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

RAVIN CROSSBOWS, LLC,)
)
Petitioner,)
)
vs.) Case No. IPR2024-00522
) Patent No. 8,683,989
MCP IP, LLC,)
)
Patent Owner.)

VIDEOCONFERENCE DEPOSITION OF CHARLES REINHOLTZ, PHD
TAKEN ON BEHALF OF THE PETITIONER
FEBRUARY 11, 2025

VIDEOCONFERENCE DEPOSITION OF CHARLES REINHOLTZ, PHD, produced, sworn, and examined on the 11th day of February 2025, between the hours of 9:00 o'clock in the forenoon and 6:00 o'clock in the evening of that date via Zoom videoconference, before KARA D. INCE, a Certified Court Reporter within and for the State of Missouri, in a certain cause now pending UNITED STATES PATENT AND TRADEMARK OFFICE, BEFORE THE PATENT TRIAL AND APPEAL BOARD, wherein RAVIN CROSSBOWS, LLC, is the Petitioner and MCP IP, LLC is the Patent Owner.

TABLE OF CONTENTS

EXAMINATION
Questions by Mr. Schmidt 4

EXHIBITS:
Exhibit No. 2018 Declaration of Dr. Charles Reinholtz 7

Exhibit No. 1001 Patent 8,683,989 18

Exhibit No. 1005 Islas Reference 32

CERTIFICATE OF REPORTER 72
ERRATA SHEET 73
SIGNATURE PAGE 74

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* * * * *

(The deposition commenced at 9:57 a.m.)

THE COURT REPORTER: We are on the record. My name is Kara Ince. I am a Missouri Certified Court Reporter, CCR License No. 1348. Today's date is February 11, 2025. Will the witness please raise their right hand.

CHARLES REINHOLTZ,
of lawful age, being produced, sworn, and examined on behalf of the Petitioner, deposes and says:

EXAMINATION

BY MR. SCHMIDT:

Q. Good morning, Dr. Reinholtz.
A. Good morning, Chris.
Q. So my name is Chris Schmidt, and I'm from the law firm Erise IP representing the petitioner, Ravin Crossbows, LLC.
And -- and who else do you have with you there?
A. In the room with me, just Mr. Colvin.
Q. Dr. Reinholtz, can you, please, state your full name for the record.
A. Charles Frederick Reinholtz.
Q. And where are you testifying from today?
A. I am in the Fish & Richardson office suite

Page 5

1 **in Dallas, Texas.**
2 Q. And have you been deposed before?
3 **A. Yeah.**
4 Q. About how many times?
5 **A. On the order of 50.**
6 Q. Wow. Okay. So I -- I probably don't need
7 to go over the ground rules, but I'll just cover
8 very briefly that we do have a court reporter here;
9 so I would just ask that you provide verbal answers
10 so the court reporter can record your answers and
11 create an accurate record.
12 Does that work for you?
13 **A. Yeah, of course.**
14 Q. And if for any reason you don't understand
15 one of my questions or if the question is unclear to
16 you, please, just let me know, and I'll be happy to
17 rephrase it or to clarify the question; so the
18 record is clear.
19 Does that work for you?
20 **A. Yeah.**
21 Q. Okay. And I usually take breaks about
22 every hour, but if you need a break earlier than
23 that, please, let me know, and I would just ask if
24 there -- that if there is a pending question, that
25 you, please, answer the question before we go on a

Page 6

1 break.
2 Is that okay?
3 **A. Yeah.**
4 Q. And, Dr. Reinholtz, do you understand that
5 you're under oath today?
6 **A. Yes, I do.**
7 Q. And are you aware of any reason that you
8 cannot testify truthfully and accurately today?
9 **A. No. There's no reason I cannot be**
10 **truthful and -- and accurate.**
11 Q. And are you -- are you being compensated
12 for your time today?
13 **A. Yes, I am.**
14 Q. And what is your hourly rate for your time
15 on this case?
16 **A. It's my standard hourly rate I charge on**
17 **every case, $500 an hour, flat rate.**
18 Q. And do you have a copy of your declaration
19 in front of you that was submitted as Exhibit 2018
20 in these proceedings?
21 **A. I do, yes. I have it both in hard copy,**
22 **and I have -- I- -- I've placed in a folder on my**
23 **computer a copy of the number of the files that are**
24 **relevant that may come up today, exhibits and**
25 **patents and file history that I have in a folder.**

Page 7

1 **So I can work from a hard copy or I can work from**
2 **what I have on my computer or if you want to send me**
3 **something in a chat, I could work from that, as**
4 **well.**
5 Q. Okay. Thank you.
6 I'm going to go ahead and put a copy of
7 Exhibit 2018 into the chat, just so the court
8 reporter has it, but you're welcome to use your
9 printed copy or electronic copy, if you prefer.
10 (Deposition Exhibit No. 2018 was marked
11 for identification.)
12 **A. Okay.**
13 MR. SCHMIDT: And, Ms. Ince, I just got
14 a- -- an error that the file size is too large.
15 (Discussion off the record.)
16 BY MR. SCHMIDT:
17 Q. So, Dr. Reinholtz, could you, please, turn
18 to Paragraph 18 of Exhibit 2018.
19 **A. Okay. I'm there.**
20 Q. Okay. Now, is it correct that for your
21 analysis that you provided in this declaration, that
22 you considered the relevant time frame of the
23 inventions for the '989017 and '831 patents as
24 September 30th, 2009?
25 **A. Yes, that's correct.**

Page 8

1 Q. Okay. And what is -- was it important to
2 you to consider that time frame when rendering your
3 opinions?
4 **A. Well, in -- in rendering opinions,**
5 **generally, the case that the -- a perspective of a**
6 **person of ordinary skill of the art is taken around**
7 **this -- this date -- the invention date, and so I**
8 **don't know that anything would have changed**
9 **significantly in my analysis, had I considered some**
10 **later date, for example, but I tried to focus on**
11 **this date. So I -- it is important to consider the**
12 **date. Sometimes technology changes.**
13 Q. And can you, please, turn to Paragraph 42
14 of the same exhibit, 2018.
15 **A. Okay. I'm on Paragraph 42.**
16 Q. Okay. You state in Paragraph 42 that the
17 draw length is 30 inches, and is there anything
18 particularly advantageous about a draw length of
19 30 inches, specifically?
20 **A. Well, I -- I do talk about the draw**
21 **length. So in the middle of that paragraph, there**
22 **is a sentence that says, The draw length of the --**
23 **the draw length module of the bow is adjustable to**
24 **the maximum draw of 30 inches. And so the -- the**
25 **Menace bow, which is what we're talk about, which I**

1 have in front of me here, you can see the module.
2 And this bow is, in particular, designed to have a
3 range of adjustability from 17 all the way to 30; so
4 it's got a significant range. And that allows it to
5 be adjusted to be adapted for different users, for
6 example, beginning teenage archer could use it with
7 a smaller draw length and a lower -- a draw forth.
8 And a more experienced archer -- bigger archer or
9 strong one could use it, with longer arms could use
10 it at a drawing of 30. So that range is really
11 important, yes.
12 Q. And in your opinion, would there be an
13 advantage to providing an even longer draw length,
14 such as 31 or 32 inches?
15 A. There certainly could be. All other
16 things being equal, a -- a greater adjustability can
17 be advantageous, but there can be trade-off in the
18 design, as well; so it has to be considered
19 holistically.
20 Q. Sure.
21 And in your opinion, are there any
22 specific barriers that need to be overcome to
23 achieve a longer draw length, for example, 31 or
24 32 inches in the bow you just showed?
25 A. Ye- -- yes, there are a number of

1 considerations. One is the size of the rotatable
2 member of the cam itself; though, a larger cam tends
3 to give longer draw lengths. But it also has some
4 disadvantages, making a large cam -- one, for
5 example, requires more material and~~, perhaps, more~~
6 machining; so there can be -- there can be a
7 downside to that. And I -- the key -- on one of the
8 key aspects of the invention is allowing the cam to
9 rotate further by -- by moving that terminal point
10 outside, and we see a greater rotation.
11 So -- but there -- yeah, there -- there
12 can be tradeoff, but having a longer draw length
13 with everything else being equal is generally a
14 positive. I'd have to see a specific case to see
15 what the disadvantages might be, but, generally, if
16 everything is equal, it's advantageous.
17 Q. And you stated that one of the key aspects
18 of the invention is, allowing the cam to rotate
19 further by moving the terminal point outside, and
20 that allows a greater rotation.
21 Does that allow for a longer draw length,
22 as well?
23 A. Yes. All other things being equal, the
24 cam can rotate, but an additional -- through an
25 additional angle, and that's pretty clearly shown in

1 all of the patents and in the provisional patent,
2 this ability to rotate further by -- by moving the
3 terminal and using the a -- the capstan. It does
4 allow a greater draw length where it --
5 (Reporter clarification.)
6 THE WITNESS: Capstan, C-A-P-S-T-A-N. Not
7 a common word.
8 A. So by moving the -- by using a capstan and
9 by moving the terminal to the outer edge of the --
10 the rotatable member, you can achieve ad- -- an
11 additional angle of rotation of the cam, which can
12 give greater draw length.
13 BY MR. SCHMIDT:
14 Q. And is that additional rotation of the cam
15 enabled by the reverse wrap design over, say, the
16 forward wrap design?
17 A. I think it's possible. There may -- there
18 may be other ways to achieve the same result, but
19 certainly in the patent, it talks about the --
20 moving that terminal post out to achieve a greater
21 rotational angle of the -- the cam or the rotatable
22 member. So certain- -- it's certainly a factor in
23 allowing a greater rotation of the cam and,
24 therefore, greater draw length.
25 Q. And you also state in Paragraph 42 that,

1 The power cables are in contact with the flat
2 portion of the draw length module, and rotation of
3 the cam stops just before the capstan contacts the
4 power cable.
5 Does having the cam stop before the power
6 cable contacts any other portion of the bow an
7 important aspect of bow design?
8 A. I would broadly answer that by saying:
9 You do not want interference between components
10 on -- on -- on the cam and the cable. For example,
11 that certainly -- detrimental when such contact or
12 interference occurs. So I think -- I think,
13 generally, it's important to avoid that kind of
14 interference or contact. There may be exceptions to
15 that, but certainly in the patent, that's -- that's
16 a consideration.
17 Q. So following up on that, then, how does
18 the cam stopping just before the capstan contacts
19 the power cable improve the design of the bow?
20 A. The -- the -- so not having interference
21 between mechanical elements. For example, between a
22 terminal and a power cable or between a capstan and
23 a power cable, that, generally, is a design goal.
24 You do not want interference between components.
25 You don't want -- as you draw the bow, you don't

Page 13

1 **want two components to interfere with each other.**
2 **That will create an impact, wear -- if it's the**
3 **cable that's being contacted, it will create**
4 **potential wear on the cable. So avoiding that kind**
5 **of contact or interference is a- -- an important**
6 **consideration in design of the bow.**
7 Q. Okay. So is it fair to say that having a
8 capstan interact with the power cable or -- have- --
9 having really any physical components on the bow
10 make additional physical contacts with the cable is
11 a potential source of wear, and is something to be
12 avoided where possible?
13 **A. Yeah. I don't -- I don't know. I --**
14 **there may be cases where that's not true, but I -- I**
15 **think that is a true statement for the designs that**
16 **we're looking at in these patents, that avoiding**
17 **interference is a desirable design goal. I can't**
18 **think of a case where you would want to have**
19 **interference, unless there was some intentional stop**
20 **built in, which is also possible. And in that case,**
21 **it would be designed to accommodate that contact or**
22 **interference.**
23 Q. Okay. If you would, can you, please, turn
24 to Paragraph 65 of Exhibit 2018.
25 **A. Okay. I'm there.**

Page 14

1 Q. Okay. Thank you.
2 And looking at the photo shown in
3 Paragraph 65, I -- I note that you've made some
4 highlights here in red and in yellow and in purple,
5 and for the portion that you've highlighted in red,
6 are you referring to that as the elongate, straight
7 portion of the power cable?
8 (Witness is reviewing document.)
9 **A. In -- in Paragraph 65, I don't immediately**
10 **see the term "elongate," but in 26, which is**
11 **highlighted in red, the patent refers to as -- I**
12 **think the straight portion of the power cable.**
13 BY MR. SCHMIDT:
14 Q. And can you describe where that straight
15 portion, in your opinion, starts and ends?
16 **A. I don't know that it's necessary to define**
17 **the full extent of what would be a straight portion**
18 **of the power cable, but when it beg- -- when the**
19 **cable begins to wrap the cam, for example, or the**
20 **capstan, then, it's no longer straight. So that**
21 **wouldn't be part of the straight portion.**
22 **Here, there is some light contact, in some**
23 **cases, between the adjustable module and the cable,**
24 **which can cause it to take a shape, other than a**
25 **perfectly straight line. And, then, the -- the**

Page 15

1 **power cable, of course, runs to the cam on the other**
2 **side of the bow, and all of that, I think, could be**
3 **considered the straight portion, but I think the**
4 **claim simply require that there is a straight**
5 **portion of the power cable.**
6 Q. And is -- is there a boundary between the
7 straight portion that you just described, and what
8 the patent calls the capstan portion?
9 **A. Again, I don't think it's necessary to**
10 **define a precise location that is a boundary. I**
11 **think the claims require a straight portion. But,**
12 **generally, when the cable begins to contact a cam or**
13 **another member that changes it from being a straight**
14 **line, then it would -- clearly would not be a**
15 **straight portion anymore. So any -- any place a**
16 **bend would occur, would be the end of the straight**
17 **portion.**
18 Q. And can you describe what, then, would be
19 the beginning of the capstan portion?
20 **A. And, again, I don't believe it's**
21 **necessary. From my recollection -- I'm not looking**
22 **at the claims of the patent at the moment -- but I**
23 **don't think it's necessary to define a precise**
24 **beginning or end of the capstan portion, what's**
25 **highlighted in yellow. The claims require that**

Page 16

1 **there is a portion of the cable that's in contact**
2 **with the capstan. And I've, generally, highlighted**
3 **that in yellow.**
4 Q. Okay. So, I guess, is it your opinion
5 that there is no clear beginning and end for the
6 capstan portion?
7 **A. I think it may change, depending on the --**
8 **for example, the position of the adjustable module.**
9 **So in the figure in Paragraph 65 or the**
10 **photograph -- I think this is a photograph from the**
11 **Inside Archery article -- we can see all the**
12 **adjustment values. So that -- that module was**
13 **adjusted to a mid-draw length of, I think, 24 in**
14 **this picture. If it were some other adjustment**
15 **point, the cable may be deflected a little bit**
16 **further, de- -- just depending on the specifics of a**
17 **implementation, but I don't think that affects the**
18 **fact that there is a capstan portion in contact with**
19 **the capstan.**
20 Q. Is it correct, then, to say that the
21 capstan portion of the power cable is just that
22 portion of the power cable that is in contact with
23 the capstan itself, and not any other additional
24 portion of the cable that isn't in contact with the
25 capstan?

A. I think that's correct. I would have to go back and review the patent to see if there's any occasional insight offered in the patent. But, clearly, there is a portion that's in contact that wraps the capstan and is in contact with it. And that certainly would qualify as the portion that -- that wraps the capstan.

Q. And just turning now to the Terminal portion, same questions: Can you describe what, in your opinion, is the beginning and end of the terminal portion of that power cable?

A. I can. So what I would say is that, clearly, anything that is in contact with that terminal is part of the portion that's looped around the terminal. I think we could debate whether it extends as far as that magenta highlighting indicates. It clearly is the part that's contacting the terminal. I don't think there's any real need to debate exactly where it terminates, but there's clearly a part that contacts that terminal, and that meets, I think, the -- the claim limitations and the requirements of the patent.

Q. So is it -- is it your opinion that the terminal portion is at least the portion in contact with the terminal, and it may or may not be some

additional portion beyond that?

A. Well, that's a -- that's a good question. I think probably we should turn to the patent maybe for some clarity on that. So I'm going -- going to pull up probably the '898 [sic] --

Q. Sure.

A. -- patent. And we'll see --

Q. And I believe that's -- yeah, I believe it's '989.

A. '989, sorry.

Q. See if I can drop that one in the chat at least.

So I've placed into the chat Exhibit 1001, which is a copy of the '989 patent.

(Deposition Exhibit No. 1001 was marked for identification.)

A. I don't think there's any need for me to download that, unless you would prefer that I look at that copy. I have the hard copy --

BY MR. SCHMIDT:

Q. That's fine.

A. -- in front of me. Okay.

Q. Yeah, whatever your preference is, that's primarily for the court reporter.

A. Okay. Fair enough.

(Witness is reviewing document.)

A. Okay. So I'm reading here in Column 4, starting at Line 25 -- and I'll read it into the record -- The first power cable 24 extends around the Capstan 30 and attaches to the Terminal Post 32. The Power Cable 24 comprises a Capstan Portion 34 -- and so I'm looking -- this is really for the other power cable, but the -- I think the -- every- -- everything we're talking about will be the same; so I think this is a useful description. I'm sorry to interrupt my own reading.

The power cable -- I'm starting again at the beginning of the sentence -- The Power Cable 24 comprises a capstan portion in contact with the Capstan 30. So the part that's actually in contact, that -- that may change, depending on the particulars of the design, but the part that's in contact with the capstan is called the Capstan Portion 34, and a Terminal Portion 20 -- I'm sorry -- a Terminal Portion 36 -- so this is what you were just asking me about -- in contact with the Terminal 32.

So reading that description, I would say that what I've highlighted in magenta probably extends beyond at least what that particular

sentence tells us is the terminal portion. I don't think it's been an issue or is an issue in the case. I think it's just required that there is such a terminal portion, but probably thinking about it again, I probably would not have put the magenta highlighting as far as I did.

Let me look at the actual terminal, though, on the bow. It may be a little clearer here. Since we're looking at a photograph, yeah, some terminals are teardrop-shaped, but this one seems to be a circ- -- a circle, and so I would say it's just -- by that paragraph or sentence, at least, it's just the part that's in contact with the terminal.

BY MR. SCHMIDT:

Q. Okay. And, Dr. Reinholtz, can you, please, turn to Paragraph 67 of our declaration, which is Exhibit 2018.

A. Sure.

(Discussion off the record.)

A. I'm sorry, but could you tell me again what paragraph?

BY MR. SCHMIDT:

Q. Sure.

Could you, please, turn to Paragraph 67.

Page 21

A. Okay. Mr. Colvin is managing paper for me. Working from the paper copy does create some -- some shuffle -- un- -- unnecessary shuffling maybe, but it's nice to look at a hard copy.

Q. No problem at all.

A. Okay. I'm on Paragraph 67. Thank you for your patience.

Q. Thank you.

I'm looking at the third sentence there, which is down at the bottom of page 54, and it says, **A POSITA would have understood that the dashed red line along the elongate straight portion of the power cable defines a plane parallel to the viewing access, e.g., extending into and out of the page.**

And my question is: How -- how, in your opinion, does an elongate straight portion define a plane?

(Witness is reviewing document.)

A. Well, a person of ordinary skill in the art would understand that the power cable -- the elongate portion of the power cable defines -- there -- there could be a number of planes that include a straight line, such as the straight portion of the power cable, but the -- we're looking at the side view of this bow. And so there is a

Page 22

plane of the bow.

The -- the centers of rotation of the two cams and in the absence of length. So in a -- in a theoretical setting, at least, the axes point out of the page or into the page, perpendicular to the page, and that is the plane that we're talking about that the -- the straight section of the power cable lies in.

So I think a person of un- -- skill in the art would understand that the power cable does define a plane that's parallel to the viewing axis here.

BY MR. SCHMIDT:

Q. And is there anything in the '989 patent, in this specification, that would indicate to a POSITA that that is the specific plane that's being referred to and not another plane?

A. Well, let me, again, look for the -- for the patent to see if there's anything -- I think you're asking me explicitly: Is there anything explicit in the patent that describes that plane?

Q. That's the -- that's correct.

And may -- maybe let me rephrase my question: Is there anything in the '989 patent that indicates that the plane that you've just described

Page 23

is the correct plane, and not any number of other planes that could be defined by a line?

A. I think it'll -- if you'll turn to Column 2 of the '989 patent, it discusses this point. And it says -- starting at Line 16 -- starting at Line 16, it says -- no, I'm sorry, starts at Line 14, not 16.

Q. Okay.

A. It says, In some embodiments in the brace condition, the elongate straight portion of the power cable defines a plane wherein said first axle -- so the first axle is the axis that I was talking about that's the axis of the -- of the axis of rotation of the cam -- and said terminal are located on opposite sides of said plane.

So that tells us that there's a plane the axle defines the -- the viewing angle -- clearly, we're looking at a plane or image in the patent, and the plane is defined with the straight portion of -- the straight elongate portion and the direction of that first axle or the axis along that first axle. There are probably other places this is discussed, but I think that is sufficient.

Q. The -- using that description that you just referred to in Column 2, Lines 14 to 17, could

Page 24

there be other planes, for example, not at a -- a 90-degree angle to the page, but at some other angle to the page, in which it would still be correct that the straight portion would define a plane, wherein the first axle and the terminal are on opposite sides of that plane? Is that still possible?

A. I -- I think it would be possible to imagine some abstract bow that would- -- wouldn't be probably practical. A person of skill in the art would understand this to define the plane to be the plane perpendicular to the page of the paper. I don't really think there's any other possibility here.

Q. So is -- is it your opinion that other planes that are not a 90-degree angle to the page, say, a 60-degree angle to the page in which it's still true that the first axle in the terminal are on opposite sides of that plane, that that's just not contemplated by the '989 patent?

A. Yeah, I have not seen any such design. I think a person of skill in the art would understand this plane to be perpendicular to the page -- the plane of the page that we're looking at. If there are other examples, I can't recall having seen any of those. I don't know that it's restricted -- the

Page 25

1 **patent is restricted necessarily to that, but the**
2 **embodiments that we see, to me, clearly show that.**
3 Q. Dr. Reinholtz, can you turn to
4 Paragraph 69 of Exhibit 2018, please.
5 **A. Okay. I'm on Paragraph 69.**
6 Q. And in the image shown in Paragraph 69,
7 which is on the top of page 57, do you see where the
8 power cable is exiting the capstan? And before it
9 touches the cam track, would you agree that that is
10 a straight portion of the power cable; that span
11 between the capstan and the cam track?
12 **A. You said at the top of the page, but just**
13 **to clarify the record, I think -- I would call that**
14 **photograph being in the center of the page.**
15 Q. Yeah. You're right.
16 **A. Yeah. I -- I haven't considered that. I**
17 **think it's possible there could be a portion in**
18 **there that's generally straight. I -- I -- I just**
19 **haven't done that analysis.**
20 Q. Does that -- in -- in your opinion, would
21 that portion, spanning from where it exits the
22 capstan and before it touches the cam track, would
23 that power cable form a straight line?
24 **A. I certainly think it's possible that there**
25 **is a straight line -- a small straight line portion**

Page 26

1 **of the power cable in that location.**
2 Q. And in this image shown in the middle of
3 page 57, there are two measurements that are taken.
4 There is a -- there's a red arrow spanning from the
5 terminal to the vertical red line -- or, mostly,
6 vertical red line on the -- the right side, and
7 there's a- -- another red arrow that spans from a
8 point on the capstan to that same red line.
9 And is there any reason why that arrow --
10 that top arrow that's -- purports to measure from
11 the capstan to the vertical red line, why that
12 measurement can't be taken from another portion on
13 the capstan? In other words, could you measure the
14 distance from the center of mass of the capstan to
15 that red line? And would that still be the distance
16 from the capstan to the vertical red line?
17 **A. Yeah, again, just to clarify, I'm not**
18 **making measurements here; so there's no physical --**
19 **there's no numerical value that I've associated**
20 **with, as I'm simply showing that the terminal is**
21 **further away than the portions of the capstan, which**
22 **is, I think, what's required in the claim.**
23 **The capstan actually -- interesting**
24 **here -- the capstan actually bends around for --**
25 **and, again, I'll to go to the physical bow --**

Page 27

1 **this -- this design, I believe, was so novel, that**
2 **it was important to the designer -- the manufacturer**
3 **to put -- and it's a little -- little bit hard to**
4 **see in the picture -- but if you look at the -- the**
5 **capstan, it extends much farther than it really**
6 **needs to. So the portion you're asking about really**
7 **is just to prevent somebody from misthreading the**
8 **cable on this bow. There's actually an arrow on**
9 **the -- on the capstan that shows how the threading**
10 **goes.**
11 **And so that's not a portion of the capstan**
12 **that's used, but I don't really think that's an**
13 **issue. Even if that portion were used, clearly,**
14 **part of the capstan is closer than any part of the**
15 **terminal. I think that's the key dimension that**
16 **we're talking about.**
17 Q. And is there anything in the '989 patent
18 that tells you that you should measure from that
19 location on the capstan that you've chosen there
20 versus another location on the capstan, say, the
21 additional curved portion that you mentioned there
22 that, you know, is down below the terminal? Is
23 there any reason why the measurement needs to be
24 taken from the location that you chose in view of
25 the '989 patent?

Page 28

1 **A. I think this is really a matter of how a**
2 **person of skill in the art would read this claim of**
3 **the patent. And so what the claim -- I'm looking,**
4 **for example, at Claim 3 of the '989 patent -- and I**
5 **think it kind of generally gets to your question --**
6 **The archery bow of Claim 1 wherein the brace -- in**
7 **the brace condition, which is what we're looking at**
8 **before the bow is drawn -- the power cable -- I'm**
9 **sorry -- wherein in the -- yeah, I -- I was reading**
10 **from Claim 2; so let me start this over again.**
11 **Claim 3 says, The archery bow of Claim 1,**
12 **wherein a distance bet- -- a distance between a**
13 **first axle and a terminal is greater than a distance**
14 **between the first axle and the cam track -- oops,**
15 **probably that's not the claim that I wanted to be**
16 **reading from.**
17 **I can't find the -- the claim. I think**
18 **this is covered in one of the claims, and I could**
19 **spend more time, but I think, generally, what we're**
20 **talking about here is that: Is there a portion of**
21 **the capstan that's closer than a -- the -- the**
22 **terminal? And there clearly is, and that, I think,**
23 **meets the limitations of the claim. We could**
24 **measure other distances, but those are not**
25 **necessary. They're superfluous to interpreting the**

claims of the patent.

Q. Okay. So if -- if I understand correctly, your -- your opinion is that you could measure from other locations in the capstan, but you were only concerned with whether there is a location on the capstan that is closer than the distance to the terminal; is that fair?

A. Yeah. I -- I would say it this way: That I am looking at the claims -- the requirements of the claims of the patent to see if these -- these are embodied in the images and the devices that are -- are at issue in this case. So the -- in this case, we're looking at the first embodiment and the Mission-Menace-type bow that mirrors very closely the -- the first embodiment --

(Reporter clarification.)

THE COURT REPORTER: I'm sorry, hold on. You cut out.

"That mirrors very closely to the" ...

A. The first embodiment that's shown in the '989 patent.

BY MR. SCHMIDT:

Q. And when you say "the first embodiment," what -- what are you referring to in the '989 patent?

A. The '989 patent shows a first embodiment that corresponds to Figures 1, 2, and 3. And that embodiment is almost identical, except for some -- some markings that are on the physical device to the Mission Menace bow.

And, then, starting with Figure 4, there is a second embodiment that is very close to, if not identical to the geometry of the -- the other bow that we have here with us. This is the -- the Monster bow, and we can look at the cam geometry on this and see it matches identically or very -- very close to being identically to the second embodiment of the patent.

Q. And so is it your opinion, then, that because this photograph in Paragraph 67 is very similar to the Monster and Menace bows, that that's what's telling you to take the measurement from that location on the capstan?

A. No, I wouldn't say it that way. The claims require certain things to be in particular locations, some things closer than others, and I'm just testing or checking to see whether that's true. And it's true in the patent figure, and it's true in the devices.

Q. But is -- and -- and there's nothing else

that -- that you're aware of that indicates that that measurement that's referred to in the claims needs to be taken from that location on the capstan? In other words, the closest location on the capstan to the vertical red line?

A. My understanding of -- in -- in reading a patent is -- the -- the question really is: Is it true that the capstan -- there could be portions of the capstan that are -- that are further away -- but the question really is: Is any part of the capstan closer than the terminal? Which is -- it's clearly true. And that is the way I understand you interpret the claims of the patent.

Q. And, Dr. Reinholtz, can you, please, turn to Paragraph 111 in your declaration, which is Exhibit 2018.

A. I'll try. And Matt is reshuffling the deck for me.

Q. That's right. We will assign all blame to Matt for any delays.

A. No, it's all my fault. I'm getting it all mixed up.

Okay. So we're looking at Paragraph 112?

Q. 111, please.

A. Okay. Yes, okay. I'm on Paragraph 111.

Q. And, generally speaking, can you describe the purpose of power cables in a compound bow?

A. The term "power cable" is pretty descriptive. So these bows have two power cables, and they serve the purpose of creating a tensile force or -- or, in other words, bending the limbs of the bow to store energy. That's the -- the primary way energy is stored in the bow, through the power cable. So the "power cable" is a descriptive terminology for the cables that cause the limbs to deflect and store energy.

Q. And if we could, for a moment, turn to the Islas reference, which is Exhibit 1005.

(Deposition Exhibit No. 1005 was marked for identification.)

BY MR. SCHMIDT:

Q. See if you have that available to you.

A. I do. You said -- you said "Islas," and I think I've been saying "Islas."

Q. Okay. I can see --

A. I don't know if it's correct, but I may say "Islas," so -- just so Kara is not confused, I think we're talking about the same thing.

Q. And I'll switch to that pronunciation as well, because I genuinely have no idea.

THE COURT REPORTER: Can I get a spelling on that?
MR. SCHMIDT: It's I-S-L-A-S.
THE COURT REPORTER: Thank you.
A. Okay. I'm with you. I have the reference in front of me.
BY MR. SCHMIDT:
Q. So in the Islas reference, is the purpose of the two power cables the same? In other words, do the two different power cables depicted in Islas have different purposes, or do they have the same purpose?
MR. COLVIN: Objection. Form.
THE COURT REPORTER: I'm sorry, was there an objection?
MR. COLVIN: Yeah, I objected to the form.
A. They -- they share a common purpose of causing the limb to deflect -- or the limbs of the bow to deflect to store energy. One -- one of these cable -- Cable 30 -- I'm looking at now Figure 1 of Islas -- 31 is a cable that as the bow is drawn, 31 unwraps from its Cam 60. And as the bow is drawn, Cable 30 wraps to take up slack, and the wrap- -- the wrapping always must be greater than the unwrapping or else the -- the cable goes slack, and

the bow will explode, and it's very dangerous for that to happen.
So I -- I think they share a common purpose of providing the deflection and coordinating motion of the cam.
Maybe you have a more specific question. That was a pretty broad -- pretty broad question.
BY MR. SCHMIDT:
Q. Is it correct that the two power cables that you just referred to, 30 and 31, in the Islas reference, are effectively the same, but oriented in mirror image configurations to each other?
MR. COLVIN: Objection to form.
A. Yeah, I -- yeah, I'm not sure what you mean by that, or -- no, I just don't know what you mean by that.
BY MR. SCHMIDT:
Q. Sure.
So if you look at Cable 31, which is shown on Figure 1, if you were to go to the opposite cam on the other side of the bow, would it have the same configuration as Cable 30 that is shown in Figure 1? In other words, are we seeing sort of -- in this image, we are seeing Cable 30, and in Cable 31, we are seeing what Cable 30 will look like on the other

cam?
MR. COLVIN: Objection to form.
A. Yeah, I don't think Islas restricted to that case. Islas actually refers back to an earlier quad cam patent, and I think this configuration could, for example, be used in a quad cam bow configuration. So I -- I don't think it necessarily is required to be a mirror image. This figure, I don't think it could be. But I think the patent itself doesn't -- doesn't make clear or maybe leaves open the possibility that it could go to the other cam.
BY MR. SCHMIDT:
Q. So is it your opinion that Islas -- strike that.
So is it your opinion, then, that Islas could have a mirror image configuration on the opposing cam, but you just don't know?
A. I so, again -- again, we may have a different -- I'm still saying Islas. And you're now saying Islas.
Q. Sorry.
A. So I'm -- I'm going to continue to say "Islas," I think, or I'll try to, to be consistent.
I don't think I -- I don't think Islas is

clear on whether he's contemplated a mirror image configuration. I'd have to go back and review the whole patent. But of -- my recollection, just sitting here, is that he refers to the quad cam patent as an example of how this could be implemented, in which case Table 31 would not go to a cam on the other limb. But I think he has some generalized statement -- let me see if I can find it -- about how it could be applied to other configurations. And what he means by that, I don't think he's clear.
(Witness is reviewing document.)
A. Yeah, I know in Paragraph 24, Islas talks about -- for example, about two-thirds of the way down -- Islas talks about, That is the pylon position, the inboard cam member, so that the Power Cables 30 and 31 pull the outboard cam at a relatively steep angle relative to the power limb, and pull against a point that is fixed in relation to the bow riser, and not against the other bow limb.
So that is clearly a description of the quad-cam-type design.
BY MR. SCHMIDT:
Q. And could you take a look at Paragraph 26

Page 37

in Islas, and would that be a description of mirror image cams?

A. Right. I think that -- it is. You're correct -- but I think that's a different -- answering a different question than the one you asked about, the pow- -- what the power cables go to, and how they mirror.

So the cams on the limbs would look like mirror images in the preferred embodiment. That's what he's telling us there. I don't think that clarifies the -- whether the -- how -- how the cables are necessarily routed, whether there's a requirement there.

Q. So is it at least possible, then, that the power cables could be routed in mirror image configurations as well, or is your opinion just that you don't know?

A. I -- I think they can be routed in mirror image configuration, but I don't think Power Cable 31 goes in a mirror to the other -- to the other cam on the limb. It goes to a cam -- or at least -- at least what Islas appears to contemplate, "Is it going to a cam that's on the riser?" I still think if you took snapshots of the two ends, they would look like mirror images. But it's -- really,

Page 38

I -- I thought you were asking about where the cables went.

And so they -- Cable 31 does not appear to go to the other cam that it -- so there could be four cams here. If we talk about a bow with two cams, it does not appear to go to a -- the other cam that is on the flexible limb that stores energy. I don't think it could go to that the -- the way the drawings are shown.

MR. SCHMIDT: And, Dr. Reinholtz, we've been going for about an hour, happy to take a break or happy to keep going. It's up to you.

MR. COLVIN: Yeah, let's take a break.

THE WITNESS: Yeah, I think a break's a good idea.

MR. SCHMIDT: Sounds good.

10 minutes?

THE WITNESS: Sounds good.

(A recess was taken from 10:55 a.m. to 11:05 a.m.)

BY MR. SCHMIDT:

Q. Dr. Reinholtz, can you, please, turn to Paragraph 116 of your declaration, which is Exhibit 2018.

A. Okay. I'm there.

Page 39

Q. All right. And in your opinion, would the power cables described in the Darlington reference ever wear out?

A. That is something I have not considered, but with infinite use, everything has the possibility of wearing out. So I certainly think it's possible. In practical use, I do not know if that's an issue.

Q. And -- and in your experience with compound bows, do power cables eventually need to be replaced, generally speaking?

A. Yes, they can -- they can become frayed and worn from use.

Q. And what are some of the sources of that wear on the power cables, in your opinion?

A. Broadly, wear can be simply flexing of the cable, especially, around a tight radius, can cause fibers to -- to break or elongate permanently. So wear could be a physical failure of an -- of fiber in a cable, for example, or it could be an elongation of a -- a fiber or a, you know, surface treatment of the cable, but other sources -- common sources of wear are where -- where -- when the cable is in rubbing, sliding contact -- rubbing contact. Those are really the same thing -- with other

Page 40

elements in the bow or the cam of the bow or the arrow, for example, those -- all those things can cause wear on the cable and degrade its life.

Q. So is one source of degradation of the cables on a compound bow friction, then, from cables coming into contact with solid components on the bow, such as capstans or cam tracks?

A. It can be. Cert- -- certainly, it's an issue, yes. And so if the cable is in pure wrapping contact and there's no sliding motion or very little sliding motion, then wear is, therefore, minimized, and that's in very important consideration.

Q. And can you turn to Paragraph 117 now, please.

A. Okay. I'm there.

Q. And is it your opinion that cam lean can cause power cables to be imperfectly aligned in a cam track?

(Witness is reviewing document.)

A. I'm a little confused. You asked -- and I thought -- to -- to look at Paragraph 117; is that correct?

BY MR. SCHMIDT:

Q. That's correct.

And my question is just: Whether -- well,

Page 41

my first question is: Whether cam lean, which I believe is a term you're familiar with, is -- is something that causes power cables to be imperfectly aligned in a cam track?

A. I think the source of my confusion is I -- I don't -- I discuss cam lean in my declaration, but I don't see it discussed in Paragraph 117; so I'm not clear why you're referring me to that.

Q. Sure. So -- so maybe we -- it's better to refer to Paragraph 118. I believe your -- let me just double-check that.

Apologies. Please, look at Paragraph 114, and there is some discussion there of cam lean.

And I'll just repeat the -- the question, which is: Does cam lean cause a power cable to be imperfectly aligned in a cam track?

A. It certainly can. There may be ways to mitigate that. I have not seen any discussion of that, and there are multiple considerations in designing these devices. But if the cam lean and the cable, therefore, does not come in to the center of the track, if it rubs up against the edges -- the -- the -- the tracks in the cam have straight sides, and then they have a radius at the bottom, and if the cam comes in contact with the -- I'm --

Page 42

cab- -- I'm sorry, not the cam -- if the cable, as it's attempting to enter the track, comes in contact with the side of the track, then there's rubbing, and the friction there and the rubbing will accelerate the wear of the cable. ~~So in that case,~~ cam lean or cam misalignment definitely can contribute to accelerated cable wear.

Q. And referring now back to Paragraph 118, is it your opinion that cable guards will necessarily pull cables out of alignment with the cam surface, and that as a result, power cables are almost never in perfect alignment with the cam tracks in which there -- in which they lie?

MR. COLVIN: Objection to form.

A. Okay. Perfection is impossible to achieve. So cam lean is an important design consideration. Significant lean, which we would certainly see in the proposed combination with Darlington and Islas. It's going to -- significantly to cam lean --

(Reporter clarification.)

A. Yes, that combination that's proposed by Mr. Lange will certainly contribute significantly to increased cam lean, and that will increase the misalignment and cause the cable to -- to rub and

Page 43

accelerate the wear of the cable.

Every bow potentially has some lean -- or does have some lean, and as long as it's well-controlled and not significant, it -- it can be -- the cables can have long life. But as that misalignment increases or the cam lean increases, cable life is reduced, and could be -- could be very short in some cases.

BY MR. SCHMIDT:

Q. Do you have any quantification of the amount of cam lean that is considered unacceptable in a bow design?

A. Well, we -- the easy answer there is: If the lean takes the track out of alignment with the cable -- in other words, the diameter of the cable, which is probably on the order of a 10th of an inch or something like that, maybe smaller -- then, if the -- so I don't know that it's necessary. I mean, we can see, I think, in the proposed combination the reasons for increased cam lean, and that is not a good thing. No matter -- no matter what the magnitude of it is, it's going to make the case worse.

But I do think there's some quantification that if the lean is so significant that the cable

Page 44

has trouble entering the track when it's not already in the track, then that's -- could -- could be a catastrophic -- not a -- not a wear issue, but a catastrophic failure where the cable doesn't enter the track. So that's really a second issue with cam lean. If it gets so severe that the cable does not enter the track, then -- then it's a major problem in a single draw of the bow.

Q. And in your opinion, can you calculate the amount of cam lean just by looking at drawings, or is that something that you would need to build and test?

A. If the drawings were sufficiently detailed, I think it would be possible to provide mechanical calculations to estimate the cam lean. It's also possible to take a physical bow that's been fabricated and test it to measure cam lean. So I think both methods are viable, potentially.

Q. And what about in the case of patent drawings, which are generally not, you know, CAD files drawn to scale.

Do patent drawings generally have enough information to allow to you calculate cam lean?

A. I would -- I -- there are some exceptions probably to this. I think we could quantify --

Page 45

1 **well, let me start in a different way.**
2 **I think -- I think maybe there are some**
3 **drawings in patents -- certain patents in -- broadly**
4 **speaking, that could allow calculation to be made**
5 **that would actually give a numerical estimate of cam**
6 **lean.**
7 **In the patents we're looking at in this**
8 **case, I think it would be difficult to quantify to,**
9 **say, the lean is 1 degree or 5 degrees. But I think**
10 **what we can say is that, relatively, the amount of**
11 **lean will be increased, and I think it's possible to**
12 **quantify moment arm, and given other things being**
13 **equal, what the lean would be relative to from**
14 **one -- one situation of where a cable attaches, for**
15 **example, to another. But, generally, it would be**
16 **hard to quantify precisely what those values would**
17 **be.**
18 Q. And, Dr. Reinholtz, can you, please, turn
19 to Paragraph 121 of your declaration.
20 **A. Yes, I'm there.**
21 Q. And in Paragraph 121, in the third
22 sentence, you state that you measured both the
23 distance between the cam centers and the maximum
24 change in distance between the takeout -- sorry --
25 take-up and let-out power cables.

Page 46

1 And, generally speaking, for
2 Paragraphs 121 to 124, do all of your calculations
3 assume that the figures in the proposed combination
4 of Islas and Darlington are drawn to scale?
5 (Witness is reviewing document.)
6 **A. The -- my -- my calculations here for --**
7 **my -- my observations are specifically based on the**
8 **drawings provided by Mr. Lange, and so I have**
9 **created vectors that are oriented, for example,**
10 **based on those particular drawings. That's what was**
11 **pre- -- presented to me by your expert. But if the**
12 **dimensions change a little bit, the same problems**
13 **and concerns will still be true. They may be --**
14 **they may be amplified or reduced somewhat, depending**
15 **on particular dimensions, but I -- I don't think --**
16 **my opinions certainly aren't based on a particular**
17 **set of dimensions here.**
18 BY MR. SCHMIDT:
19 Q. So is it -- are -- are you saying that
20 your calculations were not performed based on taking
21 measurements of the drawings themselves?
22 **A. Could you refer me to the calculations**
23 **you're asking about?**
24 Q. Sure. It's generally the calculations
25 performed in Paragraphs 121 through 124.

Page 47

1 So, for example, in Paragraph 121, you
2 make the statement that you, quote, measured both
3 the distance between the cam centers and the maximum
4 change in distance between the take-up and let-out
5 power cables, and then you go on to say that, Based
6 on those measurements, there is a maximum change in
7 orientation of the power cable that is less than
8 3 degrees. And, generally speaking, there are a
9 number of references throughout Paragraphs 121
10 through 124 where you refer to "calculations."
11 And my question is: Were all of those
12 calculations based on measurements taken of the
13 drawings themselves?
14 (Witness is reviewing document.)
15 **A. The -- yeah, I -- I do talk about**
16 **calculating an angle, but I think the conclusions I**
17 **reach -- there are very few calculations here. It's**
18 **some measurements of what Mr. Lange proposes and**
19 **what Darlington shows, but my conclusions aren't**
20 **based on those calculations.**
21 **What we're really looking at here is a**
22 **velocity difference. When two -- when two**
23 **components contact -- first contact each other, like**
24 **a cable and a cam, they can be -- they could -- they**
25 **could -- it's possible for them to come into contact**

Page 48

1 **in a smooth engagement with max velocities.**
2 **Clearly, the proposed combination presented by**
3 **Mr. Lange, no matter what the dimensions are, is**
4 **going to have a velocity discontinuity, which means**
5 **the Power Cable 30 impacts. And when I say**
6 **"impact," I mean it -- it strikes the end -- the --**
7 **when it first strikes a portion of the cam, it**
8 **strikes it with a non-zero velocity -- relative**
9 **velocity in the normal direction, which is a huge**
10 **problem. It creates vibration, it affects the feel**
11 **of the bow, it creates cable wear. There are lots**
12 **of issues. And that isn't dependent on any**
13 **particular set of numbers.**
14 BY MR. SCHMIDT:
15 Q. Let me -- let me try that question again.
16 The calculations that you described -- the
17 specific calculations that you described in
18 Paragraphs 121 through 124, were those made by
19 taking direct measurements from the drawings of the
20 combination of Islas and Darlington?
21 **A. I think I only make one calculation. You**
22 **make it sound like I'm calculating quite a number of**
23 **things. I'm just showing that the base- -- so in**
24 **Paragraph 121, I say, Based on these measurements --**
25 **so there, I did use specific measurements, and I**

Page 49

1 **confirmed them in a couple of different ways -- the**
2 **maximum change in orientation of Power Cable 30 will**
3 **be less than 3 degrees.**
4 **So that calculation is based on**
5 **Mr. Lange's proposed system. I don't think --**
6 **anywhere else, I don't see where I performed a**
7 **calculation. You might point me to something, and I**
8 **would be happy to talk about it.**
9 Q. So I'll -- I'll try to ask the question
10 one more time.
11 In that specific calculation that you just
12 referred to, was that based on measuring the
13 drawings directly in order to get those
14 measurements?
15 **A. The specific number I got was based on**
16 **particular measurements that I took. The principles**
17 **and the conclusion would be the same if the figures**
18 **were -- were different. I think it's a general**
19 **principle of how the bows are laid out. We're going**
20 **to see numbers in this order of magnitude. So it's**
21 **just trying to tie some value to something that I**
22 **think is fairly obvious to a person of skill in the**
23 **art, just looking at the general configuration that**
24 **Mr. Lange has proposed.**
25 Q. I -- I guess I'm trying to understand what

Page 50

1 you did there.
2 Is -- is it your opinion, then, that
3 you -- or is it -- are -- are you saying that you
4 did not take measurements of the drawings in order
5 to do those calculations? You just estimated?
6 **A. No. Again, to be clear, there's one**
7 **calculation, an angle of 3 degrees. I think that's**
8 **the only calculation I performed. I did take**
9 **measurements to get that. If the geometry changed,**
10 **I considered that. That might be two and a half**
11 **degrees or three and a half degrees. It doesn't**
12 **affect the conclusion that I arrive at in this**
13 **section of my declaration.**
14 Q. And do those measurements that you took of
15 the drawings and the calculations you performed
16 assume that the drawings are to scale?
17 **A. The numbers I arrive at are based on the**
18 **scaled drawings. The conclusions aren't dependent**
19 **on that.**
20 Q. So if the dimensions were to change, your
21 opinions would be the same?
22 **A. Yes.**
23 Q. And if Module B5 that is shown in
24 Paragraph 122 of your declaration were to be shaped
25 differently than what is shown there, would your

Page 51

1 calculations change?
2 **A. I don't see where I performed any**
3 **calculations in Paragraph 122. What I'm referring**
4 **to there is velocity directions. And so if**
5 **dimensions change, they -- they may change slightly**
6 **with different variations of a design doc- --**
7 **Mr. Lange has presented, I think, to me, the same --**
8 **he -- he describes it, I think, as two different**
9 **embodiments. I see it as just the same thing, exact**
10 **same configuration with just a different cam module.**
11 **I certainly considered that the conclusions don't**
12 **change. There are no calculations, I don't believe,**
13 **in Paragraph 122. It's a general analysis**
14 **demonstrating that there's a velocity discontinuity,**
15 **which I think will be unacceptable in a design.**
16 Q. And is there any shape of Module B5 that
17 you can imagine that would avoid the problem of the
18 velocity discontinuity that you just described?
19 **A. Well, I have not done that analysis or**
20 **attempted to. I'm basing my analysis on what**
21 **Mr. Lange presented. So he presented these -- what**
22 **he calls "two embodiments," but two -- two**
23 **variations with different cams, and I've analyzed**
24 **those, and there's definitely going to be this**
25 **velocity discontinuity, whether other possibilities**

Page 52

1 **may occur -- may be -- whether there may be other**
2 **possibilities. There -- the design has -- designing**
3 **a cam like this, there are a number of**
4 **considerations. And so if he would present a design**
5 **that he thought might avoid these problems, I'd be**
6 **happy to analyze it. There may be other issues**
7 **that, then, arise from a modified design.**
8 **But I did not attempt to create a design**
9 **that would be an improvement on Mr. Lange's --**
10 **Mr. Lange's proposed concept or combination.**
11 Q. Is it correct that you're assuming that
12 Mr. Lange's proposed combination shown in the
13 drawings in Paragraph 122 are to scale?
14 **A. No. My conclusions are not based on the**
15 **scale of those figures.**
16 Q. So in that case, changing the dimensions
17 of all of the components shown in Paragraph 122 of
18 your declaration would not change your conclusions;
19 is that correct?
20 **A. I have not seen any evidence of a -- of a**
21 **design to which -- modified dimensions that would**
22 **change my conclusions. I haven't had the chance to**
23 **analyze anything like that. I -- I certainly see a**
24 **number of problems. This is not the only problem**
25 **that I point out. There are -- there are a variety**

Page 53

1 of problems. And the design, again, there are a
2 number of considerations, and I have not attempted
3 to create a design that avoids this problem or any
4 of the other problems that are in the solution
5 proposed by Mr. Lange. But I can say that no matter
6 what the dimensions are, the geometry he proposes is
7 going to have these problems.
8 Q. And, Dr. Reinholtz, can you, please, turn
9 to Paragraph 129 of your declaration.
10 A. Okay. I'm on 129.
11 Q. And in Paragraph 129, is your calculation
12 of an increased moment arm based on the
13 measurements, again, of the drawings, as if they
14 were drawn to scale?
15 A. Can you -- I don't think I performed any
16 calculations in this part of the report. Again, my
17 opinions are generally based on the design proposed
18 by Mr. Lange. Scale might change magnitudes, but
19 the problems I describe are going to be common, no
20 matter what the dimensions he picks.
21 Q. So if you could look at the drawings in
22 Paragraph 129 of our declaration, there are two
23 side-by-side figures, and in the figure on the left,
24 you have a box that says, Moment arm causing lean,
25 and in the figure on the right, you have another box

Page 54

1 that says, Moment arm causing lean. And it is a
2 larger moment shown in the figure on the right.
3 And my question is: Is your calculation
4 of those two different moment arms that are depicted
5 in the figure in Paragraph 129 based on the drawings
6 being to scale?
7 A. Again, I did not do any calculations. I'm
8 simply showing that the design proposed by Mr. Lange
9 has an increased moment arm. It certainly may be
10 possible to move components around, but I still
11 think the same problem exists. And, again, I'm --
12 I'm analyzing the design proposed by Mr. Lange.
13 It's not my job in -- in this case to try to develop
14 a design that avoids the problems that he's
15 introduced.
16 And so, yes, I can -- we can see
17 particular lengths of moment arm offset in these two
18 figures. They could change slightly with variations
19 in the design that haven't been proposed by the
20 petitioners in this case or Mr. Lange, but the
21 problems are going to be the same, even if the
22 dimensions change slightly.
23 Q. And could a POSITA use the additional
24 holes shown in the right-hand figure in
25 Paragraph 129 to decrease the moment arm shown in

Page 55

1 the figure on the right-hand side there?
2 A. It might be possible, but that introduces
3 other -- other -- again, there are -- there are
4 other considerations here, and so that will,
5 potentially, create other problems. So this is what
6 Mr. Lange has proposed and I've analyzed, if the --
7 if the hole -- a different hole was chosen to put
8 the terminal -- or I'm sorry -- the -- the
9 Component 72, it could slightly change the moment
10 arm, but the same conclusion -- any of the holes
11 will -- will arrive at the same conclusion, that the
12 moment arm in the proposed combination is increased.
13 And I think moving to a different hole creates the
14 potential for other issues that haven't been
15 discussed or addressed in the analysis done by
16 Mr. Lange.
17 Q. Can you identify any of those additional
18 issues that would be created if you moved to the
19 other hole?
20 A. Well, you just said "the other hole." So
21 let's start with that.
22 What other hole are you talking about?
23 Q. So on the right-hand figure in
24 Paragraph 129, you've done a measurement here where
25 it says, There's a moment arm causing lean, and

Page 56

1 you'll notice that the orange capstan is located in
2 a Adjustment Hole No. 2, and it could be moved up
3 Adjustment Hole No. 3. So that's the additional
4 hole that I'm referring to there.
5 A. Okay. Again, you said I made a
6 measurement, and I didn't. It's a -- it's, like, a
7 comparative -- you could -- you could measure these,
8 but I didn't try to assign a numerical value to
9 them. As I think you can clearly see, there are --
10 the -- the Component 72, the capstan -- or what he
11 refers to as the "capstan component," appears to be
12 in a middle hole. We could potentially move it to
13 one of the other two holes that are visible there.
14 In either case the moment arm is increased, compared
15 to the design by Darlington.
16 Moving to the hole that you just
17 suggested, increases the distance between the Power
18 Cable 30 and the cam, and probably results in a
19 greater -- I haven't done the analysis; so I'd need
20 to see the dem- -- I'd need to see the -- like, what
21 you're proposing and consider it more, but I think
22 it will lead to an ev- -- even greater increase in
23 an already problem -- already -- at least
24 detrimental and probably fatal to the design of this
25 velocity discontinuity that I've already pointed

1 **out.**
2 Q. So, in your opinion, moving that capstan
3 would create a greater velocity discontinuity?
4 That's -- that's the issue?
5 **A. Well, you're asking me to analyze**
6 **something on the fly that hasn't been presented by**
7 **your expert. I think just from the -- my quick**
8 **thinking about it, I think it will increase the**
9 **velocity discontinuity, but I'd need to think about**
10 **that more. But all the problems that I've talked**
11 **about are present, no matter which of those holes**
12 **you pick.**
13 Q. And these problems that you're talking
14 about here, are those problems based on assuming
15 that both of the drawings shown in Paragraph 129 are
16 to scale? And I -- you've said you have not taken
17 measurements here, but I just want to confirm that
18 you have done comparative measurements between the
19 left figure and the right figure based on the
20 drawings being drawn to scale; is that correct?
21 **A. That was a long question. Maybe you can**
22 **break it into pieces.**
23 **I agree --**
24 Q. Sure.
25 **A. -- that I'm -- and you can look at the two**

1 **double-headed arrows and see that the one on the**
2 **right is greater than the one on the left. That's**
3 **what's been presented. Doesn't matter which hole**
4 **you pick, that's still going to be true. I didn't**
5 **try to assign numerical values. I'm just pointing**
6 **out that this creates a problem because you're**
7 **increasing a moment arm, and you have a cable that's**
8 **not riding in a track, and there's going to be cam**
9 **lean, and the cable is going to have difficulty**
10 **coming into the track in a centered way. It- --**
11 **it's not going to. The cam will lean, the cable**
12 **will miss the track altogether or rub severely**
13 **against the edge of the track. All these problems**
14 **are independent of any particular hole that you pick**
15 **or particular set of dimensions. They're inherent**
16 **in this combination.**
17 Q. And do you have any ability to quantify
18 the amount of cam lean that would exist in the
19 left-hand figure in Paragraph 129 versus the
20 right-hand figure in Paragraph 129, or is it just
21 your opinion that one is greater than the other?
22 **A. I think -- I think it would be possible**
23 **with significant effort to quantify, at least in an**
24 **approximate way, differences in cam lean. We can**
25 **see here, it looks like at least twice the moment**

1 **arm, and so if we assume that the torsional**
2 **stiffness of the limb members is a linear torsional**
3 **stiffness, then doubling the moment arm doubles the**
4 **lean, tripling the moment arm, triple the lean.**
5 **Now, that -- that linear assumption may**
6 **not be quite true, but I think a person of skill in**
7 **the art would understand that it's going to be**
8 **significantly more lean, due to that increased**
9 **moment arm.**
10 Q. And is your opinion about that significant
11 increase in cam lean based on viewing these two
12 drawings as if they were drawn to scale?
13 **A. No.**
14 Q. So you're not assuming these drawings are
15 to scale, but you have some other method of
16 estimating the ratio between the moment arm of the
17 figure on the right, and the moment arm in the
18 figure on the left; is that correct?
19 **A. I -- I have not seen any proposal by**
20 **Mr. Lange of a design that has an equivalent moment**
21 **arm to the original Darlington or anything close to**
22 **that. There is clearly an increased moment arm.**
23 **The severity of the lean will vary a little bit**
24 **depending on how long that moment arm is, but the**
25 **problem remains of added cam lean.**

1 **So you're asking me: Could it be less?**
2 **Could it be more? Yes, it can be a little less or a**
3 **little more. The inherent problem in the design,**
4 **though, is -- is there, no matter which hole you**
5 **pick. Every -- every location -- every possible**
6 **location of the capstan that Mr. Lange didn't even**
7 **discuss, I think has the same problem. I don't see**
8 **any alternative based on his design.**
9 Q. And is it your opinion that a POSITA
10 designing a bow like this would not take any steps
11 to adjust for cam lean by, for example, moving
12 components around to decrease the moment arm? In
13 other words, the POSITA does not have that
14 capability? Is that your opinion?
15 MR. COLVIN: Objection to form.
16 **A. Yeah, well, Mr. Lange certainly had the**
17 **opportunity to consider these problems. He should**
18 **have been aware of this -- this is one of many**
19 **problems; additional cam lean. He could have**
20 **proposed a design, if he thought there was one, that**
21 **would attempt to at least mitigate this. He -- he**
22 **didn't make any attempt to do that. He didn't**
23 **discuss it at all in his declaration.**
24 **There are other design considerations. So**
25 **it's not as simple as changing one dimension and**

1 **thinking that that makes this problem better. It**
2 **needs to be done in the holistic context of: Here's**
3 **a proposed design, what are all the problems that**
4 **may arise, and how are those mitigated? So you**
5 **can't look at one and isolate -- even if you could**
6 **make the moment arm less, you may -- as I've already**
7 **pointed out -- may create other -- other problems,**
8 **or you may exacerbate other problems that are**
9 **already present in the design he's proposed.**
10 BY MR. SCHMIDT:
11 Q. And are -- all of those things that you
12 just suggested that a POSITA would do, are those
13 something that are within the capability of a
14 POSITA?
15 **A. Again, Mr. Lange didn't even identify**
16 **these problems. So could a -- could a person of**
17 **ordinary skill in the art consider modifications to**
18 **the design? Yes. Would they solve the problems in**
19 **Mr. Lange's design? No.**
20 Q. And, Dr. Reinholtz, could you turn to
21 Paragraph 131, please.
22 **A. Okay. I'm there.**
23 Q. And in the first sentence there, you --
24 you state that Mr. Lange, again, conflates desirable
25 design goals with motivations to combine.

1 Could you describe the difference between
2 a "desirable design goal" and a "motivation to
3 combine"?
4 **A. Sure. Yeah, he does this repeatedly.**
5 **So, yes, you'd like to -- in this case,**
6 **we're talking about a maximum angular sweep of the**
7 **rotatable member. And as I have already discussed,**
8 **increasing the sweep of the rotatable member can be**
9 **one factor in increasing the draw length and energy**
10 **storage -- storage capacity of a bow.**
11 **So, clearly, it can be beneficial to**
12 **increase the angular sweep of the rotatable member,**
13 **but a motivation to combine implies that the**
14 **combination benefits, and creates this additional**
15 **sweep, and that's clearly not true in the proposed**
16 **combination. The sweep is, at best, the same, and**
17 **probably less. So that -- we'd like to get more**
18 **sweep, doesn't mean you combine these two references**
19 **because the combination doesn't give you that.**
20 **That's the difference.**
21 Q. So could a desirable design goal ever be a
22 motivation to combine?
23 **A. If the combination creates the de- --**
24 **the -- or moves the design in the direction of that**
25 **goal, then, yes, certainly. But the -- the**

1 **combination we see here takes the design in the**
2 **opposite direction, and makes -- decreases the**
3 **sweep. So it can't possibly be a motivation to**
4 **combine when it makes the -- the situation worse.**
5 **It takes us away from the design goal.**
6 Q. And when you say a "design goal that's
7 desirable," who is that desirable to?
8 **A. Well, in the end, of course, the designer.**
9 **There are -- could be a number of affected parties.**
10 **The end user is certainly a important -- it's an**
11 **important consideration, making a bow that has more**
12 **adjustability to allow for a greater draw length,**
13 **for example, is a benefit to the end user, and would**
14 **be, therefore, a goal of the designer, among a**
15 **number of other goals. Reducing cable wear would be**
16 **a desirable design goal that would be of value to a**
17 **designer, a marketing person, and -- and a consumer,**
18 **and probably a number of other people, as well.**
19 Q. And, in your opinion, would it be
20 desirable to -- to increase the maximum angular
21 sweep of a cam in a bow?
22 **A. All other things being equal, generally,**
23 **yes.**
24 Q. And would that increase in a maximum
25 angular sweep of the cam and a bow, could that

1 provide a mo- -- motivation to combine with another
2 reference that would allow you to do that?
3 **A. I- -- I've seen no evidence of that.**
4 Q. So if a reference had a way to increase
5 the maximum angular sweep of a cam in a bow, in your
6 opinion, that would not provide a motivation to
7 combine that reference?
8 **A. Yeah, I'm sorry, may- -- maybe I didn't**
9 **answer your question before.**
10 **I'd have to see the reference. What**
11 **we're -- what has been proposed certainly doesn't**
12 **provide a motion to combine. If you're suggesting**
13 **that there might be some other combination of**
14 **references that would increase the angular sweep,**
15 **I'd have to analyze those and consider them.**
16 Q. Dr. Reinholtz, can you turn to
17 Paragraph 137, please.
18 **A. Okay. I'm at the beginning of**
19 **Paragraph 137.**
20 Q. Thank you.
21 So you state at the bottom of page 115
22 that, One simple -- One simple difference that can
23 easily be observed is that Cable 30 is closer to the
24 center of cam rotation in the modified Darlington
25 pulley than it is in the original Darlington.

Do you see that?
(Witness is reviewing document.)
A. Yes, I do see that.
BY MR. SCHMIDT:
Q. So is it your opinion that having the power cable closer to the center of the cam reduces the amount of power that can be stored in the cam?
A. Well, again, it's not necessarily simple. There are a lot of factors that have to be considered regarding energy storage. For example, the stiffness of the limbs and how much they deflect, but all -- again, all things being equal, it's clear, just visual inspection of the two figures, the original Darlington, as Darlington proposed it, on the left, and the combination proposed by Mr. Lange, that the cable -- Power Cable 30 is now closer to the center of rotation of the cam, and, therefore, will have less travel, and will cause less deflection of the bows, and other things being -- of the limb -- and other things being equal, will store less energy.
Q. And could increasing the amount of rotation on the cam offset that difference?
A. I think it's possible. I haven't seen any such design proposal.

Q. Dr. Reinholtz, could you, please, take a look at Figure 4B of the Darlington reference. And we're going to compare that to Figure 4 of the '989 patent.
A. Okay. I am looking at Figure 4B of Darlington.
Q. And comparing Figure 4B of Darlington to Figure 4 of the '989 patent, is it your opinion that the original unmodified Darlington stores more energy than the invention shown in Figure 4 of the '989 patent?
(Witness is reviewing document.)
A. I haven't considered this question. I'd have to think more about it. But I don't think, necessarily, one stores more energy than the other.
BY MR. SCHMIDT:
Q. The reason I asked the question is the -- well, strike that.
Would you agree that Figure 4B of Darlington depicts a power cable that is further away from the center of the cam than is depicted in Figure 4 of the '989 patent?
A. Well, I don't -- I don't think we can say that. The -- there's a scale issue here. So we're not comparing apples to apples.

In the figures that I presented in my declaration, I've taken Darlington, Figure 4B, and I've taken the modification that Mr. Lange proposes and I'm comparing those. So I think that's a -- clearly, a direct and fair comparison. I don't think -- at least off the top of my head, I can't make such a comparison between the Figure 4 in the '989 patent, and Figure 4B in Darlington.
Q. And is the reason you can't make that comparison, then, because the scales might be different?
A. Well, a number of things are different; so it's comparing two different -- totally different designs.
Q. But is it -- as -- as you stated, is it partly because the scales are different, you can't tell whether the power cable is closer to or farther away from the center of rotation of the cam; is that correct?
A. Because we don't know the scales, we don't know absolute distances, but I also make the point that there are other -- a number of other considerations, that we can't make a direct comparison like we can between the design proposed by Mr. Lange, and the original Darlington. That's a

apples-to-apples comparison where we have two devices that have the same geometric structure and the same layout. So I think we can make some analy- -- we can make some conclusions there, but I couldn't make similar conclusions -- at least with not -- without doing additional analysis and without additional consideration with respect to Figure 4 of the '989 patent.
Q. And when you say that you did apples-to-apples comparisons of Figure 4B and the combination that Mr. Lange has proposed, is that because you're assuming the scales are the same in those two -- in that comparison? Is that what the "apples to apples" means?
A. I will -- I will answer this way: That if you change the scales of these two devices, then other factors come in, and so other problems, like the velocity discontinuity, cable wear issues, also become an issue.
So looking at these two designs, as they're presented, clearly, there will be less ability to store energy in the design proposed by Mr. Lange compared to Darlington.
I haven't seen other designs to consider what the other problems might be or how the other

problems that are already present in this combined design may be made worse by making changes in scale, for example.

Q. But in the conclusions you just described there, are you assuming that the scale is the same between Figure 4B of Darlington, and the combined Darlington and Islas proposal that Mr. Lange has provided?

A. Well, I'm looking what Mr. Lange provided and comparing energy storage capability. Clearly, it's less in the proposed combination. Whether there's some modified version of this that Mr. Lange could propose, but hasn't, I haven't considered that. But at least for the -- focused on energy storage, the design that Mr. Lange proposes is clearly inferior to the original Darlington figure.

Q. So I -- I don't think you asked -- answered my question, Dr. Reinholtz.

When you say that the energy stored in the proposal for Mr. Lange is, quote, clearly less, is that based on an assumption that the scale of the drawings between Darlington's Figure 4B and the combination proposed by Mr. Lange is the same -- the same scale?

A. Yeah, I will answer that with a qualified,

yes. So looking at precisely what Mr. Lange's proposed, and not some modification that I would have to generate, I'm comparing two very similar figures that are at the same scale. Making other changes, as I have already noted, ~~has the potential~~ to worsen other problems in the design, and, therefore, I would need to consider every issue -- all of the issues that I've raised, and maybe others, if we're going to talk about changing the scale.

So looking at these two figures, yes, the scales, I'm thinking about them being the same. If there's some suggestion that there could be a modification for this that hasn't been proposed by Mr. Lange, I'd be happy to consider that, but it needs to be considered in the full context of the design, and not just: Could you make this bigger, and store more energy? That's not really a -- it's not a question that a person of skill in the art would accept. That's not the right premise to base the question on.

MR. SCHMIDT: Dr. Reinholtz, thank you for your time today. I don't have any further questions.

MR. COLVIN: Let's go off the record for a

few minutes, and I'll see if I have any redirect.

MR. SCHMIDT: Sounds good.

(A recess was taken from 11:59 a.m. to 12:01 p.m.)

MR. COLVIN: Okay. No further questions here. That will conclude the depo.

MR. SCHMIDT: And should I ask on the record, Kara, for a rough copy?

THE COURT REPORTER: I already have that. I have a rough.

I was going to ask Mr. Colvin, do you need a rough or do you need it expedited?

MR. COLVIN: No. That's not necessary here.

THE COURT REPORTER: Dr. Reinholtz, are you going to read and sign?

MR. COLVIN: Yes.

(The deposition concluded at 12:04 p.m.)

CERTIFICATE OF REPORTER

I, Kara D. Ince, a Certified Court Reporter for the State of Missouri, do hereby certify that the witness whose testimony appears in the foregoing deposition was duly sworn by me; the testimony of said witness was taken by me to the best of my ability and thereafter reduced to typewriting under my direction; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this deposition was taken, and further that I am not a relative or employee of any attorney or counsel employed by the parties thereto, nor financially or otherwise interested in the outcome of the action.

Kara Ince

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Missouri Supreme Court
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ERRATA SHEET

Witness: Charles Reinholtz

RAVIN CROSSBOWS, LLC v. MCP IP, LLC

Date Taken: February 11, 2025

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Reason for change:

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I, Charles Reinholtz, do hereby certify:

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That I have made such changes in form and/or substance to the within deposition as might be necessary to render the same true and correct;

That having made such changes thereon, I hereby subscribe my name to the deposition.

I declare, under penalty of perjury, that the foregoing is true and correct.

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182100_Charles_Reinholtz_021125_Exh 1005 2:8 32:13,14

182100_Charles_Reinholtz_021125_Exh 2018 2:6 6:19 7:7,10,18 13:24 20:18 25:4 31:16 38:24

$

$500 6:17

1

1 28:6,11 30:2 33:20 34:20,22 45:9

10 38:17

1001 18:13,15

1005 32:13,14

10:55 38:19

10th 43:16

11 4:6

111 31:15,24,25

112 31:23

114 41:12

115 64:21

116 38:23

117 40:13,21 41:7

118 41:10 42:8

11:05 38:20

11:59 71:3

121 45:19,21 46:2, 25 47:1,9 48:18, 24

122 50:24 51:3,13 52:13,17

124 46:2,25 47:10 48:18

129 53:9,10,11,22 54:5,25 55:24 57:15 58:19,20

12:01 71:4

12:04 71:18

131 61:21

1348 4:5

137 64:17,19

14 23:7,25

16 23:5,6,7

17 9:3 23:25

18 7:18

2

2 23:4,25 28:10 30:2 56:2

20 19:19

2009 7:24

2018 6:19 7:7,10, 18 8:14 13:24 20:18 25:4 31:16 38:24

2025 4:6

24 16:13 19:4,6,13 36:13

25 19:3

26 14:10 36:25

3

3 28:4,11 30:2 47:8 49:3 50:7 56:3

30 8:17,19,24 9:3, 10 19:5,15 33:20, 23 34:10,22,24,25 36:17 48:5 49:2 56:18 64:23 65:17

30th 7:24

31 9:14,23 33:21 34:10,19,24 36:6, 17 37:20 38:3

32 9:14,24 19:5,22

34 19:6,19

36 19:20

4

4 19:2 30:6 66:3,8, 10,22 67:7 68:7

42 8:13,15,16 11:25

4B 66:2,5,7,19 67:2,8 68:10 69:6, 22

5

5 45:9

50 5:5

54 21:10

57 25:7 26:3

6

60 33:22

60-degree 24:16

65 13:24 14:3,9 16:9

67 20:17,25 21:6 30:15

69 25:4,5,6

7

72 55:9 56:10

8

831 7:23

898 18:5

9

90-degree 24:2,15

989 18:9,10,14 22:14,24 23:4 24:19 27:17,25 28:4 29:21,24 30:1 66:3,8,11,22 67:8 68:8

989017 7:23

9:57 4:2

A

a- 7:14 13:5 26:7

a.m. 4:2 38:19,20 71:3

ability 11:2 58:17 68:22

absence 22:3

absolute 67:21

abstract 24:8

accelerate 42:5 43:1

accelerated 42:7

accept 70:20

access 21:14
accommodate 13:21
accurate 5:11 6:10
accurately 6:8
achieve 9:23 11:10,18,20 42:16
actual 20:7
ad- 11:10
adapted 9:5
added 59:25
additional 10:24, 25 11:11,14 13:10 16:23 18:1 27:21 54:23 55:17 56:3 60:19 62:14 68:6, 7
addressed 55:15
adjust 60:11
adjustability 9:3, 16 63:12
adjustable 8:23 14:23 16:8
adjusted 9:5 16:13
adjustment 16:12, 14 56:2,3
advantage 9:13
advantageous 8:18 9:17 10:16
affect 50:12
affected 63:9
affects 16:17 48:10
age 4:9
agree 25:9 57:23 66:19
ahead 7:6
aligned 40:17 41:4,16
alignment 42:10, 12 43:14
allowing 10:8,18 11:23
alternative 60:8
altogether 58:12
amount 43:11 44:10 45:10 58:18 65:7,22
amplified 46:14
analy- 68:4
analysis 7:21 8:9 25:19 51:13,19,20 55:15 56:19 68:6
analyze 52:6,23 57:5 64:15
analyzed 51:23 55:6
analyzing 54:12
angle 10:25 11:11, 21 23:17 24:2,15, 16 36:18 47:16 50:7
angular 62:6,12 63:20,25 64:5,14
answering 37:5
answers 5:9,10
anymore 15:15
Apologies 41:12
appears 37:22 56:11
apples 66:25 68:14
apples-to-apples 68:1,10
applied 36:9
approximate 58:24
archer 9:6,8
archery 16:11 28:6,11
arise 52:7 61:4
arm 45:12 53:12, 24 54:1,9,17,25 55:10,12,25 56:14 58:7 59:1,3,4,9, 16,17,21,22,24 60:12 61:6
arms 9:9 54:4
arrive 50:12,17 55:11
arrow 26:4,7,9,10 27:8 40:2
arrows 58:1
art 8:6 21:20 22:10 24:9,21 28:2 49:23 59:7 61:17 70:19
article 16:11
aspect 12:7
aspects 10:8,17
assign 31:19 56:8 58:5
assume 46:3 50:16 59:1
assuming 52:11 57:14 59:14 68:12 69:5
assumption 59:5 69:21
attaches 19:5 45:14
attempt 52:8 60:21,22
attempted 51:20 53:2
attempting 42:2
avoid 12:13 51:17 52:5
avoided 13:12
avoiding 13:4,16
avoids 53:3 54:14
aware 6:7 31:1 60:18
axes 22:4
axis 22:11 23:12, 13,21
axle 23:12,17,21 24:5,17 28:13,14

B

B5 50:23 51:16
back 17:2 35:4 36:2 42:8
barriers 9:22
base 70:20
base- 48:23
based 46:7,10,16, 20 47:5,12,20 48:24 49:4,12,15 50:17 52:14 53:12,17 54:5 57:14,19 59:11 60:8 69:21
basing 51:20
beg- 14:18
beginning 9:6 15:19,24 16:5 17:10 19:13 64:18
begins 14:19 15:12
behalf 4:10

bend 15:16

bending 32:6

bends 26:24

beneficial 62:11

benefit 63:13

benefits 62:14

bet- 28:12

bigger 9:8 70:17

bit 16:15 27:3 46:12 59:23

blame 31:19

bottom 21:10 41:24 64:21

boundary 15:6,10

bow 8:23,25 9:2, 24 12:6,7,19,25 13:6,9 15:2 20:8 21:25 22:1 24:8 26:25 27:8 28:6,8, 11 29:14 30:5,8, 10 32:2,7,8 33:19, 21,22 34:1,21 35:6 36:20 38:5 40:1,5,7 43:2,12 44:8,16 48:11 60:10 62:10 63:11,21,25 64:5

bows 30:16 32:4 39:10 49:19 65:19

box 53:24,25

brace 23:9 28:6,7

break 5:22 6:1 38:11,13 39:18 57:22

break's 38:14

breaks 5:21

briefly 5:8

broad 34:7

broadly 12:8 39:16 45:3

build 44:11

built 13:20

C

C-A-P-S-T-A-N 11:6

cab- 42:1

cable 12:4,6,10, 19,22,23 13:3,4,8, 10 14:7,12,18,19, 23 15:1,5,12 16:1, 15,21,22,24 17:11 19:4,6,8,12,13 21:13,20,21,24 22:7,10 23:11 25:8,10,23 26:1 27:8 28:8 32:3,9 33:20,21,23,25 34:19,22,24,25 37:20 38:3 39:17, 20,22,23 40:3,9 41:15,21 42:1,5,7, 9,25 43:1,7,15,25 44:4,6 45:14 47:7, 24 48:5,11 49:2 56:18 58:7,9,11 63:15 64:23 65:6, 16,17 66:20 67:17 68:18

cables 12:1 32:2, 4,10 33:9,10 34:9 36:17 37:6,12,15 38:2 39:2,10,15 40:5,17 41:3 42:10,11 43:5 45:25 47:5

CAD 44:20

calculate 44:9,23

calculating 47:16 48:22

calculation 45:4 48:21 49:4,7,11 50:7,8 53:11 54:3

calculations 44:15 46:2,6,20,22,24 47:10,12,17,20 48:16,17 50:5,15 51:1,3,12 53:16 54:7

call 25:13

called 19:18

calls 15:8 51:22

cam 10:2,4,8,18, 24 11:11,14,21,23 12:3,5,10,18 14:19 15:1,12 23:14 25:9,11,22 28:14 30:10 33:22 34:5,20 35:1,5,6, 12,18 36:4,7,16, 17 37:21,23 38:4, 6 40:1,7,16,18 41:1,4,6,13,15,16, 20,23,25 42:1,6, 11,12,16,20,24 43:6,11,20 44:5, 10,15,17,23 45:5, 23 47:3,24 48:7 51:10 52:3 56:18 58:8,11,18,24 59:11,25 60:11,19 63:21,25 64:5,24 65:6,7,18,23 66:21 67:18

cams 22:3 37:2,8 38:5,6 51:23

capability 60:14 61:13 69:10

capacity 62:10

capstan 11:3,6,8 12:3,18,22 13:8 14:20 15:8,19,24 16:2,6,18,19,21, 23,25 17:5,7 19:5, 6,14,15,18 25:8, 11,22 26:8,11,13, 14,16,21,23,24 27:5,9,11,14,19, 20 28:21 29:4,6 30:18 31:3,4,8,9, 10 56:1,10,11 57:2 60:6

capstans 40:7

case 6:15,17 8:5 10:14 13:18,20 20:2 29:12,13 35:4 36:6 42:5 43:22 44:19 45:8 52:16 54:13,20 56:14 62:5

cases 13:14 14:23 43:8

catastrophic 44:3, 4

causing 33:18 53:24 54:1 55:25

CCR 4:5

center 25:14 26:14 41:21 64:24 65:6, 17 66:21 67:18

centered 58:10

centers 22:2 45:23 47:3

Cert- 40:8

certain- 11:22

Certified 4:4

chance 52:22

change 16:7 19:16 45:24 46:12 47:4, 6 49:2 50:20 51:1, 5,12 52:18,22 53:18 54:18,22 55:9 68:16

changed 8:8 50:9

changing 52:16 60:25 70:9

charge 6:16

Charles 4:8,23

chat 7:3,7 18:11, 13

checking 30:22

chose 27:24

chosen 27:19 55:7

Chris 4:14,15

circ- 20:11

circle 20:11

claim 15:4 17:21 26:22 28:2,3,4,6, 10,11,15,17,23

claims 15:11,22, 25 28:18 29:1,9, 10 30:20 31:2,13

clarification 11:5 29:16 42:21

clarifies 37:11

clarify 5:17 25:13 26:17

clarity 18:4

clear 5:18 16:5 35:10 36:1,11 41:8 50:6 65:13

clearer 20:8

close 30:7,12 59:21

closely 29:14,19

closer 27:14 28:21 29:6 30:21 31:11 64:23 65:6,17 67:17

closest 31:4

Column 19:2 23:4, 25

Colvin 4:20 21:1 33:13,16 34:13 35:2 38:13 42:14 60:15 70:25 71:5, 11,13,17

combination 42:18,22 43:19 46:3 48:2,20 52:10,12 55:12 58:16 62:14,16, 19,23 63:1 64:13 65:15 68:11 69:11,23

combine 61:25 62:3,13,18,22 63:4 64:1,7,12

combined 69:1,6

commenced 4:2

common 11:7 33:17 34:3 39:22 53:19

comparative 56:7 57:18

compare 66:3

compared 56:14 68:23

comparing 66:7, 25 67:4,13 69:10 70:3

comparison 67:5, 7,10,24 68:1,13

comparisons 68:10

compensated 6:11

component 55:9 56:10,11

components 12:9, 24 13:1,9 40:6 47:23 52:17 54:10 60:12

compound 32:2 39:10 40:5

comprises 19:6, 14

computer 6:23 7:2

concept 52:10

concerned 29:5

concerns 46:13

conclude 71:6

concluded 71:18

conclusion 49:17 50:12 55:10,11

conclusions 47:16,19 50:18 51:11 52:14,18,22 68:4,5 69:4

condition 23:10 28:7

configuration 34:22 35:5,7,17 36:2 37:19 49:23 51:10

configurations 34:12 36:10 37:16

confirm 57:17

confirmed 49:1

conflates 61:24

confused 32:22 40:20

confusion 41:5

consideration 12:16 13:6 40:12 42:17 63:11 68:7

considerations 10:1 41:19 52:4 53:2 55:4 60:24 67:23

considered 7:22 8:9 9:18 15:3 25:16 39:4 43:11 50:10 51:11 65:10 66:13 69:13 70:16

consistent 35:24

consumer 63:17

contact 12:1,11,14 13:5,21 14:22 15:12 16:1,18,22, 24 17:4,5,13,24 19:14,15,18,21 20:13 39:24 40:6, 10 41:25 42:2 47:23,25

contacted 13:3

contacting 17:17

contacts 12:3,6,18 13:10 17:20

contemplate 37:22

contemplated 24:19 36:1

context 61:2 70:16

continue 35:23

contribute 42:7,23

coordinating 34:4

copy 6:18,21,23 7:1,6,9 18:14,19 21:2,4 71:8

correct 7:20,25 16:20 17:1 22:22 23:1 24:3 32:21 34:9 37:4 40:22, 24 52:11,19 57:20 59:18 67:19

correctly 29:2

corresponds 30:2

couple 49:1

court 4:3,5 5:8,10 7:7 18:24 29:17 33:1,4,14 71:9,15

cover 5:7

covered 28:18

create 5:11 13:2,3 21:2 52:8 53:3 55:5 57:3 61:7

created 46:9 55:18

creates 48:10,11 55:13 58:6 62:14, 23

creating 32:5

Crossbows 4:17

curved 27:21

cut 29:18

D

Dallas 5:1

dangerous 34:1

Darlington 39:2 42:19 46:4 47:19 48:20 56:15 59:21 64:24,25 65:14 66:2,6,7,9,20 67:2,8,25 68:23 69:6,7,16

Darlington's 69:22

dashed 21:11

date 4:5 8:7,10,11, 12

de- 16:16 62:23

debate 17:15,19

deck 31:18

declaration 6:18 7:21 20:17 31:15 38:23 41:6 45:19 50:13,24 52:18 53:9,22 60:23 67:2

decrease 54:25 60:12

decreases 63:2

define 14:16 15:10,23 21:16 22:11 24:4,10

defined 23:2,19

defines 21:13,21 23:11,17

deflect 32:11 33:18,19 65:12

deflected 16:15

deflection 34:4 65:19

degradation 40:4

degrade 40:3

degree 45:9

degrees 45:9 47:8 49:3 50:7,11

delays 31:20

dem- 56:20

demonstrating 51:14

dependent 48:12 50:18

depending 16:7, 16 19:16 46:14 59:24

depicted 33:10 54:4 66:21

depicts 66:20

depo 71:6

deposed 5:2

deposes 4:10

deposition 4:2 7:10 18:15 32:14 71:18

describe 14:14 15:18 17:9 32:1 53:19 62:1

describes 22:21 51:8

description 19:10, 23 23:24 36:22 37:1

descriptive 32:4,9

design 9:18 11:15, 16 12:7,19,23 13:6,17 19:17 24:20 27:1 36:23 42:16 43:12 51:6, 15 52:2,4,7,8,21 53:1,3,17 54:8,12, 14,19 56:15,24 59:20 60:3,8,20, 24 61:3,9,18,19, 25 62:2,21,24 63:1,5,6,16 65:25 67:24 68:22 69:2, 15 70:6,17

designed 9:2 13:21

designer 27:2 63:8,14,17

designing 41:20 52:2 60:10

designs 13:15 67:14 68:20,24

desirable 13:17 61:24 62:2,21 63:7,16,20

detailed 44:14

detrimental 12:11 56:24

develop 54:13

device 30:4

devices 29:11 30:24 41:20 68:2, 16

diameter 43:15

difference 47:22 62:1,20 64:22 65:23

differences 58:24

differently 50:25

difficult 45:8

difficulty 58:9

dimension 27:15 60:25

dimensions 46:12,15,17 48:3 50:20 51:5 52:16, 21 53:6,20 54:22 58:15

direct 48:19 67:5, 23

direction 23:20 48:9 62:24 63:2

directions 51:4

directly 49:13

disadvantages 10:4,15

discontinuity 48:4 51:14,18,25 56:25 57:3,9 68:18

discuss 41:6 60:7, 23

discussed 23:22 41:7 55:15 62:7

discusses 23:4

discussion 7:15 20:20 41:13,18

distance 26:14,15 28:12,13 29:6 45:23,24 47:3,4 56:17

distances 28:24 67:21
doc- 51:6
document 14:8 19:1 21:18 36:12 40:19 46:5 47:14 65:2 66:12
double-check 41:11
double-headed 58:1
doubles 59:3
doubling 59:3
download 18:18
downside 10:7
draw 8:17,18,20, 22,23,24 9:7,13, 23 10:3,12,21 11:4,12,24 12:2, 25 44:8 62:9 63:12
drawing 9:10
drawings 38:9 44:10,13,20,22 45:3 46:8,10,21 47:13 48:19 49:13 50:4,15,16,18 52:13 53:13,21 54:5 57:15,20 59:12,14 69:22
drawn 28:8 33:21, 22 44:21 46:4 53:14 57:20 59:12
drop 18:11
due 59:8

E

e.g. 21:14
earlier 5:22 35:4
easily 64:23
easy 43:13
edge 11:9 58:13
edges 41:22
effectively 34:11
effort 58:23
electronic 7:9
elements 12:21 40:1
elongate 14:6,10 21:12,16,21 23:10,20 39:18
elongation 39:21
embodied 29:11
embodiment 29:13,15,20,23 30:1,3,7,12 37:9
embodiments 23:9 25:2 51:9,22
enabled 11:15
end 15:16,24 16:5 17:10 48:6 63:8, 10,13
ends 14:15 37:24
energy 32:7,8,11 33:19 38:7 62:9 65:10,21 66:10,15 68:22 69:10,14,19 70:18
engagement 48:1
enter 42:2 44:4,7
entering 44:1
equal 9:16 10:13, 16,23 45:13 63:22 65:12,21
equivalent 59:20
Erise 4:16
error 7:14
estimate 44:15 45:5
estimated 50:5
estimating 59:16
ev- 56:22
eventually 39:10
every- 19:8
evidence 52:20 64:3
exacerbate 61:8
exact 51:9
EXAMINATION 4:11
examined 4:9
examples 24:24
exceptions 12:14 44:24
exhibit 6:19 7:7, 10,18 8:14 13:24 18:13,15 20:18 25:4 31:16 32:13, 14 38:24
exhibits 6:24
exist 58:18
exists 54:11
exiting 25:8
exits 25:21
expedited 71:12
experience 39:9
experienced 9:8
expert 46:11 57:7
explicit 22:21
explicitly 22:20
explode 34:1
extending 21:14
extends 17:16 19:4,25 27:5
extent 14:17

F

fabricated 44:17
fact 16:18
factor 11:22 62:9
factors 65:9 68:17
failure 39:19 44:4
fair 13:7 18:25 29:7 67:5
fairly 49:22
familiar 41:2
farther 27:5 67:17
fatal 56:24
fault 31:21
February 4:6
feel 48:10
fiber 39:19,21
fibers 39:18
figure 16:9 30:6, 23 33:20 34:20,22 35:8 53:23,25 54:2,5,24 55:1,23 57:19 58:19,20 59:17,18 66:2,3,5, 7,8,10,19,22 67:2, 7,8 68:7,10 69:6, 16,22
figures 30:2 46:3 49:17 52:15 53:23 54:18 65:14 67:1 70:4,11
file 6:25 7:14
files 6:23 44:21
find 28:17 36:8

fine 18:21
firm 4:16
Fish 4:25
fixed 36:19
flat 6:17 12:1
flexible 38:7
flexing 39:16
fly 57:6
focus 8:10
focused 69:14
folder 6:22,25
force 32:6
form 25:23 33:13, 16 34:13 35:2 42:14 60:15
forward 11:16
frame 7:22 8:2
frayed 39:12
Frederick 4:23
friction 40:5 42:4
front 6:19 9:1 18:22 33:6
full 4:22 14:17 70:16

G

general 49:18,23 51:13
generalized 36:8
generally 8:5 10:13,15 12:13,23 15:12 16:2 25:18 28:5,19 32:1 39:11 44:20,22 45:15 46:1,24 47:8 53:17 63:22
generate 70:3
genuinely 32:25
geometric 68:2
geometry 30:8,10 50:9 53:6
give 10:3 11:12 45:5 62:19
goal 12:23 13:17 62:2,21,25 63:5,6, 14,16
goals 61:25 63:15
good 4:13,14 18:2 38:15,16,18 43:21 71:2
greater 9:16 10:10,20 11:4,12, 20,23,24 28:13 33:24 56:19,22 57:3 58:2,21 63:12
ground 5:7
guards 42:9
guess 16:4 49:25

H

half 50:10,11
hand 4:7
happen 34:2
happy 5:16 38:11, 12 49:8 52:6 70:15
hard 6:21 7:1 18:19 21:4 27:3 45:16
have- 13:8
head 67:6
highlighted 14:5, 11 15:25 16:2 19:24
highlighting 17:16 20:6
highlights 14:4
history 6:25
hold 29:17
hole 55:7,13,19, 20,22 56:2,3,4,12, 16 58:3,14 60:4
holes 54:24 55:10 56:13 57:11
holistic 61:2
holistically 9:19
hour 5:22 6:17 38:11
hourly 6:14,16
huge 48:9

I

I- 6:22 64:3
I-S-L-A-S 33:3
idea 32:25 38:15
identical 30:3,8
identically 30:11, 12
identification 7:11 18:16 32:15
identify 55:17 61:15
image 23:18 25:6 26:2 34:12,24 35:8,17 36:1 37:2, 15,19
images 29:11 37:9,25
imagine 24:8 51:17
immediately 14:9
impact 13:2 48:6
impacts 48:5
imperfectly 40:17 41:3,16
implementation 16:17
implemented 36:6
implies 62:13
important 8:1,11 9:11 12:7,13 13:5 27:2 40:12 42:16 63:10,11
impossible 42:15
improve 12:19
improvement 52:9
inboard 36:16
Ince 4:4 7:13
inch 43:16
inches 8:17,19,24 9:14,24
include 21:23
increase 42:24 56:22 57:8 59:11 62:12 63:20,24 64:4,14
increased 42:24 43:20 45:11 53:12 54:9 55:12 56:14 59:8,22
increases 43:6 56:17
increasing 58:7 62:8,9 65:22
independent 58:14
inferior 69:16
infinite 39:5

information 44:23
inherent 58:15 60:3
Inside 16:11
insight 17:3
inspection 65:13
intentional 13:19
interact 13:8
interesting 26:23
interfere 13:1
interference 12:9, 12,14,20,24 13:5, 17,19,22
interpret 31:13
interpreting 28:25
interrupt 19:11
introduced 54:15
introduces 55:2
invention 8:7 10:8,18 66:10
inventions 7:23
IP 4:16
Islas 32:13,18,19, 22 33:8,10,21 34:10 35:3,4,14, 16,20,21,24,25 36:13,15 37:1,22 42:19 46:4 48:20 69:7
isolate 61:5
issue 20:2 27:13 29:12 39:8 40:9 44:3,5 57:4 66:24 68:19 70:7
issues 48:12 52:6 55:14,18 68:18 70:8
It- 58:10

J

job 54:13

K

Kara 4:4 32:22 71:8
key 10:7,8,17 27:15
kind 12:13 13:4 28:5

L

laid 49:19
Lange 42:23 46:8 47:18 48:3 49:24 51:7,21 53:5,18 54:8,12,20 55:6, 16 59:20 60:6,16 61:15,24 65:16 67:3,25 68:11,23 69:7,9,12,15,20, 23 70:15
Lange's 49:5 52:9, 10,12 61:19 70:1
large 7:14 10:4
larger 10:2 54:2
law 4:16
lawful 4:9
layout 68:3
lead 56:22
lean 40:16 41:1,6, 13,15,20 42:6,16, 17,20,24 43:2,3,6, 11,14,20,25 44:6, 10,15,17,23 45:6, 9,11,13 53:24 54:1 55:25 58:9, 11,18,24 59:4,8, 11,23,25 60:11,19
leaves 35:10
left 53:23 57:19 58:2 59:18 65:15
left-hand 58:19
length 8:17,18,21, 22,23 9:7,13,23 10:12,21 11:4,12, 24 12:2 16:13 22:3 62:9 63:12
lengths 10:3 54:17
let-out 45:25 47:4
License 4:5
lie 42:13
lies 22:8
life 40:3 43:5,7
light 14:22
limb 33:18 36:7, 18,21 37:21 38:7 59:2 65:20
limbs 32:6,10 33:18 37:8 65:11
limitations 17:21 28:23
linear 59:2,5
Lines 23:25
LLC 4:17
located 23:15 56:1
location 15:10 26:1 27:19,20,24 29:5 30:18 31:3,4 60:5,6
locations 29:4 30:21
long 43:3,5 57:21 59:24
longer 9:9,13,23 10:3,12,21 14:20
looped 17:14
lot 65:9
lots 48:11
lower 9:7

M

machining 10:6
made 14:3 45:4 48:18 56:5 69:2
magenta 17:16 19:24 20:5
magnitude 43:22 49:20
magnitudes 53:18
major 44:7
make 13:10 35:10 43:22 47:2 48:21, 22 60:22 61:6 67:7,9,21,23 68:3, 4,5 70:17
makes 61:1 63:2,4
making 10:4 26:18 63:11 69:2 70:4
managing 21:1
manufacturer 27:2
marked 7:10 18:15 32:14
marketing 63:17
markings 30:4
mass 26:14
matches 30:11
material 10:5
Matt 31:17,20
matter 28:1 43:21 48:3 53:5,20 57:11 58:3 60:4

max 48:1

maximum 8:24 45:23 47:3,6 49:2 62:6 63:20,24 64:5

may- 64:8

means 36:10 48:4 68:14

measure 26:10,13 27:18 28:24 29:3 44:17 56:7

measured 45:22 47:2

measurement 26:12 27:23 30:17 31:2 55:24 56:6

measurements 26:3,18 46:21 47:6,12,18 48:19, 24,25 49:14,16 50:4,9,14 53:13 57:17,18

measuring 49:12

mechanical 12:21 44:15

meets 17:21 28:23

member 10:2 11:10,22 15:13 36:16 62:7,8,12

members 59:2

Menace 8:25 30:5, 16

mentioned 27:21

method 59:15

methods 44:18

mid-draw 16:13

middle 8:21 26:2 56:12

minimized 40:11

minutes 38:17 71:1

mirror 34:12 35:8, 17 36:1 37:1,7,9, 15,18,20,25

mirrors 29:14,19

misalignment 42:6,25 43:6

Mission 30:5

Mission-menace-type 29:14

Missouri 4:4

misthreading 27:7

mitigate 41:18 60:21

mitigated 61:4

mixed 31:22

mo- 64:1

modification 67:3 70:2,14

modifications 61:17

modified 52:7,21 64:24 69:12

module 8:23 9:1 12:2 14:23 16:8, 12 50:23 51:10,16

moment 15:22 32:12 45:12 53:12,24 54:1,2,4, 9,17,25 55:9,12, 25 56:14 58:7,25 59:3,4,9,16,17,20, 22,24 60:12 61:6

Monster 30:10,16

morning 4:13,14

motion 34:5 40:10,11 64:12

motivation 62:2, 13,22 63:3 64:1,6

motivations 61:25

move 54:10 56:12

moved 55:18 56:2

moves 62:24

moving 10:9,19 11:2,8,9,20 55:13 56:16 57:2 60:11

multiple 41:19

N

necessarily 25:1 35:7 37:12 42:10 65:8 66:15

nice 21:4

non-zero 48:8

normal 48:9

note 14:3

noted 70:5

notice 56:1

number 6:23 9:25 21:22 23:1 47:9 48:22 49:15 52:3, 24 53:2 63:9,15, 18 67:12,22

numbers 48:13 49:20 50:17

numerical 26:19 45:5 56:8 58:5

O

oath 6:5

objected 33:16

objection 33:13, 15 34:13 35:2 42:14 60:15

observations 46:7

observed 64:23

obvious 49:22

occasional 17:3

occur 15:16 52:1

occurs 12:12

offered 17:3

office 4:25

offset 54:17 65:23

oops 28:14

open 35:11

opinion 9:12,21 14:15 16:4 17:10, 23 21:16 24:14 25:20 29:3 30:14 35:14,16 37:16 39:1,15 40:16 42:9 44:9 50:2 57:2 58:21 59:10 60:9,14 63:19 64:6 65:5 66:8

opinions 8:3,4 46:16 50:21 53:17

opportunity 60:17

opposing 35:18

opposite 23:15 24:5,18 34:20 63:2

orange 56:1

order 5:5 43:16 49:13,20 50:4

ordinary 8:6 21:19 61:17

orientation 47:7 49:2

oriented 34:11 46:9

original 59:21 64:25 65:14 66:9

67:25 69:16

outboard 36:17

outer 11:9

overcome 9:22

P

p.m. 71:4,18

paper 21:1,2 24:11

paragraph 7:18 8:13,15,16,21 11:25 13:24 14:3, 9 16:9 20:12,17, 22,25 21:6 25:4,5, 6 30:15 31:15,23, 25 36:13,25 38:23 40:13,21 41:7,10, 12 42:8 45:19,21 47:1 48:24 50:24 51:3,13 52:13,17 53:9,11,22 54:5, 25 55:24 57:15 58:19,20 61:21 64:17,19

Paragraphs 46:2, 25 47:9 48:18

parallel 21:13 22:11

part 14:21 17:14, 17,20 19:15,17 20:13 27:14 31:10 53:16

particulars 19:17

parties 63:9

partly 67:16

patent 11:1,19 12:15 14:11 15:8, 22 17:2,3,22 18:3, 7,14 22:14,19,21, 24 23:4,18 24:19 25:1 27:17,25 28:3,4 29:1,10,21, 25 30:1,13,23 31:7,13 35:5,9 36:3,5 44:19,22 66:4,8,11,22 67:8 68:8

patents 6:25 7:23 11:1 13:16 45:3,7

patience 21:7

pending 5:24

people 63:18

perfect 42:12

Perfection 42:15

perfectly 14:25

performed 46:20, 25 49:6 50:8,15 51:2 53:15

permanently 39:18

perpendicular 22:5 24:11,22

person 8:6 21:19 22:9 24:9,21 28:2 49:22 59:6 61:16 63:17 70:19

perspective 8:5

petitioner 4:10,16

petitioners 54:20

photo 14:2

photograph 16:10 20:9 25:14 30:15

physical 13:9,10 26:18,25 30:4 39:19 44:16

pick 57:12 58:4,14 60:5

picks 53:20

picture 16:14 27:4

pieces 57:22

place 15:15

places 23:22

plane 21:13,17 22:1,6,11,16,17, 21,25 23:1,11,15, 16,18,19 24:4,6, 10,11,18,22,23

planes 21:22 23:2 24:1,15

point 10:9,19 16:15 22:4 23:5 26:8 36:19 49:7 52:25 67:21

pointed 56:25 61:7

pointing 58:5

portion 12:2,6 14:5,7,12,15,17, 21 15:3,5,7,8,11, 15,17,19,24 16:1, 6,18,21,22,24 17:4,6,9,11,14,24 18:1 19:6,14,19, 20 20:1,4 21:12, 16,21,24 23:10, 19,20 24:4 25:10, 17,21,25 26:12 27:6,11,13,21 28:20 48:7

portions 26:21 31:8

POSITA 21:11 22:16 54:23 60:9, 13 61:12,14

position 16:8 36:16

positive 10:14

possibilities 51:25 52:2

possibility 24:12 35:11 39:6

possibly 63:3

post 11:20 19:5

potential 13:4,11 55:14 70:5

potentially 43:2 44:18 55:5 56:12

pow- 37:6

power 12:1,4,5,19, 22,23 13:8 14:7, 12,18 15:1,5 16:21,22 17:11 19:4,6,8,12,13 21:13,20,21,24 22:7,10 23:11 25:8,10,23 26:1 28:8 32:2,3,4,8,9 33:9,10 34:9 36:16,18 37:6,15, 19 39:2,10,15 40:17 41:3,15 42:11 45:25 47:5, 7 48:5 49:2 56:17 65:6,7,16 66:20 67:17

practical 24:9 39:7

pre- 46:11

precise 15:10,23

precisely 45:16 70:1

prefer 7:9 18:18

preference 18:23

preferred 37:9

premise 70:20

present 52:4 57:11 61:9 69:1

presented 46:11 48:2 51:7,21 57:6 58:3 67:1 68:21

pretty 10:25 32:3 34:7

Charles Reinholtz, Ph.D.
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prevent 27:7

primarily 18:24

primary 32:7

principle 49:19

principles 49:16

printed 7:9

problem 21:5 44:7 48:10 51:17 52:24 53:3 54:11 56:23 58:6 59:25 60:3,7 61:1

problems 46:12 52:5,24 53:1,4,7, 19 54:14,21 55:5 57:10,13,14 58:13 60:17,19 61:3,7,8, 16,18 68:17,25 69:1 70:6

proceedings 6:20

produced 4:9

pronunciation 32:24

proposal 59:19 65:25 69:7,20

propose 69:13

proposed 42:18, 22 43:19 46:3 48:2 49:5,24 52:10,12 53:5,17 54:8,12,19 55:6, 12 60:20 61:3,9 62:15 64:11 65:15,16 67:24 68:11,22 69:11,23 70:2,14

proposes 47:18 53:6 67:3 69:15

proposing 56:21

provide 5:9 44:14 64:1,6,12

provided 7:21 46:8 69:8,9

providing 9:13 34:4

provisional 11:1

pull 18:5 36:17,19 42:10

pulley 64:25

pure 40:9

purple 14:4

purports 26:10

purpose 32:2,5 33:8,12,17 34:4

purposes 33:11

put 7:6 20:5 27:3 55:7

pylon 36:15

Q

quad 35:5,6 36:4

quad-cam-type 36:23

qualified 69:25

qualify 17:6

quantification 43:10,24

quantify 44:25 45:8,12,16 58:17, 23

question 5:15,17, 24,25 18:2 21:15 22:24 28:5 31:7, 10 34:6,7 37:5 40:25 41:1,14 47:11 48:15 49:9 54:3 57:21 64:9 66:13,17 69:18 70:19,21

questions 5:15 17:9 70:24 71:5

quick 57:7

quote 47:2 69:20

R

radius 39:17 41:24

raise 4:6

raised 70:8

range 9:3,4,10

rate 6:14,16,17

ratio 59:16

Ravin 4:17

reach 47:17

read 19:3 28:2 71:16

reading 19:2,11, 23 28:9,16 31:6

real 17:18

reason 5:14 6:7,9 26:9 27:23 66:17 67:9

reasons 43:20

recall 24:24

recess 38:19 71:3

recollection 15:21 36:3

record 4:3,22 5:10,11,18 7:15 19:4 20:20 25:13 70:25 71:8

red 14:4,5,11 21:11 26:4,5,6,7, 8,11,15,16 31:5

redirect 71:1

reduced 43:7 46:14

reduces 65:6

Reducing 63:15

refer 41:10 46:22 47:10

reference 32:13 33:5,8 34:11 39:2 64:2,4,7,10 66:2

references 47:9 62:18 64:14

referred 22:17 23:25 31:2 34:10 49:12

referring 14:6 29:24 41:8 42:8 51:3 56:4

refers 14:11 35:4 36:4 56:11

Reinholtz 4:8,13, 21,23 6:4 7:17 20:16 25:3 31:14 38:10,22 45:18 53:8 61:20 64:16 66:1 69:18 70:22 71:15

relation 36:19

relative 36:18 45:13 48:8

relevant 6:24 7:22

remains 59:25

rendering 8:2,4

repeat 41:14

repeatedly 62:4

rephrase 5:17 22:23

replaced 39:11

report 53:16

reporter 4:3,5 5:8, 10 7:8 11:5 18:24 29:16,17 33:1,4,

14 42:21 71:9,15
representing 4:16
require 15:4,11,25 30:20
required 20:3 26:22 35:8
requirement 37:13
requirements 17:22 29:9
requires 10:5
reshuffling 31:17
respect 68:7
restricted 24:25 25:1 35:3
result 11:18 42:11
results 56:18
reverse 11:15
review 17:2 36:2
reviewing 14:8 19:1 21:18 36:12 40:19 46:5 47:14 65:2 66:12
Richardson 4:25
riding 58:8
right-hand 54:24 55:1,23 58:20
riser 36:20 37:23
room 4:20
rotatable 10:1 11:10,21 62:7,8, 12
rotate 10:9,18,24 11:2
rotation 10:10,20 11:11,14,23 12:2 22:2 23:14 64:24 65:17,23 67:18
rotational 11:21
rough 71:8,10,12
routed 37:12,15, 18
rub 42:25 58:12
rubbing 39:24 42:3,4
rubs 41:22
rules 5:7
runs 15:1

S

scale 44:21 46:4 50:16 52:13,15 53:14,18 54:6 57:16,20 59:12,15 66:24 69:2,5,21, 24 70:4,10
scaled 50:18
scales 67:10,16, 20 68:12,16 70:12
Schmidt 4:12,15 7:13,16 11:13 14:13 18:20 20:15,23 22:13 29:22 32:16 33:3, 7 34:8,17 35:13 36:24 38:10,16,21 40:23 43:9 46:18 48:14 61:10 65:4 66:16 70:22 71:2, 7
section 22:7 50:13
send 7:2
sentence 8:22 19:13 20:1,12 21:9 45:22 61:23
September 7:24
serve 32:5
set 46:17 48:13 58:15
setting 22:4
severe 44:6
severely 58:12
severity 59:23
shape 14:24 51:16
shaped 50:24
share 33:17 34:3
short 43:8
show 25:2
showed 9:24
showing 26:20 48:23 54:8
shown 10:25 14:2 25:6 26:2 29:20 34:19,22 38:9 50:23,25 52:12,17 54:2,24,25 57:15 66:10
shows 27:9 30:1 47:19
shuffle 21:3
shuffling 21:3
sic 18:5
side 15:2 21:25 26:6 34:21 42:3 55:1
side-by-side 53:23
sides 23:15 24:6, 18 41:24
sign 71:16
significant 9:4 42:17 43:4,25 58:23 59:10
significantly 8:9 42:20,23 59:8
similar 30:16 68:5 70:3
simple 60:25 64:22 65:8
simply 15:4 26:20 39:16 54:8
single 44:8
sitting 36:4
situation 45:14 63:4
size 7:14 10:1
skill 8:6 21:19 22:9 24:9,21 28:2 49:22 59:6 61:17 70:19
slack 33:23,25
sliding 39:24 40:10,11
slightly 51:5 54:18,22 55:9
small 25:25
smaller 9:7 43:17
smooth 48:1
snapshots 37:24
solid 40:6
solution 53:4
solve 61:18
sort 34:23
sound 48:22
Sounds 38:16,18 71:2
source 13:11 40:4 41:5
sources 39:14,22, 23
span 25:10
spanning 25:21

Charles Reinholtz, Ph.D.
Lexitas operates in all 50 states and is licensed where required Nevada Registration #116F. California Firm Registration #179

26:4
spans 26:7
speaking 32:1 39:11 45:4 46:1 47:8
specific 9:22 10:14 22:16 34:6 48:17,25 49:11,15
specifically 8:19 46:7
specification 22:15
specifics 16:16
spelling 33:1
spend 28:19
standard 6:16
start 28:10 45:1 55:21
starting 19:3,12 23:5,6 30:6
starts 14:15 23:7
state 4:21 8:16 11:25 45:22 61:24 64:21
stated 10:17 67:15
statement 13:15 36:8 47:2
steep 36:18
steps 60:10
stiffness 59:2,3 65:11
stop 12:5 13:19
stopping 12:18
stops 12:3
storage 62:10 65:10 69:10,15
store 32:7,11 33:19 65:21 68:22
70:18
stored 32:8 65:7 69:19
stores 38:7 66:9, 15
straight 14:6,12, 14,17,20,21,25 15:3,4,7,11,13,15, 16 21:12,16,23 22:7 23:10,19,20 24:4 25:10,18,23, 25 41:23
strike 35:14 66:18
strikes 48:6,7,8
strong 9:9
structure 68:2
submitted 6:19
sufficient 23:23
sufficiently 44:13
suggested 56:17 61:12
suggesting 64:12
suggestion 70:13
suite 4:25
superfluous 28:25
surface 39:21 42:11
sweep 62:6,8,12, 15,16,18 63:3,21, 25 64:5,14
switch 32:24
sworn 4:9
system 49:5

T

Table 36:6
take-up 45:25 47:4
takeout 45:24
takes 43:14 63:1,5
taking 46:20 48:19
talk 8:20,25 38:5 47:15 49:8 70:9
talked 57:10
talking 19:9 22:6 23:13 27:16 28:20 32:23 55:22 57:13 62:6
talks 11:19 36:13, 15
teardrop-shaped 20:10
technology 8:12
teenage 9:6
telling 30:17 37:10
tells 20:1 23:16 27:18
tensile 32:5
term 14:10 32:3 41:2
terminal 10:9,19 11:3,9,20 12:22 17:8,11,14,15,18, 20,24,25 19:5,19, 20,22 20:1,4,7,14 23:14 24:5,17 26:5,20 27:15,22 28:13,22 29:7 31:11 55:8
terminals 20:10
terminates 17:19
terminology 32:10
test 44:12,17
testify 6:8
testifying 4:24
testing 30:22
Texas 5:1
theoretical 22:4
thing 32:23 39:25 43:21 51:9
things 9:16 10:23 30:20,21 40:2 45:12 48:23 61:11 63:22 65:12,20,21 67:12
thinking 20:4 57:8 61:1 70:12
thought 38:1 40:21 52:5 60:20
threading 27:9
tie 49:21
tight 39:17
time 6:12,14 7:22 8:2 28:19 49:10 70:23
times 5:4
today 4:24 6:5,8, 12,24 70:23
Today's 4:5
top 25:7,12 26:10 67:6
torsional 59:1,2
totally 67:13
touches 25:9,22
track 25:9,11,22 28:14 40:18 41:4, 16,22 42:2,3 43:14 44:1,2,5,7 58:8,10,12,13
tracks 40:7 41:23 42:13
trade-off 9:17
tradeoff 10:12
travel 65:18

treatment 39:22

triple 59:4

tripling 59:4

trouble 44:1

true 13:14,15 24:17 30:22,23 31:8,12 46:13 58:4 59:6 62:15

truthful 6:10

truthfully 6:8

turn 7:17 8:13 13:23 18:3 20:17, 25 23:3 25:3 31:14 32:12 38:22 40:13 45:18 53:8 61:20 64:16

turning 17:8

two-thirds 36:14

U

un- 21:3 22:9

unacceptable 43:11 51:15

unclear 5:15

understand 5:14 6:4 21:20 22:10 24:10,21 29:2 31:12 49:25 59:7

understanding 31:6

understood 21:11

unmodified 66:9

unnecessary 21:3

unwrapping 33:25

unwraps 33:22

user 63:10,13

users 9:5

V

values 16:12 45:16 58:5

variations 51:6,23 54:18

variety 52:25

vary 59:23

vectors 46:9

velocities 48:1

velocity 47:22 48:4,8,9 51:4,14, 18,25 56:25 57:3, 9 68:18

verbal 5:9

version 69:12

versus 27:20 58:19

vertical 26:5,6,11, 16 31:5

viable 44:18

vibration 48:10

view 21:25 27:24

viewing 21:13 22:11 23:17 59:11

visible 56:13

visual 65:13

W

wanted 28:15

ways 11:18 41:17 49:1

wear 13:2,4,11 39:3,15,16,19,23 40:3,11 42:5,7 43:1 44:3 48:11 63:15 68:18

wearing 39:6

well-controlled 43:4

word 11:7

words 26:13 31:4 32:6 33:9 34:23 43:15 60:13

work 5:12,19 7:1,3

Working 21:2

worn 39:13

worse 43:23 63:4 69:2

worsen 70:6

would- 24:8

Wow 5:6

wrap 11:15,16 14:19

wrap- 33:23

wrapping 33:24 40:9

wraps 17:5,7 33:23

Y

Ye- 9:25

yellow 14:4 15:25 16:3