112:10, 112:15, 115:10, 115:19, 115:21, 116:1, 120:11, 120:18, 120:21, 122:3, 123:24, 124:8, 124:23, 125:5, 125:11, 125:12, 126:2, 126:14, 126:23, 127:9, 127:12, 127:22, 127:23, 128:18, 128:19, 128:20, 128:23, 129:4, 129:23, 130:4, 130:10, 130:19, 131:5, 131:20, 132:4, 151:13, 151:15, 151:16, 151:23, 152:5, 152:6, 188:2
floor
1:24, 2:7
flow
44:4, 44:12, 44:20, 44:25, 45:24, 86:15, 140:3, 140:6, 140:12, 140:19, 140:20, 140:21, 140:24, 141:3, 141:5, 141:6, 155:5, 155:9, 155:22
flowing
192:25
fluid
44:5, 44:6, 44:13, 44:14, 44:20, 45:1, 45:2, 45:24, 47:15, 82:20, 86:18, 139:20, 140:18, 193:13, 193:14
fluids
44:9, 84:2
focus
47:23, 84:9, 93:6, 97:13, 98:20, 105:11, 170:18, 192:16
focused
17:4, 17:5, 17:6, 17:8, 191:14
focusing
150:17
folks
176:25
following
210:13, 214:11, 215:15
follows
5:3
force
39:10, 51:19, 65:11, 65:16, 65:17, 65:22, 66:23, 76:7, 76:14, 116:10, 129:11, 135:14, 135:24, 136:10, 136:15, 137:3, 137:12, 137:16, 137:20, 138:10, 138:12, 186:19, 187:13, 187:15, 187:18, 187:19, 187:21, 188:4, 188:6, 188:9, 189:9, 189:12, 189:14, 189:15, 189:17, 189:19, 189:20, 189:22, 189:23, 189:24, 201:7, 201:20, 202:4, 202:20, 203:25, 204:8, 204:14, 204:17, 204:20, 204:25, 206:13
forceps
202:2, 202:13, 202:16, 202:25
forces
86:15, 138:17
forcibly
63:12, 63:17, 63:22, 63:24, 65:9, 65:15, 65:18, 65:19, 66:2, 66:5, 66:13, 66:14, 66:22, 67:7, 67:10, 67:13, 67:25, 83:23, 84:7
foregoing
212:3, 212:6, 214:6
foreign
18:10
forgot
25:4
formally
82:20
formed
44:15, 45:9, 45:11, 45:16, 45:19, 47:25, 48:4, 48:14, 52:5, 52:21, 55:23, 56:5, 56:17, 57:4, 57:24, 67:6, 72:1, 72:5, 76:22, 77:7, 83:16, 83:20, 84:12, 113:22, 116:2, 116:18
former
176:10
forming
11:4, 12:8, 98:17, 107:16, 108:11
forms
129:22, 130:4, 130:18, 131:3, 131:18, 132:2
forth
16:14, 33:11, 35:5, 81:22, 103:14, 132:2, 154:2, 154:4
found
9:16, 9:19, 68:18, 80:18
four
23:11, 23:14, 34:21, 35:6, 35:8, 35:12, 35:24, 36:3, 36:10, 36:14, 36:23, 180:6, 180:8, 195:12
frame
178:19
francisco
1:25, 2:8, 4:12
free
7:7
french
26:1, 26:4, 27:4, 28:23, 29:5, 29:10,

29:19, 30:10, 30:12, 30:14, 30:17, 159:18, 159:25, 160:1
frequently
169:21, 192:18
friction
23:12, 186:19, 188:19, 188:23
frictional
22:22, 22:24
friends
176:12
front
71:20, 76:15, 190:12, 198:18
full
7:1, 200:9
fully
104:22, 134:20, 134:21, 134:24, 135:6, 135:10
fulton
212:2, 214:3
function
190:10
functioned
21:6
further
209:8, 212:8
fused
128:11, 128:16, 128:22, 129:2

G

gap
43:15, 44:15
gaps
38:11, 39:3, 39:17, 40:3, 42:18, 43:5, 44:15, 44:23, 45:8, 45:11, 45:16, 45:19, 46:11, 46:13, 46:23, 47:2, 47:6, 47:7, 47:24, 47:25, 48:3, 48:4, 48:9, 48:24, 49:6, 49:15, 50:4, 50:14, 51:22, 52:4, 52:20, 53:24, 54:9, 54:17, 55:4, 55:23, 56:4, 56:12, 56:17, 57:3, 57:21, 58:1, 58:13, 58:15, 59:1, 59:4, 59:13, 60:6, 67:6, 76:21, 77:2, 77:4, 77:7, 77:13, 77:15, 78:12, 83:15, 84:11, 113:1, 113:22
garage
152:5
garrison
156:12, 166:25
gas
44:5, 44:6, 44:12, 44:13, 44:14, 44:20, 44:25, 45:2, 45:24, 82:20, 86:18, 193:2
gases
44:9, 84:2
gate
127:13, 127:25
gave
21:5, 127:25, 137:2, 139:19, 140:17, 193:1
gears
90:2, 109:9
gelatinous
82:18, 83:5, 83:12
general
118:22, 141:1, 189:4, 200:14
generally
26:15, 151:1, 151:12, 174:11, 181:11, 181:12, 190:23, 200:10
georgia
210:4, 210:14, 211:10, 212:1, 212:17, 214:2
getting
92:3, 118:15, 138:3, 138:4, 139:11, 152:23, 189:14, 198:2
give
6:17, 6:25, 41:7, 81:2, 83:11, 90:4, 107:9, 113:16, 153:18
given
5:16, 23:6, 38:25, 82:15, 85:17, 88:24, 106:17, 107:2, 165:25, 211:3, 212:7
go
5:11, 10:9, 11:23, 12:1, 21:25, 22:21, 25:25, 26:2, 27:23, 37:1, 42:10, 50:23, 51:4, 53:21, 66:25, 72:20, 76:16, 79:9, 80:24, 87:25, 90:2, 117:11, 141:6, 143:17, 146:24, 152:13, 158:9, 160:8, 165:2, 165:4, 166:24, 179:23, 181:1, 181:15, 184:19, 194:24, 200:25
goal
38:17, 46:2, 46:3, 46:7, 51:25, 77:3
goes
23:12, 93:3, 93:25, 188:13
going
5:11, 5:25, 6:12, 8:6, 10:9, 10:19, 15:24, 23:6, 25:14, 26:18, 27:3, 27:8, 31:9, 31:12, 31:16, 31:20, 32:2, 32:10, 32:20, 39:9, 40:12, 42:13, 52:16, 52:19, 53:8, 61:16, 62:7, 63:6, 79:15, 84:21, 90:2, 91:14, 92:13, 101:11, 109:5, 109:8, 109:13, 120:4, 123:20, 125:19, 132:17, 133:25, 146:23, 148:17, 152:11, 155:19, 160:9, 162:13, 166:5, 166:10, 166:23, 171:8, 177:20, 189:11, 194:20, 195:25, 198:4, 199:3, 201:2, 208:8, 209:14
golden
127:13, 127:25
good
50:9, 53:9, 89:10, 165:23, 197:23
grab
179:23
graft
200:19
graphic
40:11
great
6:8, 10:25,

154:12, 156:10, 160:5
green
37:16
ground
5:10
grouped
128:10, 128:16, 128:22, 129:2
grouping
94:9
guess
88:19, 195:23
guessing
59:10, 59:20
guidant
197:5, 197:6
guide
25:25, 27:3, 27:8, 27:10, 27:13, 27:21, 27:23, 28:5, 28:17, 29:16, 29:19, 29:24, 30:6, 30:16, 30:21, 31:16, 121:20, 188:2, 197:17
guide-wire-type
197:22

H

half
53:9, 109:6
hand
8:6, 15:24, 40:12, 152:11, 177:20, 188:23, 199:3
handle
119:15
happen
58:20
happened
110:22, 196:4
happening
44:24
happens
37:25, 38:8, 66:18, 203:24, 204:11
hard
85:9
harder
88:18
hardness
81:3, 81:4, 81:8, 82:4, 85:17
hartley
53:23, 54:19, 55:11, 56:16, 57:1, 58:14, 60:20, 166:1, 168:3, 168:7, 172:12, 182:15, 183:21, 191:5, 192:7, 193:23, 194:6, 194:11
hartley's
42:25, 52:25, 53:14, 54:3, 54:13, 55:10, 56:7, 56:11, 57:5, 60:25, 61:2, 67:17, 116:16, 116:20
head
6:18, 57:22, 60:3
heading
64:18
health
6:21
hear
175:23, 175:25, 176:20, 176:22
heard
23:11, 190:18
hearing
212:8
heart
120:5
help
16:4, 80:14, 203:18
helpful
16:2, 63:9, 68:10, 85:20, 114:20, 114:21, 159:25, 201:24
hemo
17:25, 104:9, 131:12, 192:4
hemostat
202:2, 202:14, 202:17, 202:25
hemostatic
87:19, 104:10, 105:6, 161:19, 183:20, 184:9, 197:10, 197:12, 197:15
here
4:2, 6:23, 7:1, 7:8, 7:9, 7:10, 8:25, 9:23, 12:11, 13:23, 15:1, 16:14, 23:14, 39:25, 42:15, 45:15, 54:2, 55:21, 57:11, 58:10, 58:12, 59:1, 68:24, 69:7, 69:18, 70:14, 71:8, 75:20, 77:25, 104:12, 104:25, 105:16, 105:17, 113:11, 117:8, 121:22, 131:3, 131:15, 133:11, 135:2, 135:20, 143:19, 145:2, 147:20, 148:5, 148:9, 153:5, 156:16, 158:21, 167:21, 171:19, 194:8, 201:23, 207:4, 210:15, 214:12
hereby
212:3
hereof
213:4, 214:8, 215:12
higher
88:14, 88:17, 165:13
highly
75:14, 75:21, 76:4, 77:21, 80:23, 85:6, 204:5
hired
18:21, 180:11
hold
172:4, 172:8
hour
53:9, 109:6, 198:24
hourly
198:22
hours
173:11, 178:21, 179:2, 179:5
housing
94:1, 169:9, 208:5
however
86:19, 114:11
huge
27:19, 30:5, 30:9, 30:17
hypothetical
144:23, 144:24, 144:25, 145:18, 146:2, 146:14, 194:13
hypothetically
145:8, 145:9

I

identification
199:8
identified
10:6, 12:14, 13:16, 13:22, 72:12, 131:3, 132:1, 167:2, 197:1
identifies
180:1
identify
201:16

illus
82:16
illustrated
43:6
illustrates
201:12
illustrative
82:16
image
37:5, 37:10, 37:13, 38:12, 39:4, 42:21, 47:5, 53:13, 56:6, 60:17, 78:7, 78:11, 169:4
images
40:21, 41:17, 41:20, 41:21, 41:24
immediately
183:5
impact
127:21
imperative
1:5, 2:2, 4:4, 4:18, 175:19, 175:21, 175:23, 175:25, 176:2, 176:4, 176:6, 176:9, 179:17, 215:3
implant
196:17
implanted
196:17
implies
18:1, 157:18, 192:4, 192:5
important
25:19, 25:21, 26:2, 122:18, 123:1, 127:17, 155:2
inari
1:11, 2:12, 4:5, 176:20, 176:22, 177:1, 177:6, 178:2, 178:5, 178:8, 208:14, 215:3
inc
1:5, 1:11, 2:2, 2:12, 4:4, 4:5, 215:3, 215:4
inception
198:25
inch
197:21
include
11:14, 11:19, 16:22, 33:19, 40:22, 60:9, 69:6, 69:10, 69:17, 69:20, 75:16, 87:7, 116:4, 116:20, 141:22, 141:25, 143:1, 172:12
included
14:25, 61:12, 70:24, 76:21, 77:6, 78:9, 78:10, 196:14
includes
29:4, 40:23, 44:7, 68:7, 70:7, 72:3, 72:14, 72:17, 73:3, 75:13, 80:23, 85:23, 143:5, 152:18, 152:25
including
7:16, 39:14, 113:10, 142:6, 204:1
incomplete
194:12
incorrect
9:20
incubator
176:25, 178:1
indicate
74:13, 154:24
indicated
215:11
indicates
73:2
indication
50:22, 51:3, 51:9
individual
91:18, 92:1, 92:7, 92:22, 93:7, 93:8, 94:4, 95:20, 96:1, 96:6, 96:10, 97:13, 101:4, 124:14, 126:8, 141:22, 144:6, 148:9
individually
108:21, 148:8
individuals
176:12, 176:14
inflate
192:18
inflexible
127:15
influence
86:18
information
40:9, 125:17, 128:21
infringing
162:8
initiating
65:17
injecting
192:22, 193:3
injuries
163:16
injury
163:11, 165:12
insert
161:21
inserted
28:13, 46:23, 46:25, 47:1, 47:2, 49:19, 51:5, 51:13, 205:12
inserting
28:5, 28:22, 29:4
insertion
29:10, 29:19, 30:16, 188:4
inside
38:20, 38:21, 43:13, 43:18, 43:22, 43:23, 77:6, 84:21, 112:6, 161:23, 187:19, 187:22, 189:6, 189:24, 205:5, 205:19, 206:15
instance
5:1, 27:14, 44:15, 47:25, 48:2, 50:23, 56:2, 56:4, 85:8, 115:25, 117:25, 127:10, 130:14, 145:13
instances
55:1, 55:4, 55:8, 196:25
instead
107:1
instrument
44:5, 44:13, 44:21, 45:1, 45:25, 46:25, 205:5, 205:19
instrumentation
188:2
intent
112:4
inter
8:21
interacts
134:7
interested
212:11
interference
8:24
interior
37:17
internal
196:23

internally
196:9
interpret
96:8
interpreted
144:20, 144:21
interrupt
156:3
intervention
161:5, 162:16, 164:13, 165:5, 165:7, 165:12
interventional
37:15, 165:22
interventions
159:4, 159:14, 160:2
intracranial
155:20, 158:5, 158:7, 158:17, 159:5, 159:15, 159:22, 160:3
intraluminal
191:11, 192:4
intravascular
16:12, 16:16, 16:20, 17:9, 17:20, 17:22, 18:17, 103:10, 103:16, 104:18, 105:2, 105:8, 117:19, 118:7
intrinsically
81:11, 81:21, 82:5, 82:8
introducer
160:24
introduction
18:14, 193:13
invention
16:14, 16:17, 16:21, 16:25, 17:2, 103:5, 103:9, 200:10, 200:12
inventor
177:5, 199:14, 200:6
inventors
190:20
involve
17:22, 186:18
involved
18:24, 19:1, 19:3, 19:5, 20:4, 104:10, 118:15, 197:3, 197:11
inward
207:25, 208:4
inwardly
89:1
ipr
1:8, 4:7, 174:17, 174:18, 174:21, 178:22
iprs
10:21, 174:21
ischemia
155:5, 155:9, 155:13
ischemic
154:17, 154:19, 155:3, 162:25, 163:21, 164:14, 165:8, 165:15, 167:6, 167:14
issue
6:11, 73:13, 89:15, 90:5, 112:24, 113:12, 117:8, 120:13, 158:15, 177:5, 189:13
issues
113:1
item
68:14, 157:8, 157:11, 157:21, 158:6, 168:14, 170:19, 170:24, 170:25, 201:25, 202:3, 202:6, 202:19
items
201:6, 201:19, 203:5, 207:5
itself
70:7, 82:20, 86:22, 88:25, 101:24, 120:14, 130:12, 131:22, 144:15

J

jhamilton@perkin-scoie
2:19
job
1:31
joe
53:8
john
8:11, 178:6
joseph
2:14, 4:15
josh
173:5
joshua
2:4, 2:10, 4:17
judicial
210:4
july
9:13, 178:16
jump
43:7
june
177:23

K

keep
76:15, 143:17, 192:22
kin
212:9
kind
99:5, 188:13, 195:25
knew
21:24, 51:20
knobbe
1:22, 2:3, 4:11, 4:17, 174:19, 175:9, 175:10, 175:14, 175:18, 179:20, 191:1, 191:2
know
10:2, 16:2, 22:12, 22:15, 49:1, 52:16, 52:19, 55:22, 55:24, 58:5, 58:12, 58:17, 58:18, 58:19, 58:23, 59:1, 62:9, 63:10, 70:10, 70:23, 75:7, 76:24, 77:10, 78:15, 79:25, 83:9, 83:20, 83:21, 84:17, 84:24, 90:12, 95:13, 97:8, 101:18, 101:20, 110:4, 111:1, 114:1, 117:14, 122:15, 124:10, 125:7, 128:21, 132:8, 134:14, 141:3, 147:15, 154:7, 161:13, 166:23, 167:9, 174:6, 174:10, 176:1, 177:4, 178:21, 186:14, 192:10
knowing
124:25, 125:16, 126:4, 152:3
knows
171:7
ktnk-resistant
3:13, 199:7

L

label
102:14
labeled
37:17, 68:21, 68:24, 69:7, 69:18, 69:19,

70:6, 70:20, 70:23, 73:2, 94:6, 94:24, 95:4, 95:23, 96:5, 97:7, 98:23, 100:14, 100:17, 100:21, 157:7, 171:15
labeling
97:9
labels
144:3
lack
155:5, 155:9
laid
83:10
laminar
141:5
language
46:10, 99:11, 99:25, 100:24, 101:4, 102:4, 144:19
laparoscopic
191:11, 191:17, 191:20, 192:2, 192:11, 192:14, 192:17, 192:21, 193:6, 193:8, 193:10
large
26:4, 27:25, 29:23, 30:11, 30:12, 127:14
large-diameter
26:8, 57:14
larger
26:11, 28:12, 28:16, 28:17, 30:20, 30:24, 138:3, 206:10
larger-diameter
28:8
last
9:4, 15:14, 42:21, 59:12, 68:8, 69:23, 72:20, 88:11, 88:15, 118:18, 125:2, 129:14, 152:13, 162:14, 164:23, 198:13, 198:15, 208:18
later
54:23, 78:17, 80:2, 80:3, 197:6
lawyer
143:11, 175:8, 175:9
lawyers
179:20
leads
112:9
leaf
186:2
leaflets
196:17
leakage
17:13, 18:5, 18:6, 18:15
learn
122:1, 122:5
least
14:11, 35:17, 72:3, 88:13, 91:6, 113:21, 141:24, 142:1, 142:3, 142:6, 142:8, 142:14, 142:22, 142:24, 142:25, 143:5, 143:7, 144:9, 144:10, 144:15, 144:20, 145:5, 145:25, 146:3, 148:6, 184:5, 195:15, 196:22, 204:7, 204:19
left
93:13, 93:14, 94:24, 96:19, 97:9, 99:3, 144:4
legal
70:9, 91:23, 93:10, 142:19, 143:10, 174:11, 183:18, 184:7, 184:15, 185:17
legs
155:13
length
133:14
less
28:1, 34:15, 50:7, 50:13, 65:24, 88:18, 111:4, 112:10, 112:15, 127:23, 179:7, 179:9
lessen
141:8
let's
9:25, 12:22, 23:20, 26:19, 30:8, 32:25, 33:3, 37:1, 42:10, 43:20, 46:9, 47:23, 48:23, 49:23, 53:10, 54:25, 56:2, 57:20, 59:25, 64:12, 64:13, 66:25, 69:23, 70:14, 71:17, 72:20, 74:17, 76:15, 76:16, 78:9, 79:11, 84:9, 86:24, 87:16, 87:25, 89:22, 90:2, 90:7, 92:11, 92:16, 92:18, 93:6, 97:13, 97:19, 97:20, 98:4, 98:19, 98:20, 99:24, 100:5, 100:24, 105:11, 109:4, 109:7, 113:9, 115:25, 117:4, 118:5, 123:13, 124:16, 125:2, 128:23, 129:14, 139:7, 139:21, 140:21, 141:5, 141:17, 143:16, 144:19, 145:6, 146:21, 148:8, 150:5, 151:16, 151:23, 154:13, 156:23, 161:16, 164:19, 166:24, 169:18, 169:19, 170:18, 170:24, 171:11, 175:11, 179:23, 181:15, 187:13, 193:20, 198:1, 204:12, 206:19, 207:3
letting
79:22
level
49:1, 64:9
light
82:21
likely
178:16, 189:20
limited
7:23
line
7:5, 10:18, 63:13, 63:15, 85:5, 90:8, 90:10, 91:15, 94:11, 101:1, 102:20, 102:21, 105:17, 107:22, 110:7, 110:8, 114:8, 117:12, 119:11, 123:14, 123:16, 126:9, 128:8, 132:16, 132:18, 132:19, 133:24, 141:17, 141:21, 142:11, 145:11, 145:25, 150:17, 152:25, 153:2, 153:12, 153:20, 159:4,

182:4, 184:19
lines
62:12, 63:14, 118:2, 118:24, 118:25, 119:9, 129:16, 131:18, 182:3
liquid
193:13, 193:14
list
10:6, 10:11, 11:10, 11:18, 12:11, 12:14, 12:17, 12:22, 12:25, 13:6, 13:16, 13:22, 14:5, 14:16, 73:6, 131:2, 173:23, 173:25
listed
12:17, 22:23, 68:20, 72:10, 125:21, 190:15, 190:21, 195:2, 195:6
lists
160:11, 187:7, 187:8, 188:3
litigation
174:21, 175:3, 210:11, 211:4
little
79:9, 90:3, 114:5, 125:20, 146:21, 181:20, 196:16
lizzie
173:5
llp
1:22, 2:3, 2:13
load
88:5
located
73:15, 73:18, 74:16, 157:21
location
158:10
locations
159:12
long
126:17, 131:22, 166:4, 199:12
longer
165:11
look
9:25, 11:7, 12:1, 12:22, 12:23, 15:11, 16:6, 41:3, 44:1, 46:20, 62:1, 62:3, 63:1, 65:14, 68:25, 69:21, 69:22, 69:23, 70:11, 70:14, 71:3, 71:9, 71:14, 71:17, 72:9, 73:8, 74:17, 79:1, 80:11, 80:15, 86:24, 90:7, 94:2, 100:24, 104:21, 109:4, 113:8, 117:4, 123:13, 125:2, 128:8, 129:14, 141:17, 143:16, 146:22, 146:23, 150:8, 153:7, 154:13, 155:15, 155:18, 156:22, 156:23, 157:13, 158:8, 159:1, 159:16, 166:21, 167:1, 173:10, 177:14, 186:9, 190:11, 203:17, 206:8, 206:18, 206:19, 207:12
looked
10:17, 42:4, 138:25, 160:5, 200:7
looking
48:11, 62:10, 62:15, 68:12, 68:22, 73:24, 79:2, 79:3, 80:1, 80:6, 80:7, 80:8, 95:18, 143:21, 143:22, 152:20, 168:25, 201:22
looks
11:8, 48:12, 48:13, 199:20
loop
56:16, 57:1, 57:2, 67:9, 103:1, 103:6, 103:21, 103:23, 104:7, 104:10, 104:17, 104:22, 105:1, 105:11, 105:13, 105:17, 105:20, 106:1, 106:2, 106:9, 106:11, 106:12, 106:14, 106:16, 106:18, 106:19, 106:25, 107:1, 107:4, 107:6, 107:12, 107:15, 107:16, 107:18, 107:19, 108:7, 108:10, 108:11, 108:16, 108:21, 108:22, 108:23, 109:1, 109:2, 123:24, 131:20
looped
56:3, 58:16, 128:24, 129:24, 138:11
looping
107:3
loops
54:23, 55:2, 105:5, 107:10, 108:19
los
2:17
loss
28:7, 28:8, 28:18, 29:7, 30:25, 31:4
lot
92:12, 112:24, 120:6, 120:15
lots
120:2
lubock
177:7, 177:8
luer
169:23, 169:25, 170:10, 170:13
lumen
37:17, 39:8, 39:16, 40:4, 42:19, 43:6, 43:22, 43:23, 44:8, 46:24, 47:1, 47:3, 47:11, 47:13, 47:14, 48:10, 50:8, 50:14, 50:17, 51:13, 51:18, 56:3, 56:16, 57:1, 57:2, 57:3, 57:6, 57:21, 58:16, 60:2, 60:15, 60:16, 61:3, 65:9, 67:4, 67:5, 76:6, 77:6, 78:17, 86:21, 110:12, 119:13, 119:21, 119:22, 120:3, 120:11, 123:24, 124:2, 128:24, 129:4, 129:5, 129:24, 130:5, 130:19, 131:6, 131:9, 131:20, 137:5, 137:13, 138:12, 138:13, 151:17, 151:24, 192:5, 201:7, 201:20, 204:1, 204:7, 204:12, 204:15, 204:24, 204:25,

205:10, 205:11, 205:19, 206:1, 206:5, 206:6, 206:13, 206:16
lunch
109:10

M

machine
121:5, 121:6
machined
150:10, 150:19, 150:24, 150:25, 151:1, 152:21, 153:25, 154:1
machining
121:6, 150:15, 151:9, 151:14, 152:9, 153:8, 153:14, 153:23
machinist
151:10
made
21:6, 27:25, 31:8, 31:11, 50:14, 51:17, 57:9, 67:7, 92:4, 92:6, 121:6, 123:17, 124:7, 124:22, 125:3, 125:4, 125:9, 125:10, 125:25, 131:25, 150:14, 150:15, 151:11, 152:9, 153:14, 162:4, 210:7, 210:25, 214:11
main
17:7
make
6:2, 16:24, 27:19, 28:18, 28:24, 29:6, 29:20, 29:25, 30:5, 46:9, 92:11, 98:12, 99:6, 102:14, 103:12, 117:1, 123:23, 125:20, 130:18, 143:15, 182:9, 207:3, 210:13
makes
27:15, 27:17, 27:18, 28:6, 75:18, 182:10
making
56:14, 112:18, 154:5, 188:13
manipulation
87:14, 134:8
manually
208:4
manufacture
89:7, 89:9, 154:8
manufactured
153:2, 153:8
many
5:8, 8:12, 20:19, 39:22, 63:2, 92:7, 160:23, 169:1, 169:13, 175:24, 178:21, 179:2, 179:5, 184:1, 186:2, 188:21, 193:8
march
1:21, 3:12, 4:1, 4:8, 199:7
marked
8:1, 8:6, 15:25, 40:13, 41:8, 152:11, 177:21, 199:8
marks
209:13
martens
1:22, 2:3, 4:12, 4:18, 174:19, 175:9, 175:18, 179:21
match
31:11, 31:19, 32:9
matched
31:15, 32:19
matching
52:9
mate
67:7
material
12:1, 13:21, 49:10, 49:18, 49:20, 49:23, 49:24, 50:14, 50:17, 51:18, 53:4, 55:25, 56:10, 57:8, 57:13, 57:17, 57:20, 57:22, 57:24, 57:25, 60:1, 67:5, 67:7, 75:14, 75:15, 75:18, 78:16, 81:10, 81:13, 81:17, 81:20, 81:21, 81:25, 82:4, 82:11, 82:13, 82:17, 82:18, 82:22, 82:25, 83:2, 83:6, 83:7, 83:9, 83:14, 84:4, 84:11, 84:18, 84:22, 85:3, 85:6, 85:15, 85:24, 85:25, 86:1, 86:20, 88:14, 88:21, 98:2, 108:11, 111:17, 112:20, 113:15, 115:16, 115:22, 121:2, 122:7, 124:11, 124:15, 125:2, 125:8, 126:4, 127:20, 129:9, 131:2, 132:9, 152:6, 153:4, 153:6, 154:1, 157:15, 160:24, 160:25
materials
10:6, 12:13, 13:15, 14:7, 39:8, 39:15, 39:16, 40:8, 46:4, 46:5, 48:8, 48:18, 54:14, 56:8, 56:15, 57:11, 77:21, 79:14, 79:21, 79:23, 80:17, 80:23, 80:25, 82:9, 88:13, 110:21, 111:8, 123:17, 123:21, 125:10, 125:16, 125:21, 126:1, 130:1, 130:17, 131:2, 131:18, 132:1, 132:10, 152:18
matter
4:4, 12:2, 12:5, 12:9, 36:15, 105:9, 174:24, 175:6, 175:15, 190:25, 195:2, 195:3, 195:6, 195:9, 198:23, 199:1, 200:14, 208:15, 209:2, 209:5, 213:3, 214:7, 215:9
matters
175:11, 178:12
maybe
13:12, 13:14, 51:19, 121:8, 125:20, 141:2, 146:21, 189:10, 189:14
meaning
46:23, 85:9, 104:2, 105:1, 117:18, 117:24,

118:10, 118:21, 122:9, 122:15, 122:17, 163:16, 174:7, 178:15, 181:6, 181:7, 181:8, 181:10
means
47:13, 47:15, 51:14, 63:24, 66:3, 66:9, 66:23, 67:22, 74:10, 75:23, 91:17, 92:8, 95:10, 114:15, 122:21, 123:4, 128:19, 133:16, 133:17, 133:19, 142:8, 146:3, 152:18, 155:4, 156:16, 156:17, 159:7, 162:16, 163:6, 163:20, 164:3, 169:9, 182:1, 184:9, 189:15, 191:8
meant
14:20, 51:8, 66:4, 111:19, 151:13, 161:9, 171:21, 181:10
mechan
201:13
mechanical
85:12, 180:18
mechanism
104:10, 114:9, 114:12, 114:13, 114:15, 114:20, 115:1, 129:11, 134:9, 142:5, 183:23, 201:13
medamicus
190:16
media
4:2
medical
1:11, 2:12, 4:5, 25:15, 26:12, 87:20, 87:22, 118:22, 119:3, 119:6, 139:2, 139:5, 170:1, 176:20, 176:22, 178:9, 180:12, 180:20, 180:21, 180:23, 200:18, 215:3
medications
6:21
meet
36:13, 172:25, 173:4, 177:8, 178:6, 179:15, 179:19
meeting
178:7
meetings
177:9
memory
197:23
mention
82:5, 159:25
mentioned
39:15, 40:10, 186:7, 187:5
mentions
70:2, 80:12
merritt
178:6
met
172:23, 173:3, 176:24, 177:4, 177:7, 177:25
metal
125:2, 125:3, 125:4, 126:6, 127:6, 127:14, 128:1, 153:15, 170:2
metallic
43:1, 57:14, 110:11, 110:17, 111:15, 112:8, 112:16
metals
150:16
michael
190:21
microphone
103:25, 130:8
middle
137:10, 160:10
might
5:22, 6:22, 16:4, 22:22, 51:17, 115:1, 115:9, 119:14, 159:24, 173:11, 185:23, 187:8, 188:24, 189:17, 202:23, 203:17, 208:7, 210:25
mind
183:6
minute
155:18, 189:8
missed
68:20
missing
33:18
misstates
14:1, 14:13, 14:22, 19:10, 22:3, 30:2, 31:23, 32:11, 32:16, 35:9, 36:1, 36:19, 39:5, 39:20, 43:10, 43:24, 45:21, 56:18, 59:22, 66:11, 71:1, 94:18, 99:9, 107:7, 112:12, 115:14, 116:22, 132:5, 142:18, 153:11, 184:6, 184:14, 205:15
mistake
14:5
mitraclip
195:12, 196:12, 196:14, 196:16, 196:18
mitral
196:18
model
85:22
modification
60:12, 60:18
modified
75:16, 80:25
modifiers
81:2
modify
179:13
module
44:7, 63:18, 64:2, 66:20, 68:5, 68:6, 68:14, 71:25, 72:3, 72:6, 72:14, 72:17, 72:23, 73:2, 73:9, 78:21, 80:1, 80:3, 83:25, 87:8, 88:4, 202:8, 202:9, 202:11, 207:2
moment
15:12, 23:10, 23:23, 46:19, 62:13, 74:20, 184:17
money
174:14
monitor
4:9
monofilament
126:11
months
178:17, 178:18, 178:25
more
20:11, 27:22, 28:7, 30:25, 34:14, 34:22, 34:25, 35:7, 35:12, 35:15, 36:5, 36:14, 49:3, 50:7,

69:21, 70:11, 71:4, 71:9, 71:15, 72:1, 72:4, 72:5, 72:17, 73:8, 73:24, 79:1, 80:9, 90:25, 91:1, 91:6, 91:10, 91:11, 92:11, 93:24, 94:8, 110:10, 110:17, 110:23, 111:1, 111:14, 111:20, 112:15, 113:8, 114:11, 114:12, 114:15, 114:19, 114:25, 115:8, 115:10, 115:19, 115:20, 120:13, 120:21, 125:17, 125:21, 127:22, 128:20, 128:21, 132:8, 141:22, 141:25, 142:2, 142:9, 142:16, 148:6, 157:13, 158:8, 159:10, 163:11, 163:12, 165:12, 166:24, 168:25, 179:6, 179:8, 179:10, 188:8, 188:16, 192:7, 192:10
morning
89:3, 180:3
most
11:9, 11:11, 19:12, 31:8, 38:10, 38:13, 165:19, 173:23, 189:20, 189:22
motivated
60:24, 110:19
movable
206:24, 207:23
move
64:1, 64:3, 64:4, 64:12, 64:21, 86:16, 114:5, 117:1, 166:23, 207:1, 208:2
moved
88:23
movement
63:16, 161:12
moves
64:15
moving
63:24, 64:6, 64:10, 87:2
much
28:12, 28:16, 28:18, 28:23, 28:24, 29:5, 29:6, 29:20, 120:13, 125:16, 159:22, 187:18, 188:23, 189:7, 189:12, 189:16, 189:24, 206:23
multiple
90:15, 90:21, 90:23, 91:1, 91:16, 91:17, 92:4, 92:5, 92:9, 92:20, 92:21, 92:25, 93:6, 93:24, 94:12, 94:13, 94:21, 95:7, 95:25, 96:7, 97:8, 97:11, 98:14, 99:13, 101:1, 101:10, 101:14, 101:23, 102:13, 113:3, 116:14, 116:19, 126:7, 143:1, 143:8, 154:8, 190:9
must
146:5

N

name
121:9, 162:2, 178:1, 178:2, 190:18, 196:11
nature
82:16, 82:19, 83:5
navigate
120:11
navigating
120:14
near
158:11
nearly
82:20
necessarily
38:9, 49:4, 52:17, 53:6, 106:17, 107:2, 107:17, 122:8, 126:16, 136:20, 139:8, 142:20, 163:17, 180:25
necessary
30:20, 30:24, 51:16
need
7:3, 7:7, 21:25, 22:12, 24:8, 25:15, 40:7, 58:11, 62:20, 71:9, 71:14, 79:9, 104:21, 111:23, 117:1, 124:10, 125:7, 128:21, 132:8, 151:15, 162:16, 164:12, 165:1, 165:4, 165:7, 180:23, 194:25, 206:22, 214:11
needed
21:10, 25:25, 26:1, 52:12, 111:20, 189:15
needs
22:21, 24:2, 24:8, 24:11, 24:16, 24:19, 24:20, 24:23, 25:12, 28:12, 79:13, 79:21
neither
55:8
neurointerventio-nal
165:9
never
31:2, 176:4, 190:18
new
199:4
next
6:4, 15:11, 88:15, 92:24, 124:16, 125:20, 126:9, 128:8, 142:11, 145:11, 150:17, 153:20, 161:16, 163:19
night
208:18
nine
178:25
nitinol
125:22
nod
6:18
nomenclature
121:25, 158:9
non-curved
64:23
noncompressible
75:15, 75:22, 75:24, 85:8, 86:21
none
184:16
notary
211:7, 212:14
noted
215:14, 215:15
notes
7:17, 7:20
nothing
34:14, 34:15, 43:22, 46:23,

112:6, 206:15
noticed
9:4, 9:21
number
3:11, 4:3, 4:7, 4:24, 8:22, 34:23, 127:20, 178:17, 196:4, 199:6, 211:10, 212:17
nylon
125:21

O

oath
5:13, 9:8, 61:21, 109:19, 166:16, 198:10, 199:21, 215:13
object
108:12
objection
9:1, 13:11, 14:1, 14:13, 14:22, 15:8, 17:24, 19:10, 20:21, 22:3, 22:14, 24:1, 24:9, 24:18, 24:25, 25:9, 25:23, 26:6, 26:9, 26:25, 27:6, 28:10, 28:14, 29:12, 30:2, 30:18, 31:22, 32:11, 32:16, 34:17, 35:9, 36:1, 36:19, 38:1, 38:4, 38:18, 39:5, 39:19, 41:23, 43:10, 43:24, 44:18, 45:3, 45:13, 45:21, 46:16, 47:9, 47:19, 50:10, 50:19, 51:23, 52:6, 53:2, 53:25, 54:10, 54:20, 55:5, 55:16, 56:18, 58:3, 58:21, 59:21, 60:8, 61:8, 61:11, 62:22, 63:8, 65:1, 65:20, 66:11, 69:11, 70:8, 70:17, 71:1, 71:12, 73:4, 76:2, 76:23, 77:9, 77:18, 78:13, 79:4, 83:17, 84:13, 90:18, 91:4, 91:19, 91:22, 93:9, 94:18, 95:11, 96:3, 96:12, 97:2, 97:25, 99:9, 99:18, 100:7, 101:8, 101:25, 102:9, 102:22, 103:2, 104:19, 106:3, 107:7, 111:6, 112:3, 112:12, 113:13, 113:24, 115:14, 116:6, 116:22, 117:21, 118:11, 120:19, 121:1, 122:11, 122:23, 123:6, 123:25, 125:13, 126:18, 126:25, 127:18, 128:4, 129:6, 130:6, 130:21, 131:8, 132:5, 133:2, 134:4, 134:17, 134:25, 135:7, 135:17, 135:25, 136:8, 136:18, 137:7, 137:15, 137:23, 138:14, 139:13, 140:15, 141:10, 142:18, 143:3, 143:9, 144:11, 145:15, 145:22, 146:7, 147:13, 147:23, 148:11, 148:21, 149:3, 149:16, 150:1, 151:4, 151:19, 152:1, 153:10, 156:6, 157:23, 158:19, 159:19, 160:19, 162:17, 162:18, 163:1, 163:22, 164:5, 164:15, 165:17, 167:7, 167:15, 168:23, 169:12, 174:8, 176:7, 177:12, 182:19, 183:1, 183:7, 183:17, 184:3, 184:6, 184:14, 185:8, 185:16, 187:24, 189:18, 191:22, 192:9, 193:25, 194:12, 201:9, 202:21, 203:6, 204:16, 205:1, 205:15, 206:2
obvious
167:23
occasionally
7:5
occlusion
157:17, 157:18, 157:19
occlusions
158:24
occlusively
82:19
occur
47:6, 49:17, 154:23, 158:24, 163:14, 163:18, 165:12
occurring
136:24, 172:18
occurs
154:22
off-the-shelf
20:11, 20:12, 23:19, 197:9
offer
215:13
offhand
23:22
office
1:1, 4:6, 7:11
often
159:5
oh
27:22, 33:8, 177:15, 181:24, 207:15
oils
81:1
olson
1:22, 2:3, 4:12
once
74:10, 84:6, 84:7, 85:4, 153:12
one-handed
167:25
one-piece
149:14
ones
11:9, 23:9, 23:22, 89:20
only
7:3, 17:17, 19:3, 25:25, 27:20, 28:3, 30:6, 82:16, 88:24, 174:24, 185:11, 214:12
open
28:16, 67:12, 84:6, 85:8, 85:15, 161:8, 161:12, 161:20, 171:8, 172:2, 188:9
opened
190:9

opening
161:10, 161:17, 172:5, 186:19, 187:13, 188:6, 189:20
operates
86:11
operation
167:25
operator
161:12
opinion
32:22, 36:11, 60:5, 107:19, 160:7, 209:6
opinions
11:4, 12:5, 12:8, 34:3, 35:22, 36:9, 36:15
opportunity
5:16
opposed
6:18, 27:14, 189:16
opposing
63:18, 83:24
opposite
64:1, 64:3, 64:4, 64:6, 186:3, 186:4
optimize
111:20, 111:23, 112:18, 112:21, 112:25, 113:4
option
55:14, 58:6, 58:9, 58:24, 59:9, 60:10, 61:4, 61:6, 80:22, 80:25, 81:3, 85:23, 88:13, 111:19, 114:21, 146:10, 146:13, 150:14, 150:15, 150:23, 152:18, 152:19, 152:22, 152:23, 152:25, 153:14, 153:16, 154:4
options
112:25, 113:6, 116:15, 154:2, 154:6, 194:15
orange
37:15
order
65:12, 121:13, 134:21, 136:11, 137:25, 180:17
ordinary
31:18, 32:4, 32:7, 32:8, 32:23, 33:12, 33:16, 33:21, 35:5, 35:16, 35:19, 35:21, 36:6, 36:12, 36:16, 40:1, 42:16, 42:24, 43:3, 48:20, 52:22, 60:23, 104:5, 104:14, 110:8, 110:15, 118:21, 154:7, 180:2, 180:13, 180:22, 181:7, 181:8, 181:10, 181:12
other
6:3, 7:12, 10:16, 10:21, 11:1, 11:7, 12:1, 12:3, 17:22, 18:6, 18:10, 19:6, 20:2, 20:5, 23:3, 23:13, 23:15, 28:3, 34:5, 35:20, 39:10, 47:16, 47:21, 49:10, 51:19, 60:2, 64:7, 70:12, 85:20, 89:1, 94:1, 102:16, 102:17, 112:19, 116:15, 121:25, 124:10, 124:13, 124:25, 131:22, 149:6, 152:18, 153:18, 153:23, 154:4, 154:6, 155:14, 160:25, 163:14, 163:16, 169:14, 169:17, 169:18, 172:2, 172:25, 173:8, 173:21, 175:3, 179:20, 180:9, 180:12, 182:12, 182:25, 183:5, 184:12, 185:6, 185:14, 186:1, 191:15, 192:25, 193:4, 193:5, 193:6, 193:8, 194:21, 196:23, 196:25, 197:4, 197:17, 201:3, 206:18, 206:23, 207:4, 210:12
others
23:21, 120:22, 186:5, 188:3
otherwise
58:15, 179:16, 179:19
out
19:5, 20:10, 20:13, 20:14, 20:16, 20:17, 21:3, 21:4, 21:8, 21:20, 22:10, 30:14, 49:14, 80:14, 83:10, 94:10, 123:23, 124:23, 125:3, 125:4, 131:17, 134:25, 140:9, 150:13, 151:11, 192:25, 193:21, 194:9, 195:2, 195:19, 195:24, 196:3, 213:3, 214:7
outer
63:18, 68:14, 83:24
outside
53:25, 55:5, 58:3, 78:13, 83:17, 84:13, 99:18, 100:7, 117:21, 118:11, 122:23, 123:3, 123:6, 123:25, 126:25, 129:6, 130:21, 133:2, 134:4, 134:17, 134:25, 135:15, 135:17, 135:21, 135:23, 135:25, 136:8, 136:11, 136:16, 136:18, 137:5, 137:7, 137:10, 140:15, 141:10, 143:10, 145:15, 146:7, 148:11, 148:21, 156:6, 157:23, 159:19, 160:19, 162:18, 163:1, 163:22, 164:15, 167:7, 182:19, 183:1, 183:7, 185:8, 185:16, 193:25, 201:9, 204:25
outwardly
169:7
oval
106:25
ovalized
107:1
over
5:11, 6:2, 109:6, 149:12, 166:1, 170:15, 179:14
overall
124:15, 127:16

overcome
172:10
overlapping
187:8
own
11:24, 12:2, 27:25, 87:13, 107:2, 147:24, 157:14, 172:23, 178:5, 200:1
owner
1:13, 2:12, 4:16, 5:1, 208:14

P

page
3:2, 9:4, 9:5, 10:2, 10:9, 32:25, 33:5, 33:7, 38:12, 39:4, 44:4, 53:17, 54:23, 56:6, 60:17, 62:9, 63:15, 67:9, 67:17, 67:19, 67:20, 68:10, 76:15, 76:19, 78:7, 88:15, 110:2, 143:22, 143:24, 150:8, 152:24, 153:7, 155:16, 156:24, 159:1, 160:10, 181:19, 186:12, 190:11, 190:16, 191:6, 198:19, 201:2, 203:11, 213:4, 214:8, 214:13, 215:16, 215:20, 215:25, 215:29, 216:1, 216:5
pages
1:32, 10:10, 53:21, 200:7, 212:6, 214:12
paragraphs
63:6, 77:25
parameters
51:19, 85:12, 85:15, 113:3
pardon
29:16
park
2:15
part
70:15, 73:9, 77:6, 95:24, 127:17, 131:23, 144:17, 151:2, 151:3, 156:20, 158:3, 161:13, 172:24, 172:25, 173:3, 176:24
partes
8:21
partial
157:19
partially
134:20
particle
18:11
particular
22:11, 23:16, 23:25, 32:15, 34:6, 34:7, 104:7, 155:6, 169:5, 172:5, 178:22, 182:9, 194:9, 194:18, 195:19
particularly
22:19, 176:13
parties
210:11, 211:2, 212:9, 212:10, 213:9
partly
165:1
parts
121:5, 151:13, 170:2
party
210:11, 210:23, 211:3
pass
47:15, 84:3
passage
44:8
passive
87:5, 87:9, 87:11, 88:7, 88:10, 160:14, 160:18, 160:22, 161:9, 161:10, 161:11, 161:14, 167:4
past
123:9, 123:11
patent
1:1, 1:2, 1:10, 1:13, 2:12, 3:11, 4:5, 4:6, 4:16, 5:1, 8:22, 15:15, 15:17, 15:19, 15:21, 16:9, 16:14, 16:18, 16:22, 17:2, 17:4, 17:7, 34:1, 34:11, 38:19, 39:1, 53:4, 55:11, 69:21, 70:12, 71:10, 71:15, 73:24, 79:1, 79:2, 79:6, 80:10, 90:5, 91:5, 92:14, 94:21, 99:2, 99:11, 99:17, 100:2, 103:3, 103:6, 104:22, 105:12, 105:14, 108:7, 108:9, 108:11, 108:18, 108:25, 117:8, 117:9, 117:24, 118:5, 118:16, 121:17, 122:18, 122:20, 123:1, 123:3, 123:17, 130:12, 138:23, 141:22, 144:1, 147:19, 151:17, 158:8, 159:16, 165:23, 168:16, 168:25, 172:3, 177:5, 181:16, 182:7, 182:11, 183:13, 183:25, 185:3, 185:10, 188:1, 189:3, 199:6, 199:14, 200:1, 200:5, 200:9, 200:11, 200:15, 201:22, 204:3, 206:7, 208:14
patents
10:16, 11:1, 11:7, 11:8, 53:4, 104:4, 104:11, 111:16, 121:17, 121:20, 121:23, 122:2, 122:6
path
44:6, 44:14, 45:2
patient
17:13, 18:5, 18:7, 18:9, 18:14, 18:16, 24:21, 119:24, 120:1, 157:5, 192:23, 192:25
patient's
18:2
paul
177:7, 177:8, 208:15
paul's
178:1
pay
175:14
payment
175:19
penalty
215:6, 215:7
pending
7:5, 79:12, 162:18
people
32:6, 176:1,

176:3, 176:5, 176:9, 178:7
perfectly 50:22, 51:3, 51:9, 116:24
perforation 163:13, 163:14, 163:17
perform 192:20
performing 112:17, 114:23
period 34:6, 179:14
perjury 215:6, 215:7
perkins 2:13, 4:16
permanently 75:25
person 28:20, 29:2, 31:18, 32:4, 32:8, 32:22, 33:12, 33:15, 33:21, 35:1, 35:4, 35:13, 35:15, 35:19, 35:21, 36:5, 36:12, 36:16, 40:1, 42:15, 42:23, 43:2, 48:20, 52:22, 56:25, 57:16, 57:17, 60:23, 85:2, 85:14, 104:5, 104:6, 104:13, 110:8, 110:15, 117:18, 118:10, 118:21, 125:4, 126:1, 151:12, 154:7, 180:13, 180:22, 181:12, 186:24, 193:19
person's 104:16
personally 214:4
perspective 34:12, 104:5, 104:13, 201:12
petition 8:21
petitioner 1:7, 2:2, 4:18
philip 2:21, 4:10
phone 25:4
photographs 41:25
phrase 47:17, 90:17, 91:14, 92:24, 94:11, 154:21, 163:19, 184:21
phrased 59:12
physician 24:11, 24:19, 161:20, 170:8, 171:7, 189:21
pick 85:14, 97:15, 97:20
piece 91:2, 94:4, 97:4, 126:17, 147:11, 151:1, 151:2
pieces 91:11
pinch 87:24, 183:21, 183:23, 184:8, 202:23
pinching 161:7, 188:10, 202:24
pipe 140:21
pipes 140:19
place 4:11, 44:6, 44:14, 44:21, 45:1, 45:5, 45:8, 47:11, 53:14, 189:16, 213:3, 214:7, 214:12
placed 151:18, 151:25, 205:19
placement 200:16
places 155:14
plain 181:7, 181:8, 181:10
plan 24:12
planet 4:10, 4:21, 210:15, 210:17, 210:19, 210:21, 211:1
plastic 43:1, 88:18, 110:11, 110:17, 111:15, 112:8, 153:25, 170:2
plastics 150:16, 153:15
play 116:11
please 4:13, 6:10, 7:3, 7:7, 61:15, 109:12, 130:7, 145:4, 209:11
plurality 128:9, 128:15, 129:1, 144:17
plus 67:16, 114:17
point 44:3, 56:14, 68:8, 73:25, 77:1, 77:12, 77:14, 85:21, 90:8, 128:1, 141:13, 152:16, 159:24, 191:6, 201:24, 207:8
pointed 46:19
points 19:21
polymer 121:9, 123:22, 123:23, 124:3, 124:4, 124:8, 124:11, 124:20, 124:22
polyurethane 75:16
poor 57:13, 57:17
poorly 171:19
portion 47:20, 62:7, 63:19, 64:14, 64:15, 64:19, 64:23, 64:25, 83:25, 94:1, 188:24, 204:9, 208:24
posita 31:17, 31:18, 33:22, 33:25, 34:6, 34:7, 34:12
position 74:12, 141:20, 172:8, 184:25, 185:21
possible 26:24, 38:10, 59:4, 59:6, 59:13, 59:15, 84:15, 111:22, 111:25, 115:8, 116:12, 123:22, 155:2, 165:16, 165:20
possibly 14:15, 107:21, 160:25, 188:18
potential 140:24

potentially
206:3
practitioner
87:22
preexisting
150:15, 153:14
prepara
172:17
preparation
15:5, 172:15, 172:17, 172:22, 173:9, 173:14, 173:17, 173:25, 179:15
prepare
172:20
prepared
13:17, 13:18
preparing
10:15, 12:12, 12:16, 13:9, 13:21, 14:20, 15:5, 15:6, 179:2, 179:6, 181:25
present
2:21, 52:14
president
195:10
presses
64:5
pressure
23:13, 86:14, 86:18, 87:1, 88:19, 88:24
pressures
23:7
presume
74:15
pretty
26:2, 48:13, 127:13, 127:15, 197:24
prevent
17:13, 18:4, 18:6, 18:8, 18:13, 18:15, 18:16, 77:3, 192:24, 193:6, 193:12
previous
154:10, 158:16, 158:18
previously
8:7, 15:24, 40:12, 41:8, 113:1, 177:20
prior
42:21, 59:23, 104:10, 152:24, 175:10, 183:12, 183:25
priority
34:10
pro
205:22
probably
14:5, 57:19, 83:21, 116:25, 126:4, 155:1, 171:21, 173:23, 177:25, 179:11, 186:5, 188:11, 189:4, 189:22, 193:18, 199:24, 201:5
problem
21:19, 33:9, 43:16, 158:18, 187:1, 187:22, 188:19, 190:6
problems
186:18
procedure
18:17, 19:20, 19:22, 21:20, 21:22, 22:11, 22:12, 22:15, 22:19, 23:16, 23:25, 24:3, 24:6, 24:8, 24:12, 24:17, 24:20, 25:8, 25:15, 26:11, 26:16, 26:17, 28:22, 29:3, 51:16, 51:20, 52:1, 52:14, 52:16, 89:14, 89:21, 89:23, 90:1, 165:22, 190:10, 191:20, 192:2, 192:15, 193:6, 194:9, 194:18, 194:19, 194:20
procedures
16:12, 16:16, 16:20, 17:9, 22:1, 24:23, 26:12, 30:15, 87:20, 103:17, 104:18, 105:3, 105:9, 117:20, 118:7, 188:21, 191:17, 192:11, 192:17, 192:19, 192:21, 193:9, 193:10, 193:11
process
131:24
processed
152:3
processing
129:9
product
19:12, 34:21, 34:23, 34:25, 36:23, 180:6, 195:13
products
180:8, 180:10
professional
174:2, 174:4, 174:5, 174:12, 211:8, 212:15
profile
76:5, 76:13, 84:23, 204:6, 205:9, 205:23, 205:24
prograft
195:14, 195:17, 197:2
program
177:24
prohibited
210:21
project
19:23, 19:24, 20:2, 20:6, 20:9, 20:10, 20:25, 21:9, 21:16, 31:13, 31:21, 104:11, 118:15, 196:1, 196:3, 197:12, 197:15
projects
22:5, 28:2, 123:11
promised
168:3
prone
163:11, 163:13
pronounce
154:18
proper
130:17, 130:18, 131:2, 131:3
properties
49:18, 49:20, 49:23, 49:24, 49:25, 53:5, 55:25, 82:12, 82:25, 83:9, 84:18, 111:17, 113:15, 115:16, 115:22, 124:11, 124:15, 125:8
property
81:18
proposed
146:15
proposing
60:18
prosecution
41:6, 199:17, 199:19, 199:22
prosthesis
200:16
protection
164:18

prototyped
183:22
provide
11:21, 110:10, 110:16, 110:23, 111:1, 111:20, 115:21, 154:6, 155:22, 164:9, 165:12, 171:4, 171:5, 171:17, 172:7, 210:18, 210:22
provided
39:23, 124:4, 152:19, 153:15, 191:1, 191:2
provides
81:10, 81:19
proximal
17:12, 17:16, 44:7, 192:12
public
211:7, 212:14
publication
37:21, 121:15
pull
118:24, 119:8, 119:9, 119:11, 121:25, 123:9, 200:23
pulls
119:16
pulse
139:7, 140:18
purchased
19:6, 169:22
purpose
76:1, 84:22, 135:11, 135:20, 170:23, 170:24, 192:14
purposes
82:16, 118:16
pursuant
210:2
push
64:24, 87:23
pushed
87:14, 208:4
put
27:3, 83:14, 117:5, 195:25, 200:1
putting
55:19, 156:17

Q

qualifications
34:14, 180:1
qualified
209:2
quantify
132:11
question
6:4, 6:5, 6:10, 6:11, 6:13, 7:4, 12:10, 16:7, 16:8, 21:13, 29:1, 29:17, 37:8, 38:5, 42:11, 42:12, 42:13, 50:5, 51:7, 52:18, 55:13, 56:13, 63:21, 69:14, 79:12, 79:19, 79:22, 79:23, 79:25, 90:12, 91:16, 97:18, 103:8, 103:22, 104:23, 105:25, 106:15, 110:5, 110:25, 122:4, 125:19, 130:23, 132:17, 142:4, 147:3, 149:11, 151:7, 151:21, 155:19, 158:16, 158:18, 162:5, 162:18, 167:17, 167:19, 167:22, 186:15, 191:24, 193:17, 203:20
questioning
7:5, 10:19
questions
5:25, 117:15, 166:25, 209:8, 209:9, 212:4
quick
165:4, 208:7
quickly
80:9, 154:22, 154:23, 154:25, 155:2, 165:2, 165:4, 165:16, 165:20, 165:23
quite
115:19, 116:1, 152:4, 152:6, 164:7

R

r&d
195:11
radial
169:7
radiologists
165:9
randomly
59:20
range
11:8, 30:13, 36:4, 51:15, 54:15, 56:9, 57:6, 81:2, 81:8, 85:12, 110:23, 113:15, 115:2, 115:5, 115:12, 116:25, 131:13
ranges
85:17
rapid
162:16, 164:12, 165:5, 165:7
rate
140:25, 141:3, 198:22
rates
140:20, 211:2
reach
53:9
read
15:12, 37:7, 42:13, 43:2, 44:11, 59:11, 62:10, 62:13, 62:23, 62:24, 63:16, 66:1, 74:20, 75:5, 90:10, 92:23, 105:24, 109:24, 118:17, 132:16, 187:1, 208:17, 213:9, 215:7, 215:9, 215:17, 215:21, 215:26, 215:30, 216:2, 216:6
readily
21:5, 27:24, 160:23, 197:16
reading
42:20, 74:25, 83:22, 133:11, 201:17
reads
79:16, 114:11
ready
90:12, 117:14, 147:3, 186:14
really
20:18, 29:8, 31:2, 37:17, 50:16, 55:9, 55:10, 55:14, 58:6, 59:8, 89:18, 102:12, 103:13, 116:13, 118:17, 136:2, 145:18, 163:3, 167:20, 189:11, 193:9, 194:15, 196:8, 199:24
reason
6:25, 16:23, 28:4, 38:23, 116:4, 116:20, 193:5, 194:10, 200:4, 209:1, 215:19, 215:24, 215:28, 215:33,

216:4, 216:9
reasonable
158:12, 160:6
reasons
30:23, 61:1, 164:24, 193:19, 203:4
recall
11:2, 89:3, 103:11, 121:19, 121:22, 121:24, 153:19, 173:22, 177:2, 178:13, 178:14, 179:2, 179:5, 182:15, 195:14, 196:8, 197:14, 197:19, 199:19, 199:21, 199:24
recalling
186:5
receive
175:19
received
105:22
recent
19:12
recess
61:17, 109:14, 166:12, 198:6, 208:10
recited
141:21, 145:5
recites
142:5, 142:15
recognize
8:17, 154:15, 168:5, 169:6, 199:10
recognized
40:2, 42:16, 42:24, 43:3, 48:21, 110:9, 110:16
recollection
197:8
record
61:16, 61:19, 79:10, 79:12, 79:20, 109:13, 109:16, 166:11, 166:14, 198:5, 198:8, 201:16, 208:9, 208:12, 209:14
red
37:16
redefine
181:5
reduced
212:5, 213:6
reducing
140:11
refer
10:20, 16:3, 40:18, 40:23, 41:12, 42:6, 78:23, 79:6, 100:2, 100:5, 101:23
reference
13:6, 16:10, 79:5, 80:9, 105:15, 105:16, 150:6, 156:12, 166:25, 204:4
referenced
12:13, 13:15, 14:7, 37:19, 63:14, 67:19
references
63:2, 78:3
referencing
41:4
referral
210:10, 210:25
referred
40:16, 69:1, 85:19, 93:18, 168:7, 195:18
referring
10:11, 10:23, 40:15, 40:19, 41:12, 42:7, 44:14, 67:16, 68:9, 69:24, 71:5, 72:6, 73:21, 77:21, 77:25, 78:1, 80:19, 80:20, 81:21, 82:22, 90:20, 92:20, 93:12, 95:19, 99:24, 101:15, 101:20, 101:21, 124:19, 142:13, 142:22, 142:24, 145:21, 145:24, 146:5, 155:11, 179:4, 202:1, 207:20
refers
62:18, 72:23, 100:9, 108:3, 142:16, 155:22, 207:9
regard
155:7
region
76:8, 204:8, 204:20
registered
211:8, 212:15
regular
30:25
regulations
210:3
reimbursed
175:16
reinforcement
133:6, 133:12
rel
127:2
relate
7:13, 24:16, 160:4
related
12:1, 34:1, 74:15, 122:18, 155:7, 156:9, 174:21, 175:12, 180:18, 187:8, 188:8, 189:17, 189:21, 189:22, 203:15
relates
15:18, 122:18, 123:1, 145:1
relating
86:12
relation
156:12
relative
50:1, 50:3, 50:6, 50:9, 50:16, 50:18, 125:14, 125:15, 127:2, 132:11, 202:19, 203:1, 207:1
relatively
26:20, 27:9, 27:12, 127:22, 128:20, 154:22, 154:23, 155:24, 156:4, 156:19
release
66:5, 66:15, 66:18, 207:25
released
66:2, 66:9, 67:23, 74:10, 84:7, 85:5
releases
68:1
releasing
66:14, 66:20
relevant
34:10, 163:25
relieve
65:12
relieving
65:4, 65:8
rely
11:3, 12:7, 14:19, 15:6
relying
63:4
remaining
205:10
remember
67:2, 105:25,

178:7, 178:20, 179:1, 180:3, 196:23
remove 161:21
removed 157:16
rendering 34:2, 35:22, 36:8, 36:10
reopen 83:21, 85:4
repeat 5:20, 12:10, 21:13, 29:1, 29:17, 37:8, 51:7, 56:13, 69:13, 151:20, 191:23, 203:20
rephrase 145:4, 173:16, 183:4, 200:11
replace 60:24
replaced 53:22, 54:7, 54:18, 55:3, 55:22, 58:14
replacing 49:12, 60:13, 60:19, 61:6
reported 1:35, 18:25, 19:2, 212:4
reporter 3:8, 4:20, 4:23, 6:1, 6:17, 210:5, 210:8, 210:9, 210:15, 210:24, 211:8, 212:15, 213:6, 214:1
reporter's 210:9
reporting 210:3, 210:7, 210:18, 210:22, 210:24
represent 4:14, 212:6
representative 210:15
represented 78:7, 202:16
representing 4:10, 4:16, 4:18, 4:21
reproduction 144:1
request 7:4
requested 213:5
require 22:1, 140:11, 161:11
required 21:10, 57:15, 154:25, 161:7, 188:9
requirement 24:13, 25:22, 26:22, 35:17, 188:12, 189:5, 189:21, 190:4, 190:6, 190:8
requirements 20:14, 20:17, 21:2, 21:6, 21:9, 21:15, 21:24, 22:8, 22:22, 22:23, 22:24, 23:1, 23:2, 23:3, 23:5, 23:12, 23:15, 23:24, 24:7, 24:16, 24:24, 25:8, 25:12, 35:20
requires 87:21, 88:5
reseal 161:22
resilient 65:23
resistance 172:10
respect 14:11, 46:6, 60:6, 67:1, 162:24, 163:20, 164:13, 170:4, 184:12, 185:15, 190:24, 196:4, 204:9
responsible 19:13
result 19:24, 151:3, 212:11
resume 177:14, 195:1, 195:3, 195:8, 195:9
retained 174:20, 175:10, 178:11
retract 63:20, 74:7, 74:12, 84:1, 84:6
retrograde 86:15
return 214:12
review 8:21, 11:1, 79:13, 79:21, 79:23, 173:15, 173:20, 173:24, 198:15, 208:18
reviewed 9:14, 156:12, 172:23, 173:13, 173:17, 199:12, 199:16, 199:18
reviewing 104:4, 104:11, 199:19, 208:22
rhv 161:25
ribbon 118:3, 129:17, 130:13, 131:19
rid 8:12
rigid 48:25, 49:3, 50:3, 115:20, 124:8, 124:24, 125:5, 125:11, 125:12, 126:2, 126:15, 128:17, 128:19, 128:20, 129:5, 132:4, 151:3, 202:18
rigidity 49:1, 64:9, 64:24, 125:15, 203:1
ring 133:13
ringing 25:4
risk 28:8, 30:25, 165:13
rmr 1:36
room 7:12
rope 129:16, 129:17, 130:13, 131:19
ropes 118:2
rotary 171:1, 172:12, 172:13
rotate 87:23, 161:20, 161:21
rotated 87:15, 171:2
rotating 87:15, 87:19, 161:7, 161:19, 161:24, 182:14, 182:22, 183:20, 184:9, 188:11, 197:9, 197:12, 197:14
rotator 87:15

rough
178:24
roughly
178:14
round
107:1
row
118:18
rows
118:18
rpr
1:36
rubber
160:24
rules
5:10, 210:2
runs
119:19

S

s4
3:13, 199:7
said
11:15, 12:12, 14:18, 14:24, 18:4, 21:1, 26:4, 30:10, 42:11, 43:7, 49:22, 51:2, 51:11, 53:18, 54:25, 64:11, 66:4, 69:1, 79:13, 79:21, 111:18, 115:3, 116:7, 131:12, 132:7, 133:21, 134:12, 138:16, 140:8, 146:2, 161:9, 164:6, 166:23, 171:17, 173:3, 173:13, 173:17, 189:9, 193:17, 205:18, 212:8, 212:10, 212:11, 213:10, 214:9
same
19:17, 19:19, 19:20, 26:9, 28:14, 32:24, 46:10, 53:19, 60:1, 74:17, 80:17, 80:20, 81:6, 81:25, 82:1, 82:4, 83:2, 83:7, 94:23, 95:2, 95:4, 95:23, 96:17, 97:6, 100:21, 114:6, 125:19, 139:1, 139:4, 139:19, 149:2, 152:1, 162:1, 162:6, 164:5, 167:15, 184:19, 213:6, 215:9
san
1:25, 2:8, 4:12
satisfied
143:7
satisfy
25:7, 25:15
save
215:10
saw
208:24
saying
40:24, 48:17, 56:14, 65:18, 68:18, 94:20, 104:9, 105:4, 107:4, 150:13, 164:18, 200:12
says
35:6, 42:23, 44:4, 44:11, 65:14, 65:15, 76:3, 76:13, 80:22, 81:19, 82:15, 88:4, 93:2, 94:12, 95:7, 100:25, 101:4, 102:4, 102:6, 106:10, 106:18, 117:25, 134:6, 141:24, 142:11, 143:4, 152:25, 171:1, 188:1, 198:21, 204:3
scale
81:4, 81:10
scenario
59:2, 59:4, 59:13
scenarios
59:25
scope
54:1, 55:6, 58:4, 78:14, 83:18, 84:14, 99:19, 100:8, 117:22, 118:12, 122:24, 123:7, 124:1, 127:1, 129:7, 130:22, 133:3, 134:5, 134:18, 135:1, 135:18, 136:1, 136:9, 136:19, 137:8, 140:16, 141:11, 143:10, 145:16, 146:8, 148:12, 148:22, 156:7, 157:24, 159:20, 160:20, 162:18, 163:2, 163:23, 164:16, 167:8, 182:20, 183:2, 183:8, 185:9, 185:17, 194:1, 201:10
scratch
88:2, 97:12, 196:8, 196:21, 196:22
seal-type
160:14, 160:18, 160:22, 167:4
sealed
47:11, 47:13, 51:25
sealing
17:8, 43:17, 44:2, 45:15, 78:17, 88:5, 110:20, 110:22, 111:9, 113:1, 113:10, 113:12, 113:16, 113:21, 116:10, 134:10, 135:11, 161:15, 203:25, 204:1, 204:2, 204:12, 204:13, 204:23, 205:22, 206:12
seals
38:25, 39:2, 43:13, 43:22, 45:7, 45:18, 46:11, 76:5, 161:1, 161:5, 204:6, 204:24, 206:12, 206:16
searches
12:3
second
42:23, 62:8, 63:15, 73:23, 74:2, 85:24, 85:25, 86:2, 86:6, 86:17, 88:13, 88:20, 93:1, 93:3, 93:4, 93:12, 93:15, 93:21, 93:23, 94:5, 94:14, 94:23, 95:5, 95:8, 95:9, 95:14, 95:21, 96:2, 96:11, 96:17, 96:20, 96:21, 97:5, 97:17, 99:8, 100:12, 100:21, 101:2, 101:5, 102:5, 137:17, 137:20, 144:4, 152:25, 184:24
second-to-last
181:19

section
37:7, 37:22, 38:12, 60:22, 62:23, 108:3, 108:6, 118:17, 131:4, 132:1, 132:3, 204:3
see
9:7, 9:9, 12:23, 13:1, 15:14, 40:6, 40:7, 40:25, 41:20, 41:21, 42:11, 44:2, 62:15, 68:11, 68:15, 68:20, 68:21, 68:24, 69:7, 69:18, 69:19, 71:25, 72:9, 79:3, 80:8, 80:14, 88:12, 88:23, 94:14, 94:15, 97:20, 99:5, 103:7, 103:18, 105:15, 107:22, 107:23, 107:25, 110:13, 114:9, 123:18, 124:17, 125:23, 126:9, 128:12, 129:18, 142:6, 143:14, 145:10, 147:5, 150:9, 150:12, 150:13, 150:20, 152:22, 153:21, 157:8, 159:16, 170:19, 171:13, 182:3, 182:8, 184:21, 186:17, 186:21, 198:1, 201:6, 201:22, 207:4, 207:11, 208:22, 209:1
seeing
183:13, 183:25
seem
41:24
seems
124:20, 160:5
seen
104:9, 124:3, 199:11, 199:13, 208:19
select
29:19, 29:22, 30:23, 130:17, 131:1, 193:20, 193:22
selected
197:14
selecting
23:15, 24:5, 29:18
selection
197:11
self-closing
82:19, 83:5
sense
27:15, 27:17, 27:18, 27:19, 27:25, 28:6, 30:5, 31:8, 31:11, 99:6, 141:1
sentence
42:20, 42:21, 42:23, 43:2, 62:7, 62:11, 63:16, 63:23, 65:14, 66:8, 68:8, 69:3, 69:5, 69:23, 72:21, 73:1, 73:16, 73:17, 73:20, 74:6, 81:22, 88:4, 88:11, 88:12, 88:15, 90:10, 90:16, 91:17, 92:3, 94:11, 102:20, 105:24, 106:18, 106:19, 106:23, 114:11, 125:21, 129:14, 133:1, 150:9, 160:10, 160:15, 162:14, 164:4, 164:23, 167:1, 181:4, 181:9, 186:17
separate
55:3, 61:6, 91:13, 147:14, 150:2, 202:1, 202:13
separately
58:11, 148:15, 148:18
september
34:8
services
210:7, 210:18, 210:23
set
16:14, 20:14, 33:11, 35:5, 81:22, 103:14, 132:2, 154:2, 154:4, 168:1, 200:21, 213:3, 214:7
setting
20:16
several
7:16, 15:4, 20:22, 60:25, 118:2, 129:16, 186:5, 194:21
shafer
37:20, 38:8, 38:9, 38:13, 38:24, 39:14, 39:17, 39:23, 40:6, 40:7, 40:15, 40:18, 40:20, 40:23, 41:12, 42:6, 42:12, 43:8, 43:12, 43:15, 43:17, 43:19, 44:1, 45:18, 46:2, 48:1, 52:4, 62:4, 67:8, 67:16, 68:10, 69:10, 71:19, 76:11, 79:1, 79:2, 79:6, 80:4, 80:7, 80:10, 80:11, 80:15, 111:3, 111:23, 112:1, 112:5, 112:9, 113:5, 113:7, 113:8, 113:12, 113:21, 113:22, 114:21, 114:24, 115:6, 115:18, 116:2, 116:21, 150:5, 151:17, 186:10, 190:12, 190:21, 190:24, 190:25, 191:2, 193:23, 194:10
shafer's
40:3, 42:17, 43:1, 43:4, 45:23, 52:20, 52:24, 53:15, 53:22, 54:4, 54:7, 54:8, 54:18, 55:21, 57:25, 58:13, 60:13, 60:19, 60:24, 110:10, 110:17, 111:2, 111:3, 111:15, 112:8, 112:24, 115:11, 115:25, 116:12, 116:18
shaffer's
37:22, 37:25
shall
210:5, 210:12
shape
48:6, 48:19, 49:18, 49:20, 54:14, 56:8, 57:6, 106:14, 106:16, 106:17, 106:19, 106:21,

106:25, 107:1, 107:2, 107:5, 107:13, 107:16, 107:18, 115:5, 115:7, 115:12, 139:16, 139:17, 139:22, 139:24, 140:14, 151:17, 151:24, 205:24, 205:25, 206:10, 206:11
shapes
76:5, 76:11, 76:14, 84:23, 115:9, 204:6, 205:9, 205:23, 206:13
sheath
156:18, 195:21, 195:23, 195:24
sheaths
160:24
sheet
118:3, 129:17, 131:19, 173:10, 215:1, 215:12
shelf
27:24
shore
81:3, 81:4, 81:8, 81:9, 82:4
short
155:24, 156:4, 156:19
should
11:18, 14:16, 165:20, 209:2, 215:17, 215:21, 215:26, 215:30, 216:2, 216:6
show
38:7, 44:23, 45:8, 46:22, 60:17, 67:9, 149:24, 203:24, 204:11, 204:23, 205:8, 205:14, 206:11, 206:22
showing
47:4, 47:10, 102:12, 158:21, 206:14
shown
37:5, 37:10, 37:15, 38:11, 39:1, 39:3, 43:21, 44:15, 46:6, 46:14, 48:24, 57:1, 57:2, 58:1, 63:3, 68:5, 68:6, 68:19, 69:8, 69:16, 77:22, 78:11, 84:23, 85:3, 86:1, 86:25, 91:12, 91:25, 97:14, 98:14, 98:19, 102:7, 105:22, 106:6, 106:7, 108:23, 144:7, 147:20, 168:19, 201:8, 201:20, 201:25, 204:14, 206:24
shows
43:12, 68:13, 87:1, 94:16, 149:17, 150:2, 205:22
shrink
137:21
shrinking
138:4, 138:6, 138:8
sic
69:5
side
30:11, 30:12, 44:8, 76:6, 94:24, 94:25, 96:18, 96:19, 96:20, 97:9, 97:10, 99:3, 120:5, 126:24, 144:4, 144:5, 204:7, 204:19
sign
213:9
signature
3:9, 9:5, 9:6, 9:8, 216:11
signature-bi6ds
211:5
signature-sc3
212:12
signed
214:13
signing
9:13, 199:21
silicone
75:16, 125:22
silly
185:23
similar
53:7, 109:1, 124:20, 124:22, 189:9, 190:1, 190:4, 197:17
similarly
167:25
simple
40:11, 167:25
simpler
80:11, 125:20
since
9:13, 70:19, 86:19, 86:20, 176:15, 198:25
single
54:22, 54:25, 55:1, 55:10, 56:3, 60:14, 60:16, 61:3, 67:9, 89:21, 89:23, 91:2, 91:11, 93:8, 94:4, 97:14, 97:15, 97:23, 98:1, 98:4, 98:5, 98:8, 98:11, 98:18, 98:20, 99:3, 99:6, 99:20, 99:24, 100:10, 100:16, 100:20, 101:5, 101:15, 105:20, 106:11, 126:10, 126:14, 141:23, 142:16, 142:25, 143:1, 143:8, 144:6, 144:21, 146:3, 146:6, 147:11, 149:1, 149:13, 149:24, 172:12
single-use
89:20
sit
9:23, 23:14, 55:21, 58:9, 58:12, 59:1, 71:8, 104:25, 121:22, 156:16, 167:21, 194:8
site
165:19, 200:17
six
63:14, 178:18
sixth
63:13, 63:14
size
21:24, 22:6, 22:21, 26:15, 26:19, 26:23, 29:13, 31:4, 31:9, 31:11, 31:14, 31:15, 31:20, 32:1, 32:9, 32:19, 39:9, 39:16, 40:2, 42:17, 43:4, 48:3, 48:5, 48:7, 48:15, 48:18, 48:19, 49:18, 49:20, 52:10, 54:14, 56:8, 57:6, 115:4, 115:7, 115:12, 124:3, 127:11, 130:1, 130:12,

130:13, 130:16, 131:6, 131:9, 131:10, 131:12, 131:14, 159:13, 160:2, 160:6, 172:5, 172:8, 197:18, 197:19
sized
22:7
sizes
115:9, 120:21, 130:10, 130:11, 131:13, 131:16, 206:9, 206:12
skill
28:20, 29:2, 31:18, 32:4, 32:7, 32:8, 32:23, 33:12, 33:16, 33:21, 35:1, 35:5, 35:13, 35:16, 35:19, 35:21, 36:6, 36:12, 36:16, 40:1, 42:16, 42:24, 43:3, 48:20, 52:3, 52:22, 56:25, 57:16, 57:18, 60:19, 60:23, 85:2, 85:14, 104:6, 104:14, 110:9, 110:15, 117:18, 118:10, 118:21, 125:5, 126:1, 126:22, 128:17, 130:17, 132:3, 151:12, 154:7, 180:2, 180:13, 180:22, 181:13, 185:5, 186:24, 193:20
skilled
83:13, 110:25, 131:1, 131:16
sliding
188:24, 208:3, 208:5
slit
160:25
small
26:20, 26:23, 27:9, 27:12, 40:3, 42:18, 43:5, 48:3, 48:4, 48:9, 159:11, 164:7, 206:10
small-diameter
27:20
smaller
26:13, 28:4, 28:23, 29:5, 138:4, 139:12, 163:10
soft
77:21, 81:10, 81:20, 82:9, 84:5, 188:1
solve
21:19
some
5:11, 7:11, 8:2, 8:9, 10:20, 12:3, 19:21, 23:2, 25:24, 25:25, 30:15, 43:8, 51:17, 64:9, 82:11, 98:13, 105:19, 108:12, 113:6, 117:14, 117:25, 120:21, 120:24, 121:3, 121:25, 123:10, 125:21, 126:10, 129:15, 164:24, 173:21, 174:19, 176:1, 176:21, 176:25, 180:9, 180:23, 187:4, 187:5, 187:6, 187:7, 192:20, 193:12, 193:14, 196:2, 208:24
somebody
162:5, 162:8
someone
29:9, 29:18, 34:13, 34:25, 35:7, 35:12, 35:23, 36:4, 36:17, 36:21, 112:23, 162:7, 180:2, 180:14, 181:4
someone's
139:6
something
33:4, 41:4, 50:7, 55:18, 57:17, 58:19, 87:19, 87:21, 94:17, 122:2, 127:12, 134:15, 135:10, 135:15, 140:12, 162:8, 166:24, 192:24, 200:1, 201:3
sometime
5:15
sometimes
157:19
somewhat
53:7, 115:19, 115:20, 151:10, 205:10, 205:11, 205:12
somewhere
158:11, 158:23
sorry
13:4, 21:10, 27:22, 33:8, 41:5, 41:10, 53:17, 64:11, 75:3, 78:19, 83:23, 88:11, 119:22, 129:21, 132:23, 156:3, 161:9, 186:3, 204:18
sort
180:23, 193:12
sound
185:23
source
210:10
speak
179:16, 179:19
spec'd
21:3
specced
20:10, 20:13, 20:16, 21:4, 195:19, 195:23, 196:3
speccing
19:5, 193:21, 194:8
special
159:6
specific
26:16, 105:1, 173:22, 199:25
specifically
41:18, 190:23
specification
69:9, 105:25
specifics
141:4
specified
34:15
spectrum
126:24
speculate
59:6, 59:7
speculating
59:19
spent
178:21, 179:2, 179:5
spoke
6:2
spring
39:10, 51:18, 63:25, 64:6, 116:10, 129:11, 172:9, 185:3, 185:19, 185:23, 185:24, 185:25, 186:2, 186:3,

186:4
spring-actuated
114:18
springs
48:9, 53:15, 131:23, 186:1, 186:2, 186:6, 186:7, 186:8
spun
178:4
squeezing
202:24
st
1:24, 2:7
stainless
125:22
stand
61:15, 109:12, 209:12
standard
20:12, 170:1, 197:24
standpoint
27:16, 27:18, 28:6, 99:1
start
78:3, 149:11, 153:20, 162:21, 162:23, 165:20, 206:19
started
176:25
starting
62:17, 62:18, 75:5, 90:8, 91:15, 94:11, 102:20, 110:7, 117:12, 123:14, 126:9, 128:8
starts
150:13, 153:13
stasis
88:6, 150:14, 153:13, 201:12
state
4:14, 10:5, 56:6, 60:22, 191:10, 212:1, 214:2
stated
212:4
statement
38:24, 40:5, 42:19, 71:25, 95:7, 134:3, 152:20, 155:3, 155:11, 187:15
statements
199:22
states
1:1, 4:5, 38:19, 152:16, 210:4, 214:5
static
160:14, 160:17, 160:21, 161:5, 161:6, 161:9, 161:13, 167:4
stating
210:6
stay
79:11
stayed
176:14
stays
139:18
steel
125:22
steerable
118:24, 119:9, 120:4, 121:20
stenographically
1:35
stent
200:19
sterilization
24:12
stick
99:25
sticks
82:19
sticky
81:11, 81:21, 82:5, 82:7, 82:8, 82:10, 83:12, 84:5, 85:3
stiffer
115:20
stiffness
56:22, 120:15, 125:15
still
35:1, 49:6, 56:17, 57:3, 61:21, 109:18, 162:11, 165:19, 166:16, 190:10, 197:24, 198:10, 215:13
stop
81:12, 140:20, 140:24
stops
140:5, 172:7
stowell@knobbe
2:10
straight
120:6
strand
126:5, 126:11, 126:14, 126:17
strands
96:6, 124:14, 126:7, 126:8, 126:23, 127:5, 127:6, 127:20, 128:9, 128:15, 129:1
street
1:23, 2:6
strength
172:9
string
42:25, 48:21, 49:3, 49:7, 49:8, 49:15, 52:25, 53:5, 53:14, 53:23, 54:3, 54:8, 54:9, 54:13, 54:19, 54:22, 54:25, 55:1, 55:3, 55:10, 55:22, 55:25, 56:3, 56:7, 56:11, 56:15, 56:21, 56:22, 56:25, 57:5, 57:8, 58:14, 60:1, 60:14, 60:16, 60:20, 60:25, 61:2, 61:3, 61:7, 67:4, 67:6, 67:11, 67:17, 67:23, 68:1, 92:14, 116:16, 116:21, 122:3
string-type
117:2
strings
49:5, 49:13, 53:14, 53:16, 55:9, 57:25, 60:2, 60:7, 60:14
stroke
154:17, 154:19, 155:1, 155:7, 155:10, 162:25, 163:21, 164:14, 164:20, 165:8, 165:14, 165:15, 167:6, 167:14
strong
121:9, 121:10, 121:11
structure
63:19, 84:1, 133:6, 133:13, 204:10
structures
182:9, 182:10, 182:12, 185:6
subject
12:2, 200:14
submitted
8:23, 41:5, 208:14
subscribed
216:16

substance
18:11, 82:18
substantive
5:18
substitute
92:13, 146:4
sufficient
64:24
sufficiently
123:23, 130:4, 130:9, 130:19, 131:5, 131:20
suggesting
49:2
suite
2:16
suited
22:19
support
8:21, 127:14
suppose
34:22
supposed
21:7
supposition
204:13
sure
5:10, 12:20, 16:24, 21:6, 27:1, 28:17, 37:9, 41:1, 46:9, 50:11, 57:10, 58:17, 58:18, 70:19, 73:23, 83:19, 85:17, 86:13, 101:17, 101:19, 102:23, 103:12, 108:13, 122:12, 138:6, 152:15, 156:10, 158:20, 158:23, 168:24, 174:3, 175:7, 181:14, 193:8, 194:3, 194:7, 207:3
surgery
164:20
surprise
122:1, 122:5
susan
1:36, 4:21, 4:23, 211:7, 212:14
suture
67:11, 85:5
switched
53:21
switching
166:7, 166:8
sworn
4:22, 5:2, 214:5, 216:16
symptoms
154:22, 157:20
synthetic
124:17, 124:20, 124:21, 124:23
syringes
170:7
system
18:2, 20:7, 25:20, 184:21, 184:23, 185:1, 185:6, 185:11, 196:18
systems
164:21, 185:14, 197:6

T

table
10:10, 11:4, 11:11, 12:7, 40:20
tactile
171:4, 171:5, 171:17, 171:21, 188:22
take
7:4, 8:15, 9:25, 12:23, 15:12, 39:14, 46:20, 49:23, 53:10, 56:2, 56:25, 57:20, 59:25, 61:14, 62:3, 62:13, 74:17, 74:20, 86:13, 90:7, 100:5, 109:4, 109:7, 109:10, 115:25, 117:4, 139:7, 146:22, 148:8, 155:15, 155:18, 156:22, 159:1, 165:2, 186:9, 186:25, 197:25, 208:7
taken
6:16, 147:24, 213:2, 213:5, 214:6, 215:8
taking
4:11, 6:1, 53:13, 140:18, 210:6, 210:19
talk
48:23, 49:12, 55:1, 77:20, 83:5, 98:19, 111:17, 113:9, 118:5, 124:16, 153:4, 156:10, 161:16, 181:20
talked
59:25, 66:25, 182:14, 187:6, 189:8, 190:23
talking
28:2, 29:14, 37:22, 43:20, 53:20, 65:16, 88:3, 101:21, 140:7, 141:2, 145:1, 186:23, 189:4
talks
81:8, 82:12
tape
118:3, 129:17, 131:19
tell
70:15, 124:8, 124:23, 125:4, 125:10, 126:1, 126:14, 128:16, 129:3, 131:13, 132:3, 207:16
telling
13:23, 94:16
tells
111:4, 155:10
ten
178:25
tender
210:5
tendered
8:8, 16:1, 40:14, 177:22, 199:5
tension
65:4, 65:8, 65:12, 65:24, 66:2, 66:6, 66:9, 66:15, 66:19, 66:20, 67:11, 67:23, 68:1, 74:10, 84:6, 85:5, 121:12, 208:1
tensioning
134:9
term
31:19, 63:12, 67:8, 67:15, 67:18, 67:22, 87:11, 103:6, 103:21, 103:23, 104:3, 104:7, 104:16, 105:1, 105:4, 105:11, 105:13, 107:15, 107:23, 107:25, 108:10, 117:17, 117:23, 118:9, 118:20, 118:23, 118:25, 119:2, 121:14, 121:18, 121:19, 121:23, 121:24, 122:2, 122:6, 122:10,

122:21, 123:4, 123:10, 126:8, 126:20, 133:15, 141:20, 142:23, 156:15, 161:6, 174:11, 181:5, 181:6, 182:8
termed
193:21
terms
46:15, 52:25, 138:20, 138:22, 140:10, 143:12, 189:3
testify
6:22, 104:12
testifying
8:25
testimony
5:21, 7:1, 14:2, 14:14, 14:23, 19:11, 22:4, 28:20, 28:25, 29:2, 30:3, 31:23, 32:12, 32:17, 35:10, 36:2, 36:20, 39:6, 39:20, 43:11, 43:25, 45:22, 56:4, 56:17, 56:19, 56:24, 59:22, 61:23, 66:12, 69:5, 70:22, 71:2, 78:25, 84:25, 94:19, 99:10, 104:8, 106:9, 107:8, 109:21, 112:13, 115:13, 115:15, 116:23, 122:16, 132:6, 142:19, 166:18, 184:7, 184:15
thank
156:2, 168:4
thanks
8:11
themselves
4:14, 89:2, 119:1
theoretically
106:24
thereof
75:17, 202:2
thereto
212:5
thin
126:17
thin-walled
189:6
thing
32:24, 34:5, 152:13, 162:6
things
18:11, 39:15, 130:3, 130:16, 156:9, 160:12, 165:23, 187:16, 188:17
think
7:19, 23:9, 23:14, 23:22, 24:10, 30:4, 32:24, 35:11, 36:3, 36:17, 38:9, 39:7, 46:17, 50:9, 52:12, 52:22, 53:17, 56:20, 58:19, 59:15, 66:13, 67:15, 74:1, 77:19, 77:22, 78:23, 84:15, 85:2, 87:9, 89:9, 89:15, 92:14, 94:7, 96:14, 99:5, 99:11, 101:9, 102:2, 106:20, 110:19, 111:25, 113:3, 121:2, 122:17, 122:25, 126:7, 126:19, 126:23, 127:13, 127:15, 127:19, 131:24, 132:7, 134:19, 135:2, 135:9, 135:19, 136:5, 138:16, 139:5, 139:20, 140:18, 141:1, 143:4, 145:1, 155:1, 158:25, 161:14, 163:14, 163:18, 165:9, 169:13, 169:20, 170:13, 172:7, 174:18, 180:16, 182:9, 182:10, 182:21, 182:24, 183:19, 184:16, 185:10, 185:18, 187:25, 188:8, 189:8, 189:19, 189:20, 189:22, 190:4, 193:2, 193:16, 193:17, 193:18, 194:21, 198:2, 205:8, 208:7
thinking
119:8, 119:25, 121:7
thinner
163:10
third
68:7, 69:2, 69:6, 69:22, 70:2, 70:7, 71:7, 72:23, 73:7, 73:23, 74:2, 74:5, 74:13, 75:9, 75:13, 76:4, 80:22, 82:17, 85:19, 85:25, 86:1, 86:2, 86:8, 86:18, 86:20, 86:22, 88:14, 88:21, 88:25, 204:5
thornton
1:18, 3:4, 4:4, 4:25, 5:6, 8:20, 109:18, 209:10, 209:14, 213:2, 214:5, 215:5, 216:14
thought
13:4, 24:13, 80:13, 136:2, 167:20, 200:2
thread
122:3
thread-like
122:7
threads
118:2, 129:16, 131:18
three
19:13, 19:14, 19:16, 19:17, 19:18, 19:20, 19:21, 19:24, 20:3, 125:10, 125:16, 171:12, 196:19, 206:11
thress
178:6
thrombotic
157:15
through
21:25, 22:21, 22:24, 23:6, 23:12, 25:25, 26:2, 26:18, 27:8, 31:9, 31:12, 31:16, 31:20, 32:2, 32:10, 32:20, 39:9, 41:18, 43:21, 46:6, 48:1, 50:23, 51:4, 51:13, 62:18, 63:3, 63:4, 69:25, 70:6, 70:16, 70:24, 70:25, 77:16, 77:23, 78:1, 78:2, 78:4, 78:7,

78:10, 78:20, 78:22, 79:16, 80:2, 80:4, 82:2, 82:3, 84:3, 85:4, 86:1, 86:12, 98:15, 105:21, 116:3, 119:19, 119:21, 120:11, 120:12, 139:21, 140:4, 140:12, 140:19, 140:21, 141:6, 159:16, 161:1, 161:2, 188:24, 189:11, 194:20, 203:10, 203:14, 203:16, 203:22, 203:24, 204:5, 204:11, 204:21, 204:23, 208:24
thrust
17:7
tight
82:20, 188:1
time
4:8, 13:17, 14:4, 19:3, 19:19, 28:1, 34:6, 38:10, 38:14, 52:17, 53:10, 59:12, 79:9, 79:16, 89:18, 105:6, 155:19, 165:2, 165:10, 172:18, 173:10, 175:16, 177:25, 178:19, 195:11, 197:5, 197:18, 197:20, 199:12, 208:19, 210:6, 213:3, 214:7
times
5:8, 5:9, 190:9
tiny
30:14
tip
119:17
tissue
155:8, 155:10, 155:11
tissues
155:5, 155:6
title
191:7, 191:9, 213:4, 214:8
titled
10:10
today
4:10, 4:21, 6:23, 7:1, 7:8, 8:25, 9:23, 10:19, 13:23, 23:14, 55:21, 58:10, 58:12, 59:1, 70:22, 71:8, 104:12, 104:25, 121:22, 144:8, 156:16, 161:6, 166:18, 167:21, 172:15, 172:16, 172:18, 173:14, 173:15, 186:23, 194:8, 195:18, 195:25
today's
4:8
together
11:17, 55:19, 91:7, 94:7, 94:12, 95:24, 96:6, 96:16, 99:2, 99:12, 99:16, 108:20, 109:1, 116:12, 127:21, 133:18, 144:8, 144:12, 147:15, 148:6, 169:21, 207:21
took
57:24, 83:13
tool
37:15, 38:21, 39:9, 39:17, 40:2, 40:4, 42:17, 42:18, 43:4, 43:5, 43:13, 43:15, 45:5, 45:8, 45:19, 46:25, 47:2, 47:7, 47:11, 48:2, 48:10, 48:11, 48:19, 49:19, 50:23, 51:3, 51:4, 51:10, 51:13, 52:10, 52:13, 52:14, 77:7, 84:20, 202:1, 202:13, 205:12, 205:25, 206:6
tools
38:20, 43:17, 43:23, 48:6, 51:16, 52:1, 52:13, 52:16, 52:19, 54:15, 56:9, 57:7, 76:12, 110:23, 112:6, 115:3, 115:5, 115:12, 116:14, 116:19, 116:25
top
62:8, 63:15, 157:9, 207:13
torsion
185:19, 185:23
tortuosity
159:11
tortuous
164:8
total
92:4, 92:21, 139:18, 139:24, 141:8
touch
176:14
touching
47:21
toward
64:6, 64:11, 64:20, 86:17, 117:25
towards
64:18, 136:17, 137:1, 137:5, 137:10, 138:18, 188:13
trade
121:9, 162:2
trademark
1:1, 4:6
transcarotid
155:25, 156:5, 156:17, 157:4
transcartoid
155:24
transcript
5:16, 210:13, 212:3, 212:7, 213:10, 214:6, 214:9, 215:8
treat
155:2, 167:13
treated
157:15
treating
167:6, 200:19
treatment
154:25, 162:24, 163:21, 164:14, 165:8, 165:15, 165:19
trial
1:2, 4:6
triangular
205:10, 205:11, 205:13
trip
200:12
trouble
146:16
troy
1:18, 3:4, 4:3, 4:25, 8:20, 209:14, 213:2, 214:4, 215:5, 216:14
true
40:5, 42:19,

85:18, 138:7, 140:18, 141:1, 199:23, 200:2, 200:5, 212:6, 214:8, 215:10
truthful
7:1, 9:9, 9:16
truthfully
6:23
try
6:3, 33:9, 92:11
trying
21:19, 22:10, 27:20, 29:23, 30:6, 49:13, 51:8, 94:10, 129:10, 131:10, 140:9, 172:10, 205:8, 205:14
tu
134:7, 137:25
tube
48:9, 131:22, 139:20, 140:1, 140:4, 141:7, 141:8, 141:9, 169:1, 203:1
tubular
134:7, 134:8, 134:10, 134:21, 135:3, 135:12, 135:21, 135:24, 136:12, 136:15, 136:16, 137:25
tuohy
161:17, 161:18, 162:1, 162:2, 162:4, 167:12
turn
25:5, 32:25, 33:5, 62:6, 96:24, 110:1, 132:14, 133:22, 141:15, 150:5, 162:9, 168:10, 170:15, 181:18, 186:12, 191:3, 198:18, 203:10
turned
9:4
twisted
128:10, 128:15, 128:22, 129:2
two
5:9, 20:6, 20:7, 20:8, 34:21, 35:6, 35:8, 35:23, 36:3, 36:10, 36:14, 36:22, 48:14, 53:15, 55:1, 55:9, 57:24, 57:25, 59:25, 60:2, 60:6, 85:20, 89:1, 91:6, 91:10, 91:11, 91:12, 92:1, 93:14, 96:21, 97:4, 97:5, 97:16, 97:17, 97:19, 98:11, 98:21, 98:23, 98:25, 99:1, 99:7, 99:23, 100:1, 100:10, 101:6, 108:4, 133:18, 138:25, 139:3, 140:10, 143:18, 144:6, 147:8, 147:22, 148:1, 148:3, 148:9, 148:14, 148:18, 148:19, 149:6, 149:10, 149:14, 149:17, 150:2, 154:2, 157:8, 170:25, 171:10, 173:8, 180:5, 180:8, 184:5, 188:10, 188:17, 195:15, 196:1, 196:25, 202:18, 202:19, 203:5, 207:1, 207:9, 207:10, 214:11
type
50:23, 51:3, 51:10, 152:4, 167:5, 170:3, 182:17, 182:21, 182:25, 183:9, 185:11, 185:25, 202:22
types
19:16, 19:18, 19:25, 20:3, 20:19, 20:23, 154:8, 164:21, 170:7, 183:5, 186:1, 186:2, 186:6
typewriting
212:5
typewritten
213:6
typical
29:22
typically
31:25, 89:15, 121:7, 126:7, 126:22, 127:8, 152:10, 164:21, 197:9, 202:24

U

u-shaped
37:14, 37:22, 37:25, 40:3, 42:17, 43:1, 43:4, 48:3, 48:15, 48:23, 48:25, 49:5, 49:9, 49:13, 49:14, 49:18, 49:21, 50:1, 50:13, 51:12, 52:9, 52:25, 53:6, 53:15, 53:22, 54:4, 54:8, 54:18, 55:2, 55:22, 55:25, 58:1, 58:13, 60:2, 60:7, 60:13, 60:20, 60:24, 64:1, 64:14, 64:21, 64:24, 65:3, 65:4, 65:9, 74:11, 74:16, 84:19, 107:19, 108:3, 108:6, 110:11, 110:17, 110:21, 111:2, 111:9, 111:11, 111:15, 112:9, 112:16, 114:22, 115:6, 115:17, 115:22, 116:1, 116:9, 116:13, 116:18, 147:18, 147:22, 151:18, 151:24, 207:1, 207:5, 207:21
uh-huh
21:12, 21:23, 75:8, 94:3, 170:12, 181:17
un
81:1
un-cross-linked
81:2
unclear
6:9, 39:21, 41:25, 42:3, 113:14, 205:17
uncollapsed
63:20, 84:2
under
5:13, 35:2, 61:21, 82:21, 86:17, 88:19, 109:19, 166:16, 198:10, 210:20, 212:5, 215:6, 215:7, 215:13
understand
5:13, 5:17, 5:22, 6:12,

6:19, 10:20, 24:8, 37:5, 37:10, 40:19, 41:15, 42:11, 47:25, 51:8, 61:21, 62:20, 63:5, 65:13, 66:7, 66:24, 85:11, 86:10, 107:4, 109:18, 122:4, 122:21, 124:17, 144:24, 145:3, 157:1, 159:7, 162:14, 163:6, 166:16, 168:12, 172:3, 180:5, 182:6, 185:1, 185:5, 191:8, 198:10, 201:4, 203:13, 203:21
understanding
7:25, 16:19, 17:3, 33:22, 33:24, 44:16, 65:21, 66:1, 66:22, 71:7, 88:22, 104:13, 104:16, 122:13, 123:4, 123:10, 124:21, 139:3, 146:16, 152:8, 156:15, 157:11, 159:13, 160:1, 161:4, 163:7, 163:8, 163:20, 164:3, 165:18, 182:1, 187:3, 189:4, 192:18, 206:8, 215:12
understood
122:9, 170:6, 181:11, 181:12
unfortunately
162:14, 164:23
united
1:1, 4:5
unless
68:20
unlimited
35:24
unrelated
122:20
unsealed
74:7, 74:12
until
6:3, 6:5
usage
126:20
use
16:15, 16:20, 17:9, 18:6, 20:12, 22:11, 24:6, 85:3, 88:4, 88:5, 89:10, 92:16, 92:18, 103:16, 104:17, 105:2, 105:8, 108:9, 117:19, 118:6, 118:23, 120:20, 121:14, 121:18, 128:23, 142:23, 159:18, 164:21, 165:3, 165:21, 166:6, 188:14, 189:21, 191:17, 192:1, 192:11, 192:19, 193:4, 193:5, 193:21, 194:25, 201:3, 206:18
useful
115:1
user
87:22, 161:5, 188:8, 188:9, 188:14, 188:16
user-related
188:12
uses
127:13
using
46:10, 60:14, 92:12, 112:20, 121:22, 123:10, 135:2, 167:5, 167:13, 194:5, 197:18, 197:19
usual
211:1
usually
170:2, 197:21
utilized
195:12

V

vacuum
23:13
vacuums
23:7
vague
26:6, 26:25, 27:6, 29:12, 30:18, 31:22, 38:18, 39:19, 41:23, 44:18, 47:9, 47:19, 50:10, 50:19, 53:2, 62:22, 63:8, 76:2, 77:18, 90:18, 97:2, 97:25, 120:19, 121:1, 137:7, 147:23, 148:12, 149:3, 149:16, 150:1, 151:4, 151:19, 168:23, 169:12, 183:1, 183:7
valve's
40:4, 42:19, 43:6
valves
15:18, 15:20, 16:11, 16:15, 16:19, 17:8, 17:17, 17:21, 18:6, 18:15, 18:22, 19:6, 19:14, 19:16, 19:17, 19:18, 19:25, 20:4, 20:7, 20:8, 20:11, 20:12, 20:20, 20:23, 21:4, 22:2, 22:7, 25:7, 25:11, 25:18, 25:24, 26:1, 27:23, 31:3, 31:14, 32:1, 89:16, 103:16, 104:17, 105:2, 105:6, 105:8, 117:19, 118:6, 118:15, 167:2, 169:19, 170:5, 180:15, 180:17, 180:21, 182:18, 182:25, 183:12, 183:15, 183:16, 184:2, 184:13, 185:7, 185:15, 192:7, 192:8, 192:12, 195:13, 195:15, 196:2, 196:3, 197:4
vari
76:11
variety
51:25, 76:5, 76:13, 84:23, 105:18, 123:17, 204:6, 205:8, 205:22, 206:9, 206:12
various
76:11
vary
39:11
varying
54:4, 85:13
vas
26:20
vascular
18:2, 159:22, 176:24
vasculature
26:20, 119:23, 120:7, 158:4, 158:7, 158:17, 159:5, 159:15,

160:3, 163:10, 164:7
vectran
121:8
vein
139:8, 139:11
vendor
21:1, 195:22, 195:24
vendors
20:15, 20:17, 21:5
venous
120:5
venture
176:24
ventures
176:23, 177:10, 177:24
verb
135:3
versions
14:18, 14:19, 14:25, 15:3
versus
1:9, 95:5, 97:9, 132:12, 140:13, 193:23
vessel
26:18, 140:5, 140:12, 154:20, 160:6, 192:6
vessels
159:11, 159:12, 163:10
via
6:16, 134:8
vice
195:10
video
4:9, 4:11
videographer
2:21, 4:2, 4:9, 4:20, 61:15, 61:18, 103:24, 109:12, 109:15, 130:7, 166:10, 166:13, 198:4, 198:7, 208:8, 208:11, 209:11
videotaped
1:17, 4:3
view
201:12
vinyl
75:16
virtually
75:15, 75:22, 85:7
voice-identify
4:13
vs
215:3

W

wait
6:3, 6:5, 165:11
walls
63:18, 68:14, 83:24
want
7:6, 8:15, 9:22, 16:24, 16:25, 17:1, 34:5, 40:22, 47:24, 90:7, 103:8, 103:13, 109:10, 119:12, 132:16, 143:14, 143:17, 143:18, 151:2, 155:18, 158:9, 160:9, 160:12, 162:7, 162:13, 162:14, 165:16, 179:23, 180:5, 181:18, 181:20, 188:23, 191:6, 192:22, 195:2, 200:12, 201:3, 203:17, 207:12
wanted
42:11, 102:13, 152:16
wants
188:21
waste
79:16
watch
130:7
waxes
81:1
way
47:17, 50:9, 77:16, 94:20, 120:5, 129:23, 135:19, 139:1, 154:24, 169:5, 169:10, 169:16, 187:1, 193:21, 208:2, 212:11
ways
136:23, 154:8, 169:1, 169:14
we'll
101:2, 138:12
we're
6:12, 8:24, 10:23, 21:19, 43:20, 46:9, 63:6, 92:12, 95:19, 101:21, 131:4, 141:2, 145:1, 146:23, 150:17, 166:8, 166:10, 183:10, 207:3
we've
53:19, 83:7, 109:5, 113:9, 146:2
wednesday
4:1
week
173:12
well-understood
104:2, 117:17, 118:9, 118:20, 170:3
went
21:1, 22:24, 53:17, 176:5
weren't
45:15, 51:15, 105:9, 110:20, 110:22, 114:22, 115:6
whatever
23:6, 52:12, 107:15, 137:13, 193:16
whatever's
138:11
whether
58:12, 60:6, 70:15, 73:12, 82:10, 125:10, 126:14, 127:22, 128:17, 128:21, 129:3, 154:25, 161:23, 165:21, 171:7, 188:10, 193:13, 193:14
whole
77:14, 164:17
wide
11:8, 110:22
widely
85:13
wider
54:15, 56:8, 57:6, 115:2, 115:5, 115:12
wire
25:25, 27:3, 27:8, 27:10, 27:13, 27:21, 28:5, 28:17, 29:16, 29:19, 29:24, 30:6, 30:16, 30:21, 31:16, 98:1, 110:9, 110:16, 110:23, 111:1, 111:5, 111:10, 111:14, 112:11, 112:21, 115:8, 115:10, 116:5, 116:16, 116:20, 118:3, 119:14, 121:8, 121:25, 129:17, 131:19,

152:5, 152:9, 188:3, 197:18
wires
27:23, 118:24, 119:9, 123:9
withdraw
38:5, 50:4, 52:18, 103:8, 103:22, 106:14, 138:21, 142:4, 149:11, 162:5, 187:14
within
21:11, 44:6, 44:14, 45:1, 57:21, 141:21, 158:13, 158:14, 171:16, 200:17, 204:12, 205:25, 208:5
without
44:5, 44:13, 44:20, 45:1, 45:5, 45:7, 45:19, 45:24, 73:24, 87:13, 124:25, 125:16, 134:15, 135:10, 140:8, 152:2, 161:2, 161:5, 168:24
withstand
121:12
word
17:25, 92:12, 126:5, 132:17, 132:25, 133:19
worded
97:18
words
85:11, 134:1, 139:1, 139:3, 157:14
work
48:17, 65:13, 89:25, 113:20, 167:24, 174:19, 175:14, 176:1, 176:2, 176:10, 190:25, 196:5
worked
19:23, 27:8, 31:3, 31:6, 31:7, 31:13, 31:14, 31:21, 31:25, 89:20, 116:24, 120:4, 120:16, 169:21, 176:4, 176:5, 176:6, 178:8, 179:13, 195:5, 195:22, 195:24, 197:7
working
11:16, 18:24, 19:2, 20:2, 51:15, 104:11, 176:15, 176:23, 177:24, 179:14, 180:9, 197:21
wouldn't
22:12, 27:19, 27:24, 28:7, 28:16, 30:23, 35:16, 47:6, 50:15, 51:22, 56:11, 80:11, 82:7, 83:21, 85:3, 85:4, 113:12, 117:1, 127:9, 161:11, 191:19, 202:12, 202:15, 203:4
woven
127:6, 127:21, 128:10, 128:15, 128:22, 129:2
wrap
129:10, 130:10, 131:10
wrapped
129:4, 129:5, 129:24, 130:5, 130:19, 131:6
wrapping
106:20, 106:22
write
179:12, 179:13
writes
175:17
written
94:21, 101:9, 135:20, 171:19, 171:20
wrong
53:17
wrote
36:22

Y

yeah
8:14, 9:10, 33:25, 53:21, 56:6, 58:5, 62:10, 70:10, 79:15, 86:14, 87:7, 92:23, 95:13, 106:1, 109:11, 114:1, 130:13, 137:10, 143:11, 154:1, 158:20, 161:11, 163:24, 167:9, 181:14, 189:19, 194:2
year
177:2, 177:11
years
34:21, 34:23, 35:6, 35:8, 35:12, 35:18, 35:24, 36:3, 36:10, 36:14, 36:23, 175:24, 176:21, 180:6, 180:8
yep
81:16
yesterday
172:21, 172:24, 172:25, 173:3
yourself
174:2

Z

zalesky
208:15, 209:1, 209:4
zalesky's
208:23

$

$500
198:24

.

.3271
2:18
.4114
2:9

0

0.018
197:21
00
81:4, 81:10
001
13:4
01
108:9
011
15:15, 15:16, 15:19, 15:21, 16:8, 16:14, 16:17, 16:21, 17:2, 17:4, 34:1, 34:10, 103:5, 105:12, 105:13, 108:7, 108:9, 108:11, 117:9, 123:16, 138:23, 141:22, 144:1, 177:5, 181:16, 182:7, 183:10, 183:13, 183:25
01157
1:8
018
197:21
03
1:20, 4:1, 4:9

1

1
108:9

1-7-0
86:5
10
61:16, 61:19, 94:11, 101:1, 117:12, 123:14, 150:14, 157:8, 157:11, 157:21, 158:6, 197:2, 204:4, 210:2, 211:9, 212:16
100
63:18, 66:21, 68:5, 71:25, 72:6, 72:10, 73:2, 73:10, 83:25, 85:22, 88:4, 179:6, 202:6, 202:8
1001
15:25, 90:4, 117:4, 123:13, 181:15
1003
8:7, 8:17, 8:19, 10:20, 10:23, 12:8, 12:23, 12:25, 13:5, 13:7, 13:24, 13:25, 14:11, 14:15, 14:19, 33:1, 110:1, 194:25, 198:18
1004
177:19, 177:21, 195:1
1005
40:13, 40:15, 40:19, 41:16, 41:22, 42:1, 42:7, 62:3, 69:10, 71:19, 74:18, 87:25, 146:23, 150:5, 150:9, 154:5, 186:9, 190:12, 200:23
1006
166:1, 168:3, 168:5, 191:3
1008
41:5, 41:8, 41:15, 41:19, 41:21, 42:4, 42:7, 46:20, 62:15, 62:20, 63:1, 63:5, 146:23
1009
40:21, 40:22, 40:25, 41:1
1011
152:12, 154:13, 154:15, 166:25
108
63:19, 83:25
11
94:11, 102:21, 132:14, 132:22, 132:23, 203:11, 210:21
11,697,011
1:10, 8:22
110
202:8, 204:9
1101
162:11
12
33:5, 33:7, 77:23, 86:1, 86:12, 90:10, 102:21, 109:13, 132:21, 172:13, 203:16, 203:19
13
86:25, 87:1, 88:23, 90:8, 91:14, 101:1, 102:20, 105:17, 107:22, 126:9
1312
109:16
132
105:21, 105:22
133
9:4, 9:5
14
201:2
142
93:5
14383
1:36, 4:24
1449
166:11
1459
166:14
15
77:23, 81:3, 81:4, 81:9, 86:1, 86:12, 128:8, 203:16
150
91:16, 92:5, 93:4, 94:9, 96:7, 97:20, 97:21, 97:23, 98:8, 98:20, 100:1, 100:10, 100:15, 100:16, 100:21, 101:16, 101:24, 105:18, 105:19, 106:10, 108:4, 144:8, 144:15, 144:22
16
9:25, 10:5, 10:12, 12:12, 13:14, 13:20, 14:10, 14:21, 203:10, 203:13, 203:21, 203:24, 204:4, 204:11, 204:21, 204:23, 205:18, 206:9, 206:10
160
63:19, 84:1
1601
198:5
1617
198:8
1643
208:9
1648
208:12
1649
209:15
165
68:7, 68:11, 68:15, 68:18, 68:21, 68:24, 69:6, 69:10, 69:17, 69:20, 69:22, 70:3, 70:7, 70:11, 70:15, 70:24, 71:5, 71:8, 72:24, 73:3, 73:7, 73:9, 73:12, 73:14, 73:17, 74:3, 75:10, 75:13, 75:19, 76:1, 76:4, 76:21, 77:1, 77:5, 77:12, 77:17, 77:20, 78:9, 78:10, 78:23, 78:24, 80:12, 80:18, 80:21, 81:6, 82:1, 82:17, 83:14, 85:19, 85:25, 86:8, 86:21, 86:22, 87:2, 88:25, 113:10, 113:11, 113:22, 204:2, 204:6, 204:13, 204:24
166
75:11, 75:12, 75:14, 75:15, 75:18, 80:23, 82:18, 82:23, 86:20
17
15:12, 181:22, 205:4, 206:15
170
85:23, 86:4, 86:10, 86:15, 87:2, 88:23, 89:1

1700
2:16
1721
2:17
18
205:7, 205:9, 205:12, 205:13, 205:21, 205:25, 206:9, 206:11
180
85:24, 86:6, 86:17, 89:1
186
9:8, 9:10
1888
2:15
19
1:21, 4:1, 4:8, 203:11, 203:14, 203:22, 203:24, 204:5, 204:11, 204:21, 204:23, 206:9, 206:10
190
205:18
192
76:5, 204:6, 205:9, 205:21, 205:23, 205:24
193
76:6, 86:21, 204:7
194
76:6, 204:7
195
204:9
199
3:11

2

20
26:1, 26:4, 30:12, 30:16, 62:12, 81:4, 81:9, 118:18
2000
195:10
2006
3:11, 199:4, 199:6, 199:10
2012
177:23, 195:10
2014
177:23
2017
34:8, 34:18
2024
1:8, 9:13, 178:16
202401157
4:7
2025
1:21, 4:1, 4:8
2028
211:9, 212:16
21
1:24, 2:7, 181:1, 186:12
210
3:7
2125
211:10, 212:17
214
3:8
216
1:32, 3:9
22
78:4, 141:15, 181:18, 181:23, 184:19, 211:9, 212:16
226
160:11
23,2010
3:12, 199:7
24
27:4, 28:23, 29:4, 29:10, 29:19, 30:10, 141:17, 141:21, 159:18, 182:4
25
179:10
26
16:3, 16:10, 16:15, 16:23, 68:10, 103:15, 103:19
261
150:10, 150:18, 152:17, 152:21
27
63:18, 68:14, 150:8, 200:25, 201:12, 201:19, 201:21, 201:25
270
86:15, 87:1, 88:24
28
171:16, 210:21
29
105:17, 109:13

3

30
35:18, 41:18, 43:21, 46:6, 48:1, 62:18, 69:2, 69:24, 70:6, 70:16, 70:24, 70:25, 78:1, 78:2, 78:6, 78:10, 78:20, 78:22, 80:2, 80:4, 82:2, 85:4, 116:3
300
201:25, 202:3
31
63:3, 63:4
310.788
2:18
32
43:12, 46:20, 47:4, 47:5, 47:8, 47:10, 207:12
320
133:7
33
146:24, 147:1, 147:6, 149:11, 149:13, 149:18, 149:24, 171:1, 206:20, 206:22, 206:24, 207:11, 207:13, 207:19
333
1:23, 2:6
34
41:18, 43:22, 46:6, 48:1, 62:19, 63:3, 63:4, 68:5, 68:6, 68:13, 68:15, 68:19, 68:22, 69:2, 69:8, 69:17, 69:25, 70:6, 70:16, 70:25, 72:9, 72:14, 73:3, 74:14, 78:1, 78:2, 78:7, 78:10, 78:20, 78:22, 80:2, 80:4, 82:2, 82:3, 85:4, 116:3
35
30:14, 33:4, 33:7, 33:11, 33:19, 33:23, 34:14, 35:6, 36:22, 179:24
36
170:19, 170:21, 170:24, 170:25
37
201:18
38
155:16, 184:19
39
159:1

4

4
171:14, 209:16
415.954
2:9
42
132:16, 132:18,

132:19, 159:2, 159:4
43
61:16
44
107:22
45
162:9
48
143:24
49
209:16

5

50
179:8, 207:9, 207:10, 207:11, 207:13, 207:17, 207:19, 207:21, 207:23
51
85:21
54
78:3
55
61:19, 63:17, 64:1, 147:5, 149:18, 150:10, 150:18, 152:21, 154:5, 207:22
56
38:12, 56:6, 76:19, 78:7
575710
1:31, 215:2
59
54:23, 60:17, 67:10, 67:17, 67:19, 67:20, 74:17, 74:23, 74:24, 75:3, 75:4, 75:5, 77:20, 78:25, 80:18, 81:5, 81:7, 81:8, 81:15, 81:18, 81:19, 81:23, 82:12, 82:13, 83:8, 83:14, 87:25

6

60
76:3, 78:25, 84:24, 203:17, 204:3, 204:4
604
105:20
62
160:9, 167:1
63
88:2, 159:24, 159:25
64
85:22
65
69:2, 86:14, 88:11, 88:15
66
62:17
67
76:7, 204:8
69
75:1, 75:2, 75:9, 110:2
6th
34:8

7

7,682,380
3:12, 199:6
700
93:13, 93:23, 94:6, 94:22, 94:24, 95:23, 96:5, 96:19, 97:7, 97:9, 98:23, 100:9, 100:14, 144:4
702
93:13, 93:23, 94:23, 94:25, 96:20, 97:10, 144:5
74
201:24
75
62:18, 71:17, 71:22, 73:6, 73:19
76
207:8
77
62:6, 63:14, 68:10, 68:11, 68:25, 69:23, 72:20, 73:17, 73:20, 83:22

8

80
60:22
81
32:25, 37:2, 37:6, 37:11, 37:13, 38:12, 39:4, 39:25, 40:16, 42:15, 42:22, 44:16, 44:23, 45:8, 46:14, 47:6, 47:23, 47:24, 48:12, 48:24, 53:13, 53:19, 54:13, 57:3, 58:2, 67:1, 67:3, 76:17, 76:19, 76:21, 78:11, 80:15, 80:20, 82:1, 83:3, 83:4, 83:8, 83:9, 83:10, 83:15, 113:2, 113:23, 152:16, 152:24
82
3:12, 150:8, 153:7, 153:8, 153:13, 154:2, 199:7
89
197:5

9

9
1:20, 4:1, 4:9, 93:18
9--(c
210:21
90067
2:17
92
212:12
94
110:2, 110:7, 114:6
94101
2:8
95
197:5