

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Case No. IPR2024-00216

Patent 8,550,223 B2

SRAM, LLC,

Petitioner,

v.

FOX FACTORY, INC.,

Patent Owner.

REMOTE VIDEOTAPED DEPOSITION

of ALEXANDER SLOCUM, Ph.D.

Reporter: Michael D. O'Connor, RMR, CRR, CRC

Job No. 6933281

Page 2 1 2 3 4 5 Friday, October 25, 2024 6 11:06 a.m. EST 7 8 9 REMOTE VIDEOTAPED DEPOSITION of 10 ALEXANDER SLOCUM, Ph.D., held via Zoom 11 videoconference in Palo Alto, California, 12 pursuant to notice, before Michael D. 13 O'Connor, Registered Merit Reporter, 14 Certified Realtime Reporter, Certified 15 Realtime Captioner. 16 17 18 19 20 21 22 23 24 25	Page 4 1 INDEX 2 Deposition of: Page 3 ALEXANDER SLOCUM, Ph.D. 4 By Mr. Durbin 7 5 By Ms. Bhattacharyya 165 6 7 EXHIBITS 8 No. Page 9 Exhibit 1001 U.S. Patent 8,550,223 9 10 Exhibit 1005 U.S. Patent 6,558,430 90 11 Exhibit 1006 U.S. Patent 5,405,407 145 12 Exhibit 1010 U.S. Patent 8,162,112 61 13 Exhibit 1017 U.S. Patent 7,374,028 29 14 Exhibit 1018 U.S. Patent 5,775,677 120 15 Exhibit 2010 Declaration of Alexander 16 H. Slocum, Ph.D. 10 17 Paper 2 Petition for Inter Partes 18 Review for U.S. Patent 19 No. 8,550,223 60 20 21 22 23 24 25
Page 3 1 APPEARANCES: 2 3 ATTORNEYS FOR PATENT OWNER: 4 (Attending Remotely) 5 FINNEGAN, HENDERSON, FARABOW, 6 GARRETT & DUNNER, LLP 7 3300 Hillview Avenue 8 Palo Alto, California 94304 9 (650) 849-6600 10 BY: ARPITA BHATTACHARYYA, ESQ. 11 arpita.bhattacharyya@finnegan.com 12 13 ATTORNEYS FOR PETITIONER: 14 (Attending Remotely) 15 LEWIS RICE LLC 16 600 Washington Avenue, Suite 2500 17 St. Louis, Missouri 63101 18 (314) 444-7600 19 BY: MICHAEL H. DURBIN, ESQ. 20 mdurbin@lewisrice.com 21 22 Also Present: Brad Thompson, Videographer 23 24 25	Page 5 1 PROCEEDINGS 2 3 THE VIDEOGRAPHER: Good morning. 4 We are going on the record at 11:06 a.m. 5 eastern time on October 25, 2024. 6 Please note that this deposition is 7 being conducted virtually. The quality 8 of recording depends on the quality of 9 camera and internet connection of 10 participants. What is seen from the 11 witness and heard on the screen and is 12 what will be recorded. Audio and video 13 recording will continue to take place 14 unless all parties agree to go off the 15 record. 16 This is media one of the video 17 recorded deposition of Dr. Alexander 18 Slocum, Ph.D., taken by counsel for 19 Petitioner in the matter of SRAM LLC 20 versus Fox Factory, filed in the United 21 States Patent and Trademark Office, case 22 number is IPR2024-00216. 23 My name is Brad Thompson 24 representing Veritext and I'm the 25 videographer today. The court reporter

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SRAM EXHIBIT 1020, PAGE 2 OF 105

Page 6 1 is Michael O'Connor for the firm 2 Veritext as well. I'm not authorized to 3 administer an oath. I'm not related to 4 any party in this action nor am I 5 finally interested in the outcome. If 6 there are any objections to proceeding, 7 please state them at the time of your 8 appearance. 9 Counsel and all present, including 10 remotely, will now state their 11 appearances and affiliations for the 12 record, beginning with the noticing 13 attorney. 14 MR. DURBIN: My name is Michael 15 Durbin. I am the noticing attorney. I 16 am with the law firm Lewis Rice and 17 represent Petitioner, SRAM LLC. 18 MS. BHATTACHARYYA: Arpita 19 Bhattacharyya from the law firm Finnegan 20 on behalf of Fox Factory and the 21 witness. 22 23 24 25	Page 8 1 other substance or do you have any condition 2 that would prevent you from answering my 3 questions truthfully and completely? 4 A. I am not under any influence of 5 anything, and I will do my best to fully answer 6 your questions, and, of course, truthfully. 7 Q. Dr. Slocum, I have to ask also, do 8 you understand that you're here today to answer 9 my questions truthfully and completely? 10 A. Yes. 11 Q. Okay. Then let's get started. 12 Where are you appearing today for 13 this deposition? 14 A. I'm in the law offices of Finnegan 15 in Palo Alto, California, in a Zoom conference 16 room all by myself. 17 Q. Is counsel present with you in 18 that room? 19 A. No. She's in some other office 20 somewhere and just joining and Zoom. 21 Q. Is anyone present with you in that 22 room? 23 A. No. All by myself. 24 Q. Then all I would ask is if at any 25 time during our deposition someone is present
Page 7 1 ALEXANDER SLOCUM, Ph.D. 2 3 having been duly sworn by the Notary Public, 4 was examined and testified as follows: 5 6 EXAMINATION 7 BY MR. DURBIN: 8 Q. Good morning, Dr. Slocum. 9 A. Good morning. 10 Q. Dr. Slocum, since you have been 11 deposed by me for the last few days and also in 12 the related district court proceedings to these 13 various patent office proceedings, I will spare 14 you all the long instructions before starting 15 today's deposition. 16 But I'd like to ask, if you have 17 any questions for me about how things will 18 proceed today? 19 A. No. I'm good. 20 Q. Dr. Slocum, is there anything that 21 would prevent you from giving your testimony 22 today? 23 A. No. 24 Q. Dr. Slocum, are you under the 25 influence of any medications, alcohol, or any	Page 9 1 in the room with you, please just let us know 2 so we can note it for the record. 3 A. Okay. 4 MR. DURBIN: I would first like to 5 introduce an exhibit that has already 6 been marked Exhibit 1001. 7 (Document marked as Exhibit 1001 8 for identification) 9 A. Okay. I have paper. Let me do 10 the refresh to see if it appears. I see it in 11 my exhibit share, and I have clean paper copies 12 of what I think will be all the exhibits, 13 because I like paper if I can. Sometimes I 14 need to zoom in because some of the text is 15 fuzzy on the paper. But in general, I'll use 16 paper. 17 Q. That works for me, Dr. Slocum. If 18 at any time I would like to draw your attention 19 to something specific, we'll talk about it. If 20 need be, we'll use exhibit share together. I 21 don't anticipate that being necessary today. 22 Dr. Slocum, what is Exhibit 1001 23 in this matter? 24 A. This is the Fox Factory 25 Incorporated patent that is the subject of why

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Page 10 1 we're here. It is titled "Methods and 2 Apparatus For Position Sensitive Suspension 3 Damping," U.S. Patent No. 8,550,223, which I 4 guess I'll just call the '223 patent for 5 simplicity if needed if that's okay or the Fox 6 patent -- well, no, there's another Fox patent. 7 So let's call it the '223. 8 Q. Dr. Slocum, I believe this is what 9 you said in your previous rounds, but can we 10 agree to refer to Exhibit 1001 as the '223 11 patent as we discuss these issues today? 12 A. Yes, please. That would be very 13 nice. 14 Q. Okay, Dr. Slocum, I'd like to 15 introduce an additional exhibit. This exhibit 16 has previously been marked Exhibit 2010 in this 17 matter. 18 (Document marked as Exhibit 2010 19 for identification) 20 A. I have that. That is a clean copy 21 of my declaration. It also appears on the 22 exhibit share screen. 23 Q. Dr. Slocum, did you draft Exhibit 24 2010, your declaration, in this matter? 25 A. Yes.	Page 12 1 machines, but it takes me a while to get format 2 right. It's often best to leave it to the 3 person who has a particular format requirement 4 to let them put things where they want them. 5 But the opinions are mine. So she was 6 basically the scribe and I was the geek -- I'm 7 sorry, expert. 8 Q. And what may also affect that is 9 what is your hourly rate, Dr. Slocum? 10 A. My hourly rate is \$800 an hour, 11 whether I'm reading at the CAD station, writing 12 code. So most people don't want me to do that 13 and become a word editor. So that's a good way 14 to prevent people from asking me to do word 15 editing, which I do not like to do. 16 Q. For this matter being the inter 17 partes review involving the '223 patent, how 18 much have you billed? 19 A. I don't recall. This document was 20 done a while ago. I spent more than a day but 21 less than a couple weeks on it. So that's kind 22 of bracketing it. But it was not an extensive 23 amount of work in terms of months, effort, no. 24 But it was done a while ago, so I don't exactly 25 recall.
Page 11 1 Q. Dr. Slocum, did you draft all 2 portions of your declaration in this matter? 3 A. No. There are some legal 4 boilerplate parts. The process I went through, 5 I was asked to read the inter partes, the 6 original complaint that SRAM had filed, the 7 patent declarations, the testimony of some of 8 the experts, like Dr. Wang. 9 I also list the names of the 10 depositions I read on Page 5, and then I 11 reviewed also the patents that SRAM brought up 12 as prior art. 13 And then I formed, just in 14 response to each of the elements of the 15 complaint, my first pass views, and then that's 16 what I type in and then go back and forth with 17 Arpita to make sure I've covered the points 18 that she wants me to cover. 19 But these are my opinions, and 20 then I did the drafting of all the technical 21 opinions. 22 Q. These things tend to be an 23 iterative process, correct? 24 A. Yes, and I'm not exactly the best 25 formatter. I'm very good at designing	Page 13 1 Q. Is your figure of more than a day 2 but less than a couple of weeks include any 3 work on the underlying District Court matter 4 also involving the '223 patent? 5 A. No. That was a separate part, and 6 that was even longer ago. 7 Q. Do you have any indication as to 8 how much in total you spent on matters 9 involving the '223 patent? 10 A. I don't recall. I just had that 11 rough guesstimate for this declaration. I do a 12 lot of things for my own companies to a lot of 13 design work and teaching, so the world moves 14 pretty fast for me, and what's in the past I'm 15 not too concerned about. 16 Q. How much has Fox Factory paid you 17 over the number of engagements you have had 18 with them? 19 A. I don't recall. I mean, it's more 20 than a day and, you know, less than a big 21 number. This was, I guess, we were asked -- 22 you asked me this yesterday. Probably a few 23 hundred thousand total over the years. I 24 really don't have any finer granularity than 25 that.

Page 14 1 Q. Do you keep records of your hours 2 over the years? 3 A. I don't. My wife handles all of 4 my activities. She's the business person. I'm 5 literally just the geek. You can see it from 6 my CV, I'm very active in designing and 7 producing products. That's my whole focus in 8 life really. That goes with the teaching. To 9 teach engineering, I'm a firm believer you have 10 to do engineering. So that's where I spend 11 most of my time. 12 Q. Not considering the business side 13 of things, but the substantive side of your 14 work, has your wife been involved in this 15 matter? 16 A. No. She does -- she's an amateur 17 astronomer, retired electrical engineer. So 18 she has her focii, and it's one of those good 19 things where her focii are different than my 20 focii. So we don't step on each other's toes. 21 Q. Has Jonathan Slocum or Alexander 22 Slocum, Jr. been involved in this matter? 23 A. They have not. 24 Q. Did you do any preparation before 25 today's deposition?	Page 16 1 anything else other than that. 2 Q. In your preparations for today or 3 in preparing your declaration, have you had any 4 conversations with anyone other than counsel? 5 A. I have not. 6 Q. Have you spoken with anyone from 7 Patent Owner, Fox Factory, Inc., regarding the 8 '223 patent, this IPR, or the underlying 9 District Court matter? 10 A. For this declaration, I have not. 11 For the District Court matter, there was the 12 meeting in Denver, in court in Denver, and I 13 think there was some Fox people there. I don't 14 recall. I haven't discussed any of the 15 technical aspects of what are in my report with 16 any Fox engineers or anything. 17 Q. Dr. Slocum, have you had any 18 conversations with Everett Ericksen, who is a 19 named inventor on the '223 patent? 20 A. No. I read his deposition. As I 21 said, I haven't been in discussions with him -- 22 actually, anything, anything technical. I just 23 read the deposition. 24 Q. Similarly, Dr. Slocum, have you 25 had any conversations with Wesley Allinger, who
Page 15 1 A. Yes, for this case, I spend 2 probably a total of about two days total. I 3 guess over the last month or so, I review a 4 little bit here and there. Then I flew in 5 Monday, arriving late morning, and then met 6 with Arpita, and with her through the remainder 7 of Monday. 8 On Tuesday, Robert McCauley had 9 stopped in for a brief chat here and there. 10 And then, I'm sorry I'm mispronouncing her 11 name, Xirui, another attorney at Finnegan, was 12 on a Zoom call a little bit. I don't think it 13 was about this particular patent. 14 So basically I met with Arpita. 15 It was for all three cases. So I don't know. 16 I can't parse how much for each. I guess 17 evenly about. 18 Q. And what else did you do in 19 preparation for this matter; anything you 20 haven't disclosed here and without disclosing 21 the substance of any conversation you had with 22 your counsel? 23 A. No, that was it. In roughly the 24 two days or so prep period I read my report, 25 and the referenced patents. But I didn't do	Page 17 1 is also a named inventor on the '223 patent? 2 A. No. I'm just reading his 3 deposition. Like I said, if they were at the 4 Denver hearing, I don't recall, but it would 5 have been hi, how are you. It wouldn't be 6 let's get our slide rules out -- I guess they 7 don't use those any more. But anyway. Sorry. 8 Q. Have you relied on the deposition 9 testimony of Everett Ericksen in your 10 declaration? 11 A. No. I was reading -- I read 12 everything. My declaration is based on reading 13 the patent -- the patents that SRAM has brought 14 up, and then I look at what SRAM's points were. 15 As an expert, I technically look at those 16 pieces. But I didn't have to rely on anything 17 in the depositions that were done, but I read 18 them as a matter of completeness, but I didn't 19 find anything enlightening or surprising there. 20 Q. In your preparations for today's 21 deposition, or in drafting your declaration, 22 did you review any documents? 23 A. Yeah. 24 COURT REPORTER: I'm sorry, the 25 answer has to be repeated. There was a

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Page 18 1 malfunction in the connection. 2 MR. DURBIN: Will do. 3 Q. Dr. Slocum, is it fair to say that 4 you rely on all the documents listed in Section 5 3 of your report and drafting your report? 6 A. (No audio for Dr. Slocum). 7 THE VIDEOGRAPHER: Stand by. The 8 time is 11:23 a.m. We're off the 9 record. 10 (Off the record at 11:23 a.m. and 11 reconvening at 11:32 p.m.) 12 THE VIDEOGRAPHER: The time is 13 11:32 eastern time. We're on the 14 record. 15 BY MR. DURBIN: 16 Q. Dr. Slocum, I'll repeat my 17 previous question. 18 Dr. Slocum, is it fair to say that 19 you rely on all the documents listed in Section 20 3 of your declaration? 21 A. Yes. 22 Q. Dr. Slocum, did you review any 23 documents not listed in Section 3 of your 24 declaration? 25 A. No.	Page 20 1 patent? 2 A. So broadly what the '223 patent is 3 about is it's a shock absorber for a bicycle, 4 for example, and the issues were concerned with 5 or what is called the bottom out cup, where in 6 the normal damping chamber there's an 7 additional smaller chamber at the end of travel 8 that doesn't do anything, it's just there, 9 until the secondary piston enters it at near 10 the end of stroke. 11 And so that helps through the 12 combination of elements there at the very end 13 of stroke to soften the final landing, if you 14 will, of the damper at its absolute maximum 15 compression so you don't feel a sudden jarring 16 or banging. 17 Q. Dr. Slocum, does the '223 patent 18 purport to have invented bottom out cups in and 19 of themselves are? 20 A. The term bottom out cup, it's an 21 element, and then the invention is it comprises 22 several elements. So I guess it depends on how 23 you construe the word "bottom out cup." 24 Q. Dr. Slocum, would you please turn 25 your attention to Page 7 of Exhibit 1001, the
Page 19 1 Q. Dr. Slocum, do you rely on any 2 documents not listed in Section 3 of your 3 declaration? 4 A. No. 5 Q. Did you communicate with any third 6 parties during your preparations? 7 A. No. 8 Q. Did you do anything else to 9 prepare for today's deposition that you have 10 not yet discussed with me? 11 A. No. 12 Q. Dr. Slocum, did you speak with 13 anyone else that we have not yet discussed 14 today? 15 A. No, other than my wife. I told 16 her where I will be, and she said, "Yes, dear." 17 Q. Dr. Slocum, would you please turn 18 your attention to the document marked as 19 Exhibit 1001, which we referred to as the '223 20 patent. 21 A. Okay. I have that here. 22 Q. Are you familiar with this 23 document? 24 A. I believe I am. 25 Q. What is disclosed in the '223	Page 21 1 '223 patent. I will represent to you this is 2 the first page of the written description 3 having Columns 1 and 2 on it. 4 A. I'm there. 5 Q. Dr. Slocum, what is the title of 6 this invention? 7 A. "Methods In Apparatus For Position 8 Sensitive Suspension Damping." 9 Q. Dr. Slocum, is there a section 10 heading under the title in Column 1? 11 A. Well, there are three headings. 12 There's the first one "Cross-Reference to 13 Related Applications." Then becomes the 14 section "Field of the Invention." Then the 15 section "Background of the Invention." 16 Q. Dr. Slocum, what does the section 17 heading "Background of the Invention" mean to 18 you? 19 A. So this is the applicant stating 20 here is what existed. And typically in this 21 section when they go through what has existed 22 in the past, they're identifying what they 23 believe are problems with what has been with 24 other things in the past, and therefore, laying 25 the framework for problem to be solved by the

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Page 22 1 invention that then they will then disclose. 2 Q. Have you reviewed the section of 3 the '223 patent previously? 4 A. I have. 5 Q. Dr. Slocum, may I please turn your 6 attention to the paragraph beginning around 7 Column 1, Line 65, beginning with, "To avoid 8 bottom out, various means have been utilized." 9 Would you please review that 10 paragraph? 11 A. Okay. 12 Q. Does this paragraph describe a 13 bottom out cup? 14 A. Yes. If you go to Column 2, line 15 3, it says "a shock absorber includes an 16 additional piston located at an end of the 17 piston shaft and designed to enter a completely 18 closed cup-shaped member as the shock absorber 19 approaches complete compression. The 20 arrangement adds an additional fluid metering 21 dampening piston and therefore additional 22 dampening, as the shock nears the end of its 23 stroke." 24 So that would be broadly and 25 generically a bottoming out cup. So that part	Page 24 1 bottoming out cup or there are other ways you 2 can soften the blow without having to have such 3 a feature, because that does add cost. 4 Q. But you could get a metal-on-metal 5 crunch at the end if you didn't have those 6 protections or you didn't have a design built 7 in some sort of bottom out protection? 8 A. Some systems will actually use an 9 elastomer at the very bottom, and the 10 elastomeric spring is a non-linear spring. 11 When you first touch it, it's a very low spring 12 rate and the spring rate increases as you 13 compress it. So that is another strategy that 14 may be used, and is not -- it's not as 15 expensive. 16 So again, it all depends upon what 17 force response you want to achieve and what 18 you're willing to pay for the force response, 19 and then also for the generic term is cost of 20 ownership. 21 In other words, how long between 22 rebuilds and between rebuilds, because all of 23 these hydraulic systems are typically rebuilt 24 after a certain amount of use; right? So how 25 much performance are you willing -- performance
Page 23 1 is known. As I mentioned earlier, the 2 additional elements that were added to it that 3 is the purported invention. 4 Q. Dr. Slocum, are you familiar with 5 any other bottom out cup systems that predates 6 the '223 patent? 7 A. In terms of the term "generic 8 bottom out cup" as I just read, hydraulic 9 cylinders typically have that type of smaller 10 sections at the base. As the patent's 11 background says here, that aspect is fairly 12 well known at the very end of stroke to keep 13 things from banging. 14 Q. In devices without such bottom out 15 protections, can there actually be like a hard 16 bottom out for the shock absorber? 17 A. It depends upon how the rest of 18 the shock absorber is designed. It really is a 19 question of, when you design these things, you 20 can write the equations for what will be the -- 21 what would look like the force on the system as 22 a function of position and velocity. 23 And depending on what you want to 24 have, you may or may not decide that you want 25 to have the additional expense of this generic	Page 25 1 change are you willing to accept between 2 rebuild periods. 3 Q. Dr. Slocum, would you please turn 4 your attention to Page 4 of the '223 patent, 5 which is also Exhibit 1001. 6 A. That shows Figures 3A and 3B. 7 Q. What is shown broadly in Figures 8 3A and 3B? 9 A. What is shown in Figure 3A is the 10 secondary piston or the bottoming out piston, 11 we could call it, as it first per enters the 12 bottoming out cup, and it's showing various 13 fluid paths and fluid restriction elements 14 associated with what is going to happen, as, 15 for example, in Figure 3B, now that bottoming 16 out piston has moved fairly far into the 17 bottoming out cup, but it has not gone all the 18 way yet. It's not fully bottomed out. It's 19 pretty close. It's getting there. I would say 20 it's probably three-quarters to seven-eighths 21 of the way through its full maximum possible 22 stroke. 23 Q. Dr. Slocum, what is element 301 in 24 Figure 3B? 25 A. 301 is pointing to a fluid

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Page 26 1 passageway that's extending radially in the 2 orientation in the figure, as you look at it, 3 downward from the center line of the system. 4 Q. Dr. Slocum, what is element 302 in 5 Figure 3B of the '223 patent? 6 A. That is a fluid passageway going 7 the other way. Let me just check to make sure 8 I have the terminology right. Yeah, so on 9 Column 3, line 67, it says "one of two paths, 10 301, 302." 11 So I call it a passageway. The 12 patent is calling it a path, a fluid path. 13 Those are synonymous terms. 14 Q. Dr. Slocum, is element 301 shown 15 in Figure 3B adjustable? 16 A. 301 is just a hole. A hole is not 17 adjustable, a drilled hole, for example. It's 18 not a hole all the way through. It's a blind 19 hole as shown there in that passage. 20 Q. If fluid were to enter from 302 21 from the bottom out cup, where would that fluid 22 flow to? 23 A. So in Figure 3B, as shown, the 24 fluid flows -- and again, I'm using my 25 orientation looking down on this drawing. So	Page 28 1 starting at 30, it says, "fluid moves from a 2 first side (the compression portion) to an 3 opposite side (the rebound portion) of the 4 chamber 220 through the paths formed in the 5 piston 210." So that would be rebound. 6 "Additionally fluid must move through a flow 7 path from the chamber 220 into the side 8 reservoir 125, thereby causing a reservoir 9 floating piston to compress a gas chamber in 10 the reservoir 125." 11 And then it refers to U.S. Patent 12 7,374,028, which is incorporated by reference, 13 which that particular patent describes the 14 design of that floating piston. It's a gas 15 spring. 16 Q. Dr. Slocum, other than in Figure 17 1, can you tell me where side reservoir 125 is 18 connected to the chamber 220? 19 A. In this particular patent, there's 20 not the drawings for that. We would have to go 21 to this, I'll call it the '028 patent, that has 22 more complete drawings for the connection. 23 MR. DURBIN: Dr. Slocum, I would 24 now like to introduce an exhibit that I 25 will be marking as Exhibit 1017.
Page 27 1 the fluid flows upward, which is in the radial 2 direction, through 302. 3 And do you see the line 400 there, 4 so it will go around or between the gap of the 5 tip of that adjustable element 370, and which 6 is forming an adjustable orifice, let's call 7 it. It's actually an annular restricter, but I 8 think just to say adjustable orifice is a 9 little more -- helps people to understand. So 10 it will go up 302 and then out 400 back into 11 the compression chamber 220. 12 Now, the patent also discusses, 13 associated with that in Figure 1, there's an 14 air springs part of this shock absorber in can 15 125. So in this particular cross-section, you 16 can't easily see the connection, but some of 17 the fluid can also go into that air spring 125 18 to compress the air spring to store energy, 19 because this is not just a shock absorber, it's 20 also a -- there's a spring element into it. 21 Q. What is element 125? 22 A. So let me get the exact naming so 23 I have the nomenclature. It is called side 24 reservoir 125 in Column 4, line 2. 25 And if you go to Column 3, lines	Page 29 1 (Document marked as Exhibit 1017 2 for identification) 3 A. I don't have a paper of that. I 4 assume it's the '028. I'm clicking refresh on 5 my exhibit share. Theoretically it will soon 6 appear. 7 Q. It's in the process of loading, 8 Dr. Slocum. Let's give the system a minute or 9 two. I want to make sure everybody has it. 10 MR. DURBIN: Arpita, do you have 11 access to the exhibit share? 12 MS. BHATTACHARYYA: I do. 13 MR. DURBIN: I'm going to refresh 14 it since it's just giving me a swirling 15 circle. 16 A. Okay. Here it is. 17 MR. DURBIN: Arpita, do you have 18 it in exhibit share? 19 MS. BHATTACHARYYA: I do. 20 Q. Dr. Slocum, are you familiar with 21 this document that I have marked as Exhibit 22 1017? 23 A. I am. I consider it part of the 24 '223, because it says "incorporated by 25 reference."

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Page 30 1 Q. Excellent. Now, Dr. Slocum, where 2 does Exhibit 1017 place its reservoir? Scratch 3 that. 4 Dr. Slocum, what does Exhibit 1017 5 indicate to you as to the placement of 6 reservoir 125 in the '223 patent? 7 A. Okay. Let's look at, for example, 8 Figure 11 of the '028. And if you'll notice 9 there, and it's not labeled -- let me see if I 10 can find one that has it numbered. Okay. 11 They're not. 12 Go back to Figure 11 -- I'm sorry, 13 Figure 10. Do you see in Figure 10 the 14 structure is called out as 410 for the body of 15 the shock, and right to the left you'll see a 16 circle. So that would be, I would call it, a 17 trunnion, for example, or the bearing. But 18 that hole is what a pin passes through to make 19 the shock absorber part of the linkage that is 20 the rear suspension. 21 If you look at Figure 3B, for 22 example, and it's not labeled here in the 23 figure either, but you can tell what it is, you 24 can see what looks like a mounting bracket 25 where a hole would pass through. You see some	Page 32 1 tool typically has that relief on it. 2 Here, and I'd have to go back and 3 refresh my memory with the '028, the rod is 4 attached to the piston with a nut. You can see 5 there, and again, it's not labeled, so that nut 6 has features that will probably nest close in 7 there. I don't see details on that. That 8 wasn't the topic of the patent, of the '028, 9 but that's ostensibly what happened there. 10 It's not a bottoming out cup. 11 It's the end of the bore, so when you machine 12 these things, you have an ability to then drill 13 at an angle the hole that then forms the 14 passageway over to the air spring, which is 15 125. 16 Q. Dr. Slocum, why do oil-based 17 dampers include reservoirs, such as reservoir 18 125? 19 A. Well, it's -- remember, this is 20 more than just a shock absorber. It is a 21 suspension system. It has to have a spring and 22 it has to have a damper. 23 Oil, for all intents and purposes, 24 is incompressible. So you have to have 25 something that is compressible, and that can be
Page 31 1 o-rings and a grease fitting. That view is 2 orthogonal to Figure 10. 3 So the passageway you see in 4 Figure 10 you can't see in Figure 3B. What you 5 were seeing in Figure 3B is if I go -- I'm 6 sorry, 3B of the '223. If I go to the '028 7 patent, and I draw a center line through the 8 rod 120, and then I draw little arrows pointing 9 to the left, that would be my cut plane. 10 So now I'm looking at, and I will 11 see 3B, but in Figure 3B of the '223 patent, 12 125 and everything is out of the page on top of 13 the desk. So you can't see anything there. 14 If I were to put the arrows the 15 other way, in Figure 3B, do you see in the very 16 bottom of the bottom out cup it looks like a 17 little trapezoidal piece on the bottom, you 18 would see a little oval hole representing the 19 passageway that is leading over to reservoir 20 125. 21 Q. Dr. Slocum, does Exhibit 1017 also 22 include that trapezoidal shape? 23 A. It does. It has an additional 24 little rectangular. That's an artifact of when 25 you bore a hole, for example, the end of the	Page 33 1 a coil spring or an air spring, because air is 2 compressible, and some of the systems use a 3 hybrid, a combination of a mechanical coil and 4 an air spring, because air, when you compress 5 it, gets hot, and the characteristics of air 6 change with temperature, but the mechanicals, 7 like a coil spring, does not. 8 On the other hand, air has some 9 other desirable properties when you use it as a 10 spring. The non-linear properties can be very 11 desirable of the compression of the air, and 12 that is where some of the really advanced 13 systems will use a hybrid. 14 Mechanical springs, fatigue, and 15 can wear and break. While air springs won't, 16 but the seals can wear out. So everything has 17 a finite life. And again, it boils down to 18 what is the performance that you want to 19 achieve that your customer wants, and what are 20 they willing to pay for it for the initial 21 cost, and then pay in terms of cost between 22 rebuilds, you know, service. 23 Q. Dr. Slocum, is a purpose of a 24 reservoir, at least in part, to provide a place 25 for the incompressible oil to go as the piston

Page 34 1 rod enters into the chamber taking up volume? 2 A. So in the context of these shock 3 absorbers for bicycles, motorcycles, you know, 4 what we're talking about here, the oil that 5 leaves the compression chamber has to go 6 somewhere. You can send it back to the other 7 side, the rebound chamber, then it's just a 8 damper, for example, or you can send it over to 9 compress, remove the piston that then 10 compresses the air, and that's what's shown in 11 the '028. But it has got to go somewhere, 12 because it's incompressible. 13 For all intents and purposes, the 14 amount it will compress, you will destroy the 15 shock absorber and the person riding it if you 16 didn't let it go somewhere. 17 Q. That's my next question. 18 Dr. Slocum, if the shock absorber described in 19 the '223 patent didn't have a reservoir 125, 20 what would happen during compression? 21 A. You have to have some way to send 22 it back to the rebound side, and if you look 23 and it's not discussed in this patent, but in 24 other art, if you look, for example, at the 25 close-up, and I believe I talk about this in my	Page 36 1 compression to the rebound side within a shock 2 absorber. 3 Q. Dr. Slocum, at least some oil must 4 return -- scratch that. 5 Dr. Slocum, at least some oil must 6 transfer from the compression side to the 7 rebound side in order to prevent cavitation, 8 correct? 9 A. Cavitation is an event that 10 occurs. When you pass fluid at high velocities 11 through a restriction -- it's the Bernoulli 12 effect -- you can have a local low pressure 13 region form. That low pressure region can 14 actually be lower than the vapor pressure of 15 the oil, or water, which could literally cause 16 it to vaporize, and then you form a bubble. 17 When you exit from that region, the bubble now 18 condenses or collapses, and it forms a 19 slamming, like a little micro jackhammer, and 20 that can cause erosion. 21 So I'm not -- this patent doesn't 22 go through any of the details, for example, in 23 the piston, of those fluid flow control 24 features, and you avoid things like sharp 25 corners and you have to be very careful about
Page 35 1 report -- look at Figure 4, for example, the 2 cross-section in the '223 patent. Are you 3 there? 4 Q. I am. 5 A. Do you see those plates labeled 6 "477" and looks like a whole bunch of black 7 lines forming kind of a trapezoid? That's on 8 one side 477. Then there's other plates on the 9 other side. 10 This view does not, because it's 11 just a cross section, show the complete what's 12 happening with fluid passages on other sections 13 if you were to do it. 14 But those are plates that are put 15 in there and they're preloaded, they have some 16 force on them, so when the fluid pressure gets 17 high enough in the compression side, the plates 18 flex and oil can squirt -- flow is probably the 19 nicer word -- from the compression side to the 20 rebound side 221. 21 But that's not discussed in this 22 particular patent. If I recall, there are 23 other patents. It's a very old art within 24 shock absorbers to use those kind of spring 25 plates on a piston to control flow from the	Page 37 1 the relative diameters through the flow 2 passages to avoid cavitation, but that's not at 3 all anywhere near what the subject of this 4 patent is. 5 Q. Dr. Slocum, during a compression 6 stroke, the volume of the rebound portion of 7 the '223 patent's damper, which is labeled 221 8 in Figure 4, increases, correct? 9 A. Correct. 10 Q. Dr. Slocum, is it necessary for 11 oil to transfer from the compression side to 12 the rebound side during a compression stroke in 13 order to accommodate this change in volume? 14 A. Correct. That's what I was 15 discussing in terms of those plates, for 16 example, 477. The patent does also discuss -- 17 do you see in the center of the rod in Figure 18 4, there's various fluid elements in there, and 19 there's a line of fluid flow called 465, and 20 there's a specific part of the patent we can go 21 to later if you want or go to it now that talks 22 about which way you want the fluid to flow and 23 how you would orient the fluid elements to make 24 flow happen the way you want. 25 But there are two ways you can do

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Page 38 1 it through the plates 477 I spoke of earlier or 2 through the bore, but through the bore of the 3 rod is sometimes also set up where you don't 4 have fluid flow going from 222 to 221. 5 The patent is -- very particularly 6 discusses how you might want to set things up. 7 There's two states. 8 Q. Dr. Slocum, does Figure 2 of the 9 '223 patent show the shock absorber at or near 10 maximum extension? 11 A. Correct. 12 Q. Dr. Slocum, is the volume of the 13 chamber 220 at or near its maximum in Figure 2? 14 A. Correct. 15 Q. Dr. Slocum, does Figure 4 of the 16 '223 patent show the damper of the '223 patent 17 nearing its most compressed state? 18 A. Well, it's getting there. In this 19 case, the bottoming out piston is a little more 20 than halfway into the bottoming out cup. So it 21 has got a little bit more to go, but it's 22 definitely nearing the end of travel. 23 Q. Dr. Slocum, is the internal volume 24 -- scratch that. 25 Dr. Slocum, does the piston rod	Page 40 1 out piston travels through the bottom out cup 2 during a compression stroke, some fluid will 3 travel through orifice 400 back to the 4 compression portion of the damper and some 5 fluid will travel into the reservoir 125 and 6 possibly some fluid will travel through the 7 blow-off valve after element 301 if whatever 8 threshold is built in is met? 9 A. Okay. Looking at 3B, I don't see 10 how anything is going to go out the blow-out 11 threshold, given it's just entering, for 12 example, and line 281 is indicating that's 13 actually -- we'll go into this later, but 14 there's a taper on the cup. That taper gives 15 you this variability and flow. That is 16 determined at the factory in terms of you can 17 adjust that to make it whatever you want based 18 on how you dimension things. And you can even 19 physically see the gap and it discusses the gap 20 between the seal 251 in the bore at the 21 entrance. 22 So in this state in Figure 3A, I 23 don't see how any fluid is going to go out the 24 blow-out valve, which is numbered 300 in Figure 25 3B, because you've got the side reservoir,
Page 39 1 having entered and extended well into the '223 2 patent's damper reduce the total volume 3 available in that tube for damper fluid? 4 A. Okay. Could you ask me again, 5 because Figure 4, it's not going into the cup 6 any more. It's actually starting to withdraw 7 from the cup. So I need your question again, 8 please. 9 Q. Dr. Slocum, shock absorbers tend 10 to include reservoirs to compensate for the 11 volume displacement of the piston rod as it is 12 thrust into the damper chamber, correct? 13 A. That is a -- correct. That is a 14 typical way that you will handle differential 15 volumes. 16 Q. Dr. Slocum, during a compression 17 stroke, we will have some volume of oil 18 transferring into the side reservoir 125, 19 correct? 20 A. Correct. 21 Q. Dr. Slocum, please turn your 22 attention to Figures 3A and 3B of the '223 23 patent. 24 A. Okay. 25 Q. Dr. Slocum, as the '223's bottom	Page 41 1 which is the air spring, you've got fluid 2 flowing there. You've got fluid flowing 3 through the opening at the adjustable, the 4 other adjustable, the 400 past the orifice 5 there, and you have the fluid can also be 6 leaking out shown along line 281. 7 Now, as you're coming down, in 8 this particular state, I believe you will find 9 -- remember, the fluid from 220 has got to go 10 somewhere. So the flow direction of that fluid 11 will be through and along 400 down and out to 12 125. You will have some potential for flow up 13 along the line 281 is discussed, but there's 14 plenty of places for the fluid to go before you 15 -- again, 300 is just at the very, very bottom 16 of stroke. If everything goes wrong, you'll 17 activate it. But you nominally should not need 18 to activate that blow-off valve. 19 That's your emergency, because you 20 really don't want to come all the way to the 21 end and go bang. If 125 is working the way 125 22 is supposed to, I don't see how you'll ever 23 actually activate it. 24 You need to have something just in 25 case, because if you do get some kind of an

Page 42 1 extreme hydraulic pressure, you can actually 2 explode things. Now, fortunately, when this 3 type of thing explodes, it doesn't have much 4 stored energy, because of the incompressible 5 nature of fluid, but it does make a mess. The 6 cylinder will just split open and then splooch. 7 All the oil comes out. 8 Q. And users don't like to handle 9 hydraulic fluid, correct? 10 A. No. And if you're riding and your 11 cylinder were to split open, that would be, not 12 only the end of your ride, it can be dangerous 13 because the rear end of your bike would 14 suddenly collapse. 15 I have not had that happen to me. 16 But again, I think these systems in general are 17 well designed with these insurance or, you 18 know, with the contingency elements just in 19 case to keep people safe. 20 Q. Dr. Slocum, during a compression 21 stroke starting somewhere around, I assume, 22 what's shown in Figure 2, and, let's say, up 23 until 3A or just before 3A, will fluid flow 24 through -- scratch that. 25 Dr. Slocum, during a compression	Page 44 1 the other places, and I just wanted to clarify 2 that I'm just going to be talking about what 3 fluid does that doesn't go through the piston 4 to replace the rebound side. That's what I was 5 attempting to set the basis for my answer. 6 Q. Dr. Slocum, I think I can ask 7 maybe a more fulsome question and that might 8 clear it up. I will withdraw my previous 9 question. 10 Dr. Slocum, as the piston 11 compresses to what's shown in Figure 2 to 12 what's shown in Figure 3A, some of the oil will 13 pass the piston and come into the rebound 14 portion and some of the oil will travel into 15 reservoir 125, correct? 16 A. Correct. 17 Q. Dr. Slocum, and I understand this 18 may be a somewhat involved answer, but how does 19 the '223 create dampening, and if there are 20 multiple elements or multiple steps, would you 21 please discuss each of them in turn? 22 A. Okay. Oil flow through any 23 passages will sheer the oil. Sheering of the 24 oil generates heat. That means you're 25 dissipating mechanical energy. You're
Page 43 1 stroke, starting somewhere around what's shown 2 in Figure 2, up to just before what's shown in 3 3A, will some fluid flow into reservoir 125? 4 A. Okay. Let's just assume, do you 5 see in Figure 3B, the lower spring pack is 6 labeled 215, and then there was 477. So I'm 7 just going to for all intents and purposes now 8 delete any potential fluid flow from the 9 compression side to the rebound side through 10 one of those restrictions. Okay? That will 11 make our conversation a lot simpler. 12 So now, when you start the 13 compression stroke, so we'll start at Figure 2 14 and we'll start moving downward. I think 15 that's what you want me to do; is that correct? 16 Q. I would prefer that you consider 17 the fluid passing through the piston. I think 18 it shouldn't change your analysis too much, but 19 I'd rather hear your opinion. 20 A. Okay. As it's going down, you 21 have to have some fluid flow through to replace 22 the volume above. That's, as we discussed 23 earlier, you have to do that. 24 But I think you're now asking me 25 about fluid from 220, that's now also going out	Page 45 1 transforming mechanical energy into thermal 2 energy, and that thermal energy is then 3 radiated out of the shock absorber. 4 Now, the name of the game is as 5 the shock absorber compresses, what is the type 6 of fluid passages through which the oil pass to 7 give you the desired energy dissipation, which 8 is dampening, that you want in order to have 9 the force response curve where that is a 10 function of the velocity of compression and the 11 position of the compression. 12 Q. Dr. Slocum, would you please turn 13 your attention to your declaration at 14 Paragraphs 34 through 41. 15 A. This is talking about claim 16 construction? Do you want me to read them all 17 to you or one at a time. How would you like me 18 to proceed? 19 Q. Do you offer claim constructions 20 in your declaration? 21 A. I am here. That's why I have this 22 section "Claim Construction." 23 Q. In Section 7A of your report, do 24 you offer a claim construction for bottom out 25 cup?

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Page 46 1 A. Well, there's Fox's proposed 2 construction if that's what you mean by "do I 3 offer," yes. SRAM has one, and then PTAB has 4 one. And in my discussion here in Paragraph 5 35, I'm attempting to resolve the differences. 6 Q. Dr. Slocum, do you know where 7 PTAB's preliminary construction comes from? 8 Scratch that. 9 Dr. Slocum, do you know who or 10 what entity offered the PTAB's preliminary 11 construction? 12 A. I don't recall. If I read it at 13 one time in one of these documents or one of 14 the depositions, but I don't remember. 15 Q. Dr. Slocum, this is perhaps a 16 better question. Does your table on Pages 15 17 and 16 of your report list or cite a source of 18 the PTAB's preliminary construction? 19 MS. BHATTACHARYYA: Objection. 20 Form. 21 A. I don't think I cited. I think it 22 came -- I think this was what was provided to 23 me by Arpita, and when I say "Arpita," Fox's 24 counsel. So I just took it at face value. 25 If I had seen the actual exact	Page 48 1 Court proceeding? 2 A. I don't remember. It would have 3 been something similar to this, but I don't 4 remember the exact wording. That was a while 5 ago. 6 Q. Dr. Slocum, fluid travels through 7 the bottom out cup in the '223 patent during 8 compression before the bottom out piston seals 9 with the bottom out cup, correct? 10 A. I think that's fair to say that 11 you will have some fluid that will flow through 12 there, some through the side, depending on the 13 position of the valve end 370. 14 If you go to Figure 3C, for 15 example, and if that element 370 had been 16 closed all the way, like you see there, then 17 all the fluid will be passing through the 18 bottom out cup on its way to 125 as you're 19 starting in Figure 2 moving down. 20 If it's open, it's a fluid 21 resistance, and then fluid, there will be some 22 resistance through the passage 400, some 23 resistance through the bottom out cup. There 24 are two resistances, so you will have some flow 25 in each, because fluid flows just like
Page 47 1 quote and citation, do you see it says 2 "Institution Decision" at 14, that's probably 3 where Paragraph 14 in the institution decision, 4 but I didn't go back and read that. I just 5 took it at face value for what it was quoted 6 here. 7 Q. Dr. Slocum, do you know what the 8 institution decision is in this matter? 9 A. I don't recall. 10 Q. Dr. Slocum, is Fox's proposed 11 construction a construction that you came up 12 with? 13 A. I don't think I came up with it. 14 I know we had discussed it, and I said it makes 15 sense, because the whole patent is about what 16 happens at the end of stroke when the secondary 17 piston enters the cup. Until that point, the 18 cup is not doing anything, so it doesn't really 19 mean anything. This gets back to the 20 background. 21 So that is where I concur that the 22 bottoming out cup is that cup that is doing 23 something specifically near the end of stroke. 24 Q. Dr. Slocum, did you offer a 25 different construction in the parallel District	Page 49 1 electricity in that regard. You treat it as a 2 series of resistance elements. 3 Q. Dr. Slocum, that makes a little 4 sense. That's a great way -- scratch that. 5 As a result, both restrictions for 6 -- scratch that. 7 Dr. Slocum, would you please turn 8 your attention to Paragraph 36 of your 9 declaration, which is Exhibit 2010 in this 10 matter. 11 A. Okay. 12 Q. Would you please review this 13 paragraph. 14 A. Okay. 15 Q. Dr. Slocum, you state in about the 16 middle of this paragraph, let's see, starting 17 six lines down, that you "disagree that Fox is 18 importing new limitations into the claims by 19 explaining the structure and function of the 20 'bottom out cup' in its proposed construction," 21 correct? 22 A. Correct. 23 Q. What do you mean by this 24 statement? 25 A. If you go back to the table on

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Page 50 1 Page 15, Fox had proposed cup-shaped feature 2 configured for providing dampening only at the 3 end portion of a compression stroke. So 4 they're saying bottoming out cup and they added 5 this detail of it. 6 SRAM tried to say, no, it's just 7 something that's cup shaped. And the board 8 said, well, it's something cup shaped that 9 helps provide damping. 10 So -- and I don't recall the 11 details of the institution. I probably read 12 it, but I just don't recall them. 13 I'm saying here, I don't think 14 that Fox is adding detail that's not clearly 15 stated in the patent about what a bottoming out 16 cup is in the context of the patent. 17 The background of the patent talks 18 about features on the bottoms of pistons. 19 Generically you could call it a bottoming out 20 cup. But they're not a bottoming out cup in 21 the context of the way the patent is 22 configuring this feature in the end of the 23 compression chamber, along with other things to 24 provide very specific dampening response at the 25 end of travel.	Page 52 1 make sure that any wording in the claims is 2 discussed in the specification so there will 3 not be ambiguity. 4 Sometimes there's really no word 5 for what you're talking about. So in my own 6 patents, I've actually put phrases in quotes. 7 Then I'm acting as the term is my own 8 lexicographer. 9 None of these terms here are so 10 complex that I think the inventors need to do 11 that. But this is where the quotation is -- 12 this is what this Paragraph 36 is talking 13 about, that in the patent, in the '223 patent, 14 in the specification, it was pretty clear what 15 bottoming out cup was meant to be, and that's 16 the basis Fox was saying is why they should be 17 allowed to have that claim construction, and 18 I'm saying, yeah, I agree with that. 19 Q. Dr. Slocum, would you please turn 20 your attention to Claim 1 of the '223 patent. 21 A. Just a heads up. I'm fine with 22 questions on this, but at sometime this morning 23 the first bio break maybe, please. 24 Q. Right after I ask you one question 25 about this exhibit, let's go ahead and take
Page 51 1 Q. Dr. Slocum, is it your 2 understanding that it is proper for a claim 3 construction to inject the structure into a 4 claim limitation using structures that are not 5 recited in the claims? 6 MS. BHATTACHARYYA: Objection. 7 Calls for a legal conclusion. 8 A. Can I have that question again 9 slowly? I'm just not familiar with the 10 wording, so I need it carefully again, please. 11 Q. I will reword it slightly for you. 12 Dr. Slocum, is it your understanding that it is 13 proper for a claim construction to inject 14 structure from the specification into the 15 claims using structures that are not recited in 16 the claims? 17 MS. BHATTACHARYYA: Same 18 objection. 19 A. I will attempt to answer as a 20 layperson who has a lot of patents. If there's 21 a term in the claim that, gee, I could read it 22 several ways, I look to the specification to 23 see is the specification defining what that 24 term means, or if I'm writing a patent for my 25 own, I'm very -- I try to be very careful to	Page 53 1 your break. I have a few more things in this 2 area, but I have no problem stopping here. 3 A. Okay. 4 Q. Dr. Slocum, would you please turn 5 your attention to the fourth line of Claim 1 of 6 the '223 patent that reads, "a bottom out cup 7 formed at the end of the compression portion." 8 A. Okay. 9 Q. Dr. Slocum, does this indicate 10 that the patent applicant for the application 11 that eventually matured into the '223 patent 12 understood how to claim a bottom out cup at the 13 end of the compression portion? 14 A. I'm sorry, I don't understand your 15 question. I mean, I don't know what the 16 applicant -- what was in the applicant's mind. 17 I just know what I read and understand from 18 reading the patent. 19 MR. DURBIN: Dr. Slocum, let's go 20 ahead and take a break with. 21 THE WITNESS: Okay. 22 THE VIDEOGRAPHER: The time is 23 12:32 p.m. We're off the record. 24 (Recess taken at 12:32 p.m. and 25 reconvening at 12:41 p.m.)

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Page 54 1 THE VIDEOGRAPHER: We're on the 2 record. The time is 12:41 p.m. 3 BY MR. DURBIN: 4 Q. Dr. Slocum, would you please turn 5 your attention to Paragraph 36 of your 6 declaration. 7 A. Okay. 8 Q. Would you please review your 9 Paragraph 36. 10 A. Okay. Give me a moment. Okay. 11 Q. Dr. Slocum, in the last two 12 sentences of this Paragraph 36 of your 13 declaration, which is Exhibit 2010 in this 14 matter, do you discuss implicitly recited claim 15 elements? 16 MS. BHATTACHARYYA: Objection. 17 Calls for a legal conclusion. 18 A. I start on Page 17 where it says 19 "Moreover, it is implicit that the 'bottom out 20 cup' is configured to receive a bottom out 21 piston." The patent specifically says the 22 bottom out cup receives this piston. 23 Without the piston, it's just, I 24 don't know, it's just part of the whole chamber 25 222. Unless it has a piston in it, it's like	Page 56 1 So therefore, for all intents and 2 purposes, the bottoming out cup doesn't even 3 exist until the secondary piston enters it. 4 That's the simple physics of what's going on, 5 and that's why my opinions are what they are. 6 Q. Dr. Slocum, in this Paragraph 36 7 of your declaration, you state, "Fox's previous 8 construction is thus technically correct and 9 does not import limitations beyond what is 10 already implicitly recited in the claims," 11 correct? 12 A. Correct. 13 Q. What is your understanding of the 14 role of implicitly recited limitations in claim 15 construction? 16 MS. BHATTACHARYYA: Objection. 17 Calls for a legal conclusion. 18 A. This gets back to earlier, when I 19 read a term in a claim as a nonlawyer 20 layperson, practitioner of the art, I look at 21 it and I have to read the whole patent. So I 22 read a whole patent, and in the patent in this 23 case, it's the bottoming out cup is only 24 referred to and mentioned and used when there's 25 the bottoming out piston is just entering it.
Page 55 1 one up hand clapping. It doesn't do anything. 2 It's such a huge diameter in comparison to the 3 other flow passages for the oil through which 4 the oil can flow that -- let me just interject 5 if you will the physics of flow. 6 Resistance to flow is inversely 7 proportional to the gap to the third power 8 through which liquid flows. So if something 9 has a characteristic dimension of, let's say, 10 ten millimeters, and something next to it has a 11 characteristic dimension of one millimeter, 12 fluid will flow through the thing with ten 13 millimeters 1,000 times easier than the one 14 millimeter thing. 15 If it's around, it's the diameter 16 to the fourth power. So that will be 17 resistance to fluid flow through a ten 18 millimeter hole is one-ten-thousandths 19 resistance through a one millimeter hole. 20 So you see, the bottom out cup is 21 pretty big, it's about half the diameter of the 22 compression chamber, is orders of magnitude 23 less restrictive to flow than any of the other 24 little passages in there that the oil is forced 25 to go through as the piston is traveling.	Page 57 1 So implicit to me, understanding 2 as a POSITA, the physics of the mechanism that 3 is what makes perfect sense to me, because you 4 haven't started using it to do something 5 specific with a fluid. It just simply does not 6 exist with respect to the fluid flow. 7 As I explained earlier, how fluid 8 flows is a function of the power, you know, the 9 exponent on the sizing of the elements. So 10 that is my understanding of implicit. I have 11 to read things as a POSITA with an 12 understanding of the patent in the whole. 13 Q. Dr. Slocum, I'd like to ask you a 14 question that is a yes or no question. During 15 this last break, did you discuss the substance 16 of your prior testimony or the testimony you 17 are to give today with counsel? 18 A. No. 19 Q. Dr. Slocum, what is Ganatra? 20 A. I'm sorry, I didn't hear what you 21 said. Ganatra? 22 Q. Dr. Slocum -- scratch that 23 question. 24 Dr. Slocum, what is Ganatra, which 25 is spelled, G-a-n-a-t-r-a?

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Page 58 1 A. It must be an acronym for 2 something. I don't recall. 3 Q. Dr. Slocum, would you please turn 4 your attention to Page 18 of your report, 5 footnote 1, "Thereon." And by "report," I mean 6 your declaration. 7 A. Mm-hmm. I see that there. That's 8 not a legal term. That's a term I use. 9 That's, again, that's part of what I would 10 consider the boilerplate by counsel. 11 Q. Dr. Slocum, what's the alleged 12 unpatentability based on Ganatra? 13 A. That must be some particular case, 14 so I'm not a lawyer. I can't comment on what 15 that precedent or whatever is. 16 MS. BHATTACHARYYA: If I may 17 clarify, I think, Mr. Durbin, you're 18 pronouncing it in a way that Dr. Slocum 19 and I don't pronounce. The prior art 20 reference, we call it Ganatra. Maybe 21 that's the confusion. 22 A. Prior art, but I don't understand 23 it as some acronym for anything. 24 MS. BHATTACHARYYA: Sorry, it's a 25 matter of pronunciation. I think that's	Page 60 1 Paper 2 in this matter, which is SRAM's 2 petition for inter partes review, the '332 3 patent. 4 A. Let me know, please. When your 5 system says it's uploaded, then I will start 6 clicking refresh. It just came up. 7 Q. I uploaded the incorrect document. 8 I will fix that. I'm now introducing Paper 2 9 into the exhibit share. 10 A. Okay. (Document marked as Paper 2 for identification) 11 A. Okay. Paper 2 is here. 12 Q. Would you please turn your 13 attention to Page V, which is the fifth page of 14 this PDF paper. 15 A. Okay. 16 Q. Do you see Item E there that's 17 listing, "Ground V: Claims 1 through 5, 9 and 18 19 Are Anticipated Under 35 U.S.C. Section 102 19 by Gartner"? 20 A. Gartner. I know Gartner. I think 21 we have a typo here for Ganatra. I'm sorry, I 22 didn't camp that. I just -- when I first read 23 through things -- I know Gartner, but I don't
Page 59 1 causing the issue. I just wanted to put 2 it on the record there. 3 Q. Dr. Slocum, are you familiar with 4 Ground V, the petition in this matter? 5 A. That was so long ago I read that, 6 I would have to go back and reread the 7 petition. I did not review that for what we're 8 here today on. So I would have to go back and 9 look at that again. 10 The grounds are a whole bunch of 11 different things the board is citing in their 12 discussion, and I did not review that where I 13 can recall at this time. 14 Q. Dr. Slocum, believe it or not, I'm 15 actually not trying to test your memory. I 16 believe that this is a typographical error, and 17 I'm trying to figure out what is stated in 18 here. 19 Would you please turn to -- 20 scratch that. 21 What I will do is I will introduce 22 an exhibit. This exhibit has previously -- 23 scratch that. 24 This is a paper that has been 25 previously introduced in this matter. It is	Page 61 1 -- I bet that's a Microsoft spelling fix. 2 Q. Did you know that this spelling 3 error is also made in Fox's response to the 4 petition? 5 A. You know, I don't. When I see 6 things, I think my brain just automatically had 7 turned it into as I'm reviewing the actual 8 technical things. Gartner which -- I have 9 Gartner here. 1010 is the Gartner patent, this 10 one. 11 MR. DURBIN: Dr. Slocum, I will go 12 ahead and introduce into the record what 13 has already been marked in this 14 proceeding as Exhibit 1010. (Document marked as Exhibit 1010 for identification) 15 Q. Dr. Slocum, do you have Exhibit 16 1010 what's been marked before you? 17 A. Yes. It says Exhibit 1020 on the 18 share -- oh, no, I'm sorry. Wow, that's really 19 funny. It says Exhibit 1020, but then later on 20 it says Exhibit 1010. I have the paper that 21 says Exhibit 1010. 22 If you're talking about Gartner, 23 that's the simpler way to do this.

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Page 62 1 Q. What is what's marked on the page 2 as Exhibit 1010, what is this? 3 A. This is a patent by Gartner, et 4 al. titled "Methods and Apparatus For 5 Protecting a Shock Absorber From Bottoming," 6 U.S. Patent 8,162,112. 7 Q. Dr. Slocum, will you agree with me 8 that we can refer to what is marked as SRAM 9 Exhibit 1010 as either Gartner or Exhibit 1010 10 interchangeably? 11 A. Yes. 12 MS. BHATTACHARYYA: Just for the 13 record, Mr. Durbin, you are introducing 14 previously marked exhibits, and it seems 15 you have labeled them with new exhibit 16 numbers. That's going to be really 17 confusing. I don't know if you want to 18 clarify that on the record, because now 19 Gartner has two exhibit numbers, 1010 20 and 1020, and the prior exhibits also 21 have two exhibit numbers. 22 I think the cleaner way would be 23 to introduce them into the marked 24 exhibit folder without remarking them, 25 if it's previously in the record with	Page 64 1 them instead of introducing them. If 2 you click "introduce," then it will add 3 some exhibit number to it. 4 MR. DURBIN: I will thank counsel 5 for Fox Factory for that excellent 6 suggestion, and going forward, I will 7 ensure that I move them in from my 8 private folder into the marked folder 9 without using the introduction process 10 where I'm not marking a new exhibit. 11 A. I'm just glad I have paper. 12 MR. DURBIN: I will now note for 13 the record that I have at least 14 provisionally fixed all the naming of 15 the exhibits in exhibit share. I have 16 named them with file names that reflect 17 the exhibit numbers that the parties 18 have previously marked on them, and for 19 the papers, the paper numbers designated 20 by the United States Patent Trial and 21 Appeal Board. 22 And I will also state on the 23 record that I will review these over our 24 lunch break, and if I find the need for 25 any other changes to the naming, I will
Page 63 1 either Petitioners or Patent Owners 2 exhibit numbers on it. 3 I just want to clarify that this 4 is going to be really confusing and 5 maybe we have to come up with a system 6 of managing exhibits. But I would 7 recommend not marking the exhibits again 8 if they're previously marked when you 9 put them in the marked exhibits folder. 10 MR. DURBIN: I understand now the 11 issue, Arpita. For the record, I will 12 state my understanding of what has 13 happened as these have been uploaded by 14 exhibit share. I believe exhibit share 15 has appended my file names with certain 16 exhibit designators that I did not know 17 what was occurring, and I am right now 18 going to amend those exhibit names as 19 they exist in file share so that they 20 reflect the exhibit numbers as they have 21 been previously marked by the parties. 22 MS. BHATTACHARYYA: And just so 23 you know, when you're moving exhibits 24 previously marked into the marked 25 exhibit folder, just copy paste or move	Page 65 1 let counsel know and state it on the 2 record. 3 Does that work for you, counsel 4 for Fox Factory? 5 MS. BHATTACHARYYA: Yes. And what 6 I see currently in the marked exhibit 7 folder looks correct to me. So, so far, 8 so good. 9 MR. DURBIN: Again, thank you, 10 counsel for Fox Factory. 11 Q. Dr. Slocum, would you please turn 12 your attention back to Page 18 of your 13 declaration in this matter, Exhibit 2010. 14 A. Okay. 15 Q. Dr. Slocum, did you author this 16 footnote? 17 A. No, I did not author it. I 18 understood what was happening in terms of way 19 back when reading through things. Now it's 20 starting to ring my memory a little bit. 21 I must admit, I just read through 22 it and my brain turns it into Gartner. That 23 Ganatra word spelling correction or whatever 24 happened is just, wow. 25 So when you ask me that question,

Page 66 1 Ganatra, I'm like, is that what I'm having for 2 lunch? Gee. 3 Q. Dr. Slocum, what do you mean -- 4 what is meant by the statement in footnote 1 on 5 Page 18 of your declaration? 6 A. When you look at this claim 7 construction for bottom out cup, and this 8 tussle that seems to be happening, you would 9 have to go back to the board, and SRAM has -- 10 they're called grounds for why they think 11 something is not patentable or whatever, and I 12 have to go read Ground V and see what's in 13 there. 14 And with respect to Gartner, when 15 we get into it, Gartner actually has a 16 secondary shock absorber on the end of the 17 piston that travels with it, for example. 18 That's one of the embodiments. Is that a 19 bottoming out cup or is that a whole new 20 mechanism unto itself. 21 From the prior art that was cited, 22 that was, if you will, a unique thing about 23 Gartner in comparison to the other prior arts. 24 That's where it really starts to become 25 important in the defining of bottoming out cup,	Page 68 1 past, I can't recall it ever being different. 2 Q. Dr. Slocum, in your declaration, 3 Exhibit 2010 in this matter, do you apply more 4 than one construction for the term "bottom out 5 cup"? 6 MS. BHATTACHARYYA: Objection. 7 Mischaracterizes the record. 8 A. No. What I did here, and if we go 9 back to Page 18, Paragraph 37, I'm attempting 10 to explain here my thought process for how I 11 look at things. 12 I said, "Nevertheless, the board's 13 construction of 'bottom out cup' as a 14 'cup-shaped figure configured for providing 15 dampening,' may be sufficient to resolve the 16 disputes in this IPR if the construction is 17 clarified to state that the 'bottom out cup' 18 provides dampening only at the end portion of a 19 compression stroke," and then there's that 20 footnote for Gartner. 21 As I attempted to explain earlier 22 in terms of the physics of how these devices 23 work, I think, yeah, unless the piston is 24 entered into it, it doesn't -- you can't tell 25 what's a bottoming out cup versus just a
Page 67 1 because some of the other prior art, if you 2 just look at it at first glance geometrically, 3 you can see, wow, there's this smaller diameter 4 feature that's a continuational part of the 5 compression chamber, and that will get into the 6 discussion is it a bottoming out cup or not in 7 terms of the function. But with Gartner, it 8 doesn't even look like it. 9 So that's where I think -- that's 10 where that footnote emanates from, because 11 Gartner is unique against these other prior 12 arts. 13 Q. Dr. Slocum, is it your 14 understanding that a given claim limitation may 15 have multiple constructions? 16 MS. BHATTACHARYYA: Objection. 17 Calls for a legal conclusion. 18 A. I'm not a lawyer. I can't say 19 that, but I've never understood that to be 20 true. To me, one equals one, always. I don't 21 think you can have in a patent -- I've never 22 seen or heard of that before. 23 Is there some legal way it can? I 24 don't know. It all depends. For all the 25 patents I own and have and reviewed in the	Page 69 1 machining artifact when the tool comes in to 2 make the compression chamber. 3 Fluidically the fluid particle 4 does not know, does not care. This is the 5 whole fourth power of fluid resistance, the 6 diameter of the fourth power issue. 7 I'm assuming the board does not 8 have many fluid dynamics experts on it. 9 Actually, you don't even need to be a fluid 10 dynamics expert. You remember your fluid 11 mechanics class from engineering? So if the 12 board heard this explanation, I'm assuming they 13 would go, okay, that makes sense. 14 Q. Dr. Slocum, I understand your 15 discussion here in Paragraph 37 of your 16 declaration to be indicating that Fox's 17 proposed construction listed slightly above of 18 this paragraph is relevant to your discussion 19 of Ground V, which involves Gartner; is that 20 correct? 21 A. It's relevant. I think -- and 22 again, I don't know what was in the PTAB's 23 mind. So I can just conjecture. 24 Maybe they thought only at the end 25 portion of the compression stroke, maybe they

18 (Pages 66 - 69)

Page 70 1 didn't like that, because you didn't say how 2 close to the end. So perhaps that's why they 3 offered for providing dampening, because maybe 4 the board had some really good fluid mechanics 5 people on it who would understand that, okay, 6 it becomes a bottoming out cup when it starts 7 to provide dampening. That's not necessarily 8 all the way at the end. That's just when the 9 piston starts to enter. So maybe that's what 10 they were thinking. 11 And that's why I said in 37, okay, 12 I'll go with, and that's how I did go with in 13 terms of my report, so I don't use two 14 different constructions. I'm going with the 15 board's construction where my understanding is 16 that this is a bottom out cup when it starts to 17 actually provide damping. Something has to 18 start to go into it. Now it's a bottoming out 19 cup. 20 Q. Dr. Slocum, all claims involved in 21 this matter -- scratch that. 22 Dr. Slocum, all claims of the '223 23 patent involved in this matter include the term 24 "bottom out cup," correct? 25 A. I'm pretty sure they do. Hold on.	Page 72 1 that, like all the other references. Gartner, 2 I don't see, has that. 3 Q. Dr. Slocum, for your declaration, 4 which is Exhibit 2010 in this matter, what 5 construction or constructions did you apply to 6 bottom out cup for Ground V? 7 A. I applied cup-shaped feature 8 configured for providing dampening, where I 9 understand those words to mean that you are 10 going to have a protrusion from the piston 11 going into it, because otherwise, it can't 12 provide dampening. It can only provide 13 dampening, you know, at that near end of stroke 14 where that smaller piston starts to enter it. 15 Now it starts to provide dampening. 16 So it's -- I think I'm seeing eye 17 to eye with the PTAB. What I'm saying here is 18 that I only have what they read, so this is my 19 interpretation of what it means, and that's how 20 I'm moving forward. It's not multiple 21 constructions in any way. 22 Q. Dr. Slocum, for Ground V, did you 23 -- scratch that. 24 Dr. Slocum, for Ground V, did you 25 apply any of the constructions stated in the
Page 71 1 Yes, that's my recollection and my quick read. 2 Q. Dr. Slocum, Gartner is featured in 3 Ground V, correct? 4 A. Correct. 5 Q. Is the term bottom out cup 6 relevant to Grounds I through IV? 7 A. I mean, they're all talking about 8 prior art and where SRAM thinks prior art makes 9 this patent not valid. 10 So in my review of the other 11 non-Gartner patents, when you look at it, you 12 can see where they have some protrusion or a 13 secondary to be called some secondary piston or 14 some sort of protrusion from the bottom of the 15 main piston is entering something of a diameter 16 smaller than the main chamber diameter, and 17 we'll get into that, and even the patent 18 background itself says that's known. 19 The dispute will be over what else 20 is happening to the fluid. But Gartner doesn't 21 have that, if you will, obvious or clear, I 22 think that's a better word, clear, smaller 23 diameter feature connected to a larger diameter 24 feature with then the piston is moving down and 25 a smaller portion of the piston is going into	Page 73 1 table that spans Pages 15 to 16 of your 2 declaration in this matter, and if so, which 3 one or ones? 4 A. I have to go back and read Ground 5 V, so let me pull it up, because you're asking 6 me questions about something that was so long 7 ago, at least in my world. So that's Paper 2, 8 I believe, I'm supposed to click on? 9 Q. Paper 2 will list Ground V, 10 Dr. Slocum. 11 A. Okay. Going down to Ground V, I 12 have to read. Again, that was a while ago. 13 Okay. I'm just going to start reading here. 14 I'm on Page 105 of Paper 2. The title of this 15 section is "Ground V: Claims 1 through 5, 9 16 and 19 are Anticipated Under 35 U.S.C. 102 by 17 Gartner." 18 So now, when I read all of those 19 claims, I have to find each and every element 20 of each claim, clearly only within Gartner. 21 Again, that was a while ago. I will just start 22 studying this and let you know when I'm done. 23 Q. Dr. Slocum, why are you referring 24 to Paper 2 when the question pertains to your 25 declaration?

19 (Pages 70 - 73)

Page 74 1 A. Because you're asking me a 2 question about Ground V and Gartner and what my 3 thoughts were on that. I read this paper long 4 ago, but I don't remember what I read so long 5 ago, specifically about Gartner and how it is 6 said, alleged by SRAM, to anticipate. 7 So if you want to ask me any 8 questions, I have to go and restudy all of this 9 stuff. 10 Q. Dr. Slocum, may I reask my 11 question, then? I'll withdraw my previous 12 question. 13 A. Okay. 14 Q. Dr. Slocum, in your report in 15 Paragraphs 104 to 107, what construction of 16 bottom out cup do you apply? 17 A. That of the board, as I just 18 stated earlier, with my understanding that the 19 bottoming out cup is a bottoming out cup when 20 it actually starts providing dampening, and that, 21 as one skilled in the art, understands that 22 only happens when you have the cup-shaped 23 feature where this secondary piston starts to 24 enter it, now it starts providing dampening, 25 and the physics -- why that is so, which any	Page 76 1 same as Fox's proposed construction in your 2 table that spans 15 and 16 of your declaration? 3 A. I think they're functionally the 4 same. There's obvious wordsmithing back and 5 forth that the parties or some of the parties 6 seem to disagree with, and that is where I 7 attempted to rectify that so I could move 8 forward in my Paragraph 37. 9 Q. Dr. Slocum, do both Fox's proposed 10 construction and the PTAB's preliminary 11 construction include the words "cut-shaped 12 feature configured for providing damping"? 13 A. They do. 14 Q. Dr. Slocum, is that the extent of 15 the PTAB's construction? 16 A. The PTAB stopped at that point. 17 Q. And, Dr. Slocum, does Fox's 18 proposed construction add to the end of that 19 prior statement the words "only at the end 20 portion of a compression stroke"? 21 A. Correct. 22 Q. Dr. Slocum, for those paragraphs 23 we discussed below that relate to Ground V that 24 involves participation allegations by SRAM 25 based on the reference Gartner in this matter,
Page 75 1 person skilled in the art would understand, I 2 explained earlier. 3 Q. Dr. Slocum, is it your opinion 4 that you do not apply Fox's proposed 5 construction? 6 MS. BHATTACHARYYA: Objection. 7 Mischaracterizes the record. 8 A. I think they're the same. There's 9 wordsmithing going on, but to a POSITA, 10 functionally they're the same. 11 I'm not a lawyer, so I don't know 12 where the wordsmithing is coming from. All I 13 understand is as a POSITA looking at these 14 patents, what functionally and physically do 15 they do. And I can repeat what I said earlier 16 about a cup, a piston, diameter flows, all of 17 that stuff, if you would like. 18 Q. Dr. Slocum, would you please turn 19 your attention to Pages 15 and 16 of your 20 expert declaration in this matter. 21 A. I'm sorry, 15 and 16? 22 Q. The table that spans the two. 23 A. Okay. 24 Q. Dr. Slocum, is it your opinion 25 that the PTAB's preliminary construction is the	Page 77 1 which is Exhibit 1010, do you apply 2 construction for bottom out cup that requires 3 that the dampening only be provided at the end 4 portion of a compression stroke? 5 A. Yes. I am clarifying, though, not 6 -- end portion, as in very is end. 7 As I explained earlier, when the 8 secondary piston enters this region to be 9 referred to as a bottoming out cup, that in my 10 mind removes any potential ambiguity I thought 11 might be happening between the board and Fox. 12 In other words, it's not a 13 bottoming out cup until you start to have a 14 piston enter it. 15 When I was reading all of this, 16 and this is my recollection from way back when, 17 that seemed to be the contention, because 18 SRAM's proposed construction just says anything 19 that looks like a cup basically, and that makes 20 no sense. 21 So I actually as a POSITA, one 22 skilled in the art, I can look at Fox's 23 proposed construction and the PTAB's 24 preliminary construction and say they're 25 agreeing actually.

20 (Pages 74 - 77)

Page 78 1 Now, I'm not a wordsmith and I'm 2 not a lawyer, so maybe there's some fine words 3 going on there, but as the technical expert 4 evaluating these prior arts, in context of the 5 patent-in-suit, when I look at something that 6 is cup shaped, at the bottom of a compression 7 chamber, it's not a bottoming out cup unless 8 that something can receive a piston portion 9 that goes into it as I am entering the 10 end-of-stroke region, otherwise it doesn't do 11 anything, and the claims require a bottoming 12 out cup, it requires all of this stuff to 13 provide damping at the end of stroke. 14 As the piston comes toward the 15 end, not end of stroke like slamming into the 16 end, there's a period of slowdown that that's 17 what this structure is supposed to help with. 18 Q. Dr. Slocum, in this Section 7A of 19 your declaration, which is Exhibit 2010, do you 20 state that something is not a bottom out cup 21 until you start to have a piston enter it, and 22 if you do, will you please let me know where? 23 A. If you go to Page 17, the couple 24 of sentences just above Paragraph 36, I state, 25 "The 'bottom out cup' receives a secondary,	Page 80 1 2010, at Paragraphs 40 through 41. 2 A. Okay. 3 Q. Is what is being discussed in this 4 portion of your declaration, Dr. Slocum? 5 A. This is the claim elements "'fluid 6 communication from the cup to the compression 7 portion of the chamber.'" So that's the very 8 specific part of one of the claims. 9 Q. Dr. Slocum, in Paragraph 40 of 10 your declaration, which is Exhibit 2010 in this 11 matter, you state that, "a POSITA will 12 understand that 'fluid communication from the 13 bottom out cup to the compression portion of 14 the damper chamber' requires some fluid to flow 15 from the cup to the compression portion," 16 correct? 17 A. That's what "from" means, correct. 18 It's giving me a directionality. That's what 19 I'm opining or I'm discussing here and then 20 opining on it, that I'm agreeing with that. 21 Q. Dr. Slocum, would you agree with 22 me the from/to language can also refer to one 23 direction of a bidirectional communication 24 path? 25 MS. BHATTACHARYYA: Objection.
Page 79 1 bottom out piston near the end of a compression 2 stroke, which then generates secondary 3 compression forces within the bottom out cup, 4 which effectively adds to the forces being 5 generated in the compression chamber." 6 So as I just explained earlier, as 7 you approach the end, you have this additional 8 resistance to help slow you down. If you don't 9 have additional resistance to help slow you 10 down further than you already are, you could 11 slam into the bottom, which is bad. 12 Q. Dr. Slocum, what construction of 13 the bottom out cup do you apply to Grounds I 14 through IV? 15 A. It is the same one everywhere. I 16 don't change a construction based on which 17 grounds are which, because as a POSITA reading 18 this thing, a bottoming out cup is this smaller 19 diameter feature in the compression chamber 20 that a smaller diameter portion of the piston 21 enters in, and as soon as it enters it in, it 22 starts to provide damping, and that's the same 23 for all references. 24 Q. Dr. Slocum, would you please turn 25 your attention to your declaration, Exhibit	Page 81 1 Form. 2 A. I'm not sure I fully understand, 3 because if I have a hose, like a hose, like 4 your garden hose, you will always have an 5 anti-siphon valve on it. For example, so when 6 you turn the hose off on the outside, you don't 7 accidentally suck water back up into your 8 residential supply. So if your dog was 9 drinking from the hose and just shut off the 10 valve, you don't get some dog slobber 11 accidentally going back up into your house 12 water. 13 The hose can take flow either way, 14 but it's the valve that dictates I'm only 15 letting watering from the house to the hose to 16 the dog. I will not let it go the other way, 17 even though the hose could let it go the other 18 way. 19 Q. Dr. Slocum, if you and I held one 20 end, each of us, of that hose, would it be fair 21 to say that that hose extended from me to you, 22 but also from you to me? 23 MS. BHATTACHARYYA: Objection. 24 Form. 25 A. I could describe it that way,

21 (Pages 78 - 81)

Page 82 1 correct. Just a simple, plain, open hose. 2 Q. And water could flow in either 3 direction, either from you to me or me to you? 4 MS. BHATTACHARYYA: Same 5 objection. 6 A. You know, forgive me for being 7 pedantic. You would have to have water, 8 because it's just a hose. There's no fluid 9 source. So there's no water in it. I would 10 have to prefill it, and then it depends who is 11 holding their end of the hose higher to cause 12 the water to flow or we would both have to be 13 blowing on it, and we would have one of those 14 contests we used to do as kids. 15 Q. Dr. Slocum, does fluid flow in a 16 damper without some sort of force acting upon 17 it? 18 A. Fluid will only flow from high 19 pressure to low pressure in general. 20 Q. Thank you. Dr. Slocum, would you 21 please turn your attention to the figures of 22 the '223 patent. 23 A. Okay. 24 Q. In particular, please turn your 25 attention to Figure 4 of the '223 patent.	Page 84 1 there and closing off -- sorry, displacing the 2 floating piston and compressing the air. 3 That will be the normal operation. 4 If there is some problem, right -- and by the 5 way, in this position, the seal, and it's very 6 important to note this, the seal 251, which is 7 not labeled here, but it's the little rectangle 8 near the end of the bottoming out piston, it's 9 now entered a portion of the bottoming out cup 10 where for all intents and purposes it's a 11 perfect seal with no leakage or blow by past 12 it. 13 There is a portion to the right, 14 as you can see, there's a vertical line segment 15 demarcating where there's the taper where it's 16 intended to have controlled and variable blow 17 by. But in this instance from this point to 18 the left, we're going to assume it's a perfect 19 seal. 20 So all the fluid from the bottom 21 out chamber has to go and flowing through to 22 125. Now, as you continue to move to the left, 23 the fluid in 222 has to go somewhere. It can't 24 be compressed. 25 The blow-off valve 300 is
Page 83 1 A. Okay. 2 Q. As the damper of the '223 patent 3 continues to -- assuming this is a compression 4 stroke -- continues to compress, what allows 5 for fluid to enter from the bottom out cup into 6 the compression portion 222 as the volume of 7 the compression portion 222 reduces during the 8 compression stroke? 9 A. Okay. So Figure 4 is supposed to 10 be for rebound. But you're asking me to now 11 look at this and now make it go compression 12 instead of rebound, correct? I just want to 13 make sure -- 14 Q. Yes. 15 A. Okay. Okay. So as I look at this 16 figure here, the valve 350 is closed. And 17 again, I'm just going to state what I see and 18 understand from the figure. 19 So that its variable orifice, 20 needle valve, how everyone described it, that 21 adjustable valve in this figure is closed. So 22 if I am now moving to the left for compression, 23 as such, fluid cannot flow from the bottoming 24 out cup into 222 because there's the side 25 chamber 125. The fluid will be flowing in	Page 85 1 definitely not going to let anybody go by. So 2 any fluid in 222, because it can't be 3 compressed, will be displacing the spring 4 stacks -- do you see there 477 -- to let it go 5 back and it will be fluid resistant. So it 6 will definitely act as a damper to end into 7 221, where all the fluid from the bottoming out 8 cup that's being pushed out will be compressing 9 125, you know the floating piston in 125. 10 That's what will be happening in this state 11 going to the left. 12 Q. Dr. Slocum, does Figure 3B show 13 the damper of the '223 patent in a compression 14 stroke? 15 A. Let me just read to make sure that 16 was the intent, because it doesn't -- it 17 doesn't have an arrow on there. And I can, 18 again, I can envision it to go either way, but 19 this shows -- it says "the bottom out piston 20 fully engaged and sealed therein," but Figure 21 3B I could move the piston either way. It's 22 not telling me there directionality. There's 23 no arrow. And the title of the figure does not 24 tell me the directionality at that point. 25 Let me go to the text and see what

22 (Pages 82 - 85)

Page 86 1 they want the intent to be. Because the piston 2 still has some way to travel, and 3B goes right 3 below 3A, it can go either way. It can 4 continue to go to the left a little bit or 5 there may be sufficient force now in the piston 6 from the right or in the spring 125 to now 7 cause the rebound to start. 8 So that probably is a neutral 9 position at the -- it now will depend upon 10 further force from the rider. 11 Q. Dr. Slocum, if the damper shown in 12 Figure 3B were to further compress, what would 13 happen to the oil in region 222? 14 A. Again, everything is a resistance. 15 So there's a fluid resistance from those plates 16 477 that goes from 222 back into the rebound 17 chamber. There resistance across that variable 18 valve opening at 370. There is fluid 19 resistance into 125, the side chamber. And I 20 would -- in order to tell you exactly what's 21 going to flow where from those various zones 22 will depend upon the relative resistances and 23 pressures. 24 But in general, if you're moving 25 to the left, the pressure in 222 will be higher	Page 88 1 of the paths for fluid to flow from the rebound 2 chamber to the compression chamber. 3 There are also the plates, which 4 are not discussed -- again, that's a lot of 5 prior art on that -- that would be plates 215 6 in Figure 3C. 7 And then, again, associated with 8 the flow through the bore of the rod, there's a 9 special case, a separate set of embodiments 10 near the end, where they actually reverse those 11 elements to allow some flow to go the other 12 way. 13 So I think that basically covers 14 all the fluid paths that are discussed. It 15 does discuss, if you have an over-pressure 16 event, you know, one of these risk issues, to 17 prevent damage, then that blow-off valve can be 18 reactivated, but that's the risk contingency. 19 That's not the normal intended operation. 20 If that goes, you have other 21 issues that are happening, someone -- an 22 extremely heavy rider hitting something 23 extremely hard, I would guess, or one of the 24 orifices is getting plugs because a piece of 25 the rubber seal broke off, plugged something
Page 87 1 than the rebound chamber. So some fluid will 2 go back into the rebound chamber, as we 3 discussed earlier, via by displacing those 4 plates. Some will go through along the passage 5 400 onto 125, and that you will have some fluid 6 joining that fluid going to 125 from the 7 continued motion of the bottoming out piston 8 into the bottoming out cup. 9 Q. Dr. Slocum, what are the fluid 10 flow paths discussed in the '223 patent? 11 A. I'm trying to understand your 12 question. The fluid flow paths is how I have 13 been answering. It depends upon where you are 14 in the strokes. 15 Ostensibly the two primary ones 16 are flow associated from the bottom out cup to 17 the compression chamber 222 to the side chamber 18 125, and you also have flow along through the 19 valve through the center of the rod, and there 20 is that -- if you go to Figure 4, and you see 21 the line 465, there's a dotted line, and that 22 dotted line for one embodiment is saying on the 23 rebound, that flow that goes through that 24 collection of elements in the -- through the 25 center of the piston rod, allows fluid -- one	Page 89 1 and prevents fluid from flowing, which does 2 happen. 3 Q. Dr. Slocum, I'm not sure how long 4 we've going now, but I am at a natural stopping 5 point if you want to take a break. I have no 6 concept of how long we have been going? 7 A. About an hour, hour ten. So this 8 is actually a good bio concept break. 9 MR. DURBIN: Is that okay with 10 you, Arpita, we'll take a five,- 11 ten-minute break now, and the next break 12 will be a longer half hour break for 13 lunch? 14 MS. BHATTACHARYYA: That should be 15 good. Let's take a short one now and 16 then we'll follow up with a longer break 17 in about an hour. 18 MR. DURBIN: That works for me. 19 THE VIDEOGRAPHER: The time is 20 1:42 p.m. We're off the record. 21 (Recess taken at 1:42 p.m. and 22 reconvening at 1:52 p.m.) 23 THE VIDEOGRAPHER: On the record, 24 the time is 1:52 p.m. eastern time. 25 MR. DURBIN: Dr. Slocum, I will

Page 90 1 now be introducing an exhibit that's 2 been previously marked in this matter as 3 Exhibit 1005. 4 (Document marked as Exhibit 1005 5 for identification) 6 A. Okay. I have that here in my 7 unmarked paper. 8 Q. Dr. Slocum, what is Exhibit 1005? 9 A. This is United States Patent No. 10 6,558,430. It's titled, "Air-Cylinder 11 Apparatus For Prosthetic Limb." The first 12 named inventor is Nakaya. 13 So maybe we can refer to this as 14 the Nakaya patent in concert with our general 15 nomenclature of using the inventors' names if 16 they are pronounceable. 17 Q. Dr. Slocum, then you can agree 18 that we can both refer to what is marked as 19 Exhibit 1005 in this matter both as Exhibit 20 1005 and the Nakaya interchangeably? 21 A. I'm fine with that. 22 Q. Thank you. Dr. Slocum, Nakaya 23 performs damping during the compression stroke, 24 correct? 25 A. It is a -- part of what it does	Page 92 1 Q. Nakaya's throttle valve 140 is a 2 restriction, correct? 3 A. Correct. That's down at the very 4 bottom there. Let me just double-check. Let 5 me make sure that's what he calls it. 6 Functionally, it is a resistance to flow. 7 It says on Column 8 or Column 7, 8 if we go to Column 7, line 55, "and a constant 9 throttle valve 140 received in the bottom 10 part." 11 So when it says "constant throttle 12 valve," that's telling me it acts as a fluid 13 resistor. 14 Q. Dr. Slocum, as it exists in Figure 15 7 through 9 -- scratch that. 16 Dr. Slocum, as it exists in Figure 17 7 through 8, is throttle valve 140 a 18 restriction? 19 A. It is. That's what is meant by 20 "throttle." 21 Q. Dr. Slocum, will you now please 22 take a look at Figures 17 and 18 of Nakaya, 23 which is Exhibit 1005. 24 A. Okay. 25 Q. Dr. Slocum, do you see element 140
Page 91 1 is, its primary thing, again, it's a prosthetic 2 limb device, if you provided a lot of damping, 3 it will be like running through sand. So the 4 primary function is actually energy storage and 5 return. 6 Everything provides damping; 7 right? That's the second law of 8 thermodynamics. The world is going to 9 continually eventually turn into protons which 10 then go away. 11 The intent of this patent is 12 energy storage and return, so to aid in 13 walking. 14 Q. Dr. Slocum, Nakaya's throttle 15 valve 140 is a restriction, correct? 16 A. Hold on. Let me go to the page 17 and figure so we can -- I know the valve you're 18 talking about, but I would like to talk about 19 things, if you don't mind, to give me a figure 20 you would like me to refer to, because there's 21 a bunch of them. 22 Q. Dr. Slocum, for example, in 23 Figures 7 and 8. 24 A. Okay. I am at both of them. So I 25 -- okay. Ask me the question again, please.	Page 93 1 here again? 2 A. I do. 3 Q. Is Nakaya's element 140 a 4 restriction in Figures 17 and 18 of Nakaya? 5 A. It's the same element, yes. It 6 throttles flow. That's what the patent tells 7 me it does. 8 Q. Dr. Slocum, in Figures 7 and 8, 9 the compression stroke of Nakaya's device 10 causes fluid to be forced through the 11 restriction of throttle valve 140, correct? 12 A. Correct. That's how it is 13 eventually going to flow back up into what's 14 the rebound chamber 81. As you compress the 15 fluid in 82, it has to go somewhere. And also, 16 you can't create a vacuum up in what would be 17 the rebound chamber. You've got to replace the 18 fluid. 19 Unlike the shock absorbers for 20 bicycles, this particular piston doesn't have 21 any of those flow plates as part of the piston 22 structure itself. So its eventually got to get 23 up there, and we'll probably go into more 24 detail, but that's what happened. 25 Q. Dr. Slocum, in the embodiment

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Page 94 1 shown in Figures 17 and 18 of Nakaya, the 2 compression stroke of this embodiment of Nakaya 3 causes fluid to be forced through the 4 restriction of throttle valve 140, correct? 5 A. Yeah, I think that's what we were 6 just talking about. It has to go through there 7 in order to get back up into the rebound 8 chamber. It has to go somewhere. There's no 9 air spring element separate. I mean, this is 10 all an air spring. 11 So you will have some compression. 12 In other words, I don't know if we're going to 13 go into this now or later, but do you see at 14 the bottom, right after 140, is a spring-loaded 15 check valve, and that is numbered 92A in Figure 16 7, for example, or Figure 8 it is just labeled 17 92. 18 So the way this thing works, 19 because remember, it's an air spring. 20 Everything is air. It's not -- when you say 21 fluid, that's what you understand it to be, 22 air, because when you're compressing, you will 23 get a fair amount of spring, the fluid, the air 24 will compress in the compression chamber before 25 that check valve 92 opens up. That's part of	Page 96 1 where it shows knee angle and then torque, 2 zero, and it takes some torque to move even 3 before you have any angle showing. So they 4 didn't give me the scale on the torque axis, 5 but it doesn't go through zero, because there's 6 always some resistance of the seal's friction. 7 You will start to have -- you will 8 have very little torque initially as you're 9 compressing or you can barely see any slope 10 happening. It's very low. As you initially 11 compress the fluid, the air, air is a fluid. 12 And your torque will start to rise as you 13 compress, and then the shape will change as you 14 then activate, that valve will break free. 15 The text of the patent goes 16 through how these elements are affecting the 17 shape of that torque versus knee angle. 18 Q. Dr. Slocum, a spring is an energy 19 storage device, correct? 20 A. Correct. 21 Q. Are there other types of energy 22 storage devices typically used in shock 23 absorbers? 24 A. Typically, no. You're using some 25 sort of spring. We are going to exclude
Page 95 1 the response they want to give you for walking. 2 That's why they're using air. I think they 3 even have a -- hold on. I recall a -- here we 4 go. 5 If you look on Figure 20, for 6 example, you have torque versus knee angle. 7 Torque would be the force in this damper acting 8 over a distance. The bend angle is part of 9 that. There's another one in Figure 10 that 10 shows the torque is a function of angle. 11 So that shape of that curve will 12 be governed, in part, by when that valve 92 13 opens up, and the text talks about how to do 14 that. 15 So when I said, and you asked the 16 question, yes, there will be flow past 140, 17 there will always be flow past 140. Whether or 18 not it goes past the check valve back to the 19 other chamber, you have to have a certain 20 pressure before that occurs. 21 Do you see in the plots, I will 22 show you where that is in these plots -- let's 23 look at Figure 20. That's representative. Let 24 me find the other one, the first one. 25 If you go to the plot in Figure 10	Page 97 1 electromagnetic shock absorbers that do exist. 2 Q. That's why I wanted to ask the 3 question. I thought that that was true. 4 A. You can transform the energy into 5 charge, but that's just -- and I do work on 6 things like that also. Remember, we talked 7 about my work was renewable energy devices. 8 None of this technology has anything to do with 9 that. This is all just simple springs of 10 various types, mechanical, coil springs, air 11 compression. Really the heart of what the 12 springs are here. 13 Q. Dr. Slocum, shock absorbers 14 include both energy storage and energy removal, 15 correct? 16 A. Well, a shock absorber, just 17 generally the term, doesn't store energy. If 18 you have a bicycle shock absorber, there's an 19 implication that it has an energy storage 20 device associated with it. But if you say a 21 shock absorber for your car, no, there is no 22 energy storage. It works in conjunction with a 23 separate spring. 24 So if you want to say shock 25 absorber and ask that question, I'm just going

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Page 98 1 to have to caveat my answer with bicycle shock 2 absorber, which then they generally do have a 3 spring associated with it, the energy 4 dissipation device. 5 Q. Do other shock absorbers for 6 vehicles tend to have both an energy storage 7 and energy removal component? 8 A. No. You can't generalize like 9 that. There's a huge number that have no 10 energy storage. They're purely dissipative 11 devices. Some do have coil springs in 12 conjunction with them, but most vehicle shock 13 absorbers, like for just the kind of vehicle 14 you see on the road, they have a separate 15 spring suspension system, and then the shock 16 absorber is purely dissipative damping. 17 Q. In such a case, does the 18 suspension system rely on both the energy 19 storage and the energy dissipation portions? 20 A. Right, because the suspension 21 system is that which provides the user with the 22 dynamic response that is pleasing to them as 23 you are driving and encountering obstacles. 24 And everything is a mass, a spring 25 and a damper. Now, what the relative sizing of	Page 100 1 what's -- the mass times the acceleration, plus 2 the displacement times the spring constant 3 equals zero, and that's an oscillator. 4 So if you took a step, your knee 5 would -- you couldn't walk. It would be 6 uncontrollable. 7 So the equation has the mass times 8 acceleration plus motion times a spring 9 constant, plus damping times velocity equals 10 zero or some forcing function. 11 When you saw that differential 12 equation, it gives you damped or underdamped is 13 the terminology or critically damped, and from 14 that you can actually then solve for what is 15 the most efficient way of moving forward 16 without unwanted oscillations. 17 And that mathematics is what is 18 done when you design these prosthetic devices, 19 and I do work in this area, too, with Professor 20 Herr. We share a student who this is his whole 21 thesis, by the way, and I've done other ones 22 for ankles. And that's the magic, is how you 23 tune it. 24 The damping level is typically a 25 couple percent at most. You need a little bit,
Page 99 1 those elements are, again, the designer has to 2 select them to get the response that the user 3 will be happy with. 4 Q. This is first year physics stuff, 5 correct? 6 A. Correct. This is simple second 7 order differential equation. Do you want the 8 equation? 9 Q. No, thank you, Dr. Slocum. 10 A. Okay. 11 Q. Dr. Slocum, if Nakaya intended to 12 only be an energy storage device, would Nakaya 13 have been -- would the Nakaya inventors have 14 included a throttle valve? 15 A. You can't only -- you can't have a 16 pure energy storage device. Any time you're 17 moving fluid, right, there will be losses. And 18 so your goal is to make them happen where you 19 want them to happen to give you the dynamic 20 response you want. 21 For the knee, this prosthetic 22 device, for example, if it had absolutely zero 23 damping and it was a idealistic pure mechanical 24 spring, you couldn't walk, because you would 25 have in the dynamic equation, you would have	Page 101 1 like just a pinch of salt in your stew, to make 2 it very responsive. You want it to feel like 3 spring in your step, but you don't want to then 4 start going unstable, because that's very bad. 5 You get too much, it's like running in sand, 6 which is a great workout, but most people do 7 not like to run in sand. 8 Q. Dr. Slocum, would you please turn 9 your attention to Figure 7 of Nakaya, which is 10 Exhibit 1005 in this matter. 11 A. Okay. I'm there. 12 Q. Would the device shown on this 13 page be a more efficient energy storage device 14 if we blocked off throttle valve 140 such that 15 no air could flow there through? 16 A. The simple answer is, no, because 17 when you compress air, there's an equation, PV 18 equals NRT. 19 When you compress air, it gets 20 hot. So if you just ran this thing with no 21 return, I think that's what you're asking, if 22 we're blocking 140; is that what you're asking? 23 Q. Yes, Dr. Slocum. 24 A. Okay. What will end up happening 25 is you compress the air, and it will be a

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Page 102 1 spring, but you will lose energy as the air 2 gets hot. You will be dissipating. 3 Q. So when you say "more efficient," 4 you may end up losing almost as much energy as 5 heat by the compression. You will find it very 6 difficult to tune. You want to use an element 7 like 140, as I mentioned earlier. You want the 8 dissipation to happen where and when you want 9 it and you need to be able to dial it in to be 10 exactly what you want. 11 A. If you're relying on a little bit 12 of damping you get by compression, by heating 13 up the air around the cylinder, now you're 14 subject to the knee will perform differently 15 when it's in the summertime than in the winter; 16 okay? There you go. 17 A. By putting it down there, 18 specifically with that type of dissipation by 19 sheer as opposed to compressing of gases, I 20 design in what's called determinism in my 21 device. It will do what I expect it to do. 22 You make a device more robust, because now it's 23 not so dependent on, for example, the external 24 air temperature. 25 Q. Dr. Slocum, would you please turn	Page 104 1 You've seen the runners, the amputees, with 2 blades. They're faster than normal people. 3 Q. Dr. Slocum, would you -- scratch 4 that. 5 A. Dr. Slocum, the '223 patent's 6 damper includes a spring, correct? 7 A. Okay. So let me -- right. That's 8 the chamber 125 off to the side. 9 Q. Dr. Slocum, the '223 patent also 10 shows an external coil spring 115, correct? 11 A. Correct. As I discussed earlier, 12 you can have all air, all mechanical, or a 13 hybrid. You'll select them according to the 14 type of response that you want to have, because 15 the mechanical coil of this type shown is a 16 pure linear spring, and the air is a non-linear 17 spring, and when you add the two, you can get 18 some very nice tunability. 19 Q. Dr. Slocum, can you adjust the 20 pressure of the air in 125 of the '223 patent? 21 A. I have to go back to the 22 incorporated reference. Most of these shocks 23 allow you to pump up the air side, and that 24 changes the stiffness. It is essentially -- if 25 you add air pressure to an air spring, you
Page 103 1 your attention to Figure 10 of Nakaya Exhibit 2 1005 in this matter. 3 A. Okay. I'm there. 4 Q. Dr. Slocum, if we cut off throttle 5 valve 140, such that Nakaya was essentially 6 acting as an air spring, could you tell me how 7 this curve would change? 8 A. Well, the slope will get steeper. 9 Because remember, Nakaya is allowing some air 10 to flow back from the compression to the 11 rebound chamber, and that's how you adjust the 12 effective stiffness of the device. 13 A. Stiffness is a force divided by a 14 displacement or a torque divided by an angle. 15 That's angular stiffness; okay? So you'll 16 change that, that can be tuned in these devices 17 by how much air you allow to compress versus 18 how much air you allow to go back to the other 19 side. 20 A. And that will set up the leg or 21 this prosthetic will be set up, dependent upon 22 the weight of the user, the size of the user, 23 and the type of what they want to do. That's 24 why the runner will use blades, which have 25 basically no damping, they're all springy.	Page 105 1 change the stiffness. 2 Q. Dr. Slocum, would you please turn 3 to Paragraph 43 of your declaration, which is 4 Exhibit 2010 in this matter. 5 A. Okay. I'm there. 6 Q. Would you please review Paragraph 7 43. 8 A. Okay. I've reviewed it. 9 Q. Dr. Slocum, the second of 10 Paragraph 43 reads, "Nowhere does Nakaya 11 disclose that air-cylinder body 112 can damper 12 or absorb shock impulses," correct? 13 A. Correct. 14 Q. Dr. Slocum, what does the word 15 "disclose" mean in that sentence? 16 A. So it means that Nakaya is getting 17 an invention that aids a prosthetic limb in 18 walking. That's what it's teaching. Then in 19 my continuation where it doesn't describe 20 something as specifically designed to absorb 21 shock, and to absorb shock, you want to have a 22 lot of damping. That's what absorbing shock 23 does. That's why they're often called shock 24 absorbers, highly dissipative elements. 25 A. So you have to read the whole

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Page 106 1 paragraph in context. I do say that, yes, you 2 will have to have some damping, otherwise you 3 will oscillate uncontrollably, which is bad for 4 normal prosthetic use; right? We're not 5 talking about Olympic athletes trying to get, 6 you know, the blade runners. 7 Q. Dr. Slocum, where in your 8 declaration do you discuss how much damping 9 would be produced by Nakaya? 10 A. I don't say or the units are 11 meters per second per newton. That's what 12 damping -- newtons per meter per second. 13 That's what the units of damping are. I don't 14 say five; right? What I describe here, you're 15 going to need just enough so you don't 16 oscillate your leg. 17 I didn't feel I needed to provide 18 examples of equations that show what they are. 19 Air, as I describe, is not highly dissipative. 20 That's one of the primary reasons why it makes 21 such a really good spring for these 22 prosthetics, because it has just a few percent 23 typically damping as you're moving it around 24 within the mechanism. 25 If you were to put oil in Nakaya	Page 108 1 buy one of these things, there are so many 2 different dampers, and even within a particular 3 damper, if you buy one, it will say, you know, 4 here is the air pressure you put in 125 in 5 accordance with the weight of the rider and the 6 type of riding they do. 7 And as we saw yesterday, they even 8 then have an adjustment typically on them to 9 allow you to vary the amount of damping, but 10 it's still typically on the order of tens of 11 percent. When I say percent, in terms of given 12 a force that comes in over a displacement 13 range, that's energy, how much that energy gets 14 dissipated. 15 So when you look at one of these 16 machines, and I refer to it as a machine, 17 because it's a collective elements that does 18 some function, the percent of damping means, as 19 you activate the machine with a force over the 20 stroke, how much of that energy do you recover 21 versus how much do you dissipate, and the shock 22 absorber in this thing is typically in the tens 23 of percent type of thing. 24 Q. Dr. Slocum, the amount of damping 25 is not relevant to the claims of the '223
Page 107 1 with a coil spring or a side air spring, it 2 would be like trying to run in mud. It just 3 wouldn't work. Oil is just too dissipative. 4 You can't use it in these things. You don't 5 want to. And it's also heavy, et cetera, et 6 cetera. 7 But just in terms of a working 8 fluid, it's not going to work. 9 Q. Dr. Slocum, a particular amount of 10 damping is not claimed in any claim of the '223 11 patent, correct? 12 A. Correct. None of these patents 13 are giving me how many newtons per meter per 14 second. They're framing it in the context of 15 what it's used for. It's a suspension system 16 for mountain bikes or vehicles, like 17 motorcycles I think some of them may even refer 18 to. 19 So a POSITA will have an 20 understanding, if you're at all skilled in this 21 area, of the amount that you will need, but 22 even so, it's going to be framed in the context 23 of here is the weight of the rider and here is 24 the type of riding they do, and that is one of 25 the reasons why when you look at -- you go to	Page 109 1 patent, correct? 2 MS. BHATTACHARYYA: Objection. 3 Form. Mischaracterizes the record. 4 A. I disagree, because if I look at 5 Claim 1, it says "a damper for a shock absorber 6 comprising." 7 So here the claim preamble is 8 telling me it's a shock absorber. I need to be 9 able to have significant energy absorption, and 10 then hence, dissipation. 11 So that sets the stage for my 12 understanding as a POSITA of how I'm actually 13 going to practice this claim. 14 Q. Dr. Slocum, what is the amount of 15 damping that is required for something to be 16 considered a shock absorber? 17 A. Again, the POSITA will understand 18 what that exact number is, but it sets up in 19 their mind that this is going to be not a 20 percent or two, this is going to have to 21 absorb, you know, many percents of the energy 22 impact that comes in. 23 So I can't give you any more 24 granularity than that. 25 Q. Dr. Slocum, is there a discussion

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Page 110 1 of percents of the energy impact discussed in 2 your declaration? Scratch that. 3 Dr. Slocum, is there a discussion 4 of the requisite percents of energy impact in 5 your declaration? 6 A. I gave the analysis of running 7 through sand for people to understand what it 8 would be like if, for example, one of the 9 prosthetic limbs were to be classified as a 10 damper. 11 I specifically felt I didn't need 12 to provide any particular number, and to 13 provide a number would be to take things out of 14 context, because again, the POSITA will design 15 it to provide the customer experience for which 16 they're creating the product. 17 Q. Dr. Slocum, is there a threshold 18 at which above that threshold we have a damper 19 and below that threshold we don't have a 20 damper? 21 A. I think I would put it the other 22 way, that when you have an oil-based system, 23 like all the stuff that's shown, it's always 24 going to be a damper, because oil is, you know, 25 a thousand times more viscous than air. It	Page 112 1 the computer has a burp, and the thing that's 2 moving is now going high speed to the end of 3 travel, you will put -- I design a lot of 4 machines, I know -- you put emergency shock 5 absorbers at the end of travel, sometimes 6 they're called bumpers. 7 On the highway, you've got -- at 8 the off ramp, you'll see those what looks like 9 accordions, collapsible things. That's a shock 10 absorber for someone who is on their cellphone 11 not paying attention, oh, I've got to exit, and 12 then, wham, you want to absorb the shock of the 13 vehicle. 14 Yeah, from highway off ramps, you 15 go skiing and you have the padded -- the pads 16 around poles. Those pads are actually not just 17 pieces of foam. The better ones are designed 18 to actually be -- lessen the impact on the 19 person, but do so in a controlled manner. 20 Football helmets, the latest rage is these 21 extra protective pads on them. Those are shock 22 absorber. 23 It's just such a very broad term, 24 but it's a good mechanical element. 25 Q. Dr. Slocum, are the claims of the
Page 111 1 depends on what kind of oil you're using and 2 temperatures and stuff, but that order; right? 3 So you take any of these devices, 4 and even if you open them all the way up on the 5 adjustability, they still damp a lot, and if 6 you were to attempt to take that device and put 7 it in a prosthetic leg, it would be like 8 running through mud, for example. 9 That's how I would think about 10 these things. To move oil around, you lose 11 energy. 12 Q. Dr. Slocum, may shock absorbers be 13 used in a number of different applications? 14 A. Yeah. Any time you have 15 machinery, vehicles, bicycles, quite often the 16 shock absorbers are used there, and there's a 17 whole range of different things where they 18 active through the entire stroke of a 19 mechanism, sometimes just at the very end. 20 When you have high-speed 21 automation equipment, the control system 22 doesn't want to have any dissipation other than 23 just, again, a small fraction of the energy to 24 keep things stable. 25 But if something goes wrong and	Page 113 1 '223 patent limited to any particular 2 application of a shock absorber? 3 A. Well, they are in terms of because 4 it's a piston and shaft type. So that 5 differentiates it right away from the -- a lot 6 of the examples I just gave you, because you 7 asked me the generic question about shock 8 absorber. 9 So the context here is a bicycle, 10 but I can take this device and use it on 11 non-bicycles. I could take this device and use 12 it on a quad runner vehicle; right? You've 13 seen the four-wheeled zoom, zoom thingees, 14 because between, they have a suspension, a 15 spring and a damper. 16 Anywhere I need a spring and a 17 damper, like a quad cycle could do it, a 18 motorcycle, a bicycle -- I'm trying to think in 19 terms of outside that area -- some sort of a 20 transportation vehicle, in general, sure. 21 Q. Dr. Slocum, could the -- scratch 22 that. 23 Are the claims of the '223 patent 24 limited to shock absorbers for vehicles? 25 A. It doesn't say vehicle. It just

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Page 114 1 says a damper for a shock absorber comprising. 2 So again, in the mathematics of things, mass, 3 spring, damper, shock absorber. So that 4 damping term, B, in the mathematical equation, 5 B is the damped amount times the velocity. 6 B is going to have, again, to one 7 skilled in the art, there's a relative value of 8 B in relation to the mass in the spring that 9 will make that equation respond favorably to, 10 for example, an impulse, which is a shock. 11 So it will prevent the thing from 12 oscillating wildly. 13 Q. Dr. Slocum, shock absorbers 14 provide resistance to compression, correct? 15 A. Correct. I mean, they could also 16 provide the counter. They could be 17 bidirectional. But nominally, the primary 18 damping element is in one direction. 19 Q. Dr. Slocum, the level of 20 resistance is appropriate for a given -- 21 scratch that. 22 Dr. Slocum, the level of 23 resistance to compression for a given shock 24 absorber is appropriate for the intended use of 25 that shock absorber, correct?	Page 116 1 many of the other systems, because the minute 2 you start compressing air at any rate that is 3 useful, it gets really hot. 4 You may have a home air compressor 5 like for your bicycles, the electric ones, and 6 you notice when it's on, the tank gets hot, and 7 that's because you're compressing the air. It 8 has nothing to do with the bearings and the 9 motor and seals and all the other stuff. Most 10 of that is coming from compressing the air that 11 makes it get hot. 12 Q. Dr. Slocum, would you please turn 13 your attention to Paragraph 59 of your 14 declaration, which is Exhibit 2010 in this 15 matter. 16 A. Okay. I'm here at 59. 17 Q. Would you please review this 18 paragraph, Dr. Slocum. 19 A. Okay. 20 Q. Dr. Slocum, starting on the setup 21 line, the sentence reads, "'Dampers' generally 22 use oil and a special arrangement of chambers 23 and metered passages to dissipate large amounts 24 of energy generated and do not need to store 25 energy to help propel the user forward."
Page 115 1 A. Okay. That's a very broad -- 2 generally, because remember, compression and 3 resistance, that includes the spring term. 4 There's two things; there's linear position or 5 displacement, which is what affects the spring, 6 and then there's the velocity of that 7 displacement, which is what dissipates the 8 energy in the damper. 9 This gets back to the math. Force 10 equals the mass times acceleration, plus the 11 spring constant times displacement, and 12 springs, other than the air springs, don't care 13 about the velocity at which you squish them. 14 Plus the damping times the velocity. 15 Now, if I look at an air spring, I 16 can actually separate the function 17 thermodynamically between the compressibility 18 of air, which I can now say is independent of 19 the loss or the velocity, but I have to now 20 account for the heating of the air by the rate 21 of compression with a separate term. 22 This is why when people talk about 23 using compressed energy, or compressed air as 24 an energy storage element, they're so sadly 25 mistaken that it can be good or compete with	Page 117 1 Correct? 2 A. Correct. 3 Q. Dr. Slocum, do some dampers use 4 air dampers as a damping medium? 5 A. You can. It will not be as volume 6 efficient as oil. If you tried to dissipate 7 the same amount of energy with air in the same 8 volume as you are with oil, that would be 9 really hard. I'm not even -- I don't think you 10 can do it in the same volume. That would be 11 really difficult. I'm loathed to say never, 12 but, wow, that would be really challenging in 13 my opinion. 14 If I really wanted to dissipate 15 that much energy, I'm going to use an oil or a 16 water, you know, a liquid. 17 Q. Dr. Slocum -- 18 A. I'm saying generally oil. Water 19 has other issues associated with it. 20 Q. Dr. Slocum, there are commercial 21 products that use air as a damping medium, 22 correct? 23 MS. BHATTACHARYYA: Objection. 24 Form. 25 A. I didn't say there aren't. I said

Page 118 1 in the same volume as an oil system. The 2 reason you need to have some that don't use 3 oil, there are requirements, for example, in 4 some food service machines for cleanliness 5 where air is a cleaner working fluid than an 6 oil; in space applications, for example. 7 So, yeah, I can write the 8 equations and I can make things happen the way 9 I want. It's a question of volumetric 10 efficiency. 11 So, for example, for a vehicle, 12 you would end up with this really large thing. 13 Q. Dr. Slocum, are you familiar with 14 the company named Cane Creek? 15 A. Cane Creek? No. I may have seen 16 them in an advertisement in a bike magazine or 17 something at some point, but I don't know the 18 company. 19 Q. Dr. Slocum, are you aware of major 20 headset manufacturers in the United States? 21 A. A few of them. I'm not that much 22 of a bicycle aficionado that I spend a lot of 23 time keeping up to date on all the 24 manufacturers and all the products. 25 Q. Dr. Slocum, I will also represent	Page 120 1 (Document marked as Exhibit 1018 2 for identification) 3 Q. Dr. Slocum, please let me know 4 when you receive Exhibit 1018 in the exhibit 5 share. 6 A. Let me just click again. A little 7 window just said something there. Okay. I 8 have it. This is U.S. Patent 5,775,677. I 9 have not seen this before. 10 Q. Dr. Slocum, what is the title of 11 this patent? 12 A. This is "Air or Gas Sprung and 13 Dampened Shock Absorber." Inventor is Englund, 14 E-n-g-l-u-n-d. 15 Q. Dr. Slocum, I understand you 16 haven't been presented with this exhibit 17 before. Would you please review the abstract. 18 Take as much time as you would like, and when 19 you're finished, let me know. 20 MS. BHATTACHARYYA: Mr. Durbin, if 21 you're going to ask Dr. Slocum to answer 22 questions based on some kind of 23 reference he has never reviewed before, 24 I have to object to that. 25 MR. DURBIN: You're welcome to do
Page 119 1 to you that they make bicycle suspension 2 products in addition to being one of the 3 largest manufacturers of headsets. 4 A. Could be. 5 MR. DURBIN: Dr. Slocum, I'm now 6 going to introduce an exhibit, which I 7 will mark as Exhibit 2018. 8 MS. BHATTACHARYYA: Mr. Durbin, 9 why are you marking it as Exhibit 2018? 10 Is this a new exhibit you're 11 introducing? 12 MR. DURBIN: Yes. 13 MS. BHATTACHARYYA: The 14 nomenclature is Petitioner's exhibits 15 start with 1. Patent Owner's exhibits 16 start with two. So this is going to be 17 your exhibit, so you may want to rename 18 that. 19 MR. DURBIN: I again appreciate, 20 counsel for Fox Factory's assistance, 21 and making sure the record is clear. I 22 will take back my prior statement about 23 marking the exhibit I'm about to 24 introduce as Exhibit 2018. I will now 25 be marking an exhibit as Exhibit 1018.	Page 121 1 so. 2 MS. BHATTACHARYYA: No, I'm going 3 to instruct Dr. Slocum not to answer. 4 MR. DURBIN: You're going to 5 instruct your witness not to answer? 6 MS. BHATTACHARYYA: About prior 7 art references that you're just 8 introducing now. 9 MR. DURBIN: Would you like to 10 take this conversation off the record or 11 do you want to put it on the record that 12 you're instructing him not to answer? 13 MS. BHATTACHARYYA: I have to 14 listen to your question, but I'm just 15 warning you that if you are going to ask 16 him detailed questions about what this 17 reference teaches or something, you 18 should have put it into the record 19 before the deposition. That's what I'm 20 saying. 21 I'm going to have to go question 22 by question, but I'm just giving you a 23 fair warning that this is -- that you 24 have to be careful about what questions 25 you ask.

Page 122 1 A. I can't read and concentrate on 2 anything while there's other talking going on. 3 So with all due respect, I have paused my 4 review of things while you guys discuss this. 5 MS. BHATTACHARYYA: Dr. Slocum, go 6 ahead and review. I'm not asking you 7 not to review. I'm just telling Mr. 8 Durbin that he needs to be careful with 9 the questions he asks, because this is 10 the first time I'm seeing this 11 reference, too, and I have to read it 12 and understand so that I can object 13 properly. 14 That's why I'm raising it, because 15 I am not qualified to read and 16 understand the reference, and I don't 17 know what questions you're going to ask, 18 so how am I going to object to the 19 questions properly if I don't get an 20 opportunity to review the reference. 21 MR. DURBIN: I understand. Your 22 extremely lengthy objection is noted on 23 the record. You can object by all means 24 after any question I ask. 25 MS. BHATTACHARYYA: No, you're not	Page 124 1 MS. BHATTACHARYYA: These are not 2 speaking objections. I'm not objecting 3 to a question, so it's not a speaking 4 objection. I'm just putting it on the 5 record that the direction you're going 6 is not proper. It's just a fair 7 warning. This is not a speaking 8 objection, Mr. Durbin. Maybe you should 9 look that up, too. 10 A. I'm not sure what I'm supposed to 11 be doing. 12 Q. Dr. Slocum, would you please just 13 review the abstract. 14 A. Okay. Okay. I've read the 15 abstract. 16 Q. Dr. Slocum, does this abstract 17 purport to disclose a damper that uses air as a 18 damping medium? 19 MS. BHATTACHARYYA: Objection. 20 Form. Mischaracterizes the record by 21 introducing new reference not introduced 22 before. 23 A. There are words in the abstract 24 that state that. 25 Q. Dr. Slocum, was it your earlier
Page 123 1 understanding the point, Mr. Durbin. I 2 cannot object because you could be 3 misrepresenting something in the 4 reference. I don't understand the 5 reference. 6 MR. DURBIN: I haven't done 7 anything you have suggested. Can you 8 wait until it occurs, please? 9 MS. BHATTACHARYYA: I'm just 10 giving you a fair warning -- 11 MR. DURBIN: This is a speaking 12 objection. If we need to take this off 13 record and discuss what's proper in a 14 PTAB deposition. 15 MS. BHATTACHARYYA: Mr. Durbin, 16 you have made it very clear you don't 17 understand the proceeding. You don't 18 even know how to mark the exhibits on 19 Veritext, and you don't understand that 20 Patent Owner exhibits start with two, 21 Petitioner exhibits start with one. So 22 please do not give me a lecture on PTAB 23 proceedings. 24 MR. DURBIN: Please stop your 25 speaking objections.	Page 125 1 testimony that air-based dampers would be too 2 large to be used for a vehicle? 3 A. I stated that they will be not 4 nearly as volumetrically efficient or useful as 5 an oil-based system. They will have to be much 6 larger. 7 I also stated it depends upon what 8 the designer wants to accomplish. There are 9 advantages of air in terms of cleanliness. 10 There are disadvantages thermally, and they are 11 going to be bigger. 12 So it's going to be battled out in 13 the market. I believe I was pretty clear on 14 that. 15 Q. Dr. Slocum, is it possible to have 16 an air-based damper? 17 MS. BHATTACHARYYA: Objection. 18 Mischaracterizes prior testimony. 19 A. As I stated earlier, yes. I can 20 design a system. It will not be as efficient 21 in terms of size as an oil-based system, and 22 you'll have a number of thermal issues that you 23 were going to have to deal with, and in some 24 applications you may want that, so you don't 25 have -- sometimes, like I said, oil has

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Page 126 1 cleanliness issues. 2 Every type of system will have 3 some pluses and minuses, and in the vehicle 4 system, in general, you're trying to minimize 5 the size of things. 6 Q. Dr. Slocum, are you familiar with 7 Cane Creek's AD10 and AD12 products? 8 A. I am not. 9 MR. DURBIN: I am not sure, folks, 10 how long I have been going. Are we at 11 lunch break time or should I move into a 12 new area? 13 THE WITNESS: We're close to 14 lunch. 15 MR. DURBIN: Would we all like to 16 take lunch now, because I'm moving on? 17 MS. BHATTACHARYYA: We can take a 18 lunch break now. 19 MR. DURBIN: The time is 1:52. Do 20 you want to say 2:25? Is that enough 21 time for everyone. 22 THE WITNESS: We should leave it 23 on the even half hour. 24 MR. DURBIN: Even half hour. That 25 works for me?	Page 128 1 - U.S. 7,374,028. 2 A. I'm not sure what all of that 3 means. I will wait a few minutes and then I 4 will click refresh. 5 Q. After you refresh, Dr. Slocum, the 6 exhibit name as stated in the file name will 7 now match the exhibit marking on the relevant 8 document in every case. 9 A. Okay. 10 Q. Dr. Slocum, would you please turn 11 your attention to Paragraph 58 of your 12 declaration, which is Exhibit 2010 in this 13 matter. 14 A. Okay. Give me a second and I will 15 read. 16 Q. Please do so. 17 A. Okay. 18 Q. Dr. Slocum, in this paragraph you 19 state "all achieved with the single working 20 media (air)." 21 A. Hold on a second. That's at the 22 last sentence in that paragraph? 23 Q. Yes, Dr. Slocum. 24 A. Okay. 25 Q. In this paragraph you state "all
Page 127 1 THE WITNESS: So 38 minutes -- 2 MR. DURBIN: Oh, I understand. 3 We'll come back at the half hour; is 4 that what you're saying? 5 THE WITNESS: Yes. I'll be a 6 minute or two earlier. 7 MR. DURBIN: That works for me. 8 THE VIDEOGRAPHER: The time is 9 2:52 p.m. eastern time. We're off the 10 record. 11 (Luncheon recess taken at 12 p.m. and reconvening at 3:32 p.m.) 13 THE VIDEOGRAPHER: The time is 14 3:32 p.m. eastern time. We're on the 15 record. 16 MR. DURBIN: First I have a bit of 17 housekeeping. I reviewed the exhibit 18 names to make sure that they -- and the 19 exhibit share that we all share to make 20 sure that they match as they have been 21 marked, and I am going to right now 22 rename the file name in exhibit share 23 for the exhibit that has been marked as 24 Exhibit 1017 from the file name Exhibit 25 2017 - U.S. 7,374,028 to be Exhibit 1017	Page 129 1 achieved with the single working media (air) 2 that primarily provides energy storage through 3 air compression in both (downward and upward) 4 directions and only a little bit of damping 5 through the use of metered orifices for 6 airflow," correct? 7 A. Correct. 8 Q. Dr. Slocum, what do you mean when 9 stating that Nakaya primarily provides energy 10 storage? 11 A. Again, when you were doing a 12 prosthetic device, you want to have efficient 13 walking. If you have too much damping or, 14 let's just say, if you do not have an efficient 15 energy storage device, it will feel like you 16 were walking through sand or mud, and users 17 won't -- your device will never -- you will 18 never go anywhere. You won't sell any of them 19 and people will be very unhappy. 20 There's biomechanics issues of if 21 you do it all the time you'll wear out your 22 hips and other issues. So you design these 23 machines to be efficient, and as I showed and 24 stated earlier, you have to have some damping, 25 otherwise you have oscillations that will --

Page 130 1 you will lose balance and you won't be able to 2 walk. 3 So one of these actually showed -- 4 maybe it was the other prosthetic device -- 5 showed a very nice sequence of showing the 6 person as they're walking what the stages of 7 the device are as you walk. 8 Again, that's where the user has 9 to -- their needs have to be met. The person 10 who designs it, the same basic equation I said 11 earlier applies across all of these devices, 12 whether it's energy storage with a little 13 damping or a lot of damping, the math is the 14 same. And now you size elements to make the 15 device work the way you want, and that will 16 have ramifications on the size of the device, 17 how much heat is generated. It all goes into 18 the detail of the design. 19 Q. Dr. Slocum, would you now please 20 turn your attention to Paragraph 66 of your 21 declaration, which is Exhibit 2010 in this 22 matter. 23 A. Okay. Hold on. Okay. 24 Q. Dr. Slocum, the second sentence in 25 this paragraph reads, in part, "The flow from	Page 132 1 specifically calling out the numbers of each 2 element. So this is not my opinion. This is 3 how the device works. 4 Q. Other than what you described in 5 your previous answer as a citation to Figure 8, 6 and to the numbers, do you cite any other 7 portions -- portions of any exhibit in this 8 matter, in this Paragraph 66? 9 A. I guess I don't understand what 10 you mean by cite other portions, because I'm 11 reading the patent. I'm saying here is Figure 12 8. I'm recalling, you know, recounting the 13 numbers with the names of all the parts and 14 what the numbers refer to. 15 So I just don't understand what 16 your question means other than that do I cite. 17 So I don't have an answer. I don't know what 18 you mean. 19 Q. Dr. Slocum, beginning two lines 20 from the bottom, you include a statement that 21 says, "but the flow is always from the 22 compression chamber to the rebound chamber," 23 correct? 24 A. Correct. 25 Q. Dr. Slocum, the next sentence
Page 131 1 chamber 821 must now all effectively go through 2 throttle passage 823 in order to flow into 3 chamber 822," correct? 4 A. Correct. 5 Q. Do you cite to Nakaya as support 6 in this paragraph? 7 A. Let's see if I give the actual 8 citing. You read Nakaya and it talks about how 9 the damper works, and as a POSITA you can see 10 where flow has to go. 11 So I can, in my writing here, I 12 don't give an actual line from Nakaya. I just 13 call out the elements. I can go to Nakaya and 14 get you that passage if you would like, because 15 it describes what's happening in those figures. 16 Q. Dr. Slocum, in Paragraph 66 of 17 your declaration, you do not cite to any 18 evidence, correct? 19 A. I disagree. Figure 8 -- Figure 8 20 is from the patent. Figure 8 is well numbered. 21 A POSITA looks at Figure 8, reads the patent, 22 and knows where the air will flow. I mean, 23 that is what a POSITA does. So Figure 8 is the 24 citation. 25 And the numbering, I'm	Page 133 1 reads, "There is no flow from lower compression 2 chamber 822 (i.e., the alleged bottom out cup) 3 to the upper compression chamber 821 during the 4 compression cycle," correct? 5 A. Correct. 6 Q. Dr. Slocum, do you cite any 7 portion of Nakaya in support of these 8 statements? 9 A. It is how that device works. I 10 will go to Nakaya, since you seem to want to 11 have a column/line number, so give me a minute. 12 Okay. So if you go to Column 9, 13 and one of the things of Nakaya that is very 14 nice, he explains in exquisite detail all the 15 elements everywhere. 16 So if you go down to starting 17 around line 20, and I shall read and explain. 18 "At a stage where the bending degree of the 19 knee is small and the second chamber 82 is not 20 yet divided in two, the constant throttle valve 21 140 generates a torque necessary for increasing 22 the pressure in the second chamber 82." This 23 is as we were discussing earlier when I was 24 talking about that graph. 25 Now here is the key. "On the

Page 134 1 other hand, at a stage when the bending degree 2 of the knee is increased and the second chamber 3 82 is divided in two," so that is what you now 4 have starting in Figure 8. 5 So earlier what I was reading 6 refers to Figure 7. Now we're at the Figure 8 7 stage. "The constant throttle valve 140 8 increases the pressure in the chamber 822 and 9 the throttle valve 824 increases the pressure 10 in the chamber 821." 11 That's telling me that the flow 12 can only go through 140 and back up to fill up 13 the rebound chamber. Those words to a POSITA 14 means that you will not have flow going the 15 other way. The flow will go from high pressure 16 to low pressure, and that is what I have drawn 17 with the red arrows there. 18 So again, to me, Figure 8, I'm 19 reciting Figure 8 and all the elements, and a 20 POSITA knows you go from high pressure to low 21 pressure, and there it is right there after 22 starting on Page 8, line 34, all the way down 23 here to the end. 24 Q. Dr. Slocum, do you cite any 25 portion of Column 9 in Paragraph 66?	Page 136 1 communication between the cup and the primary 2 compression chamber in a compression stroke of 3 the damper." 4 So that's telling me I have a 5 defined fluid resistance, not just a leakage, 6 but something that the designers intended there 7 to be that can be set somehow during 8 manufacturing, somehow. It doesn't give me 9 that information. 10 When I read the patent, 11 particularly in Figure 3A, it's very 12 specifically calling out how the entrance to 13 the cup is tapered, because it wants there to 14 be initially flow along the line 281, and that 15 is going to change as the piston 250 enters the 16 cup. 17 So my reading would be, then, that 18 in Claim 11 that fluid flow path is as 19 indicated by the line 281. 20 Now, as I read on to the next 21 claims, Claim 13 I think is what you asked 22 about next, was, "The damper of Claim 12," 23 which is Claim 11, which comes -- we just read 24 about -- "further including a fluid flow path 25 formed between the cup and the primary
Page 135 1 A. As I said, I say Figure 8, and I'm 2 calling out all the numbers. I don't know how 3 to cite such long verbiage, other than that I'm 4 saying here is the number of the figure, here 5 are the elements, and that's my job as an 6 expert is to explain what is happening. 7 So I don't know how to respond to 8 your question, other than that. 9 Q. Dr. Slocum, will you please turn 10 your attention to Paragraph 79 of your 11 declaration, which is Exhibit 2010 in this 12 matter. 13 A. Okay. Hold on. Okay. I'm there. 14 I shall read it. Okay. 15 Q. Dr. Slocum, can you tell me which 16 element in the figures of the '223 patent 17 describe the fluid flow path for Claim 11 and 18 which element in the figures of the '223 patent 19 describe the fluid flow path in Claim 13? 20 A. Okay. So if you look at Figure 21 3A, I'll use that one. That's a good figure 22 for this. 23 Claim 11 states, the last element, 24 "an adjustable fluid flow path formed in the 25 cup, the flow path providing fluid	Page 137 1 compression chamber; wherein the capacity of 2 the fluid flow path is adjustable." 3 So again, in reading the patent, 4 and looking at Figure 3A, for example, that 5 tells me it's that needle valve 350. Let me 6 make sure -- yeah, that adjustable valve there, 7 by you opening and closing it, it will vary the 8 flow that can go through it, which is sometimes 9 referred to as capacity. 10 Okay, Column 5, Line 5 -- excuse 11 me, six, it says, "the user adjustable metering 12 valve 350," and then down below, starting at 13 line 14, it says, "even when the valve 350 is 14 completely closed with no fluid entering the 15 compression portion of the chamber through the 16 metering valve 350." 17 So it's telling me, okay, that is 18 open -- you can open and close that. So that 19 would be that that's -- from open to close, 20 that's the capacity. You can adjust it to be 21 totally open, closed, or anything in between. 22 And then Claim 14 goes on, I think 23 to reinforce that, by saying it's externally 24 accessible. 25 So the first flow path is not

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Page 138 1 externally accessible. So that's how I know 2 that 350 is the adjustable one. 3 Q. Dr. Slocum, what is a shim stack? 4 A. In the context of this patent, a 5 bunch of thin pieces of metal that are often 6 called shims that are stacked up. So together 7 they give you a spring rate that you want. 8 Now, the reason you use a stack of 9 thin pieces of metal as opposed to just one 10 thick piece is, I can have for a given force 11 more deflection opening without yielding the 12 metal by stacking them than by trying to 13 achieve the same thing with one solid piece. 14 This gets to, because deflection 15 goes as a function of thickness cubed, stress 16 is a function of thickness squared. It's that 17 non-linear relationship that a designer works 18 with in determining to use a single piece of 19 something, and these are called flectures, or 20 stack them up. 21 It's the same thing as the leaf 22 springs in your car. Well, most cars don't 23 have leaf springs. If you look at the springs 24 on a truck, why there are many layers as 25 opposed to just one thick piece of steel. So	Page 140 1 stack be replaced with another set, another 2 shim stack having a different set of stress and 3 bending properties? 4 MS. BHATTACHARYYA: Objection. 5 Form. Incomplete hypothetical. 6 A. I can't say yes or no. I have to 7 see the shim stack you're talking about and 8 what you would like to replace it with, and 9 then I could perform an analysis to see if that 10 is possible, you know, it's a viable 11 replacement. It's too vague of a question for 12 me to answer one way or the other. 13 Q. Are you aware that Petitioner, Fox 14 Factory, allows a consumer to buy a rear shock 15 absorber or a fork having different, what they 16 refer to as tunes, that at times include 17 different shim stacks? 18 MS. BHATTACHARYYA: Objection. 19 Form. Mischaracterizes the record. Fox 20 is not the Petitioner here. 21 MR. DURBIN: Strike my question. 22 Q. Dr. Slocum, are you aware that 23 Patent Owner, Fox Factory, allows consumers to 24 buy shock absorbers having different tunes? 25 A. I'm not specifically aware, but I
Page 139 1 here the shim stack is what you used, pressure 2 gets to a certain point, and gives you the flow 3 rate through from one side of the piston to the 4 other. 5 Q. Can a set -- scratch that. 6 Can a shim stack be replaced with 7 a shim stack having different properties? 8 MS. BHATTACHARYYA: Objection. 9 Form. 10 A. That question doesn't make any 11 sense to me. Can I replace something with 12 something that's different? I need to know a 13 lot more what you're replacing what with whom? 14 Q. Dr. Slocum, does a given shim 15 stack have a set of stress and bending 16 properties that you discussed in your previous 17 answer? 18 A. Yeah, any shim stack will have, 19 based on the materials, the size, how it is 20 constrained and how it is preloaded, a set of, 21 if you will, elastic properties, how it forms 22 according to force or pressure, and how and 23 when it will fail. 24 Q. For a given damper that uses a 25 piston having a shim stack, could that shim	Page 141 1 am aware in general in the industry that kits 2 are sold so people can optimize their shocks 3 for the type of ride they want. 4 There are so many different people 5 and so many different desirements, and it's 6 very expensive to keep a huge range of product 7 numbers on the shelf. So often you keep a 8 limited number of products, and then you sell 9 the pieces that would enable someone who has 10 the ability or they will get their bike shop to 11 change out elements, so you effectively can 12 increase your product range with a minimal 13 number of things that must actually be stored 14 on the shelf at the -- and that reduces your 15 inventory costs and gives users -- I think 16 users actually appreciate that ability, the 17 high end users anyway. 18 That's my experience in designing 19 products. 20 Q. Dr. Slocum, are you familiar with 21 the company named Rock Shocks? 22 A. I am. SRAM bought them a little 23 while ago, but they were originally just their 24 own company. 25 Q. Dr. Slocum, does Rock Shocks also

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Page 142 1 over different tunes that include different 2 shim stacks for shock absorbers and torques? 3 A. I am not aware, but it wouldn't 4 surprise me. As I said earlier, most of these 5 bicycle shock component companies enable users 6 to buy either from them -- there's a lot of 7 aftermarket things often that are sold. 8 Q. Dr. Slocum, would you please turn 9 your attention to Paragraph 45 of your 10 declaration. 11 A. Okay. 12 Q. Dr. Slocum, would you please 13 review Paragraph 45 of your declaration. 14 A. Okay. 15 Q. Dr. Slocum, you state in your 16 declaration that "for Kodama, because it is an 17 air-based system, it would require significant 18 engineering analysis/experimentation" -- 19 scratch that. 20 Dr. Slocum, in this Paragraph 45 21 you state that because Kodama is an air-based 22 system, it would require significant 23 engineering analysis/experimentation to adapt 24 Kodama for use as a damper or shock absorber, 25 correct?	Page 144 1 to modeling all the fluid passages, and 2 essentially write more extensive matlab script, 3 that would be analysis. Slash experimentation 4 means, well, go buy one. Hook it up to your 5 instruments. See what it does. Measure 6 temperatures. 7 So you would approach it from an 8 experimental perspective from trial and error, 9 so you could either do it almost pure analysis 10 or pure trial and error or somewhere in 11 between, you know, a little bit of both. 12 Two hours in the lab can save ten 13 hours of analysis and two hours of analysis can 14 save ten hours in the lab. That is the skill 15 of the practitioner to minimize the effort; 16 right? 17 Q. Dr. Slocum -- 18 A. That's what I would have to do. 19 So I can't look at it and say, yeah, I know how 20 to do this. It will work, because experience 21 shows what's here should work. My experience 22 says, you wouldn't normally do it, but if you 23 want me to do it, I would have to spend some 24 time to try to figure out how I could, if it 25 could be done.
Page 143 1 A. I say would be required to adapt 2 it. I don't say it can't be done. I'm saying 3 I would have to work at it to figure out how to 4 do that. 5 Q. Dr. Slocum, in this paragraph, 6 what do you mean by "significant engineering 7 analysis/experimentation"? 8 A. Well, first of all, you don't 9 scale a patent drawing; okay? And if something 10 is an air-based system, my experience as a 11 POSITA would know by experience, it could be a 12 great spring. Everything always has some 13 damping. That's just the second law of 14 thermodynamics. 15 And you would also, just reading 16 from the cover of the patent, that these are 17 prosthetic limbs, which sets the stage for a 18 POSITA to understand it's mostly a spring, you 19 will have some damping so you don't go out of 20 control, but you're primarily using it as 21 energy storage and return element. 22 So that tells me that, okay, if I 23 wanted to set it up to use it as a damper, 24 that's fine. I'll take this overall geometry, 25 but I'm going to start from scratch with regard	Page 145 1 Q. Dr. Slocum, would a POSITA know 2 how to perform those calculations and 3 experiments? 4 A. Yeah, I think -- I'm looking at 5 this as a POSITA. That's what the POSITA's 6 opinion would be, that, gee, you know, that's 7 not intended for that, but, you know, if 8 someone is going to pay me to do it, I'll have 9 a go. I might be successful, I might not. But 10 it's not something you're going to do in an 11 hour. 12 MR. DURBIN: Dr. Slocum, I'm going 13 to introduce an exhibit that's already 14 been marked, Exhibit 1006. 15 (Document marked as Exhibit 1006 16 for identification) 17 A. Gartner. I've got it in my paper 18 somewhere. What happened to my Gartner? 19 Q. Dr. Slocum, Exhibit 1006, I 20 believe, would be referred to by everyone as 21 Kodama. 22 A. Oh, I'm sorry. I looked at the 23 screen and it was too small. But, yeah, this 24 is Kodama. That's my unmarked paper copy. 25 Q. Dr. Slocum, would you please turn

Page 146 1 your attention to Figure 2 of Kodama. 2 A. Okay. I do want to note that 3 Figure 4, ah-ha, as I recalled earlier, I 4 remember seeing one of the prosthetic patents 5 having a sequence of walking to illustrate what 6 the devices are doing as different parts of the 7 step. 8 But I'm at Figure 2 now. It says 9 "Prior Art." 10 Q. Dr. Slocum, do you see in Kodama 11 the channel that appears to run from the 12 compression portion to the rebound portion 13 through the center of Kodama's piston? 14 A. Okay. Hold on. This is one of 15 those cases where the paper is really small and 16 smudgy, so I'm going to bring up the electronic 17 so I can blow it up. 18 Q. I believe that numeral 30 is 19 pointing to the void where the pathway from the 20 piston, the opening in the piston and the 21 compression chamber meets with the opening on 22 the side of the piston that leads to a read on 23 chamber. 24 A. Okay. Hold on. I was 25 manipulating the figures so I could actually	Page 148 1 the compression portion to the rebound portion 2 that is regulated by a needle valve? 3 A. I've got to see what kind of valve 4 it is. If you look on the '223 patents, the 5 element 470 -- those elements in the core of 6 the rod -- I think it's 477 -- I think one of 7 the embodiments talks about you can run it so 8 the fluid can go from the compression chamber 9 up through there. I don't know what kind of -- 10 I don't recall what kind of valve it's talking 11 about. Let me go ahead and check in the '223. 12 Okay. If you look at line 6 -- 13 sorry, Column 6, that paragraph, first 14 paragraph, starts out talking about rebound. 15 And then if you go down to Line 12, because I 16 think you were referring to compression, it 17 says, "In another embodiment, not shown, check 18 valve 475 is reversed and dampening of the 19 compression stroke is reduced by the allowance 20 of additional fluid flow through the shaft 215 21 and along path 465 but in an opposite direction 22 from the one shown in Figure 4 as direction 23 465. Reversing the check valve from the shown 24 embodiment results in valve member 476 and 477 25 being oriented towards the bottom out piston."
Page 147 1 see it. It's a little smudgy on the screen, 2 too. When I blow it up to be so it's not so 3 smudgy, it's kind of hard to get enough to 4 view. Okay. I think I'm at a reasonable 5 compromise here. So please go ahead now and 6 ask me now what you wanted to ask me. 7 Q. Dr. Slocum, does needle 32 8 regulate the flow, in this case, of a fluid 9 which is air during compression as the air 10 passes from the compression portion to the 11 rebound portion of Kodama? 12 A. Let me double-check. I think I 13 recall reading that, but let me double-check, 14 please. So now I've just got to go to the 15 text. 16 Yes, so in line -- sorry. Column 17 1, line 49 -- 48 through 52, that's what it 18 tells me it does. It connects the head chamber 19 24 to the rod chamber 26 where the throttle 20 valve 30 having a needle valve body 32. 21 Q. Dr. Slocum, are you aware of any 22 oil-based dampers that include, you know, a 23 hole -- scratch that. 24 Dr. Slocum, are you aware of any 25 oil-based dampers that include a pathway from	Page 149 1 So that's saying, yeah, you're 2 sending flow up through the bore. And then 3 valve number 476 and 477 I think was a needle 4 valve, but let me check. 5 475 is some sort of valve that can 6 be set by the user. I don't know if it's a 7 needle valve. There's many different types of 8 low restrictor valves. 9 But my belief is on the previous 10 from the rebound, you can set that resistance. 11 Here what the patent is saying is that that 12 provides an additional flow path, for example, 13 because you already have the shim stack from 14 477, and it's saying this is a way that you can 15 have less damping by letting that oil flow up 16 through the center on a compression stroke. 17 Q. Dr. Slocum, the '223 patent 18 doesn't purport to have invented this needle 19 valve, correct? 20 A. Well, needle valves have been 21 around, I don't know, hundreds of years. I 22 mean, it's an element that people use in 23 assemblies. 24 Q. Dr. Slocum, the use of needle 25 valves and shock absorbers was well known

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Page 150 1 before the '223 patent, correct? 2 MS. BHATTACHARYYA: Objection. 3 Form. Mischaracterizes the record. 4 A. I mean, a needle valve is a 5 restricter, and restrictors are used in shock 6 absorbers. And, you know, sometimes you design 7 them with orifices that are fixed and sometimes 8 you can adjust how much damping you want. So a 9 needle valve is a very common way in an 10 adjustable orifice. 11 So I think the answer is, yes, 12 it's correct. It's a common element. 13 Q. Dr. Slocum, would you please now 14 turn your attention to Paragraphs 104 through 15 107 of your declaration, which is Exhibit 2010 16 in this matter. 17 A. Okay. 104, I think you said, 18 correct? On Page 63, 104, correct? 19 Q. Yes, Dr. Slocum. What is 20 discussed in Paragraph 104 through 107? 21 A. Okay. Let me refresh myself, 22 please. Okay. I read through. Can you please 23 ask me your question again? 24 Q. Dr. Slocum, Gartner's bottom out 25 cup only provides damping at the end of the	Page 152 1 Column 9, line 25, it says, "Shock absorber 420 2 includes one or more features for externally 3 adjusting the damping characteristics of second 4 internal shock absorber 400." 5 So as I said earlier, you're 6 taking a shock absorber that typically exists, 7 and then you're literally adding a small 8 miniature one on the inside. So I'm not sure 9 how to answer your question. Maybe I 10 misunderstood it. If you could ask me again, 11 please. 12 Q. Dr. Slocum, do you see Gartner's 13 compression value 460.4 in Figure 12A of 14 Gartner? 15 A. Hold on. Okay. Figure 12A, 16 460.4, I see that compression volume. 17 Q. Is compression volume 460.4 18 located at the end of cylinder 26, which is 19 labeled in Figure 12A on the right side of the 20 cylinder? 21 A. Yeah, that whole shock absorber 22 within a shock absorber with the spring and all 23 the elements of a traditional big one on the 24 outside, you can see the number 400 I referred 25 to earlier, that is held in -- see the element
Page 151 1 stroke, correct? 2 MS. BHATTACHARYYA: Objection. 3 Form. Mischaracterizes the record. 4 A. Okay. So I don't think Gartner 5 has a bottom out cup. It has a second shock 6 absorber within a shock absorber. So I think 7 we have to go through the details of Figure 12 8 what that mechanism actually is, and how it 9 operates. 10 Q. Dr. Slocum -- 11 A. Excuse me. It's a shock absorber 12 within a shock absorber that is engaged by one, 13 the end of the rod smacking into the exposed 14 end of the other rod. 15 Q. Dr. Slocum, Gartner's, which you 16 referred to as a second shock absorber, only 17 provides damping at the end of Gartner's 18 compression stroke, correct? 19 MS. BHATTACHARYYA: Same 20 objections. 21 A. Hold on. I want to check -- I 22 want to read through Gartner real quick just to 23 make sure we have our terminology right. I 24 have to find my Gartner. Hold on. Here we go. 25 Gartner talks about, if you go to	Page 153 1 26.2. It looks like it's threaded into -- 2 that's what the overlapping mechanical lines 3 are. 4 You take that self-contained shock 5 absorber, thread it into that head 26.2, then 6 the body 26 actually threads on top of that in 7 there. Do you see body 26 it's a tube, and 8 comes in at 26.2, there's overlapping lines? 9 That indicates a screw thread. 10 So that's how you assemble this 11 thing. You first thread on your first shock 12 absorber, which you could take and 13 independently test it during the assembly 14 process to make sure everything is good, it 15 works, it performs as needed. Great. Now you 16 assemble the rest of it, because once you put 17 all of this stuff together, you always try to 18 test these elements if you can as you put them 19 together as part of your quality control. You 20 don't want to assemble a whole bunch of things, 21 find out the whole system doesn't work, and 22 then not know what might have not been working. 23 That's very expensive. 24 So they did a very nice job here 25 of putting one shock absorber in place so you

Page 154 1 could test it, and then adding a second one. 2 That's what those thread lines mean. 3 Q. Dr. Slocum, will compression 4 volume 460.4 provide second compression 5 characteristics at the end of a compression 6 stroke of the piston 22? 7 MS. BHATTACHARYYA: Objection. 8 Form. 9 A. Yeah, the shock absorber into 10 itself, and when the primary shock absorber 11 gets to that point, and smacks into it, it's 12 going to have additional force pushing back, 13 but it's not the force of if you smack into a 14 solid rigid wall. That's why you're putting 15 the two shock absorbers in series. 16 If you look -- well, we can go 17 into detail in the text, but that's what 18 Gartner is describing. 19 Q. Dr. Slocum, would you please turn 20 your attention to Page 65 of your declaration. 21 A. Okay. Hold on. Okay. I'm on 22 Page 65. 23 Q. Does Gartner label what you have 24 annotated as rebound chamber of shock absorber 25 400?	Page 156 1 pushes the piston back up to make 460.4 chamber 2 get back to its original volume. 3 Q. Dr. Slocum, does Gartner label 4 your purported rebound chamber with any element 5 number? 6 A. Let me see. I've got to remember. 7 No, it doesn't. There's not a separate thing 8 called the rebound chamber 400. That is where 9 the fluid flows. It's open, as you can see, to 10 the chamber 26.4 above it. 11 So the oil will exchange between 12 the two. It has to go somewhere out of what is 13 the compression chamber of 26.4. It has got to 14 go somewhere, and it doesn't exit anywhere 15 else. 16 So it's the opposite of the 17 compression chamber, and I think that's why I 18 called it the rebound chamber. 19 Q. Dr. Slocum, will you now please 20 turn your attention to Page 71 of your 21 declaration. 22 A. Hold on. 23 Q. Dr. Slocum, I will represent to 24 you 71 states Exhibit A. If you have -- 25 A. Oh, okay.
Page 155 1 A. Rebound chamber shock absorber 2 420, I think you just said 400. Oh, up on the 3 internal secondary one? Okay. Hold on. 4 Q. Dr. Slocum, strike my question. 5 It was inartfully asked. 6 Dr. Slocum, in your annotations on 7 Page 65 of your report, do you state "rebound 8 chamber of shock absorber 400," including the 9 blue arrow? 10 A. Yeah, the rebound chamber 400 with 11 the blue arrow, that's where the oil flows to 12 when you compress the volume 460.4. 13 And you can see in Figure 12A, do 14 you see the arrows indicating flow? The text 15 describes that also. That's why I called it a 16 "rebound chamber." 17 The arrows are showing how the oil 18 flows from what we have been calling a 19 compression chamber to some zone above it, and 20 that's why I'm referring to it as "rebound 21 chamber." 22 And then when the whole device 23 extends, the springs, and you can tell there's 24 springs, those little round pieces in there, 25 that's actually a mechanical spring is what	Page 157 1 Q. If you can turn your attention to 2 Page 72 if that's more convenient for you. 3 A. That's more convenient, please. I 4 don't know what happened to the Exhibit A page, 5 but I have 72. 6 Q. Dr. Slocum, what is included on 7 Pages 72 through 115 of your declaration? 8 That's through the end. 9 A. Okay. That's what I've got. 10 That's what we've been discussing the last 11 couple of days as my personnel record or 12 sometimes referred to as a CV or resume. 13 Q. Dr. Slocum, is your CV up to date? 14 A. As we discussed earlier, for the 15 matters here, it is. Since December 2022 a 16 number of hydrogen generation patents and 17 articles on that and medical devices, but I 18 don't recall anything that's of particular 19 reference for here I would want to recount or 20 need to recount. 21 Q. Dr. Slocum, may I please turn your 22 attention to Item 5 on Page 72 of your report, 23 of your declaration. 24 A. Okay. I'm there. 25 Q. What is stated in Item 5?

40 (Pages 154 - 157)

Page 158 1 A. "Principal Field of Interest: 2 Precision Engineering." 3 Q. What is precision engineering, 4 Dr. Slocum? 5 A. This is a field of engineering 6 where -- concerned with the design and 7 engineering of devices that would be called 8 "precise." 9 "Precision" means repeatability. 10 So can you design something that will do what 11 it's intended to do, and then keep doing that 12 for some desired life. 13 Quite often precision engineering 14 has an intonation of high fidelity. It's not 15 generally product design, which is often more 16 ergonomic driven. Precision engineering is 17 quite often -- requires a fair amount of 18 mathematics to predict what's going on. Then 19 you use the mathematics, you study the 20 variation of parameters to see how your device 21 will perform if things aren't exactly sized as 22 they should be, and that's from static devices 23 to dynamic devices, sometimes with computer 24 control or non-computer control. It depends 25 what you need to do. The math doesn't really	Page 160 1 professor. 2 Each step of the way you're 3 rewarded with more committees, which sounds 4 facetious, but it's an opportunity to bring 5 good change about. Yeah, it takes more time, 6 and you will get a little bit of a raise at 7 each step. 8 But it's a very flat organization. 9 It's not like when I walk down the hall, 10 assistant professors genuflect at me. No, that 11 doesn't happen. 12 Q. Dr. Slocum, what is listed in 13 Section 9 on the following page, Page 73? 14 A. That is the history of my 15 appointments. I can go through them if you 16 want. I first started in 1985 all the way up 17 to eventually I became a professor in 1998, and 18 I still am. 19 Q. Dr. Slocum, please turn your 20 attention to Page 74 of your declaration. 21 A. Okay. 22 Q. What's listed, broadly speaking, 23 in Section 12? 24 A. "Awards or Honors Received." 25 Q. Dr. Slocum, do any of these awards
Page 159 1 care. 2 Q. Dr. Slocum, what is listed in 3 Section 6 listed on Page 72 of your 4 declaration? 5 A. That is name and rank of other 6 department faculty in the same field. 7 Q. What does "rank" mean? 8 A. Well, rank is your title as a 9 professor. It ranges from assistant professor 10 without tenure. Those are the people we just 11 typically hire brand new. Then there's the 12 associate professor without tenure. Typically 13 that happens like two to three years later. 14 Then associate professor with tenure, another 15 two to three years after. 16 So typically then after a period 17 of about seven years, you have been performing, 18 you know, publishing, graduating students, 19 doing research. The tenure process, I won't 20 bore you with the details of that, but then you 21 may be awarded tenure. Now you're associate 22 professor with tenure. It can be two years, 23 three years, some people never make it, but 24 typically three to five years afterwards. If 25 you keep producing, then the title of	Page 161 1 or honors directly and explicitly relate to 2 bicycle or vehicle suspensions? 3 A. Well, directly in terms of the 4 energy absorption, renewable energy devices, 5 energy harvesting, explicitly I don't have 6 anything in here that I recall that says for 7 Slocum's work on bicycle suspensions. 8 Q. Dr. Slocum, will you please turn 9 your attention to Section 14 on Page 75 of your 10 declaration. 11 A. Okay. 12 Q. What's listed broadly in Section 13 14? 14 A. This is a listing of my patents to 15 date. There's, as I recall, maybe two dozen 16 more since that time, but not for like hydrogen 17 generation and medical devices. They're not -- 18 there might be an energy storage device or two, 19 but nothing explicitly that says bicycles in 20 the title. 21 So a lot of energy storage, 22 damping, the mathematics we talked about 23 earlier, the fluid flow, you know, for all of 24 my hydraulic devices, but they're not 25 explicitly bicycles.

41 (Pages 158 - 161)

Page 162 1 Q. Dr. Slocum, now turning to Page 82 2 of your declaration, what is listed in Section 3 16 here, and do any of these explicitly relate 4 to buys calls or vehicle suspension 5 technologies? 6 A. Again, many hydraulic systems, 7 energy storage systems, but there's none of 8 them that say explicitly major new product, 9 bicycle or bicycle components specifically in 10 the title. 11 Q. Dr. Slocum, would you please turn 12 your attention to Section 19, beginning on Page 13 85 of your declaration. 14 A. Okay. 15 Q. What is listed in Section 19? 16 A. These are "Papers in Referee 17 Journals." So these would be peer-reviewed 18 papers appearing in journals, engineering 19 journals in particular. 20 Q. Dr. Slocum, do any of these papers 21 listed in Section 19 explicitly relate to 22 bicycle suspensions or vehicle suspensions? 23 A. Again, the math of many of the 24 dampers and fluid systems, energy harvesting, 25 is directly, but them explicitly that I recall	Page 164 1 A. They would either be familiar 2 directly with them or understand the design 3 principles so they could analyze them, and then 4 assess is it appropriate or not for the 5 situation. 6 So particular catalog recollection 7 is not implied in this, understanding the 8 mathematics of how they work. And then machine 9 elements, as you can see, I talk about where 10 the crosshatch lines, what is a thread, what is 11 an orifice. They have to be able to look at 12 something and understand what it is, and then 13 understand the physical operating principles so 14 they could then assess whether or not it's 15 appropriate or what they might have to do to 16 evolve it to use it or whether it's usable or 17 not for what they want to do. 18 Q. Dr. Slocum, would a POSITA be 19 familiar with the operation of fluidic or 20 pneumatic components? 21 A. I believe so. That's basic 22 mechanical engineering. 23 MR. DURBIN: Okay. Dr. Slocum, 24 and counsel, I would like to go off the 25 record and take a ten-minute break. I
Page 163 1 talk about a bicycle component, you know, here 2 I'm doing some specific study of it. 3 MR. DURBIN: Dr. Slocum and 4 counsel, I believe I'm at a stopping 5 point, but I need to look over my notes. 6 Can we go off the record for ten minutes 7 -- strike that comment. I have one 8 question I know remaining, and then I'll 9 review. 10 Q. Dr. Slocum, would you please turn 11 to Paragraphs 23 and 24 of your declaration. 12 A. I'm sorry, paragraph or page? 13 Q. Paragraph 23 and Paragraph 24. 14 A. Okay. 15 Q. On Page 9 of your declaration. 16 A. Okay. I'm here. "Level of 17 Ordinary Skill in the Art." 18 Q. Would you please review Paragraphs 19 23 and 24 of your declaration, Dr. Slocum. 20 A. Okay. 21 Q. Dr. Slocum, a POSITA would be 22 familiar with both air-based stamping systems 23 and oil-based stamping systems, correct? 24 MS. BHATTACHARYYA: Objection. 25 Form, mischaracterizes prior testimony.	Page 165 1 believe that I'm finished with my 2 questioning. I'll know, though, after 3 this break. 4 THE WITNESS: We'll come back at 5 1:55? 6 MR. DURBIN: Yes. 7 THE VIDEOGRAPHER: The time is 8 4:44 p.m. eastern time. We're off the 9 record. 10 (Recess taken at 4:44 p.m. and 11 reconvening at 4:55 p.m.) 12 THE VIDEOGRAPHER: The time is 13 4:55 p.m. We're on the record. 14 MR. DURBIN: Dr. Slocum, thank 15 you. I have no further questions at 16 this time. 17 THE WITNESS: Thank you. 18 MS. BHATTACHARYYA: I have a few 19 redirect questions for Dr. Slocum. 20 EXAMINATION BY 21 MS. BHATTACHARYYA: 22 Q. Dr. Slocum, are you aware that 23 when Petitioner SRAM submitted its IPR petition 24 against the '223 patent, it submitted two 25 declarations in support of the petition, one

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Page 166 1 from Dr. Wang and one from Mr. Wesling? 2 MR. DURBIN: Objection. Beyond 3 the scope of cross. Leading. 4 Foundation. 5 A. I think I'm supposed to answer? 6 Q. Yes. 7 A. Yes, that was all part of what I'm 8 responding to. My declaration is in response 9 to opinions in that whole package. 10 Q. And by the whole package, you mean 11 the petition and the declarations in the prior 12 art references that were all submitted at the 13 same time when the petition was filed, correct? 14 MR. DURBIN: Objection. 15 A. I think that's what I stated in my 16 beginning. Here is all the stuff I looked at. 17 It was the petition, all the stuff in support 18 of the petition. And then -- yeah, that was 19 all there. 20 I mean, that's what my declaration 21 is about is responding to what other experts 22 are saying and what's in the petition and 23 everything. That's what it's all about. It's 24 kind of why I thought I'm here today for 25 questions.	Page 168 1 saying why it's invalid. So I apologize, 2 that's an oversight. I should have listed -- 3 well, the inter partes review, which we have 4 been talking about the whole time, and also the 5 other two reports, which I did read. 6 Q. Earlier when Mr. Durbin was 7 questioning you, he asked you a lot of 8 questions about dampers and the function of a 9 damper, et cetera. 10 Do you recall that? 11 A. I do. 12 MR. DURBIN: Form. 13 Q. And you answered that pretty much 14 any mechanical device would provide some amount 15 of damping as part of the second law of 16 thermodynamics. 17 Do you recall that? 18 MR. DURBIN: Objection. 19 Mischaracterizes prior testimony. 20 A. Everything loses energy, and it 21 does, absolutely everything. That's why the 22 patent office doesn't review anything that 23 purports to be able to generate more energy 24 than you put in it. They don't even bother 25 reviewing it. They just throw it out, because
Page 167 1 Q. If we go to Page 5 of your 2 declaration, which is Exhibit 2010. 3 A. Okay. 4 Q. You list several references in 5 Pages 5 and 6 of your declaration. 6 Do you see that? 7 A. I do. 8 Q. You did not explicitly mention the 9 declarations of Dr. Wang and Mr. Wesling in 10 here. So I just wanted to confirm with you 11 that you have reviewed those declarations prior 12 to preparing your declaration? 13 MR. DURBIN: Objection. Same 14 objections. 15 Q. Is that right? 16 MR. DURBIN: Objection. Leading. 17 Foundation. 18 A. I don't want to speak over 19 anybody. So can I answer now? 20 That's an oversight. My whole 21 report is responding to what has been -- well, 22 SRAM has been saying why Fox's patent is 23 invalid. 24 So I wouldn't have written any of 25 this if I didn't have what were the opinions	Page 169 1 you can't. The universe is winding down. 2 Everything dissipates energy. 3 Q. But then as a person skilled in 4 the art, how do you define a device as a 5 damper? 6 A. There's a couple ways. The first 7 way is, and it's somewhat subjective, but the 8 first way is, can it dissipate the amount of 9 energy I want it to dissipate continually. 10 In other words, is its 11 performance, you know, I said I want to have 12 this much energy dissipated as a function of, 13 again, we'll come back to the mathematics of 14 mass times acceleration plus spring constant 15 times amount of compression, plus this damping 16 B times velocity. 17 So those three physical parameters 18 define dynamically how a machine performs. You 19 can have an under-damp system, which is called 20 an oscillator, where you're purposely trying to 21 allow things to repeat and not take a lot of 22 energy out of it. 23 So, for example, a prosthetic leg 24 or a weaving loom, the shuttle on a weaving 25 loom has to bounce back and forth, and when it

Page 170 1 changes direction, any energy that's lost, you 2 have to put back in, but it will lose some. 3 And that would be what would be referred to 4 under-damped system. Not an oscillator yet, 5 but low damping. 6 Critically damped is something if 7 you pluck it, it will vibrate and it will decay 8 within two or three cycles. That's the decay 9 envelope it's called. 10 Now you start getting into a 11 system that is damped or using a damper, and 12 typically that means that about for every cycle 13 of motion you're taking out around 10 percent 14 of the energy and dissipating it. That's what 15 will define that decay envelope. So typically 16 within ten oscillations, it's not oscillating 17 any more. That's where that tens of percent 18 comes from; okay? 19 So if something is 10 percent 20 damped, it will only have about that many 21 oscillations. It will decay very quickly. 22 Something that's heavily damped 23 will now -- you pluck it, and maybe only one or 24 two cycles. That is a heavily or well-damped 25 system.	Page 172 1 they're very low cost and if you hit it more 2 than that and it breaks, well, you weren't even 3 supposed to hit it in the first place. These 4 are often called end of travel dampers, because 5 you really aren't supposed to be hitting them. 6 They're there just in case. 7 Q. Dr. Slocum, earlier when Mr. 8 Durbin was questioning you, you testified that 9 the Nakaya prosthetic limb device likely dampen 10 a couple of percentage of the energy. 11 Do you recall that? 12 A. I do. 13 Q. Does that damping of a couple of 14 percent of the energy turn a Nakaya prosthetic 15 leg device into a damper as a person skilled in 16 the art would understand the term "damper" to 17 be? 18 MR. DURBIN: Objection. Leading. 19 A. No, again, it boils down to the 20 mathematics of math times acceleration plus 21 springiness or spring constant times 22 displacement plus amount of damping times 23 velocity. 24 In a human ergonomic sense, if you 25 have a system that dissipates more than a few
Page 171 1 So if you take a bike, bicycle 2 with a suspension, for example, right, and you 3 drop it on the ground to watch it bound, well, 4 you've got to have a little weight on it, or 5 you go on a jump on a bike, you'll only have 6 one or two cycles of a maybe up or down motion, 7 you won't go bump, bump, bump, bump. That's 8 not damped or considered damped in the art. 9 That's how you can define for the 10 application in terms of the looking at the 11 mathematics of vibration what one for an 12 application would consider damped or not well 13 damped. 14 I hope that helps everybody 15 understand. Again, you have to look at the 16 application, what in the context of what you're 17 working with, and it's important that that 18 mechanism keeps doing it. This relates back to 19 the precision engineering question. 20 If I have something that's damped 21 and it does it once or twice, but on the 22 hundredth cycle it blows apart, it's not a 23 damper. It's a lousy product. Or there are 24 bumpers and things designed which will take -- 25 they're only designed to take ten hits, because	Page 173 1 percent energy per cycle, the human will become 2 annoyed, and here's an example, not just on 3 prosthetics. 4 There was a big move to design 5 shoes that as you walk generate energy to 6 charge your cellphone, and indeed, the Army 7 actually -- I think it was the Army. They were 8 hoping to have soldiers to be able to charge 9 their own electronics so they don't have to 10 carry so many batteries; okay? 11 We actually did a project with a 12 well-known company that often has the use of a 13 very popular rodent in its sales. For one of 14 its theme parks, the designed strollers, as you 15 push the stroller, you would run a generator to 16 charge your cellphone, because people's 17 cellphones run out, and then they go back to 18 their room to charge their cellphone, and then 19 they don't spend money in the park, and I wrote 20 out the equation and they said, just try. All 21 right. 22 We designed one of the most 23 efficient, wonderful energy generators for 24 strollers you could possibly imagine, and sure 25 enough, we used -- I think we said, I can't

Page 174 1 remember, one or two, maybe two or three 2 percent of the energy that goes to pushing a 3 stroller would be slowly sucked in, and that's 4 what you need to keep your cellphone charge. 5 And the few people who tested it 6 said, What the hell is wrong with this 7 stroller? It feels like I'm pushing it through 8 mud. 9 The human is very, very sensitive 10 to energy loss stuff and what it does; okay? I 11 work with prosthetic design research. You only 12 work with just enough to keep it dynamically 13 stable so the leg will swing with whatever 14 action you do won't cause the prosthetic to be 15 out of the expected position that the user 16 expects it to be in during the gait cycle. If 17 you put in too much, it feels like you're 18 walking through sand. 19 Q. When you say if you put in too 20 much it feels like walking through sand, do you 21 mean like if you dampen too much energy it 22 would feel like walking through sand? 23 A. Right, because then the human -- 24 you have to put in energy back in to create the 25 motion of the leg to create the walking. So to	Page 176 1 fair amount. 2 Q. The Nakaya device dampers a couple 3 percentages of the energy. So how much more 4 energy would the Nakaya device have to 5 dissipate in order for it to be classified as a 6 damper as a person skilled in the art would 7 understand that term? 8 A. You know, it's very hard. I can't 9 give you a number, but let me explain something 10 about pneumatic systems that I think is really 11 important. 12 Let's assume it was a damper that 13 I configured the orifices and whatnot such that 14 they really would dissipate a lot of energy so 15 that if you took it and you plucked it, it 16 would only go through -- it would decay very 17 quickly in its motion. 18 When you're walking, dissipating 19 all of that energy pneumatically, it's going to 20 heat up the air. As the air heats, it's going 21 to expand, and now it's going to get stiffer. 22 So now it's not even going to function as a 23 prosthetic. It won't bend the way the user 24 thinks it's going to bend. And if you were to 25 keep forcing it, you may put enough air in
Page 175 1 dampen it is foolish, because why am I taking 2 energy out of the user and putting it into heat 3 as opposed to storing the energy from the user 4 so it can be recovered to help the user move 5 forward. 6 A prosthetic is designed to assist 7 a person to walk as naturally as possible with 8 as little effort as possible, and if you're 9 taking the energy out and dissipating it 10 somewhere, that's not useful. 11 Again, everything loses some 12 energy, and you have to design it to be lost to 13 give you the dynamic bounce or performance you 14 want, but you do not want to purposely 15 dissipate it. 16 Q. Are you aware that SRAM's experts, 17 Dr. Wang and Mr. Wesling, have referred to the 18 Nakaya device as a damper? 19 MR. DURBIN: Objection. Leading. 20 Foundation. 21 A. Well, that was in my report, I was 22 talking about that SRAM wants to consider those 23 pneumatic prosthetics as dampers, and I 24 disagreed with it, and that was the -- I think 25 we went over that in the earlier questioning a	Page 177 1 there that you're going to blow the seals out. 2 So it's not designed to do that 3 function. It's designed to be an efficient 4 machine. I can only bracket it by saying a 5 couple percent is an energy storage device with 6 what should give you the gait function for your 7 walking that you want so you can have a good 8 product or in the context of a bicycle or a 9 vehicle where you're slamming down -- you 10 purposely are slamming down. If you're 11 walking, you're not supposed to be slamming 12 down. Even when you're running, you're not 13 supposed to bang the ground. The goal is to 14 run as light-footed as possible. 15 But in bicycling or mountain 16 biking, you're going off jumps. You are 17 purposely slamming down and you have to absorb 18 that energy of your mass of your body, you 19 know, has the initial velocity when the bike 20 hits the ground, and you've got a very limited 21 range of motion to absorb it, or the 22 acceleration the rider will feel will knock 23 their teeth out. 24 That's tens of percent of the 25 energy put into the system has to be taken out

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Page 178 1 right away or you'll destroy the bike and the 2 rider. That's where this order of magnitude 3 difference is, and whether it's any more 4 granularity than that I have trouble doing. 5 MS. BHATTACHARYYA: No further 6 questions for Dr. Slocum. 7 MR. DURBIN: And I have no recross 8 questions. I thank you, though, very 9 much for your time, Dr. Slocum. It has 10 been a long but good three days. 11 THE WITNESS: Thank you for being 12 a very pleasant inquisitioner. There's 13 no sense for sometimes people get 14 unpleasant. 15 MR. DURBIN: Guilty of being a 16 Midwesterner, sir. I try to be nasty; I 17 really do. 18 THE WITNESS: I think it's 19 actually more effective than the nasty. 20 So bravo to you, sir. 21 MR. DURBIN: Thank you, too, 22 Arpita, and Michael and Brad. 23 MS. BHATTACHARYYA: I just want to 24 put in the record that we are reserving 25 the right to review and revise the	Page 180 1 C E R T I F I C A T E 2 3 I, Michael O'Connor, Registered 4 Merit Reporter/Certified Realtime Reporter, 5 do hereby certify: 6 That ALEXANDER SLOCUM, Ph.D., the 7 witness whose testimony is hereinbefore set 8 forth, was duly sworn by me and that such 9 testimony is a true and accurate record of 10 my stenotype notes taken in the foregoing 11 matter to the best of my knowledge, skill 12 and ability. 13 IN WITNESS WHEREOF, I have hereunto 14 set my hand and Notarial Seal this 25th day 15 of October 2024. 16 17 <i>Michael O'Connor</i> 18 19 MICHAEL O'CONNOR, RMR, CRR, CRC 20 Notary Public 21 22 My Commission expires: 23 November 9, 2029 24 25
Page 179 1 transcript per the rules. 2 THE WITNESS: Are we off the 3 record? 4 MS. BHATTACHARYYA: We can go off 5 the record. 6 THE VIDEOGRAPHER: We are off the 7 record at 5:15 p.m. eastern time. This 8 includes today's testimony given by Dr. 9 Alexander Slocum. 10 COURT REPORTER: Counsel, rough 11 drafts this afternoon? 12 MS. BHATTACHARYYA: I don't need 13 one. If I can get the transcripts in 14 like five business days. 15 MR. DURBIN: Michael, do you know 16 what my current order is? 17 (Discussion off the record) 18 MR. DURBIN: Five days would be 19 preferable. 20 (Whereupon the deposition 21 concluded at 5:15 p.m.) 22 23 24 25	Page 181 1 Veritext Legal Solutions 2 1100 Superior Ave 3 Suite 1820 4 Cleveland, Ohio 44114 5 Phone: 216-523-1313 6 7 November 1, 2024 8 9 To: Arpita Bhattacharyya, Esq. 10 Case Name: Fox Factory, Inc. v. SRAM, LLC 11 Veritext Reference Number: 6933281 12 13 Witness: Alexander Slocum , Ph.D. Deposition Date: 10/25/2024 14 Dear Sir/Madam: 15 Enclosed please find a deposition transcript. Please have the witness 16 review the transcript and note any changes or corrections on the 17 included errata sheet, indicating the page, line number, change, and 18 the reason for the change. Have the witness' signature notarized and 19 forward the completed page(s) back to us at the Production address 20 shown 21 above, or email to production-midwest@veritext.com. 22 If the errata is not returned within thirty days of your receipt of 23 this letter, the reading and signing will be deemed waived. 24 25 Sincerely, 26 Production Department 27 28 NO NOTARY REQUIRED IN CA

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Page 182 1 DEPOSITION REVIEW CERTIFICATION OF WITNESS 2 3 ASSIGNMENT REFERENCE NO: 6933281 CASE NAME: Fox Factory, Inc. v. SRAM, LLC DATE OF DEPOSITION: 10/25/2024 4 WITNESS' NAME: Alexander Slocum , Ph.D. 5 In accordance with the Rules of Civil Procedure, I have read the entire transcript of 6 my testimony or it has been read to me. 7 I have made no changes to the testimony as transcribed by the court reporter. 8 9 _____ Date Alexander Slocum , Ph.D. 10 Sworn to and subscribed before me, a Notary Public in and for the State and County, 11 the referenced witness did personally appear and acknowledge that: 12 They have read the transcript; 13 They signed the foregoing Sworn Statement; and 14 Their execution of this Statement is of their free act and deed. 15 I have affixed my name and official seal 16 this _____ day of _____, 20____. 17 18 _____ Notary Public 19 _____ Commission Expiration Date 20 21 22 23 24 25	Page 184 1 ERRATA SHEET VERITEXT LEGAL SOLUTIONS MIDWEST 2 ASSIGNMENT NO: 6933281 3 PAGE/LINE(S) / CHANGE /REASON 4 _____ 5 _____ 6 _____ 7 _____ 8 _____ 9 _____ 10 _____ 11 _____ 12 _____ 13 _____ 14 _____ 15 _____ 16 _____ 17 _____ 18 _____ 19 _____ 20 Date Alexander Slocum , Ph.D. 21 SUBSCRIBED AND SWORN TO BEFORE ME THIS _____ 22 DAY OF _____, 20____. 23 _____ Notary Public 24 25 _____ Commission Expiration Date
Page 183 1 DEPOSITION REVIEW CERTIFICATION OF WITNESS 2 3 ASSIGNMENT REFERENCE NO: 6933281 CASE NAME: Fox Factory, Inc. v. SRAM, LLC DATE OF DEPOSITION: 10/25/2024 4 WITNESS' NAME: Alexander Slocum , Ph.D. 5 In accordance with the Rules of Civil Procedure, I have read the entire transcript of 6 my testimony or it has been read to me. 7 I have listed my changes on the attached Errata Sheet, listing page and line numbers as 8 well as the reason(s) for the change(s). 9 I request that these changes be entered as part of the record of my testimony. 10 11 I have executed the Errata Sheet, as well as this Certificate, and request and authorize that both be appended to the transcript of my 12 testimony and be incorporated therein. 13 _____ Date Alexander Slocum , Ph.D. 14 15 Sworn to and subscribed before me, a Notary Public in and for the State and County, the referenced witness did personally appear 16 and acknowledge that: 17 They have read the transcript; They have listed all of their corrections 18 in the appended Errata Sheet; They signed the foregoing Sworn 19 Statement; and Their execution of this Statement is of 20 their free act and deed. 21 I have affixed my name and official seal 22 this _____ day of _____, 20____. 23 _____ Notary Public 24 25 _____ Commission Expiration Date	

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Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

DISCLAIMER: THE FOREGOING FEDERAL PROCEDURE RULES ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY. THE ABOVE RULES ARE CURRENT AS OF APRIL 1, 2019. PLEASE REFER TO THE APPLICABLE FEDERAL RULES OF CIVIL PROCEDURE FOR UP-TO-DATE INFORMATION.

VERITEXT LEGAL SOLUTIONS

COMPANY CERTIFICATE AND DISCLOSURE STATEMENT

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