

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FOX Factory, Inc.,

Petitioner,

v.

SRAM, LLC,

Patent Owner.

U.S. Patent No. 7,147,207 B2

Filing Date: November 4, 2004

Issue Date: December 12, 2006

Title: ACTUATOR APPARATUS FOR CONTROLLING A VALVE
MECHANISM OF A SUSPENSION SYSTEM

Case No. IPR2024-00492

DECLARATION OF T. KIM PARNELL

I. INTRODUCTION AND QUALIFICATIONS

1. My name is T. Kim Parnell. I make this Declaration in support of Patent Owner SRAM, LLC's ("SRAM" or "Patent Owner") Response to Petitioner Fox Factory, Inc.'s ("Petitioner") Petition for *Inter Partes* Review ("the Petition") of U.S. Patent No. 7,147,207 B2 ("the '207 patent"). I have personal knowledge of the facts set forth below, and, if called upon as a witness, I could and would testify to such facts under oath.

2. For the reasons stated in detail below, my opinion is that, in view of this Petition, claims 1-3, 7, 8, and 10-12 of the '207 Patent are valid and patentable.

3. I have been retained by the law firm of Lewis Rice LLC ("Lewis Rice") to provide my technical review, analysis, and opinions concerning the Petition's allegations made against the claims of the '207 Patent. I understand that this patent is owned by SRAM.

4. I am a trained Professional Mechanical Engineer (P.E.) licensed in the State of California. I hold three academic degrees: a B.E.S. in Engineering Science (with Highest Honors) from the Georgia Institute of Technology in 1978, followed by a M.S. and a Ph.D. in Mechanical Engineering from Stanford University in 1979 and 1984, respectively.

5. I am an American Society of Mechanical Engineers ("ASME") Fellow and an Institute of Electrical & Electronics Engineers ("IEEE") Life Senior Member.

These are the primary professional organizations for Mechanical and Electrical Engineering, respectively. I am a Board Member of IEEE-CNSV (Consultants' Network of Silicon Valley). I am also a member of IEEE-CT (Consumer Technology), IEEE-VTS (Vehicular Technology Society), and IEEE-EPS (Electronics Packaging Society).

6. I have served as an elected officer for several of these groups including as Chair of the IEEE-SCV (Santa Clara Valley) Section (the largest IEEE Section in the US with over 8,000 members in Silicon Valley, CA), Chair of IEEE-CNSV (Consultants' Network of Silicon Valley), and Treasurer of IEEE-VTS (Vehicular Technology Society). I am also a long-time Member of ASM International (Materials Information Society) and SAE (Society of Automotive Engineers) International. I joined SAMPE (Society for the Advancement of Materials and Process Engineering) to further expand my experience in the areas of cellular materials and composite materials. I served as Vice-Chair for the NAFEMS-CWG (Composites Working Group), which focuses directly on analysis and simulation of components designed and manufactured to take advantage of the unique material properties that are possible with composites. I am currently Vice-President of the Silicon Valley Engineering Council (*SVEC-ca.org*), which is an umbrella organization for engineering and scientific societies.

7. I currently work as a private, independent consultant through Parnell Expert Consulting. I consult with companies, including law firms, regarding patents, product liability, failure analysis, reliability, and product design/development issues. I have over 30 years of professional experience using and combining analysis, simulation, and laboratory inspection/measurement to understand and solve engineering problems in a variety of industries and applications. Many of my projects involve products that require a multidisciplinary approach and expertise.

8. I began my professional career at Bell Laboratories (“Bell Labs”) in Indianapolis, IN, in 1978 as a Member of Technical Staff (MTS). I worked at Bell Labs before and while obtaining my Stanford M.S.M.E. degree. Bell Labs supported me for the M.S.M.E. degree, and I returned to continue my career at Bell Labs in 1979. In 1980, I took a leave of absence from Bell Labs and returned to Stanford to pursue a Ph.D. in Mechanical Engineering. I completed my Stanford University Mechanical Engineering Ph.D. degree in 1984. My Ph.D. thesis focused on numerical simulation (computer models) for nonlinear analysis of shell structures. My thesis was motivated in part by issues that I studied while at Bell Labs. The techniques that I developed for nonlinear analysis of shells included the analysis of snap-through buckling, a technology being incorporated into newer and more reliable keypads in the early 1980s.

9. After graduating from Stanford University, I then joined SST Systems, Inc., a Silicon Valley start-up company, as a Principal Engineer and worked there from 1984-1986. In 1986, I joined Failure Analysis Associates, Inc. as a Senior Engineer in the Mechanics and Materials Department. I was promoted to Managing Engineer in 1990. As Managing Engineer, I worked on a wide range of projects as a consultant including aspects such as cyclic fatigue, product failures, product design, and medical device development. In 1990, the company went public as “The Failure Group,” but subsequently changed its name to “Exponent”. In 1998 I was promoted to Senior Managing Engineer at Exponent. In 1999, after leaving Exponent, I joined Rubicor Medical, Inc. as Director of Research & Development. When I left Rubicor in 2000, I started independent engineering consulting with Parnell Engineering & Consulting. In 2024, I formed a corporation named Parnell Expert Consulting to further focus my consulting practice on litigation. I have been an independent consultant since 2000. During that time, I also worked for MSC Software as a Senior Manager (2006-2010) in software Product Management.

10. From 2010-2012, I was a full-time member of the Mechanical Engineering faculty at Santa Clara University and taught classes in Manufacturing, Material Science, Mechanical Design, Finite Element Analysis (FEA), Composite Materials, and Design of Mechanisms. During this time, I served as the Faculty Advisor for several Senior Design Projects. These “real world” Capstone Design

Projects encompassed design, system integration, and manufacturing aspects and provided the students with a full product development experience. I also taught graduate courses in Mechanical Engineering at Stanford University from 1995-1996.

11. My project work includes studies for a broad range of consumer products, recreational equipment, industrial equipment, and manufacturing methods. I have in-depth experience in composite materials, elastomeric materials, metallic materials, and associated manufacturing methods. Manufacturing methods include techniques for forming, extruding, joining, and other related technologies. My practice encompasses design, failure analysis, and reliability issues. I also serve as an expert witness for litigation, and my expert work often involves intellectual property matters.

12. I have consulted and performed inspections on various types of vehicles (human-powered, electrical propulsion, internal combustion engines (ICE)), as well as other types of equipment, during my career. This work has included projects for metal forming, crashworthiness, ruggedized electronic equipment (such as waterproof laptop and keyboard technology). I have also studied ruggedization of vehicles and mechanical equipment, laptop computers and similar electronic instrumentation to withstand severe service conditions in the field. This experience further includes analyses of materials and material behavior, including elasticity,

flexibility, and impact, as well as expansive experience with polymeric materials and manufacturing methods for all material types.

13. I also have direct experience with manufacturing in multiple industries. These applications include vehicle structures, consumer electronics, biomedical, medical device, automotive, petrochemical, paper, metal forming, metalworking, specialty materials, layered composite materials, and others. Equipment at issue for manufacturing often involves injection molding, metal forming and machining, welding, joining, semiconductor packaging, pipelines and piping components, pressure vessels, sensors, and control systems.

14. Based on my education and experience, I am qualified to provide analysis and opinions on the subjects set forth in this Declaration. I have also attached my curriculum vitae as Appendix A, which, *inter alia*, identifies my prior deposition and trial testimony within the last four years.

15. I am being compensated at the rate of \$650 per hour for my work in this matter, including any time spent at deposition and trial.

16. In reaching the conclusions set forth herein, I examined and analyzed all the exhibits and papers filed in this *Inter Partes* Review. I also relied on my professional experience, education, and expertise accumulated during some four decades of industrial consulting experience. To the extent I am provided with

additional documents or information, I reserve the right to supplement my analysis and provide further opinions.

II. RELEVANT LEGAL PRINCIPLES AND BACKGROUND

17. I am not a lawyer, therefore nothing in my Declaration should be interpreted as offering a legal opinion. However, as a technical expert assisting the Board in evaluating issue of patent invalidity, I have applied legal principles as I understand them.

18. I understand that the claims of a patent set forth the scope of the asserted invention. I also understand that the meanings of the terms of the claims are presumed to be the meanings that the terms would have had to a person of ordinary skill in the art at the time of the invention (“POSITA”) here, i.e., the November 4, 2004, filing date of the initial ‘207 Patent application. I also understand that the meaning of a claim term may be understood by reference to intrinsic evidence, to include the claims themselves, the specification of the patent (including its figures), and the prosecution file history as the communications between the patent applicant and the patent office. If necessary, I will also refer to extrinsic evidence, such as dictionaries or witness testimony.

19. I understand that the Board has not yet construed any of the claims of the ‘207 Patent, but the Board may establish the meaning of certain terms during this proceeding. I also understand that SRAM and Petitioner have submitted competing

interpretations of certain claim terms from the '207 patent in the district court proceeding. Ex. 2017. Although I believe that all of SRAM's proposed constructions are correct and consistent with the perspective of a POSITA, reading those claims in view of the patent claims, the patent specification, the patent prosecution file history, and relevant extrinsic evidence, I have applied plain and ordinary meaning constructions for the purposes of evaluating validity in the manner set forth below. As set forth below, it is my opinion that the claims of the '207 Patent are valid and not anticipated or obvious. I have applied these understandings below and reserve the right to modify my analysis to the extent the Board adopts any claim constructions that differ from my understanding as a person of ordinary skill in the art.

20. With respect to the question of patent validity, I understand that a patent is only valid when the invention claimed in the patent is new, useful, and nonobvious in light of the prior art, such that the invention, as defined by the patent claims, is not anticipated or rendered obvious by the prior art. I further understand that a patent's claims must meet other statutory requirements, such as written description, enablement, and definiteness.

21. With respect to the term "prior art", I understand that this term generally refers to the state of technology in the relevant field at the time of the invention and includes such printed materials as patents and publications, as well as evidence of

actual uses or sales of a technology within the United States. I also understand that categories of prior art can include, among other things, anything that was patented or described in a printed publication anywhere in the world more than one year before the inventor filed the application for the patent, as well as sales, offers for sale, and uses of the claimed invention prior to the date of that invention.

22. I understand that, under 35 U.S.C. § 102, a claim is “anticipated” by the prior art if each and every limitation of the claim is disclosed and arranged as claimed, expressly or inherently, in a single item of prior art, from which a POSITA could practice the invention without undue experimentation.

23. I also understand that, under 35 U.S.C. § 103, a person cannot obtain a patent on an invention if his invention would have been obvious to a person of ordinary skill in the art at the time the invention was made. A conclusion of obviousness may be founded upon one or more items of prior art. In determining whether prior art references render a claim obvious, the following factors are considered: (1) the scope and content of the prior art; (2) the differences between the prior art and the claims at issue; (3) the level of skill in the pertinent art, and (4) objective evidence of nonobviousness.

III. TECHNICAL OVERVIEW OF THE INVENTIONS CLAIMED IN THE '207 PATENT

24. The '207 Patent is related to mechanisms for adjusting damping in a suspension system.

A. Suspension Systems and Prior Art Adjustment Systems for Suspension Systems

25. Suspension systems typically have two main objectives: absorb energy and dissipate that energy. The absorption of energy is typically accomplished using a spring of some sort to store the energy. The energy removal is usually carried out by a damper that performs damping, itself. These two devices, a spring and a damper, typically work together in a suspension system. As a spring is compressed in the suspension system, the damper generally restricts the manner and speed at which the spring compresses and subsequently rebounds. In a bicycle, the spring compresses as a shock is experienced by the bicycle's suspension, and the damper of the suspension regulates the compression and subsequent extension of the spring so that the system does not compress or extend too fast. Otherwise, the bicycle suspension may bounce up and down, like a pogo stick. Typical bicycle suspension systems have restricted capabilities to adjust damping characteristics of the suspension itself. Further, bicycle suspensions generally only have one way to adjust damping characteristics: by changing the position of a single lever. This may be problematic to many bicycle riders because the limited ability to adjust may impede

the rider's ability to *easily* select their preferred damping characteristics, especially when switching between different damping characteristics on a ride.

26. Specifically, conventional shock absorbers (especially those in the bicycle and related vehicles field) have adjustable damping characteristics that can *only* be adjusted by changing the position of the shock absorber's single lever. This difference is explained in the '207 Patent:

A typical design for a damping adjuster uses an adjuster rod that extends down the center of the piston shaft and engages the valve mechanism or performs the function of the valve mechanism. Adjustment is commonly made ... [when] the adjuster rod is moved axially (up or down) to alter damping ... For example, a cam attached to a lever may be engageable with the adjuster rod to vary the axial position of the rod. One problem associated with this configuration is that *any given angular position of the lever/cam corresponds to exactly one position of the adjuster rod. This limits the ability of the rider to customize the damping characteristics of the suspension system to suit the terrain or the rider's particular riding style.*

Ex. 1001 ('207 Patent), 1:30-43 (emphasis added). Thus, a conventional shock absorber may be adjusted by the rider through a rotational input at the lever to rotate a cam. This level of adjustment leaves much to be desired, as discussed above. For example, a rider must find the proper angle of the lever to adjust the damping characteristics of the shock absorber between different settings. In practice, this

process can be difficult to accomplish and even more difficult to repeat, especially in a quick manner.

27. The Petition relies upon two prior art systems that include such lever/cam and adjuster rod systems: U.S. Patent No. 6,360,857 to Fox (“Fox”)¹ and U.S. Patent No. 6,491,146 to Yi (“Yi”).²

28. Further, another of Petitioner’s prior art references includes Japanese Utility Model Registration No. 2516279 (“JP’279”), which discloses a simple inclined plane and adjuster rod system, wherein the inclined plane replaces the cam/lever of the Fox and Yi systems. Here again, we see that the prior art all contains one means, either a lever/cam or an inclined plane, to adjust the axial height or position of an adjuster rod, which axial height adjustments of the adjuster rod alters the damping characteristics of the relevant suspension system.

B. Suspension Systems of the ‘207 Patent

29. Recognizing this, the inventors of the ‘207 Patent developed a solution to this well-known problem by providing shock absorbers that are tunable to the rider’s specific preferences and needs, conveniently customizable to the rider.

¹ Ex. 1005.

² Ex. 1006.

Specifically, the technology of the ‘207 Patent gives the rider a preset damping option, as well as a user-adjustable damping option.

30. To accomplish this goal, the ‘207 Patent claims a valve actuating assembly (which may be focused on the relevant lever) with one position that provides the same damping characteristics, and a second position that provides adjustable damping characteristics via an adjuster assembly. Specifically, this solution is accomplished with the novel “actuator apparatus for controlling a valve mechanism of a suspension system that includes a valve actuating assembly operable between at least two rider-selectable positions and an adjuster assembly for adjusting the damping characteristics of at least one of the rider-selectable positions.” Ex. 1001 (‘207 Patent), 1:7-13. Thus, the ‘207 Patent’s valve actuating assembly includes a first position that provides adjustable damping characteristics, the damping characteristics setting being adjustable by a novel adjuster assembly. The valve actuating assembly further includes a second position having damping characteristics that are unaffected by adjustment made by the adjuster assembly to the first position.

31. The ability to adjust damping characteristics is important, and the need for such adjustment is described in the Background of the Invention section of the ‘207 Patent:

The damping characteristics of a suspension system can affect the quality of performance provided by a shock absorber for a given application. Damping characteristics are affected by various factors such as rider weight, rider skill, terrain conditions, etc. Accordingly, it is desirable to provide a suspension system wherein the damping characteristics are adjustable. Further, it is advantageous to provide shock absorbers that are externally adjustable by the rider.

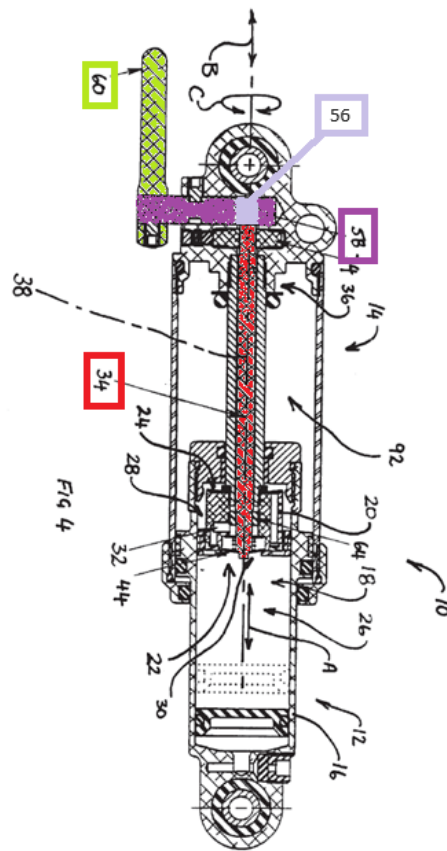
Id., 1:22-29. Said another way, riders want to be able to adjust their suspension systems to (1) alter the system on-the-go while riding to best address different terrain and (2) alter the system to best address the rider's specific needs due to weight, riding style, rider preferences, or the like. The '207 Patent and its adjuster assembly allows these advances to occur.

32. As discussed above and in contrast with the invention claimed in the '207 Patent, conventional shock absorbers (especially those in the bicycle and related vehicles field) have adjustable damping characteristics that can *only* be adjusted by changing the position of the shock absorber's single lever. This difference is explained in the '207 Patent (Ex. 1001, 1:30-43), illustrating that a conventional shock absorber may be adjusted by a rotational input by the rider at the lever to rotate a cam, leaving much room for technological improvement:

A typical design for a damping adjuster uses an adjuster rod that extends down the center of the piston shaft and engages the valve mechanism or performs the function of the valve mechanism.

Adjustment is commonly made ... [when] the adjuster rod is moved axially (up or down) to alter damping ... For example, a cam attached to a lever may be engageable with the adjuster rod to vary the axial position of the rod. One problem associated with this configuration is that any given angular position of the lever/cam corresponds to exactly one position of the adjuster rod. This limits the ability of the rider to customize the damping characteristics of the suspension system to suit the terrain or the rider's particular riding style.

33. U.S. Patent No. 6,360,857 to Fox ("Fox") (Ex. 1005), a prior art reference considered by the USPTO during prosecution of the '207 Patent, shows the arrangement discussed in the Background of the Invention. Specifically, Fox, like a conventional shock absorber, accepts a rotational input at the lever to rotate a cam. This rotation of the lever rotates that cam, and the cam engages an adjuster rod. The adjuster rod is typically biased towards the cam using a spring to provide the force. The cam then is able to move the adjuster rod axially (up-and-down) along the length of the rod. Figure 4 of Fox is shown below for illustration:



Ex. 1005 (Fox), FIG. 4.

34. Fox's actuation shaft **58** (purple) includes a cam **56** (light purple), and the two are rigidly fixed together. As the cam **56** rotates, it will move the biased shaft **34** (red) in an axial (up-and-down) direction, which axial direction is along the length of the shaft **34**. *Id.*, 8:9-30. Accordingly, Fox (as well as Petitioner's other main prior art references, Yi and JP'279) is just like the conventional shock absorber designs discussed in the '207 Patent's Background of the Invention section. Specifically, each rotational position of Fox's lever **60** (green) corresponds with an axial position of Fox's actuation shaft **58** and cam **56**. In turn, Fox shows that each

axial (up-and-down) position of the shaft **34** has a single, unchanging setting of damping characteristics. As a result, there is a single damping characteristic setting for each rotational position of the lever **60**. *Id.*

35. The inventions claimed in the ‘207 Patent improve on these conventional shock absorbers by allowing a rider to have one position of the relevant lever (or other valve actuating assembly) that provides an adjustable set of damping characteristics that can be adjusted via an adjuster assembly, and another position that provides the same damping characteristics regardless of the state of the adjuster assembly. Ex. 1001 (‘207 Patent), 8:45-58 (claim 1).

36. In my opinion, a rider would find having preset positions of the lever with consistent damping characteristics convenient, especially when those preset positions correspond with common damper settings, like an “open” position where the damper provides the least amount of damping available for the shock absorber or a “lockout” position where the damper provides the greatest amount of damping available for the shock absorber where the fluid flow is reduced to a minimum. *See, e.g., id.*, 4:51-64.

37. At the same time, the user’s personal preference may be met by the ‘207 Patent providing another position of the lever with user-adjustable damping characteristics via the novel adjuster assembly. *Id.*, 1:23-43. This way, the rider may set the damping characteristics for their user-adjustable position to have any

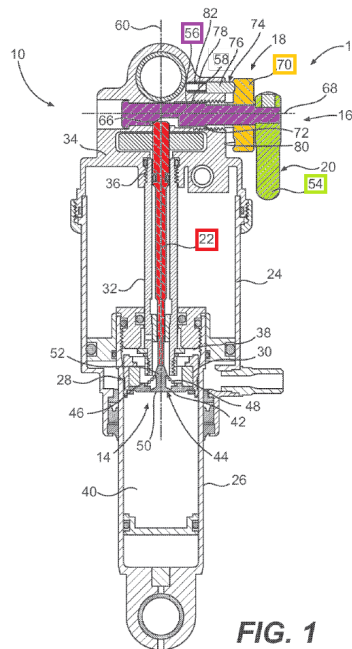
damping characteristics that the rider would like. Because of these available lever positions and the simple adjustment via the adjuster assembly, the '207 Patent is able to provide a damping system that is both easy and intuitive to adjust over a wide range of preset damping characteristics while simultaneously providing user-adjustability. This control scheme disclosed in '207 Patent has sufficient breadth to cover all or nearly all of the needs of many riders.

38. In a prior art actuator arrangement, like the device in Fox, the device may have some number of clicks of lever adjustments, such as 15 total clicks, with which they may set their preferred damping characteristics. These clicks correspond to detent positions. With this many detent positions, a rider may have some difficulty in reliably setting the actuator to a specific damper setting when the rider is ready to descend from the top of a hill. When climbing, the rider was likely using the lockout setting. As a result, the rider must change the damper setting on-the-go at the top of the hill before descending. Doing so accurately would require the rider to reach down to the suspension system, typically located between their legs, to actuate the unseeable actuator lever. The rider would need to use tactile feedback and count clicks in order to end up with the correct settings. This process may be hampered by the rider's elevated heart rate, gloves, or the fact that the rider cannot see the lever they are moving.

39. On the other hand, the inventions claimed in the '207 Patent provide a rider with a system that may have a preset "lockout" position, along with a setting that has rider-set damping characteristic for descending. The rider-set position may be set at any time, typically before the ride occurs. In this way, when the rider has to reach down between their legs to switch the damping characteristics during the ride, the rider can easily and conveniently switch between these two modes of operation. Under the prior art conventional system, like that shown in Fox, the user would need to find their correct "click" position before their descent. As a result of these operability differences, the inventions claimed in the '207 Patent allow for a controls system with truly practical adjustability. Further, not even every Fox-like system includes detent positions. A user may not even be able to count clicks, and would, instead, be required to find the correct lever angle for their preferred descending setting.

40. Also disclosed in the '207 Patent are many examples of structures capable of simultaneously providing both easy and intuitive adjustment over a wide range of preset damping characteristics and user-adjustable damping. For example, the embodiment disclosed in Figure 1 of the '207 Patent includes a valve actuating assembly **16** and an adjuster assembly **18**. The valve actuating assembly **16** includes, in an exemplary embodiment of the claimed invention, a selector **20** (which comprises a camshaft **56** (purple, below) that is rigidly attached to a rider-operated

lever **54** (green)) and a driver **22** (red). The adjuster assembly **18** shown includes a threaded knob **70** (yellow). Ex. 1001 ('07 Patent), 3:42-62, 4:23-24. These structures are highlighted in an array of colors in the annotated reproduction of Figure 1, below:



41. In this embodiment, a rider can choose between at least two positions of the valve actuating assembly **16** (and related lever **54**). *E.g., id.*, 3:42-62, 4:51-5:47. In one of those positions, the damper characteristics of that position is adjustable using the adjuster **70**. In each case, the positions of the valve actuating assembly are rotational positions of the lever **54** and correspond to positions of the camshaft **56** in the disclosed embodiment. *E.g., id.*, 3:42-62, 4:51-5:47. For example, Figures 2 and 3 show two side views of the camshaft **56** in two different axial positions, rotated around its major axis **68**:

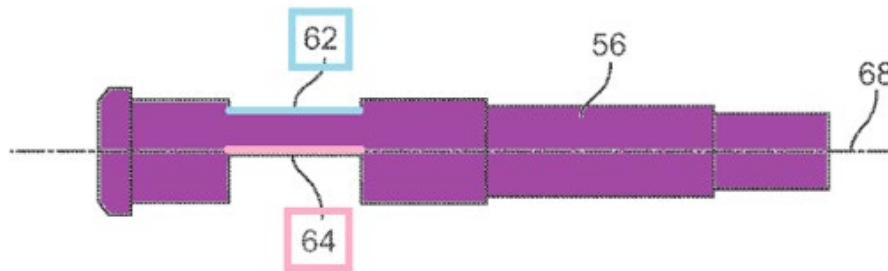


FIG. 2

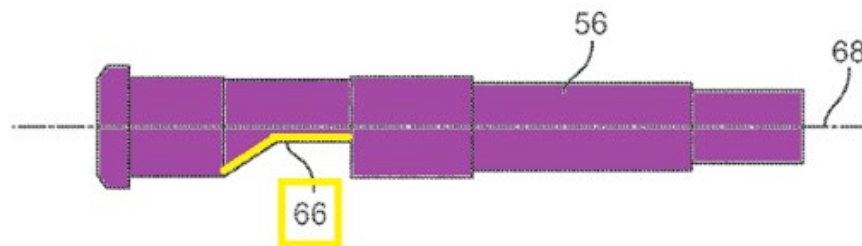


FIG. 3

42. As can be seen in the highlighted images, the '207 Patent's camshaft **56** (purple) includes three surfaces (at least in this embodiment). The surfaces shown include cam surface **62** (light blue), cam surface **64** (pink), and cam surface **66** (yellow). Cam surface **64** (pink) is formed on the camshaft **56** to have the smallest radius from the axis of rotation **68** of camshaft **56**. Cam surface **62** (light blue) has a greater radius from the axis of rotation **68**. Finally, cam surface **66** (yellow) has a *variable radius* from the axis of rotation **68**, which variable radius is possible due to the inclusion of the sloping of the surface **66**. Figures 5a, 5b, and 5c show the

camshaft **56** from a perspective that is aligned with the axis of rotation **68** so that the relationships between these surfaces and the driver **22** (red) can be seen:

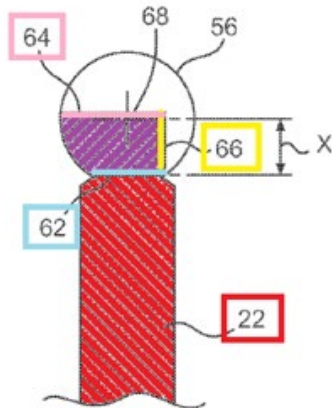


FIG. 5a

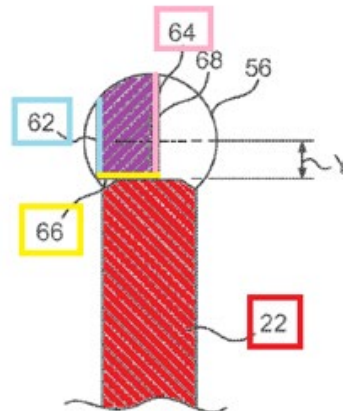


FIG. 5b

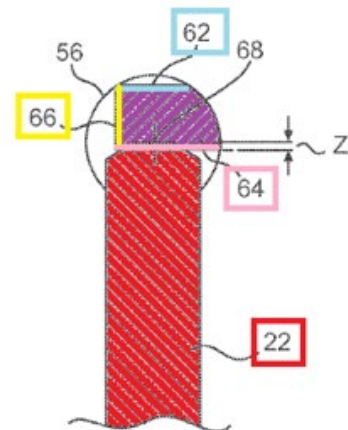


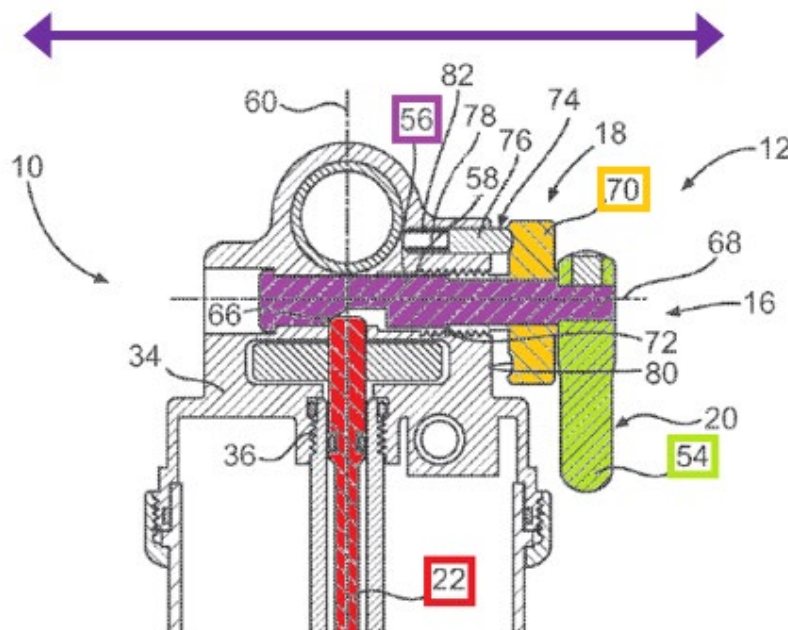
FIG. 5c

Id., FIGS. 5a-5c, 5:14-47.

43. These figures show that the cross-sectional shape of the camshaft **56** in this embodiment is mostly rectangular at one end. Other shapes for the camshaft **56** are possible. Figure 5b shows one possible cross-sectional radius **Y** from the cam surface **66** to the axis of rotation **68**. As can be seen in Figure 4 of the '207 Patent, the cross-sectional radius **Y** may be larger or smaller, depending on where along the axial extent of the camshaft **56** the driver **22** contacts the cam surface **66**. Figure 6b shows a different cross-sectional radius **W** for the cam surface **66**. Said another way,

the radius may be adjusted between at least radius **Y** and radius **W**. The cam surface **66** is sloped to provide different radii at different points of contact for driver **22** along the axial direction of the camshaft **56**. On the other hand, the other cam surfaces **62**, **64** maintain the same radius from the axis of rotation **68**, regardless of the point of contact for driver **22** along the axial extent of the camshaft **56**. *Id.*, FIGS. 5a-5c, 6a-6c (disclosing that the only axial change for driver **22** occurs between Figures 5b and 6b when the axial position of the camshaft **56** changes, whereas the positions in Figures 5a/6a and 5c/6c show the same axial position for driver **22**); *see also id.*, 5:14-47.

44. The valve actuating assembly **16** (which includes the camshaft **56**) is movable axially (purple arrow) by the adjuster assembly **18** and its threaded knob **70** (orange, below):



Id., FIG. 1, 4:38-44. As the knob **70** is turned, the camshaft **56** is moved axially along the axis of rotation for the camshaft **56**, in a direction indicated by the annotated purple arrow above. *Id.*, 4:42-44 The threads on the knob **70** move the knob **70** axially along axis **68**, which in turn, moves the camshaft **56** axially along the axis **68**. *Id.*

45. Although the initial embodiments of the '207 Patent use axial movement of the camshaft **56** to adjust the damping characteristics when the valve actuating assembly **16** is in the adjustable position (in space), the '207 Patent is not limited to this particular structural movement. In each of the embodiments shown in Figures 1-10c and 12, at least one angular position of the relevant lever (or other valve actuating assembly) is set to have its damping characteristics changeable by the adjuster assembly, while at least one other angular position of the lever will not be affected by the adjuster assembly.

46. For example, the embodiment shown in Figure 12 does not involve any axial movement of the camshaft. Here, the camshaft **140** does not move axially like the prior-discussed embodiments. The camshaft **140** in this embodiment is used to select between three different positions. *Id.*, 8:5-13. There is still an adjuster assembly **18**. The adjuster assembly **18** now includes a knob **150** that adjusts the damping characteristics when the selector **20** of the valve actuating assembly **16** is

in the adjustable (third) position. *Id.*, FIG. 12, 8:13-19, 8:22-32. The '207 Patent explains how this is accomplished:

When the lever **138** is rotated into the first two positions, the axial position of the driver **142** is determined by the angular position of the lever **138** and camshaft **140**. When lever **138** is rotated into the third position, the adjustable position, a shoulder **154** of the driver **142** contacts the knob **150** and further rotation of the lever **138** causes the driver **142** to disengage from the camshaft **140**. In this third position, the axial position of the driver **142** is determined by the axial position of the knob **150**, not by the cam surface. Accordingly, the rotation of the knob **150** allows the rider to adjust the damping characteristics of the third position without affecting the damping of the first and second positions.

Id., 8:20-32. As can be seen in this portion of the '207 Patent, this embodiment of the adjuster assembly **18** may adjust the valve actuating assembly **16** *without axial movement* of the camshaft **56**. Instead, the adjuster assembly **18** directly adjusts the valve actuating assembly **16** in one spatial position of the valve actuating assembly **16** in such a way that the adjustment from the adjuster assembly **18** does not affect at least one other position of the valve actuating assembly **16**. *E.g., id.*, FIGS 1-6, 3:42-62.

47. Using these or similar structures, the inventions claimed in the '207 Patent are capable of providing a damping system that is both easy and intuitive

to adjust over a wide range of preset damping characteristics while simultaneously providing user-adjustable damping.

C. Person of Ordinary Skill in the Art

48. I agree with the statement of the level of a person of ordinary skill in the art in SRAM's Patent Owner Preliminary Response. Paper 6, 16. Specifically, I agree that a POSITA for the '207 Patent is most appropriately connected to, and considers the particularities of, vehicle suspension designs. One of ordinary skill in the art at the time of the '207 Patent would include a person with a degree in Mechanical Engineering and approximately three years' experience in vehicle suspension technology, or a Master's degree or higher in Mechanical Engineering. Specifically, I held a Ph.D. in Mechanical Engineering for twenty years prior to the filing of the '207 Patent and I had extensive experience in the design of vehicle suspension technology and/or like technology as of 2004.

D. Claim Construction

49. I agree with Petitioner that none of the terms of the claims of the '207 Patent require construction. *See* Petition, 8; Ex. 1003 (Slocum), ¶32.

IV. WHY THE CLAIMS OF THE ‘207 PATENT ARE VALID IN VIEW OF THE PETITION’S GROUNDS

A. Fox does not anticipate the ‘207 Patent’s claims

50. Fox (Exhibit 1005) is the prior art that the ‘207 Patent disparages and improves upon. Only through mental gymnastics and claim constructions untethered to the ‘207 Patent is Petitioner even able to argue that Fox anticipates the ‘207 Patent Claims. At a minimum, Ground I must fail because Fox fails to disclose the claimed “adjuster assembly” that adjusts the damping characteristics of one position without affecting those of another.

1. Fox Fails to Disclose the Claimed “Adjuster Assembly”

51. Specifically, Fox fails to disclose an adjuster assembly in any sense. In Fox, there is nothing that accounts for a plurality of positions of the valve actuating assembly, with one of the positions having damping characteristics that are adjusted by an adjuster assembly. Petitioner does not even allege that Fox includes an adjuster assembly. Instead, Petitioner relies on the entirety of Fox’s purported valve actuating assembly, and this reliance is without *any additions*. This is just what the ’207 Patent describes in its Background of the Invention section. Accordingly, there is no adjuster assembly in Fox. In fact, the ‘207 Patent requires more than a mere valve actuating assembly, and further, rejects treating Fox as having one based on the statements made in the specification and prosecution history.

(a) The “Adjuster Assembly” Must Include More Than Fox’s Purported “Valve Actuating Assembly”

52. Petitioner’s position that the claimed “valve actuating assembly” and “adjuster assembly” may be the same structure is contrary to (1) the presumption that distinct claim elements are distinct components of the patent invention, (2) the teachings of the specification, and (3) the express wording of the claims themselves.

53. I have been advised by counsel for SRAM that there is a presumption that distinct claim elements are distinct components of the patent invention.

54. In this matter, the terms “valve actuating assembly” and “adjuster assembly” would be considered to be separate elements, to at least some extent, by a POSITA. A POSITA can see that these two terms are separately stated in the claims. Thus, there is at least a presumption that these need to be distinct structures. The ‘207 Patent’s specification supports this presumption by showing only embodiments where these two structures are at least partially separate. Specifically, the “adjuster assembly” includes something beyond what the “valve actuating assembly” provides in each embodiment of the ‘207 Patent.

55. Petitioner points to the embodiment of the ‘207 Patent shown in Figures 7a-7c. Petition, 16-17. Petitioner also points out that that the ‘207 Patent states that the “valve actuating assembly” may be integrated with the “adjuster assembly.” Petition, 17 (citing Ex. 1001 (‘207 Patent), 5:52-53, 3:53-57, 5:48-6:9, claim 6).

However, Petitioner ignores the fact that although the “valve actuating assembly” and the “adjuster assembly” somewhat overlap in physical extent, the “adjuster assembly” includes *additional structural features* not included in the “valve actuating assembly.” In particular, for this embodiment disclosed in Figures 7a-7c, the '207 Patent explains that the adjuster assembly **18** in Figures 1-6c “is replaced with threads **84** on the camshaft **56** that engage threads **86** on the first cylinder **24**.” Ex. 1001 ('207 Patent), 5:49-52. In the embodiment of Figures 7a-7c, these threads **84**, **86** (light blue boxes) allow the camshaft **56** (purple) to move axially when the lever **54** (green) is rotated through *a complete revolution*, as is shown in the difference in the positioning of the camshaft **56** in Figures 7b and 7c:

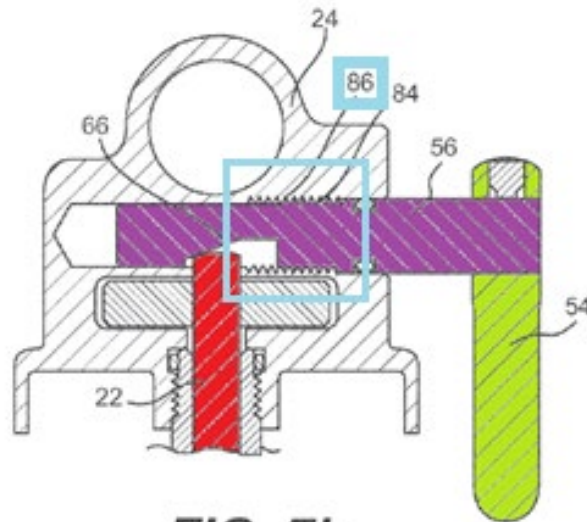


FIG. 7b

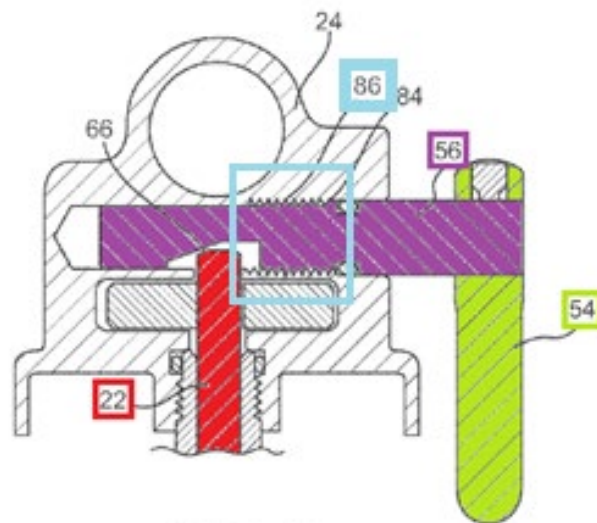


FIG. 7c

Id., FIGS. 7b, 7c, 5:48-6:9. Thus, the ‘207 Patent’s specification never shows a complete overlap between the “valve actuating assembly” and “adjuster assembly” at least because the “adjuster assembly” *includes more than* the “valve actuating assembly.” See, e.g., Ex. 2019 (Slocum Depo.), p. 37, line 6 – p. 38, line 10. And this makes sense to any POSITA because the ‘207 Patent is an improvement upon

devices having only a valve actuating assembly, such as Fox. *See* Section III(A&B), *supra*. Without an adjuster assembly, any given device is merely what existed in the prior art. Said differently, the adjuster assembly is what is needed to provide the user-adjustability of the ‘207 Patent.

56. In addition, Claim 1 states “an adjuster assembly operatively connected to the valve actuating assembly.” If the valve actuating assembly and adjuster assembly completely overlapped in physical extent, then the valve actuating assembly would need to be *connected to itself*, which is not physically possible. Although the valve actuating assembly and adjuster assembly may be integrally formed, as alleged by Petitioner, “integrally formed” here means that some portions of the combined device remain specific to the adjuster assembly. In the example discussed above, for Figures 7a-7c of the ‘207 Patent, the threads on the camshaft **56** are at least some of the portions of the combined device that are specific to the adjuster assembly.

57. Perhaps most important, if the valve actuating assembly and adjuster assembly were integrally formed without something additional and specific to the adjuster assembly, the ‘207 Patent Claims merely cover the prior art discussed in the Background of the Invention Section. Section III(A&B), *supra*; Ex. 1001 (‘207 Patent), 1:30-43. Dr. Slocum agrees that Fox includes a cam rigidly attached to a lever, wherein the lever adjusts the axial position of an adjuster rod, such that one

angular position of the lever corresponds to one axial position of an adjuster rod. This leads to only one setting of damping characteristic per position of the lever—the exact device disparaged in the Background of the Invention section of the ‘207 Patent. Ex. 2019 (Slocum Depo.), p. 84, line 20 – p. 87, line 3; *id.*, p. 93, line 14 – p. 95, line 9. This cannot be true, and, as a result, the ‘207 Patent’s adjuster assembly must be more than a typical valve actuating assembly shown in the prior art (including Fox, JP’279, and Yi discussed in this Declaration). Said another way, Petitioner’s reading of these claim terms as a single structure does exactly what the prior art does. Thus, the claimed “adjuster assembly” must be more than merely a known valve actuating assembly such that the claimed “valve actuating assembly” and “adjuster assembly” cannot be the exact same structure.

58. As a result, the Fox reference does not anticipate. As discussed above, Petitioner’s complete reliance on its theory that the valve actuating assembly and adjuster assembly may be the exact same structure to meet the claimed “adjuster assembly” elements of the ‘207 Patent’s Independent Claim 1 is neither reasonable nor convincing.

**(b) Disparaging Statements in the Specification
Narrow Claim Terms**

59. I have been advised by counsel that a disclaimer of claim scope may be found when the specification disparages a prior art technique while extolling the

benefits of the claimed invention, especially in view of the prosecution history and embodiments disclosed in the specification. Each of the specification of the '207 Patent, the relevant prosecution history, and the embodiments disclosed in the '207 Patent indicate that the claimed “adjuster assembly” of the '207 Patent excludes reading on a damping adjustment device that has only a lever-actuated camshaft that moves an adjuster rod axially (up-and-down) with nothing more.

(c) The '207 Patent's Specification Narrows the Scope of the Claimed Adjuster Assembly by Disparaging the Prior Art and Extolling the Benefits of the Functionality of the Adjuster Assembly.

60. The '207 Patent clearly excludes Petitioner's claim interpretation for Ground I. Specifically, the '207 Patent's specification disparaged Fox's lever/cam and adjuster rod combination. Afterall, Fox is identical to the prior art that the claims of the '207 Patent improve upon with the use of the novel adjuster assembly.

61. As discussed in detail in Section III(A&B) above, the Background of the Invention Section of the '207 Patent's specification directly calls out the problems of the prior art and gives an example of “[a] typical design for a damping adjuster uses an adjuster rod that extends down the center of the piston shaft and engages the valve mechanism or performs the function of the valve mechanism.” Ex. 1001 ('207 Patent), 1:30-33. In the prior art, “[a]djustment is commonly made ... [when] the adjuster rod is moved axially (up or down) to alter damping” via a

camshaft connected to a lever. *Id.*, 1:33-38. In disparaging this prior art system, the ‘207 Patent specification explains that “[o]ne problem associated with this configuration is that any given angular position of the lever/cam corresponds to exactly one position of the adjuster rod.” Further, this system, having only a lever/cam and an adjuster rod, “limits the ability of the rider to customize the damping characteristics of the suspension system to suit the terrain or the rider’s particular riding style.” *Id.*, 1:38-43.

62. But, the ‘207 Patent addresses the shortcomings of the prior art using an adjuster assembly to release the damper adjustment systems from the limitations inherent to having a direct correspondence between lever positions and damping characteristics. The ‘207 Patent explains that “[t]he present invention relates to ... an actuator apparatus for controlling a valve mechanism of a suspension system that includes ... an adjuster assembly for adjusting the damping characteristics of at least one ... rider-selectable position[.]” *Id.*, 1:7-13. Therefore, the adjuster assembly is a key to the solution of overcoming the failures of prior art systems. Specifically, the adjuster assembly alters the damping characteristics for the desired adjustable position of the lever.

63. For example, in the first embodiment of the inventions claimed in the ‘207 Patent, shown in Figures 1-6c, the adjuster assembly **18** moves the camshaft **56** axially, which axial movement alters the damping characteristic of the adjustable

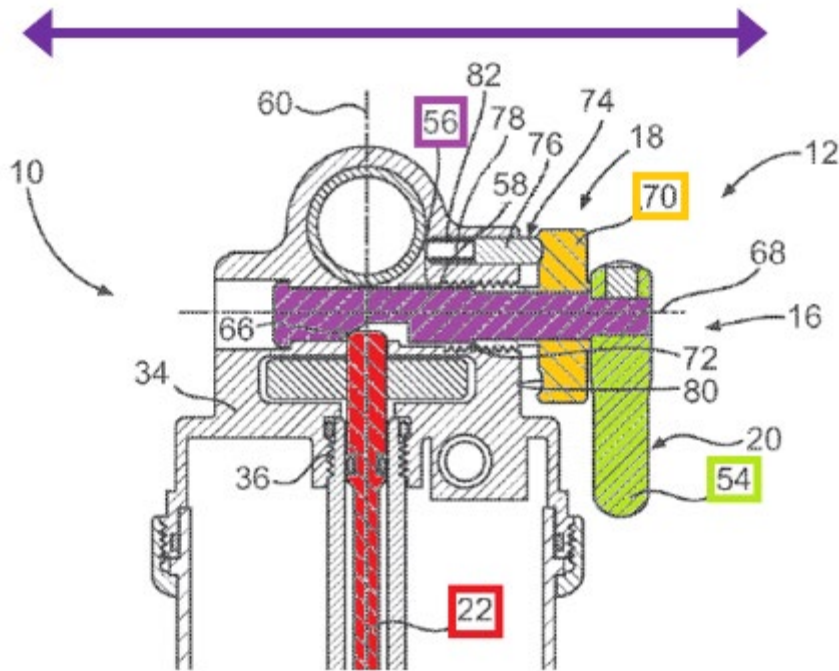
position *without affecting* the damping characteristics of the other, open position. *Id.*, 5:14-47. Accordingly, the '207 Patent's specification disparages prior art merely using a lever/cam and adjuster rod system, instead proposing the use of an additional adjuster assembly to adjust the lever/cam in an adjustable position. *Id.*, 1:7-13.

(d) Each of the Disclosed Embodiments of the '207 Patent Supports the Adjuster Assembly Being More Than a Lever/Cam and Adjuster Rod System

64. All of the '207 Patent embodiments include an adjuster assembly having a physical structure that rises beyond the typical functionality of a prior art lever/cam and adjuster rod system. In particular, there are four embodiments discussed and claimed in the '207 Patent, and shown in the following Figures: (1) Figures 1-6c; (2) Figure 7a-7c; (3) Figures 8a-10c; and (4) Figure 12. In each of these four embodiments there is the additional structure of an adjuster assembly. This additional structure is the mechanism for the adjustment of the damping characteristics of one position of the valve actuating assembly that does not also affect the damping characteristics of a second position. There is independence between these two positions, with only one being affected by the novel adjuster assembly.

65. The embodiment of Figures 1-6c is shown to include an adjuster assembly **18** having a knob **70** (yellow) that moves the camshaft **56** (purple) axially

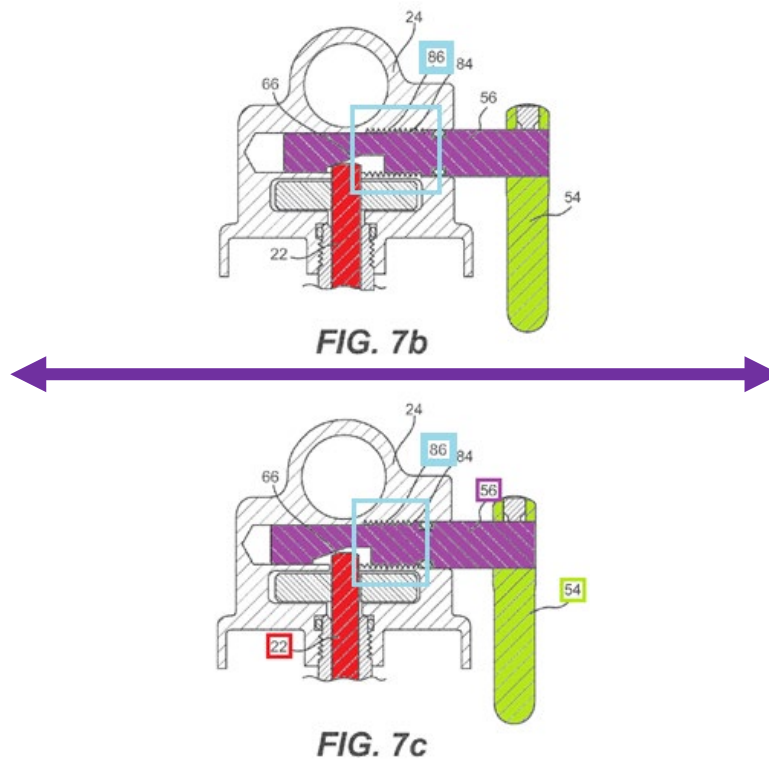
(in the direction shown by the purple arrow) to change the setting for damping characteristics for the adjustable position:



In the adjustable position of the lever **54**, the knob **70** will move the camshaft **56** axially (up-and-down), thereby adjusting the driver **22** up and down. The amount of movement, or the axial positioning of the driver **22**, is dependent on where the driver **22** contacts the camshaft **56**. Thus, this embodiment extends beyond the capabilities of the prior art lever/cam and adjuster rod system by using knob **70** to move the camshaft **56** axially without moving the lever **54**.

66. The other embodiments disclosed in the '207 Patent lead to similar results but include slightly different adjuster assemblies. For example, in the embodiment of the '207 Patent shown in Figures 7a-7c, threads **84** and **86** (light blue

box) work together to move the camshaft **56** axially (in the direction shown by the purple arrow, below):



A complete revolution of the lever **54** around its rotational axis **68** will move the camshaft **56** axially (side-to-side along the purple arrow) by one thread pitch. This will be a movement of the camshaft **56** into or out of the first cylinder **24** (which is along the extent of the purple arrow), depending on the direction of rotation (clockwise or counter-clockwise) of the lever **54**.

67. For the embodiment shown in Figures 8a-10c of the '207 Patent, the adjuster assembly has slightly different structure but the same functions. Specifically, the adjuster assembly **18** operates by reducing the length of a control

cable **88** (orange). Ex. 1001 ('207 Patent), 6:10-40. By reducing the length of this control cable **88**, the portion of the camshaft **94** (purple) that contacts the driver **22** (red) when the camshaft **94** is in the adjustable position is shifted by the amount of length reduction, as illustrated below in Figures 9a and 9b:

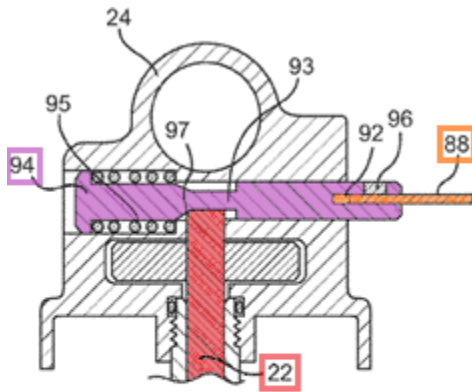


FIG. 9a

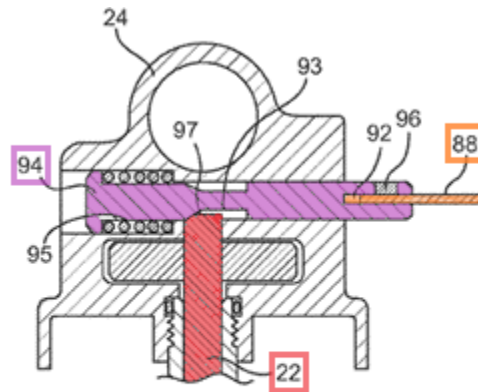


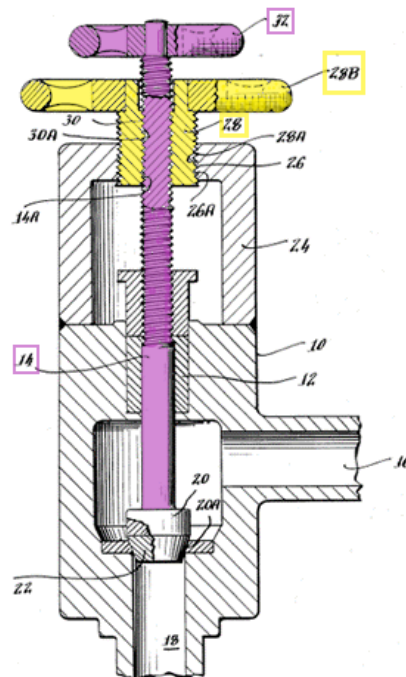
FIG. 9b

Id. Finally, the embodiment shown in Figure 12 of the '207 Patent includes knob **150**, which adjusts damping characteristics by interacting with the driver **22** directly, respectively.

68. Thus, in each of the above-discussed embodiments shown in the '207 Patent, the adjuster assembly requires **additional structure** beyond what is provided in the prior art lever/cam and adjuster rod systems. This additional structure serves as the adjuster assembly for adjusting damping characteristics. The Fox reference has no such additional structure.

(e) The Prosecution History Further Supports a Finding That the Adjuster Assembly Must Include More Structure Than the Prior Art Lever/Cam and Adjuster Rod System.

69. Having reviewed the prosecution history of the application that matured into the '207 Patent, I note that the Examiner repeatedly rejected the claims in view of U.S. Patent No. 4,488,704 to Wicker ("Wicker") (Ex. 2015). Ex. 1004 ('207 Patent Prosecution History), 90. I include an annotated figure from Wicker below, and have labeled the portions of Wicker the Examiner alleged to fulfill the '207 Patent's valve actuating assembly (32, 14 (purple)) and adjuster assembly (28B, 28 (yellow)):



Ex. 2015 (Wicker), FIG. 1 (annotated).

70. As can be seen in the prosecution history, Patent Owner repeatedly and consistently responded to the Examiner's argument with Wicker, stating that Wicker itself fails to disclose the adjuster assembly because Wicker's device merely included a fine-tuning adjuster (28B, 28 (yellow)) that adjusts the damping characteristics of *each and every* position of the valve actuating assembly (32, 14 (purple)). On the other hand, the '207 Patent claims require adjusting the damping characteristics of one position *while not affecting* the damping characteristics of another position. Ex. 1004 ('207 Patent Prosecution History), 86-87, 30, 8.

71. Further, a POSITA would understand from reviewing Wicker's disclosure that Wicker includes two dependent means for adjusting Wicker's damping characteristics. Ex. 2015 (Wicker), FIG. 1.

72. Accordingly, Patent Owner distinguished its claimed inventions (and the claimed adjuster assembly) from devices that lack the necessary adjuster assembly's structure and function of adjusting one position's damping characteristics independent of another position's damping characteristics. Said another way, a device that merely adjusts damping characteristics with the turn of a lever (or two levers/knobs dependent on each other like Wicker) are not within the scope of the claimed "adjuster assembly." Thus, the prosecution of the '207 Patent supports a construction of the claims that excludes simple lever/cam and adjuster

rod systems that are unable to adjust the damping characteristics of one position of the lever without affecting another position of the lever.

73. The ‘207 Patent’s statements disparaging the prior art lever/cam and adjuster rod systems, its statements extolling of the virtues of an adjuster assembly that can adjust positions independently, its disclosed embodiments, and its prosecution history each support narrowing the meaning of the claimed “adjuster assembly” to exclude the prior art lever/cam and adjuster rod systems discussed in the Background of the Invention. As a result, Petitioner’s reading of Fox cannot be correct, and Fox cannot anticipate the claims of the ‘207 Patent.

B. Fox in view of JP’279 does not render the ‘207 Patent’s claims obvious

74. For the reasons discussed in Section IV(A), Petitioner’s combination of Fox with JP’279 and Nagai continues to fail to disclose the claimed “actuator assembly”, as further detailed in this Section.

1. Fox in View JP’279 and Nagai Fails to Disclose the Claimed “Adjuster Assembly”

75. Not only does Fox fail to disclose the claimed “adjuster assembly” as discussed in Section IV(A), Petitioner’s purported combination of Fox with JP’279 and Nagai similarly fails to render this limitation obvious. Even if a POSITA would make the proffered combination, it would not result in the inventions claimed in the ‘207 Patent. But a POSITA would not do so at least because there would be no

benefit to the proposed combination. Moreover, Petitioner fails to provide any sufficient rationale for a POSITA to make the alleged combination. As a result, Petitioner fails to show obviousness of any claim, and Ground II must be wholly rejected.

(a) Fox fails to disclose the Claimed Adjuster Assembly

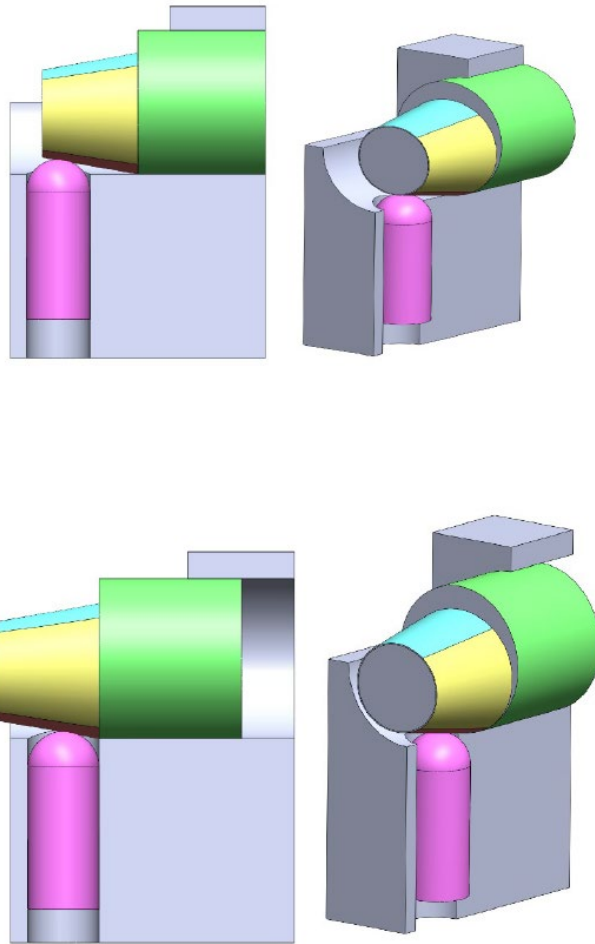
76. As discussed above in Section IV(A), Fox fails to disclose the claimed “adjuster assembly.” Instead, Fox merely discloses the lever/cam and adjuster rod system that the ‘207 Patent disparaged in the Background of the Invention. The addition of JP’279 and/or Nagai with Fox (or with Yi, as discussed below) does not provide the missing element of the ‘207 Patent Claims.

77. In the Petition, Petitioner alleges that a POSITA would have modified Fox to include a separate (but also integrated) adjuster assembly by placing a tapered surface, which may also be considered to be an inclined plane, onto the outer surface of Fox’s camshaft. Petition, 48-49. However, Petitioner’s proposed combination continues to fail to include the claimed “adjuster assembly” because, like Wicker,³ the resulting combination **would not include** a means of independent adjustment of damping characteristics for one position. Instead, Petitioner’s purported

³ Discussed in Section IV(A)(e) and overcome during prosecution.

combination is merely a lever/cam and adjuster rod system because there are no means for independent adjustment of any position. Dr. Slocum even admitted that the structure of JP'279 and Nagai is no different than the prior art already considered and overcome during prosecution of the '207 Patent. *See* Ex. 2019 (Slocum Depo.), p. 102, line 14 – p. 103, line 3; *id.*, p. 108, line 21 – p. 110, line 15.

78. Petitioner argues that a POSITA would combine Fox and JP'279 to provide a camshaft having an inclined surface *over the entire device, and not limited to one position of the valve actuating assembly*. *See, e.g.*, Petition, 50; Ex. 1003 (Slocum), ¶¶93-96. In each of Petitioner's examples of this combination of Fox and JP'279, the *entire* surface of the camshaft is tapered. Ex. 1003 (Slocum), page 67. But, I note that Petitioner's proposed combination would result in a change of damping characteristics *in all positions* of Fox's purported valve actuating assembly whenever the axial position of Fox's camshaft is changed by any purported adjuster assembly. The example below shows what appears to be the region Dr. Slocum alleges would be a "lockout" position (which it is not in any event):



79. As can be seen in the examples, a POSITA would understand from the images that an axial movement of the green-colored camshaft would change the vertical positioning of the related pink adjuster rod, thereby changing the damping characteristics setting of the device. I note that Dr. Slocum admits that these models were his own creation and not found in JP'279. Ex. 2019 (Slocum Depo.), p. 139, line 22 – p. 140, line 6. As can be further seen, Fox's proposed combination fails to include any example of the claimed "adjuster assembly" at least because all positions

would be adjusted with any axial movement. Accordingly, Ground II fails to render the claims of the '207 Patent obvious.

(b) The Petition Fails to Provide a Valid Motivation to Combine

80. Petitioner provides two unsuccessful motivations to combine: (1) JP'279 provides "fine adjustment of the compression damping settings" (Petition, 49; *see also* Petition, 37-38; Institution Decision (Paper 11), 22-23), and (2) the combination "would have involved only a combination of known prior-art elements according to known methods to yield predictable results" (Petition, 41). The first motivation's rationale is premised on a misunderstanding of the prior art and an overstatement of the motivations of a POSITA. Petitioner's second motivation also fails to show that the combination of Fox and JP'279 would have included known prior art element and methods. Accordingly, Ground II fails to render obvious any claims of the '207 Patent.

(i) JP'279 Fails to Provide Any of the Purported Benefits of Fine Tuning

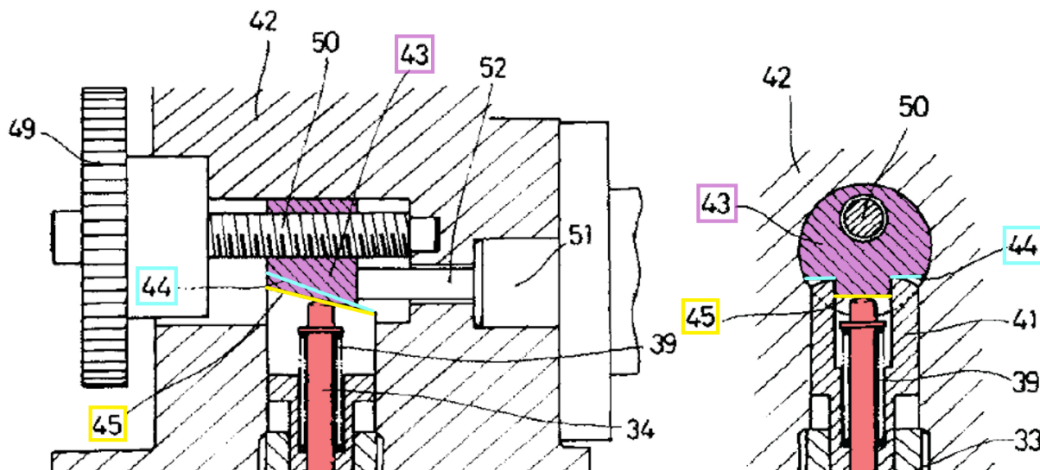
81. The premise that JP'279 provides finer adjustments than Fox is false and without any basis in the prior art references or the knowledge of a POSITA.

82. First, the concept of "fine" tuning is, in at least every conceivable example, a relative term. For example, "fine" tuning, at least in the relevant arts, only exists in reference to a related "coarse" tuning. That is, one form of tuning is

finer than another. But “fine” tuning does not exist on its own. “Coarse” tuning means that the changes made by tuning something occurs at a greater rate than a related “fine” tuning. Dr. Slocum agrees that fine adjustments are those adjustments made between coarse adjustments. Ex. 2019 (Slocum Depo.), p. 70, lines 7 to 17. Both Wicker and JP’279 discuss these concepts.

83. Wicker, as an example, defines two different screw-based valve adjusters relative to each other: one adjuster uses “a fine thread (many threads per inch)” and another uses “a coarse thread (fewer threads per inch).” Ex. 2015, 1:33-40. Wicker explains that “a fine thread requires that the actuator be rotated many times for any substantial axial displacement of the valve plug stem while the ... coarse thread only requires a few rotations of the actuator for the same degree of axial displacement.” *Id.*, 1:49-53. Thus, Wicker makes clear to a POSITA that the “fine” adjuster is only fine relative to the “coarse” adjuster.

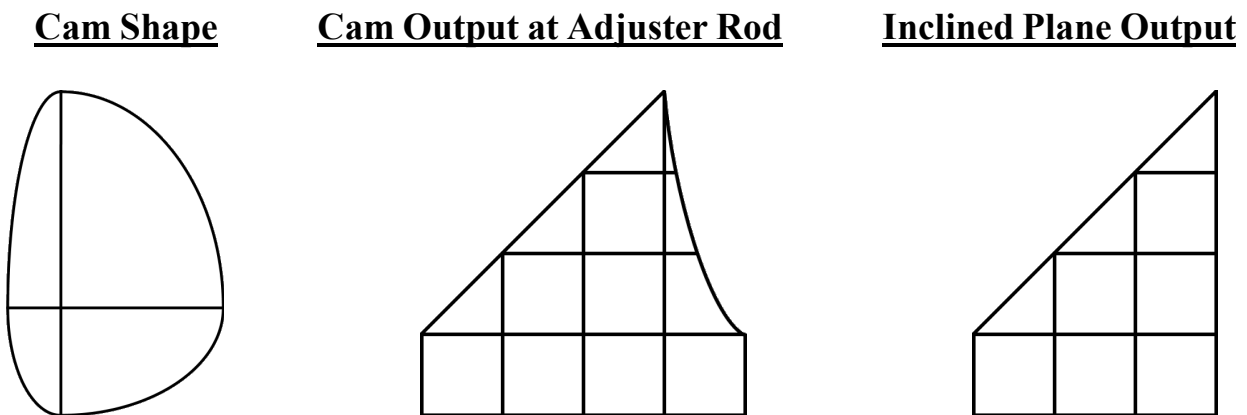
84. A POSITA would understand that the same is true in JP’279. Specifically, JP’279 explains that it includes two surfaces **44** (light blue), **45** (yellow) on its slider **43** (purple), shown below:



Ex. 1007, FIGs. 4, 5. Surface **44** is used to adjust damping characteristics when the damper is compressing, and surface **45** is used to adjust damping characteristics when the damper is extending. *Id.*, 5, 6. As can be seen in Figure 4 of JP’279 (shown above) surface **44** has a ***greater slope*** than surface **45**. *Id.*, 6. JP’279 explicitly states that surface **45** provides “fine adjustment amounts” relative to surface **44** because of the lesser slope. *Id.* See also Ex. 2019 (Slocum Depo.), p. 102, line 14 – p. 103, line 3; *id.*, p. 113, lines 4 – 19; *id.*, p. 117, lines 4 – 19. Just like in Wicker, the concept of “fine adjustment” in JP’279 is relative to another adjuster present on the same device. A POSITA would understand, looking at these two reference and considering their experience, that JP’279’s “fine adjustment” is not a pronouncement of superiority ***relative to other adjusters not considered therein***. Instead, this is a relative term in JP’279 used to compare the relative slope of two surfaces. *Id.*

85. Next, I note that a cam and an inclined plane are *each* capable of providing the exact same, or different, levels of tuning depending on the relative

sizes of the device being compared. In fact, if a cam that has a linear (or near linear) increase in its radius is unrolled so that its outer surface is in a straight line, the exact same (or nearly the same) level of tuning can be provided as would an inclined plane (as taught in JP'279). This example is illustrated in the diagram below, with a cam on the left, the cam's output at an adjuster rod in the center, and an inclined plane on the right:



As can be seen when comparing the images above, the cam output shown in the center of the three figures shows a linear change in height. In other words, the cam shape would provide the same linear “fine” or “coarse” tuning as the inclined plane related to the output shown on the right, which has a slope of 1. As can be seen from this example, *there is no inherent benefit* to using one adjuster over the other because each adjuster may be designed to provide the exact same (or nearly the same) output at the adjuster rod. Said another way, *neither a cam nor an inclined plane provides an inherently finer level of adjustment than the other.*

86. Further, as can be seen in the above figures, *the size and shaping* of the cam and slider directly affect the level of fineness. Thus, although one adjuster may be designed to be finer than the other, the sizes of Fox's camshaft **34** and JP'279's slider **43** (and the slope of tapered surface **44**) *are unstated*. As a result, *neither Petitioner nor Dr. Slocum nor anyone else knows* what the relative levels of fineness of Fox's and JP'279's adjusters would be. *See* Ex. 2019 (Slocum Depo.), p. 102, line 14 – p. 103, line 3; *id.*, p. 117, lines 18 – 21, *id.*, p. 120, lines 15 – 23; *id.*, p. 124, line 21 – p. 125, line 3. In any event, either adjuster *could be made* to provide a “finer” adjustability than the other.

87. Petitioner relies almost exclusively on JP'279's statement that “fine adjustment amounts can be achieved at the needle portion.” JP'279, 6. However, as discussed above, this statement in JP'279 *is not a pronouncement* that JP'279's slider provides *a special or elevated* amount of fine tuning. Instead, a POSITA would understand that the entire point of JP'279 is to provide different amounts of adjustments to multiple characteristics within JP'279's device all at the same time. *See, e.g.*, Ex. 1007 (JP'279), 3, 6. The different slopes in JP'279 move JP'279's two adjuster rods at different rates, one having a finer tuning due to the contact with a surface having a smaller slope. Thus, Petitioner and Dr. Slocum's focus on this term is entirely without merit to a POSITA.

88. This concept of “fine” tuning appears throughout the Petition. In my opinion, these statements by Petitioner directly result from focusing on selected words of JP’279 taken out of context. By taking these terms out of context and applying them to the ‘207 Patent, Petitioner uses hindsight to recraft the ‘207 Patents’ claims from the ‘207 Patent’s own disclosure.

- (ii) The combination of Fox and JP’279 would not have involved a combination of known prior-art elements according to known methods and would not yield predictable results

89. Without the concept of JP’279 providing a finer range than what is available to Fox without modification, the only remaining motivation to combine is Petitioner’s conclusory statement that a POSITA would only be using known elements according to known methods. *E.g.*, Petition, 40-41. The prior art in this matter does not support Petitioner’s statements. The use of an inclined plane on a camshaft ***was not known***. Using an inclined plane on only a portion of a camshaft ***was not known***. Arranging these two different movement systems at perpendicular angles, ***especially*** where the surface of the camshaft ***curves, was not known***. Using two different adjustment methodologies together to adjust an adjuster rod ***was not known***. Moving a camshaft axially (i.e., along the axis of rotation of the camshaft) ***was not known***. Ex. 2019 (Slocum Depo.), p. 195, line 14 to p. 202, line 11. In fact, none of the prior art in this case shows even a hint of anything more than a mere

lever/cam and adjuster rod system. None of the prior art seems interested in having additional adjustments, nor any preset positions. A POSITA would see that Petitioner's combinations *must be premised* in hindsight.

90. Further, Petitioner has provided no support for its argument that a POSITA would have known about these limitations and combined them. *E.g.*, Petition, 40-41. Petitioner cites to Paragraph 82 of Dr. Slocum's Declaration (Ex. 1003) in support. *Id.* At Paragraph 82, Dr. Slocum merely rehashes the statements made in the Petition. *See* Ex. 1003 (Slocum), ¶ 82; *see also* Ex. 1003, ¶125 (same statements but regarding Yi and JP'279). Dr. Slocum restates, without explanation, that *unspecified* elements and methods were known and predictable. And Dr. Slocum, again, predicates the combination as based on the benefit of fine tuning. As discussed above in Section IV(B), a POSITA would not believe the addition of an inclined plane onto the outer surface Fox's camshaft **34** would provide any additional fineness to the device's adjustability. Nor would a POSITA look to JP'279 to provide an increased level of fineness of tuning. Again, JP'279 does not disclose a system that is inherently finer than any other system, and relative fineness of any given system may be altered to be finer or less fine.

91. Dr. Slocum does not provide any additional rationale or reason why a POSITA would make Petitioner's alleged combination. At best, Dr. Slocum states

that a POSITA *could have made* the combination, not that a POSITA *would have made* the same.

92. Further, a POSITA would understand that Petitioner's combination would not have been predictable. The Fox reference places its adjustment means within the eyelet of a shock absorber. The size and shape of the eyelet is tightly controlled in practice because the length of the shock absorber is very important to performance, and the width of the eyelet needs to fit within the parameters of many different vehicles having their own size requirements. As a result, a POSITA would not know if a reimagined eyelet, necessary to fit Fox's new structures required by Petitioner's combination, would work for its intended use within a related vehicle. Said another way, there is no indication that the proposed combination could be made within the space constraints of a shock absorber, and space constraints are particularly onerous in most (if not all) shock absorber applications.

(c) The proposed combination of Fox and JP'279 relies on Hindsight

93. Petitioner's proposed combination of Fox and JP'279 relies upon alterations that are neither present in nor suggested by these references. Further, there is no suggestion outside of Dr. Slocum's statements that these references would be combined by a POSITA, as suggested by the Petition. As a result, the only avenue for Petitioner to arrive at the claimed invention is hindsight.

94. Petitioner's somewhat ham-fisted combination of Fox and JP'279 requires modifying Fox's camshaft **34** to include an inclined plane that is arranged in a direction that is perpendicular (really, orthogonal) to the surface of the camshaft **34**. Ex. 1003, ¶¶95-96. However, JP'279 does not include an inclined plane surface placed into the curved exterior surface of a camshaft, or any other curved surface. Instead, JP'279 is a linearly moving inclined plane used to move an adjuster rod axially (up-and-down) along its movement axis, much like the prior art that is disparaged in the Background of the Invention Section. *See* Ex. 2019 (Slocum Depo.), p. 102, line 14 – p. 103, line 3; *id.*, p. 108, line 21 – p. 110, line 15. No other reference teaches or suggests inclined plane usage, as argued here by Petitioner. No other prior art reference in this matter suggests arranging an inclined plane *tangentially* to the curvature of the cam. In fact, no other prior art reference in this matter even considers the perpendicular direction in any way. Accordingly, no prior art reference in this matter suggests the complicated shaping of the camshaft **34** suggested by Petitioner and Dr. Slocum. Instead, Petitioner's combination requires a completely new shape without any basis in the prior art in this matter. A POSITA would see that Petitioner's arguments are premised on hindsight.

95. Similarly, JP'279 does not disclose or suggest using its inclined plane on only a portion of Fox's camshaft **34**, or on any other camshaft. Fox's cam itself includes a continuous surface, which in no way suggests altering any portion thereof,

much less only a portion thereof. JP'279 has no suggestion that JP'279's slider **43** could even be integrated into a cam's external surface. Nor does JP'279 suggest or disclose that its tapered surface **44** of its slider **43** may be used in conjunction with any cam surface, not to mention arranged *tangentially* to the curvature of the cam. These combinations stretch well beyond the disclosure of JP'279 into Petitioner's hindsight-biased imagination.

96. Further, a POSITA would understand that the addition of an inclined plane to the curved end surface of a cam shape would be difficult to design and subsequently manufacture. Petitioner provides no support for its implicit argument that this complicated shape could even be machined into or onto a cam's outer surface's profile. Petitioner states, without evidence or explanation, that a POSITA would know how to do so. Even if this were true, knowledge does not lead directly to obviousness without more, such as a motivation to do so. Further the increased cost of producing Petitioner's complicated cam shape with these complex geometries and extra production steps would be very high, and certainly much, much higher than the cam and inclined plane in Fox and JP'279, respectively.

97. Finally, and most importantly, no prior art reference in this matter suggests that any suspension system requires two different, linear means for moving the adjuster rod in the axial direction (up-and-down). Furthermore, no prior art reference here suggests that a POSITA *would* combine these two different but

essentially equivalent adjustment means to arrange the tapered surface **43** of JP'279 perpendicular to the *curved surface* of Fox's camshaft.

98. In fact, no reference discloses or suggests any of Petitioner's alterations discussed above *would be* accomplished by a POSITA. It bears repeating that *the only support for any of these contentions* is Dr. Slocum. For Claim Term 1.2 (Petition, 48-51), Petitioner cites only to Paragraphs 81 and 91-98 of Dr. Slocum's Declaration (Ex. 1003). Petitioner's entire argument is premised on Dr. Slocum recreating the '207 Patent Claims, using those very claims as a guide.

99. Accordingly, Ground II of the Petition should be rejected for being premised exclusively on hindsight. This issue is exacerbated by Petitioner's complete lack of a motivation to combine.

C. Yi in view of JP'279 does not render the '207 Patent's claims obvious

1. Yi in view of JP'279 and Nagai fails to disclose the Claimed Adjuster Assembly

100. Just like Fox (Ex. 1005), Yi (Ex. 1006) fails to disclose the claimed "adjuster assembly." Instead, Yi is just what was disparaged in the '207 Patent's Background of the Invention. In particular, Yi merely discloses a suspension system including only a lever **201**/camshaft **2** and adjuster rod **10** to adjust the damping characteristics of Yi's shock absorber **6**. Dr. Slocum agrees. Ex. 2019 (Slocum Depo.), p. 171, line 7 – p. 174, line 7; *id.*, p. 172, line 17 – p. 174, line 7; *id.*, p. 184,

line 17 – p. 187, line 3. The addition of JP’279 and/or Nagai do not resolve the missing element of the ‘207 Patent Claims.

101. Petitioner alleges that a POSITA would have modified Yi to include a separate adjuster assembly by placing a tapered surface on Yi’s camshaft 2. Petition, 71-75. However, Petitioner’s proposed combination fails to include the claimed “adjuster assembly” because, like Wicker,⁴ the resulting combination completely lacks a means of independent adjustment of damping characteristics. Instead, the lever/cam and adjuster rod system combination disparaged in the ‘207 Patent’s Background of the Invention remains because there are no means for independent adjustment.

102. Specifically, Petitioner’s proposed combination of Yi and JP’279 would result in a camshaft having an inclined surface *over the entire device, and not limited to one position of the valve actuating assembly*. See, e.g., Petition, 85; Ex. 1003 (Slocum) at ¶120 (Dr. Slocum stating that “[t]he solid model images I created above of tapered cylindrical surface cams illustrate how a POSITA would implement this combination to achieve finely tunable cam action.”). As discussed in Section IV(B), the entire surface of the camshaft in this proposed combination includes an

⁴ Discussed in Section IV(A)(e) and overcome during prosecution.

inclined plane, and this hindsight-based alteration would result in a change of damping characteristics *in all positions* of Yi's purported valve actuating assembly whenever the axial position of Yi's camshaft 2 is changed. Accordingly, even Petitioner's proposed combination would not disclose the claimed "adjuster assembly" at least because all positions would be adjusted with any axial movement. Again, this shows that there is no independent adjustment in the proposed combination of Yi and JP'279.

2. JP'279 Again Fails to Provide Any of the Purported Benefits of Fine Tuning and May Cover the Same Range and in the Same Way as Fox

103. Again, the premise that JP'279 provides finer adjustments than what could be offered by Yi is false and without any basis in the prior art references in this matter or the knowledge of a POSITA. Thus, for all of the reasons discussed in Section IV(B), JP'279 does not suggest a method or device that provides objectively better, or "finer," tuning ability than Yi.

104. First, as explained in Section IV(B), the concept of "fine" tuning is a relative term, such that "fine" tuning only exists in reference to a related "coarse" tuning. Petitioner's emphasis on the words "fine adjustment" differs from the actual context discussed in JP'279, which shows that the fine level of adjustment is merely a lesser slope than another sloped surface. Further, JP'279's lesser sloped surface

is not inherently finer than other adjustment means, rather, it is merely finer than the coarser adjustment of the surface having a greater slope.

105. Second, a cam (such as that in Yi) and an inclined plane are *each* capable of providing the exact same (or nearly the same), or different, levels of tuning, depending on the relative sizes of the devices being compared. Thus, there is no inherent or technically valid benefit to using one adjuster over the other based on purported fineness because each of these adjusters may be designed to provide the exact same level of adjustability. Neither adjuster provides an inherently finer level of adjustment than the other.

106. Again, *the size* of the cam and the slider directly affect the level of fineness. Thus, although one adjuster may be designed to be finer than the other, the sizes of Yi's camshaft **2** and JP'279's slider **43** (and the slope of tapered surface **44**) *are unstated*. As a result, *neither Petitioner nor Dr. Slocum nor anyone else knows* what the relative levels of fineness of Yi's and JP'279's adjusters would be. *See* Ex. 2019 (Slocum Depo.), p. 102, line 14 – p. 103, line 3; *id.*, p. 117, lines 18 – 21; *id.*, p. 120, lines 15 – 23; *id.*, p. 124, line 21 – p. 125, line 3; *id.*, 171, lines 7 – 18; *id.*, p. 181, lines 6 – 15. A POSITA would know that either adjuster could be made to provide a “finer” adjustability than the other, depending on the devices' constructions.

107. In the end, Petitioner bases its obviousness combinations on words taken out of context in an effort to craft a reason a POSITA would recreate the ‘207 Patents’ claims from the claims themselves. The words and understandings in the prior art do not support Petitioner’s combination, however, leaving Petitioner without sufficient motivation to combine Yi and JP’279. As a result, a POSITA would not have made Petitioner’s proposed combination.

3. The combination of Yi and JP’279 would not have involved a combination of unknown prior-art elements according to unknown methods and would not yield predictable results

108. Without the concept of JP’279 providing a finer range than what is available to Yi without modification, the Petitioner’s only remaining motivation to combine is that the combination would only involve known elements and known methods. *E.g.*, Petition, 74-75. The prior art involved in this matter does not support Petitioner’s statements. The use of an inclined plane on a camshaft *was not known*. Using an inclined plane on only a portion of a camshaft *was not known*. Arranging these two different movement systems at perpendicular angles, *especially* when the surface of the camshaft *curves* such that the relative angles would not be commonplace in any event, *was not known*. Using two different adjustment methodologies together to move an adjuster rod *was not known*. Moving a camshaft axially (i.e., along the axis of rotation of the camshaft) *was not known*. Ex. 2019 (Slocum Depo.), p. 195, line 14 – p. 202, line 11.

109. Further, like the combination of Fox and JP'279, Petitioner has provided no support for its argument that these features (which were not known) would have been known to a POSITA. Petition, 74-75. Petitioner's only support is a citation to Paragraph 125 of Dr. Slocum's Declaration (Ex. 1003). Dr. Slocum does not provide any analysis to support his conclusions. *See also* Ex. 1003, ¶82 (same statements regarding Fox and JP'279). Instead, Dr. Slocum restates, without explanation, that *unspecified* elements and methods were known and predictable. And Dr. Slocum again states that the combination is based on the Petitioner's false allegations of benefits of fine tuning from JP'279, which is not supported by JP'279 nor any other prior art reference in this matter. *See* Section IV(B), *supra*.

110. Dr. Slocum does not state any additional rationale or reason why a POSITA would make Petitioner's alleged combination. At best, Dr. Slocum states that a POSITA *could have made* the combination, not that a POSITA *would have made* the same. Further, the combination would not have been predictable, as discussed in Section IV(B). A POSITA would not know if a reimagined eyelet, needed to fit Yi's new structures from JP'279, would work for its intended use within a related vehicle.

4. The proposed combination of Yi and JP'279 relies on Hindsight

111. Petitioner's proposed combination of Yi and JP'279 relies upon alterations that are neither present in nor suggested by these references. Further, there is no suggestion outside of the statements of Dr. Slocum that these references *would* be combined by a POSITA, as suggested by the Petition. As a result, Petitioner must be using hindsight to arrive at the inventions claimed in the '207 Patent.

112. Petitioner's proposed combination of Yi and JP'279 requires modifying Yi's camshaft **2** to include an inclined plane arranged perpendicular (really, orthogonal) to the surface of the camshaft **2**. *See, e.g.,* Ex. 1003, ¶¶93-96. However, JP'279 and all the other prior art references in this matter do not teach or suggest (1) an inclined plane surface placed into the curved exterior surface of a camshaft, or any other curved surface; (2) arranging the inclined plane *tangentially* to the curvature of the cam; (3) the complicated shaping of the camshaft **34** suggested by Petitioner; or (4) any difference between the suggested combination and the prior art devices disparaged in the Background. Instead, Petitioner's new shape has no support or basis in the prior art. A POSITA would understand that Petitioner's arguments are premised on hindsight.

113. Similarly, nothing in JP'279 suggests adding an inclined plane surface to only a portion of Yi's camshaft **2**. Yi's cam includes curved or otherwise complicated surface, which in no way suggests altering any portion thereof, let alone only a portion thereof. Further, JP'279 has no suggestion that JP'279's slider **43** could be integrated into a cam's surface. Nor does JP'279 suggest that the tapered part **44** of the slider **43** may be used with a cam surface, arranged *tangentially* to the curvature of the cam. This would be a complicated shape, indeed.

114. In fact, as discussed in Section IV(B) above, the addition of the curved surface to the end surface of a cam shape would be relatively difficult to manufacture. In any event, the cost of producing Petitioner's proposed cam device with these complex geometries and additional manufacturing steps would be very high, and certainly much, much higher than either cam devices in Yi or JP'279. *Id.*

115. Finally, and most importantly, no prior art reference in this matter suggests that any suspension system requires two different, linear means for moving an adjuster rod axially (up-and-down). Furthermore, no prior art reference in this matter suggests that if a POSITA would combine these two different but nearly equivalent adjustment means that the adjustment means should and would be arranged so that the tapered surface **43** of JP'279 would be oriented perpendicular to the *curved surface* of Yi's camshaft **2**. Again, this is a difficult and expensive change that would offer no discernable benefits.

116. No reference discloses any of these required alterations that Petitioner alleges could be accomplished by a POSITA. The only support for any of these contentions is Dr. Slocum. For Claim Term 1.2 (Petition, 82-86), Petitioner cites only to Paragraphs 123, 132 and 133-135 of Dr. Slocum's Declaration (Ex. 1003). Without any support in the actual prior art in this matter, Petitioner's entire argument is premised on Dr. Slocum recreating the '207 Patent Claims, using those very claims as a guide. This again is a hindsight recreating of the inventions claimed in the '207 Patent.

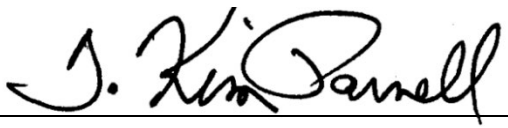
117. Accordingly, Ground III of the Petition should be rejected for being entirely premised on hindsight. This issue is exacerbated by Petitioner's complete lack of a motivation to combine.

V. CONCLUSION

118. For the foregoing reasons, it is my opinion that claims 1-3, 7, 8, and 10-12 of the '207 Patent claims are valid and patentable.

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: October 31, 2024

A handwritten signature in black ink, reading "T. Kim Parnell", written over a horizontal line.

T. Kim Parnell, Ph.D., P.E.

APPENDIX A

T. Kim Parnell, PhD, PE

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Expertise Highlights

- ☐ Medical device/biotechnology – Cardiovascular, Orthopedic, Orthodontic
- ☐ Patents & Intellectual Property
- ☐ Product Liability; Personal Injury
- ☐ Bluetooth, Zigbee, Wireless technology
- ☐ System Specifications & Test Procedures
- ☐ Composite Materials Design & Damage;
- ☐ Plastics, Molding, Manufacturing
- ☐ Telephone set design; touchpads; keypads
- ☐ Piezoelectric components
- ☐ Consumer Electronics & Products
- ☐ Laptop computers; keyboards; displays
- ☐ Materials & Metallurgy
- ☐ Robotic & Laparoscopic Surgical tools;
- ☐ Failure Analysis & Reliability
- ☐ Fracture & Fatigue
- ☐ User experience & system interaction
- ☐ User interface design
- ☐ Finite Element Analysis of Structures & Fluid/Heat Transfer (FEA/CFD)
- ☐ Structural Mechanics, Fluid Mechanics, Heat Transfer, Thermodynamics
- ☐ Transducers, Accelerometers, MEMs
- ☐ Software design, development, QA
- ☐ Green energy: Wind, Solar Trackers, PV Panels; Electric Vehicles, Battery tech
- ☐ Shock & Vibration Sensitivity
- ☐ Vehicle & Heavy-Truck Crashworthiness
- ☐ ATV & Vehicle Design, Crashworthiness
- ☐ Numerical Multi-Disciplinary Analysis
- ☐ Group Manager & Project Leader;
- ☐ Strategic & Budgetary Planning responsibility

Education

Year	University	Degree Awarded
1984	Stanford University	Ph.D., Mechanical Engineering
1979	Stanford University	MSME, Mechanical Engineering
1978	Georgia Tech	BES, Engineering Science & Mechanics (Highest Honors)
2004	San Jose State University	Silicon Valley Executive Business Program (SVEBP)
2014	Stanford Continuing Education	“A Crash Course in AI”

Ph.D. Thesis: “Numerical Improvement of Asymptotic Solutions and Nonlinear Shell Analysis”, June, 1984.

Professional Associations and Achievements

- Registered Mechanical Engineer (PE, M025550) in the State of California
- ASME Fellow; American Society of Mechanical Engineers (ASME)
- IEEE Life Senior Member; Institute of Electrical and Electronics Engineers (IEEE)
- R42 Fellows Program – XPrize Healthspan Prize Superteam
- Silicon Valley Engineering Council (SVEC-ca.org) Vice President-2024
- Society for the Advancement of Material & Process Engineering (SAMPE); Society of Automotive Engineers (SAE), Member
- ASM International Member; SMST (Shape Memory and Superelastic Technologies) Member; EDFAS (Electronic Device Failure Analysis Society) Member
- IEEE-SCV Santa Clara Valley Section Award for Member Promoting Women in Engineering; 2024
- IEEE-SCV Santa Clara Valley Section Leadership Award; 2018
- IEEE Santa Clara Valley (IEEE-SCV) Section; Chair-2011, Vice Chair-2010
- IEEE Consultants’ Network of Silicon Valley (IEEE-CNSV), Board Member; Chair: 2008-2009
- NAFEMS Member – Composite Materials Working Group (CWG), Vice-Chair 2018-2023;
- IEEE Vehicular Technology Society (IEEE-VTS); Vice-Chair, 2012-2018; Treasurer 2018-present

- IEEE Consumer Technology Society (IEEE-CT), IEEE Computer Society (IEEE-CS), IEEE Engineering in Medicine & Biology (IEEE-EMBS), IEEE Electronics Packaging Society (IEEE-EPS)
- Reviewer: *Journal of Composite Materials (JCM)*; *International Journal of Forensic Engineering (IJFE)*; *Shape Memory and Superelasticity*, *International Journal of Technology Transfer and Commercialization (IJTTC)*.
- Chinese American Semiconductor Professional Association (CASPA)

Employment History

From: 2000 **Parnell Expert Consulting; Parnell Engineering & Consulting**
 To: Present Sunnyvale, CA; Web: parnell-eng.com
 Position: *Principal & Founder*
 Provides independent engineering consulting & expert witness services for high-technology applications including:

- ☐ Medical device/biotech product development & concept design
- ☐ Medical device cardiovascular applications across wide product range
- ☐ Medical device orthopedic, spinal, prosthetic devices – IP, design
- ☐ VC technical due-diligence for prospective medical device investment
- ☐ Patent & intellectual property – litigation, IPR, research, due diligence
- ☐ Expert Witness & Litigation Support services – multiple technologies
- ☐ Nitinol, shape-memory applications; biomaterials applications
- ☐ Portable devices, keypads: robust design, reliability & durability
- ☐ Cell phone Li-Ion battery failure & fire; protective enclosures;
- ☐ Bluetooth, Cellular, Zigbee, Wireless technology
- ☐ Solar panel tracker technology; PV Panel technology
- ☐ Manufacturing technology; materials applications (metals, polymers)
- ☐ Reliability and failure analysis services; accelerated testing
- ☐ Research in application & damage of composite materials
- ☐ Teaching intensive workshops & training seminars on simulation, design, and reliability for practicing engineers
- ☐ Lecturer in Prof. Steve Tsai's *Stanford Composites Design Workshop*
- ☐ Composite materials design & applications
- ☐ Wind Energy, Solar Energy, Alternative Energy – technology
- ☐ Electric vehicles, battery systems: design & development
- ☐ Heavy-Truck Rollover, Vehicle & ATV Crashworthiness; Barriers
- ☐ Software design, development, user experience, QA, testing
- ☐ Applications of CAE, FEA, and High-Performance Computing (HPC)
- ☐ Digital Twin Technology—FEA Simulation & Test

From: 2010 **Santa Clara University**
 To: 2012 Santa Clara, CA
 Position: *Faculty, Mechanical Engineering Department*
 Taught courses covering a range of topics including Materials Science, Manufacturing Methods, Composite Materials, Finite Element Methods, Mechanism Dynamics, Computer Graphics, & Design. Advised students on Design, Safety, and Simulation for Student Projects including SAE Formula-Hybrid Vehicles. Research in Composite Materials and High-Performance Computing. Interaction with Industry Advisory Board (IAB) & ABET

Certification. Teamed with other faculty for strategic initiatives and equipment/tool grants for research. Promote IEEE, ASME, cross-disciplinary initiatives & social media avenues for student networking, professional development & project support.

From: 2006

To: 2010

Position:

MSC Software Corporation

Sunnyvale, CA

Senior Manager, User Experience; Lead Application Engineer

Integrated feedback from customers into user interface design & specifications; Beta testing of prototypes with users; CAE software Product Management role for user interface and analysis tools including:

- ☐ Product quality, testing, and improvement; drove customer satisfaction
- ☐ Application of advanced analysis technology in design & manufacturing
- ☐ Led corporate Wind Energy initiative & revival of Fatigue product
- ☐ Composite materials – acknowledged corporate & customer expert
- ☐ Customer training courses, workshops, webinars; developed & taught
- ☐ Software design, development, QA, testing of commercial apps
- ☐ Mentoring and development of junior staff; interviewed & hired staff for India; developed and trained staff using distance learning

Applied finite element technology to applications including automotive, medical device, energy, and electronics. Created customer satisfaction via:

- ☐ Customer support & analysis process development; Digital Twin
- ☐ Material testing & data reduction for development of properties

From: 1999

To: 2000

Position:

Rubicor Medical, Inc.

Redwood City, CA

Director of R&D

Led the R&D team for this start-up medical device company developing breast diagnostic and therapeutic devices. Designed device considering interaction of Physician with Device and human factors. System included a mechanical subsystem and RF generator/control electronics. Developed initial prototypes and conceptual designs; researched IP and competing technologies.

From: 1986

To: 1999

Position:

Exponent, Inc. and Failure Analysis Associates (FaAA)

Menlo Park, CA

Senior Managing Engineer

Delivered consulting services for failure analysis, accident investigation, product liability, patent/IP, insurance-related litigation, medical device and biotechnology product development, FDA submission, and forensic/failure investigation. Performed analyses involving stress, thermal, & fluid applications; testing of material properties and use of laboratory techniques such as SEM & Optical Microscopy for inspection of material samples. Led the SAE Heavy Truck Crashworthiness, Phase II project with testing & simulation of heavy-truck cabs in rollovers. Managed the Engineering Analysis Group and had profit/loss responsibility for the Engineering Computer Center. Maintained high personal utilization/billable hours and had increasing personal/group profitability with significant consulting services revenue generation.

From: 1995 **Stanford University**
To: 1996 Stanford, CA
Position: *Visiting Associate Professor, Mechanical Engineering Department*
Taught graduate courses in Theory of Plates and Theory of Shells in the Applied Mechanics Division (now Mechanics & Computation) of Mechanical Engineering. Part-time appointment while full-time staff-member at Exponent.

From: 1984 **SST Systems, Inc.**
To: 1986 Sunnyvale, CA
Position: *Principal Engineer in Pressure Vessels, Piping & Structures Division*
Managed software development, facilitated university collaboration, developed product specifications and enhancements based on customer feedback, supported and trained over 30 new customers, and created standardized product documentation. Provided sales and technical marketing support to CEO during product launch; formulated go-to-market campaign.

From: 1980 **Stanford University**
To: 1984 Stanford, CA
Position: *Research Assistant, Mechanical Engineering Department*
Established the theoretical basis and developed computational tools for nonlinear shell mechanics. Emphasized computational mechanics and engineering applications, including linear & nonlinear finite element methods and other numerical analysis techniques. Algorithm & software development

From: 1978 **AT&T Bell Laboratories**
To: 1980 Indianapolis, IN
Position: *Member of Technical Staff (MTS), Physical Design Group*
Design, development, and manufacturing of high-volume telecommunication components. Researched and designed dials, keypads, electromechanical systems, and piezoelectric polymer applications. Employed range of materials including elastomers, metals, polymers, and piezoelectrics for keypad and transducer applications. Emphasis on cost, reliability, and manufacturing simplicity. Developed new technologies to ultimately drive field improvements. Applied finite element simulation to improve designs and reduce prototypes.

From: 1976 **General Motors Corporation**
To: 1977 Atlanta, GA
Position: *Engineering Assistant, Plant Engineering Department*
Production line design and manufacturing applications for the GM Lakewood assembly plant. Supervised demolition and production line installation during changeover. Installed automated spotweld robot for sheet metal panels. Studied automotive manufacturing & assembly operations from start to finish.

Selected Grants & Research Programs

SA Photonics, Inc.

- 2013 – Phase I Navy SBIR – Post-IED Hull Inspection Tool, Topic N123-156

Stanford University

- 2012 – Phase II Army SBIR – Development and Implementation of Micro-Mechanics of Failure (MMF) Model for Composites in Commercial Finite Element Codes

Santa Clara University

- 2012 – Kuehler Summer Undergraduate Research Grant – student support for composite materials testing & characterization
- 2011 – Technology Innovation Grant – Acquisition of advanced DSC/TGA System for improved lab capability
- 2011 – Technology Innovation Grant – Acquisition of High-Performance Workstation for advanced simulation of large dynamic and nonlinear systems
- 2011 – Technology Innovation Grant – Materials Laboratory equipment upgrades and reorganization

Selected Presentations

- “SMA Seismic Damping Devices: Fabrication, Testing, Analysis, and Projections”, SMST-2014, Monterey, CA, May, 2014.
- “Mechanical Design for Reliability: What does it Mean?”, ASME Santa Clara Valley Section, Sunnyvale, CA, Mar, 2014.
- “Prosthetic Feet using Carbon Fiber Composites: Design, Simulation, & Testing”, ASME Santa Clara Valley Section, Jun, 2013.
- “Mechanical Design for Reliability: Beating the Tough Problems”, IEEE-SCV Reliability Society, Santa Clara, CA, Jun, 2013.
- “Prosthetic Feet using Carbon Fiber Composites: Design, Simulation, & Testing”, MSC Software 50th User Conference, Irvine, CA, May, 2013.
- “Composite Materials: Improved Understanding of Composite Failure Mechanisms with DIC Testing & Analysis”, Trilion User Conference, Philadelphia, PA, Sep, 2012.
- “Medical Device Failures – ‘Not so Good, Very Bad, and Truly Ugly’!!”, ASM (Materials Information Society) Santa Clara Valley Chapter, May, 2012.
- “C-Ply Bi-Angle NCF Tape Seam Assessment & Design Considerations for Automated Tape Laying”, Composites Design Forum, JEC Composites Conference, Paris, Mar, 2012.
- “Failure of Structures Designed with Composite Material – Delamination”, *‘Meet the Experts’ Forum on Composite Materials*, Joint with Prof. Steve Tsai, SMP Tech, Feb 28, 2012.
- “Shape Memory Alloy Fundamentals & Advanced Simulation Techniques for Medical Products”, *‘Meet the Experts’ Forum on Nitinol Properties and Unique Behavior for Medical Product Design*, SMP Tech, Sep 14, 2011.
- “Stiffness and Strength of Laminates Fabricated with Bi-Directional Tape”, ICCM-18 (International Conference on Composite Materials, Korea, Aug, 2011, (with Daniel D. Melo & Christine Tower))
- “Composite Materials – Damage & Delamination”, Santa Clara University, Mechanical Engineering Seminar, Feb, 2011
- “Composites Damage, Delamination, Failure & Curing” and “Workshop on Mic-Mac/FEA” with Prof. Steve Tsai, Stanford Composites Design Workshop, 2010-2012
- “Composite Damage, Delamination, and Failure” and “Workshop on Mic-Mac/FEA” with Steve Tsai, Stanford Composites Design Workshop, Jan, 2010
- “Composite Failure Methods – Application Comparisons”, Composites Durability Workshop-14 (CDW-14), UCLA, Jul, 2009
- “Composites Damage, Delamination, and Failure Analysis”, Stanford Composites Workshop, May 2009

- “Finite Element Analysis using a Thermomechanical Shape Memory Alloy Model”, SMST-2006, Monterey, CA, 2006.
- “Medical Device Issues & Trends”, in “Biomedical Wave: Opportunities for Non-Biologists”, MedTech Bridge Seminar Series, 2005.
- “Medical Device Development and Entrepreneurship”, IEEE Consultants’ Network of Silicon Valley (IEEE-CNSV), www.CaliforniaConsultants.org , 2004.
- “CFD Fundamentals and Applications in Biotechnology”, ASME Professional Development Seminar, 2003 & 2004.
- “Medical Device Business Opportunities in China”, multiple presentations to key government and industry representatives, CASPA Delegation, Oct, 2003.
- “Using Simulation with Testing for Maximum Benefit”, WESCON 2003, Low Cost Tools: Alternatives for Problem Solving in Development, Design and Application, San Francisco, CA, Aug, 2003.
- “Fracture Mechanics: Overview and Applications”, Aeronautics & Astronautics Department, Stanford University, May, 1999.
- “Integrated Fluid/Thermal/Structural Analysis of a Turbine Blade”, American Society of Mechanical Engineers Bay Area Technical Conference, May, 1995.
- “Failure Analysis Projects”, Mechanical Engineering Department, Stanford University, May. 1992.
- “Finite Element Applications in Failure Analysis”, Mechanical Engineering Department, Stanford University, Mar, 1991.
- “Soil-Pipeline Interaction Associated with a Process-Plant Explosion”, Seminar in Solid Mechanics, Stanford University, Nov, 1989.
- “Typical Failures: Causes and Consequences”, Construction Engineering and Management Program, Civil Engineering Department, Stanford University, 1989.
- “Shell Analysis Using Personal Computers”, Solid Mechanics Seminar, Stanford University, 1985.

Selected Publications

- "Numerical evaluation of SMA-based multi-ring self-centering damping devices.", (2021). Smart Materials and Structures. DOI: <https://doi.org/10.1088/1361-665X/ac1d94>. (with M. Salehi, R. DesRoches, and D. Hodgson).
- “Numerical Simulation of Seismic Response Control of Frame Structure Using High-Temperature Shape Memory Alloy Wire”; Proceedings of: International Conference on Earthquake Engineering (SE-50EEE), At MAEE, Skopje, Macedonia, May 2013, (with Md. Golam Rashed and Raquib Ahsan).
- “Equivalent Properties for Finite Element Analysis in Composite Design”, JEC Composites Magazine, No.68 (Bi-Angle NCF Special Issue), Oct, 2011, (with Stephen W. Tsai)
- “Stiffness and Strength of Laminates Fabricated with Bi-Directional Tape”, ICCM-18, Aug, 2011, (with Daniel D. Melo & Christine Tower)
- "How Reliable Is Your Product: 50 Ways to Improve Product Reliability"*, Mike Silverman, 2011 (2-Book Chapters contributed by T. Kim Parnell).
- “Heavy Truck Roll Cage Effectiveness”, IMECE2009-12423, Proceedings of IMECE: ASME-Mechanical Engineering Congress and Exposition, Nov, 2009, (with Stephen Batzer, Bruce Enz, Grant Herndon, Chandrashekar Thorbole, Robert Hooker, and Mariusz Ziejewski).
- “Composite Failure Methods – Application Comparisons”, Proceedings of Composites Durability Workshop-14 (CDW-14), UCLA, Jul, 2009

- “Thermoelastic Shape Memory Modeling of Medical Devices with FEA”, SMST-2006, The International Conference on Shape Memory and Superelastic Technologies, ASM International, May, 2006, (with Sanjay Choudhry and Jesse Lim).
- “Finite Element and Fatigue Analysis of CardioVasc Stent Graft”, CardioVasc, Inc., 2004.
- “Analysis of Rail Cracking and Development of a Rail Screening Guideline Based on Fracture Mechanics Principles”, Fatigue & Durability Assessment of Materials, Components & Structures, Proceedings of the Fifth International Conference of the Engineering Integrity Society, Queen's College, Cambridge, UK, Apr 7-9, 2003.
- “Finite Element and Fatigue Analysis of CP Stent Expansion”, NuMed, Inc., 2003.
- “Evaluation of a Failure in a Chlorine Production Facility”, Proceedings of IMECE 2001, ASME International Mechanical Engineering Congress and Exposition, Nov, 2001, New York, NY (with S. Andrew, R. Caligiuri, and L. Eiselstein).
- “Physical Testing for Good Analysis: Experimental Validation for Quality Finite Element Analysis of Medical Devices”, feature article for *ANSYS Solutions*, Fall 2000 (Machine Design Custom Media, Penton Media, Inc.).
- “Finite Element Simulation of 180° Rollover for Heavy Truck Vehicles”, ASCE Engineering Mechanics Conference, Baltimore, MD, Jun, 1999 (with Christopher V. White and Shari E. Day).
- “Finite Element Analysis of the S670 Cardiovascular Stent”, Arterial Vascular Engineering, Inc., 1999.
- “Finite Element Analysis of the S660 Cardiovascular Stent”, Arterial Vascular Engineering, Inc., 1999.
- “Finite Element Analysis of the Six Crown Extra Support Renal Stent – Minimum Dimensions”, Arterial Vascular Engineering, Inc., 1998.
- “Finite Element Analysis of the SVG Stent”, Arterial Vascular Engineering, Inc., 1998.
- “Finite Element Analysis of the GFX-II Cardiovascular Stent”, Arterial Vascular Engineering, Inc., 1998.
- “Analysis of Drill Pipe Joint Failures and Recommendations For Service”, Failure Analysis Associates, Inc. Report, Nov, 1997 (with R.D. Caligiuri, L.E. Eiselstein, M. Wu, R. Huet).
- “Finite Element Analysis of the GFX Cardiovascular Stent”, Arterial Vascular Engineering, Inc., 1997.
- “Stress Analysis: AVE MicroStent-II Cardiovascular Stent”, Arterial Vascular Engineering, Inc., 1997.
- “SAE Report CRP-12 Heavy Truck Crashworthiness – Phase II (180° Dynamic Rollover, Static Roof Crush Simulation)”, SAE Headquarters, 1997.
- “Heavy Truck 180° Dynamic Rollover and Static Roof Crush Simulation”, Failure Analysis Associates, Inc. Report, Apr, 1996 (with C. White, S. Day, T. Khatua, and L. Cheng).
- “Fracture Toughness by Small Punch Testing”, *Journal of Testing and Evaluation*, Vol. 23(1), pp. 3-10, Jan, 1995 (with J. R. Foulds, P. J. Woytowitz and C. W. Jewett).
- “Safety Analysis of Custom Designed Manufacturing Equipment”, Proceedings, American Society of Mechanical Engineers Winter Annual Meeting, Safety Engineering and Risk Analysis, New Orleans, Louisiana, Nov, 1993, Vol. 1, pp. 111 (with G. L. Rao and R. D. Caligiuri).
- “American Azide Corporation Reactor and Dryer Safety Studies”, Failure Analysis Associates, Inc. Report, Jan, 1993 (with G. L. Rao, V. B. Rao, and R. D. Caligiuri).
- “Combustion Tests on and Chemical Analysis of Therminol 66 Heat Transfer Fluid Used at American Azide”, Failure Analysis Associates, Inc. Report, 1993 (with A. Reza and R. D. Caligiuri).
- “Gas Release from Leaky Natural Gas Pipeline: The PEPCON Explosion in Henderson, Nevada”, Failure Analysis Associates, Inc. Report, 1992 (with A. Reza, M. El-Fadel and R. D. Caligiuri).

- “Computational Modeling of Dynamic Failure in Armor/Anti-Armor Materials”, Failure Analysis Associates, Inc. Final Report to U.S. Army Research Office, Contract DAA-L03-88-C-0029, May, 1992.
- “Analysis of Cracking in the Windsor Recovery Boiler Superheater”, Failure Analysis Associates, Inc. Report to Domtar, Inc., Apr, 1992 (with R. D. Caligiuri, C. H. Lange and S. P. Andrew).
- “Analysis of the Dynamic Response of a Buried Pipeline due to a Surface Explosion”, *Computational Aspects of Impact and Penetration*, L.E. Schwer and R.F. Kulak, eds., Elme Press International, 1991 (with R. D. Caligiuri).
- “Failure Analysis of Aerzen Screw Compressor Male Thrust Bearings”, Failure Analysis Associates, Inc. Report to AECI Chlor-Alkali & Plastics, Ltd., Sep, 1991 (with C. C. Schoof).
- “Gas Flow and Heat Transfer in a Pipe Tee Joint”, Failure Analysis Associates, Inc. Report to Chevron Corporation, Nov, 1990 (with R. D. Caligiuri and A. Reza).
- “Development of Dynamic Failure Criteria for Ceramic Armor Materials”, Failure Criteria and Analysis in Dynamic Response Symposium, ASME Winter Annual Meeting, Nov, 1990, H.E. Lindberg, ed.
- “DYNA3D Analysis of the Dynamic Response of a Buried Pipeline due to a Surface Explosion”, DYNA3D User Group Conference, Bournemouth, Dorset, United Kingdom, Sep, 1990.
- “Con Edison Hellgate Facilities Gas Main Rupture”, Failure Analysis Associates, Inc. Report to Consolidated Edison Company of New York, Inc., Feb, 1990.
- “Stress and Fracture Mechanics Analysis of Weld Cracking in a Rotary Ball Mill”, American Society of Mechanical Engineers Winter Annual Meeting, Paper 89-WA/DE-17, San Francisco, California, Dec, 1989 (with C. A. Rau, Jr., H. F. Wachob and E. L. Kennedy).
- “Analysis of the Plunger-to-Plunger Rod Joint in an Automotive Fuel Injector”, Failure Analysis Associates, Inc. Report to Hitachi, Ltd., Oct, 1988 (with P. R. Johnston and B. Ross).
- “Analysis of the Circumferential Seam Weld Cracking of Raw Grinding Mills”, Failure Analysis Associates Report to Kaiser Cement Corporation, Nov, 1986 (with C.A. Rau, Jr., H.F. Wachob).
- “Local Flexibility and Stresses in Cylindrical and Spherical Shells Due to External Loadings on Nozzles and Lug Attachments”, A.F.I.A.P. Conference, Paris, France, Oct, 1986.
- “Analysis of Piping Systems with Local Nozzle Flexibility Using Personal Computers”, American Society of Mechanical Engineers Pressure Vessel and Piping Conference, New Orleans, LA, 1985.
- “Numerical Improvement of Asymptotic Solutions and Nonlinear Shell Analysis”, Ph.D. dissertation, Stanford University, Jun, 1984.
- “Numerical Improvement of Asymptotic Solutions for Shells of Revolution with Application to Toroidal Shell Segments”, *Computers & Structures*, Vol. 16, No. 1-4, 1982.

Consulting Projects - Selected

Client: NanoBio Genomics, Inc.
Project: Confidential

Client: Aquedon Medical, Inc.
Project: Product development associated with implantable Nitinol medical device for aortic aneurysm; Duett product; Radial Stiffness Assessment; Correlate Test & Simulation

Client: Silver Spring Networks, Inc.; Ops A La Carte LLC
Project: Mechanical Accelerated Life Testing and Reliability Assessment of Commercial IoT Network-Connected Natural Gas Metering Equipment; Failure Analysis support; plastic component design, accelerated life testing; remote monitoring;

Client: F-Prime Capital Partners (former Fidelity Biosciences)
Project: Technical Due-Diligence review of prospective stealth-mode medical device investment

Client: SI-Bone, Inc.
Project: Design review of iFuse sacroiliac (SI) joint fixation devices; Competitive comparison

Client: TexasLDPC, Inc.
Project: Business Advisor; Flash Memory Technology development for error-correction; LDPC – Low-Density Parity Check; start-up

Client: Cerevatech Medical, Inc.
Project: Business Advisor; Medical Device developer of innovative Nitinol neurovascular stent and flow diverter devices, start-up

Client: Promed Medical Inc.
Project: Evaluation of deployment failure associated with Nitinol scaffold and bioabsorbable PLGA cover material. Test protocols; assessment of data and development of strategy to increase device reliability.

Client: Topera Inc.
Project: Evaluation of Nitinol device failure in test and clinical setting used for 3D mapping associated with treatment of arrhythmia. Comparison of current design with proposed redesign.

Client: LC Therapeutics
Project: Assessment of Nitinol coronary device.

Client: CrossRoads Extremity Systems
Project: Design evaluation of Nitinol orthopedic devices for bone fixation with focus on foot & ankle devices including staples and plates; Report for 510K submission to FDA

Client: Bridgelux, Inc
Project: Design evaluation of LED Outdoor Lighting Module (OLM) for assembly and service conditions; assessment of polymeric, injection-molded components including FRP (fiber-reinforced plastic)

Client: Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.
Project: MEMs Patent Portfolio review and assessment

Client: Design Standards Corporation (DSC)
Project: Design analysis & report for injection-molded surgical ligation clip;

Client: Sirius Engineering LLC
Project: Nitinol Vena-Cava Filter; Implantable cardiovascular medical device

Client: Nitinol Technology, Inc.
Project: Design and assessment of large-scale nitinol components for seismic damping in civil structures (buildings, bridges, roadways); analysis & testing collaboration

Client: Varian Medical, Inc.
Project: Medical radiation oncology capital equipment; shipping hazard assessment

Client: Atsina Surgical LLC
Project: Injection molded surgical ligation clip; material testing; product design, development, and optimization

Client: Home Dialysis Plus
Project: Development of reliability & accelerated testing protocols for innovative dialysis system including mechanical, electronic, & software components

Client: Freedom Innovations, LLC
Project: Carbon Fiber Prosthetic Foot – failure analysis, simulation

Client: Ops A La Carte LLC
Project: Mechanical Design for Reliability classes; failure analysis; simulation of mechanical & thermal performance; accelerated testing and root-cause analysis; TTi Sunseeker solar tracker failure analysis, redesign after full system loss due to damage from high winds;

Client: OLT Solar
Project: Product improvement under high-temperature exposure

Client: VX Aerospace
Project: Composite material product design and validation

Client: Fidelity Biosciences
Project: Medical device due-diligence and technology evaluation pre-investment

Client: DJS Associates
Project: Automated food packaging equipment - failure analysis and assessment of root cause issues

Client: Tribal Engineering, LLC
Project: Various simulation and customer training projects

Client: Gerson Lehrman Group
Project: MEMs Sensors; Various other projects

Client: Ops A La Carte LLC
Project: Various Reliability Consulting projects; Mechanical Design for Reliability Training

Client: Revascular Therapeutics, Inc (acquired by Boston Scientific)
Project: Implantable medical device for treatment of calcified lesions

Client: City and County of San Francisco
Project: Glass failure; Trial prep

Client: Sagalio LLC
Project: Retractable screen for portable cellular devices

Client: New Energy Technologies, Inc
Project: Alternative Energy concept assessment & review

Client: Square One Medical
Project: Implantable medical device design, development, simulation

Client: Kyphon
Project: Device improvement for spinal interventional device

Client: ProMed, Inc
Project: Implantable medical device for spinal application

Client: Nuvation
Project: Instrumentation assessment

Client: Ovalis, Inc
Project: Nitinol PFO Closure Device development and design improvements

Client: Gateway Medical
Project: Vascular Closure Device

Client: Ensure Medical
Project: Vascular Closure Device

Client: Abbott Laboratories
Project: Continued development and cost reduction aspects for StarClose device.

Client: Integrated Vascular Solutions (IVS) (acquired by Abbot Labs)
Project: Design & development of StarClose nitinol closure device for arterial closure following interventional procedures. 2005 MDM Excellence Award

Client: Prolifix Medical
Project: Nitinol device to excise plaque buildup from arteries

Client: Coapt Systems
Project: Bioabsorbable devices for surgical and cosmetic procedures

Litigation Support Experience

Litigation Cases; Depositions & Expert Reports as Shown:

2023 to Present	Client:	Lewis Rice LLC
	Case:	<i>SRAM LLC v Fox Factory, Inc.</i> , Case 1:23-cv099492-SCJ in the Northern District of Georgia, Atlanta Division.
	Project:	Patents; Various specialized bicycle components
	Status:	Expert Declaration
2023 to Present	Client:	Baker & Hostetler LLP
	Case:	<i>Bote LLC v Twitch LLC</i>
	Project:	Patents; Drop-Stitch, Inflatable Stand-Up Paddle Boards (SUPs)
	Status:	IPR Expert Declarations
2023 to Present	Client:	Merchant & Gould P.C.
	Case:	<i>Smarte Carte Inc. and Charles E. Bain v. Innovative Vending Solutions LLC and Innovative Strollers LLC</i> No. 1:19-cv-08681-NLH-AMD in United States District Court District of New Jersey
	Project:	Patents; Dispensing System for Wheeled Device
	Status:	Deposition, March 2024; Infringement Expert Report; Validity Rebuttal Report; 2024
2023 to Present	Client:	Lipsius-BenHaim Law, LLP
	Case:	<i>Silverwing Medical LLC v. Adorama Inc. and Kitchen Winners NY Inc. (E.D.N.Y.); and Kitchen Winners NY Inc. v. Rock Fintek LLC (S.D.N.Y.)</i>
	Project:	Inspect, Review, and Chemical Assessment of surgical gloves
	Status:	
2023	Client:	Manning & Kass LLP
	Case:	<i>Serra Aladag v Williams-Sonoma, Inc., et.al.</i> , Case No. 22STCV33894, Superior Court of California for the County of Los Angeles
	Project:	Personal Injury (burns) and alleged Product Defect & Product Liability associated with a Water Bottle
	Status:	Settled
2023 to Present	Client:	Wise Morrissey, LLC
	Case:	<i>David Ness and Nicole Ness v. Grundfos Pumps, Corp.</i> , Case No. , Circuit Court of Cook County Illinois
	Project:	Personal Injury, Product Liability associated with Workpiece ejected from a CNC Lathe
	Status:	

2023	Client:	Johnston & Hutchinson LLP
	Case:	<i>Childers v Restoration Hardware</i> , Case No. CIV1801659, Superior Court of California for the County of Marin
	Project:	Personal Injury, Product Liability associated with coating material composition and flaking on a Table
	Status:	Settled
2022 to Present	Client:	McCaulley Law Group; Haley Guiliano LLP
	Case:	<i>Surgical Instrument Service Company, Inc. v Intuitive Surgical, Inc.</i> , Case No. , United States District Court, Northern District of California
	Project:	Anti-Trust case associated with EndoWrist devices for Da Vinci surgical robots. Engineering evaluation of repaired devices.
	Status:	Deposition, March 2023; Expert Reports 2023;
2022 to Present	Client:	Spector Roseman & Kodroff, P.C.
	Case:	<i>RE: Da Vinci Surgical Robot Antitrust Litigation</i> , Lead Case No. 3:21-cv-03825-vc, United States District Court, Northern District of California
	Project:	Anti-Trust case associated with EndoWrist devices for Da Vinci surgical robots. Engineering evaluation of repaired devices.
	Status:	Deposition, March 2023; Expert Reports 2023;
2022	Client:	Calfee, Halter & Griswold, LLP
	Case:	<i>LG Electronics, Inc v. Multiple Respondents</i> , Certain Refrigerator Water Filtration Devices and Components Thereof, Investigation No. 337-TA-1290, United States International Trade Commission (ITC), Washington, D.C.
	Project:	ITC Investigation regarding alleged Validity and Infringement of 3 LGE patents for Refrigerator Water Filtration technology.
	Status:	Settled; Invalidity & Non-Infringement Declarations, June 2022. Deposition, July 2022.
2021 to 2022	Client	Banner Witcoff
	Case:	<i>Aspen Medical Products, LLC v Breg Inc.</i> Case No.3:21-cv-00631-WQH-MDD in the United States District Court, Southern District of California
	Project:	Patent matter regarding medical body and cervical support braces
	Status:	Settled.
2021 to 2022	Client:	Dovel & Luner, LLP
	Case:	<i>Rebotix Repair LLC v Intuitive Surgical, Inc.</i> , Case No. 8:2020cv02274, United States District Court, Middle District of Florida, Tampa Division.
	Project:	Anti-Trust case associated with EndoWrist devices for Da Vinci surgical robots. Engineering evaluation of repaired devices.
	Status:	Settled; Expert Report, Aug 2021; Deposition, Sep 2021;

2021 to 2022	Client:	Gibson, Dunn & Crutcher, LLP
	Case:	United States District Court, Central District of California.
	Project:	Patent matter associated with beverage systems and components
	Status:	Settled.
2021	Client:	Schlichter & Shonack, LLP
	Case:	<i>KV Inc v Heartstitch, Inc.</i> , Case No. 30-2019-01051080-CU-BC-NJC in the Superior Court for the State of California, County of Orange
	Project:	Assessment of FDA regulated custom manufactured medical device components for heart surgery. Assessment of conformance and quality.
	Status:	Settled
2021	Client:	Dentons, London, UK
	Case:	Confidential Case - <i>European Patent Office review</i>
	Project:	Medical device patent; Support review process
	Status:	European Patent Office (EPO) Declaration 2021;
2021 to 2023	Client:	Rosen & Perry, P.C.
	Case:	<i>Chamber v. Dollar Tree Store, et.al.</i> ; Case No. , Superior Court, Pennsylvania
	Project:	Personal Injury, warnings, device evaluation; – material and load evaluation of hair device; tissue damage due to pressure
	Status:	Settled.
2021 to Present	Client:	Cogan & Power, PC
	Case:	<i>Michele Volk v. Stryker Medical, et.al</i>
	Project:	Investigate microcatheter failure during medical procedure.
	Status:	Ongoing.
2021	Client:	Thompson Coburn LLP
	Case:	<i>Widdenmeyer v. Zoll Medical, Ranken-Jordan Hospital, et.al.</i> Case No. , Superior Court, St.Louis, MO
	Project:	Investigate alleged malfunction and defect in AED (Automated External Defibrillator). Site inspection.
	Status:	Resolved
2020 to Present	Client:	Klarquist Sparkman, LLP
	Case:	Various - Patent
	Project:	Medical device patent issues; infringement, validity
	Status:	Ongoing.

2020	Client:	Morrison & Foerster, LLP on behalf of Apple, Inc.
	Case:	In RE: Macbook Keyboard Litigation; Various Plaintiffs, vs. Apple Inc.; Case No. 5:18-CV-02813-EJD-VKD United States District Court Northern District of California, San Jose Division
	Project:	Potential Class Action and Class Certification; Laptop Keyboard technology; design, performance, repair rates.
	Status:	Resolved; Expert Report, Sep 2020; Deposition, Oct 2020;
2020	Client:	Baker & Hostetler, LLP
	Case:	<i>NEXTracker vs. Solar FlexRack and Northern States Metals Co.</i> , United States District Court, District of Delaware
	Project:	Patents; Solar tracker technology patents associated with Guide Rails, Clamps, etc.
	Status:	Settled; IPR Declaration Oct 2020;
2020 to 2021	Client:	Merchant & Gould P.C.
	Case:	<i>Otter Products, LLC and Treefrog Developments, Inc. vs Fellowes, Inc.</i> United States District Court, Northern District of Illinois, Eastern Division;
	Project:	Patents; Consumer Electronics technology for protection of personal electronics (cell phones, tablets, etc.) against drop, moisture, etc.
	Status:	Settled; IPR Declarations: 2-Aug 2020; 2-Dec 2020; 1-Jan 2021; Patent Infringement;
2020 to 2022	Client:	Bienert Katzman PC
	Case:	<i>Julie Hall, vs. Torax Medical, Inc., Ethicon, Inc., Johnson & Johnson, John Lipham, MD, et.al</i> , Case No. 30-2019-01078281-CU-PL-CJC in the Superior Court for the State of California, County of Orange
	Project:	Personal injury, product liability associated with medical device to treat Gastric Reflux Disease (GERD)
	Status:	Settled
2020 to Present	Client:	The Cottle Firm
	Case:	<i>Richard vs. American Honda Motor Co., Inc., Home Depot USA, Inc., et.al</i> . Case No. A-19-791675-C in the Nevada State District Court, Clark County, Nevada
	Project:	Personal injury, product liability associated with rototiller
	Status:	Deposition Nov 2021; Expert Report May 2020, Aug 2021; Ongoing.
2020 to Present	Client:	Todd Tracy Law Firm
	Case:	<i>Hendricks v DTNA, Freightliner. et.al</i> ; Cause No. 103610-86 in the District Court, Kaufman County, TX, 86 th Judicial District
	Project:	Heavy-truck rollover & crashworthiness; design assessment; product liability
	Status:	Ongoing.

2020	Client: Todd Tracy Law Firm Case: <i>Guerra v Navistar</i>; Case No. 1:18-CV-00321-KG-JFR, United States District Court for the District of New Mexico Project: Heavy-truck rollover & crashworthiness; design assessment; product liability Status: Deposition, Aug 2020; Settled
2019 to 2020	Client: Singer Davis LLC Case: <i>McIntosh vs. EVMS Academic Physicians & Surgeons Health Services Foundation, Covidien Holding, Inc., Cook Medical, LLC, et.al.</i> Case No. CL18-4817 in the Circuit Court for the City of Norfolk Virginia Project: Personal Injury, Product Liability related to Percutaneous Tracheostomy Tube; Status: Settled
2019	Client: Venable LLP Case: <i>Disc Disease Solutions, Inc., vs. VGH Solutions, Inc. Dr-Ho's Inc., Hoi Ming Michael Ho.</i> Case No. 1:15-cv-00188-LJA, United States District Court, Middle District of Georgia, Albany Division Project: Patents; Medical Device, Back-Pain Relief; Status: Settled; Claim construction, invalidity, non-infringement; Claim construction Declaration Aug 2019;
2019	Client: Baker & Hostetler, LLP Case: <i>Zadro Products, Inc. vs. SDI Technologies, Inc. d/b/a iHOME.</i> Case No. 17-1406 (WCB) in the United States District Court for the District of Delaware Project: Patents; Consumer products, LED lighting, mirrors Status: Settled
2019	Client: Gardella Grace P.A. Case: <i>Fulfillium, Inc. vs. ReShape Medical, LLC, SV Health Investors, LLC, Intersect Partners, LLC and ReShape Lifesciences, Inc.</i> Case No. 8:18-cv-01265-RGK-PLA United States District Court, Central District of California, Western Division Project: Patents; medical devices, balloons, weight control Status: Settled; Deposition Aug 2019; Expert Report Aug 2019; Declaration on Motion for Summary Judgement Aug 2019;
2019	Client: Merchant & Gould Case: <i>Carlson Pet Products, Inc. v. North States Industries, Inc..</i> Case No. 17-cv-02529- PJS-KMM, United States District Court for the District of Minnesota Project: Patents, Consumer product; Pet barrier Status: Settled; Declaration, Oct 2019;

2019 to Present	Client:	Todd Tracy Law Firm
	Case:	Multiple cases
	Project:	Heavy-truck rollover & crashworthiness; design assessment; product liability
	Status:	Ongoing.
2019	Client:	Sterne, Kessler, Goldstein & Fox, P.L.L.C. (SKGF)
	Case:	<i>Lutron v. Geigtech</i>
	Project:	Patent Post-Grant Review (PGR); Other PTAB actions
	Status:	Suspended
2019 to Present	Client:	Faegre Baker Daniels LLP
	Case:	Confidential MDL Product Litigation
	Project:	Confidential
	Status:	
2019 to 2022	Client:	Rouda Feder Tietjen McGuinn
	Case:	<i>Margo Schein v. Peak Pilates</i>
	Project:	Inspection of Pilates Reformer equipment; Accidental injury root-cause assessment; Personal Injury; explain accident scenarios; Support for mediation;
	Status:	Resolved;
2019	Client:	Manning & Kass, Ellrod, Ramirez, Trester LLP
	Case:	<i>Randy and Giselle Hoehn v. Summit to Sea LLC, Pet Pressure LLC.</i>
	Project:	Hyperbaric pressure chamber inspection, operation, and design review. Accidental injury investigation.
	Status:	Settled
2018 to 2020	Client:	Beasley, Allen, Crow, Methvin, Portis & Miles, P.C.
	Case:	<i>Miriam Naramore v. Daimler Trucks North America, LLC.</i> Civil Action No. 1:18-CV-00156 in United States District Court for the Middle District of Georgia, Albany Division.
	Project:	Heavy-truck rollover & crashworthiness; design assessment
	Status:	Settled
2018 to 2021	Client:	Maddin, Hauser, Roth & Heller, P.C.
	Case:	<i>Larry Eskilsen and Renie Eskilsen v. Oakland Orthopedic Appliances, Inc.</i> ; Case No. 18-036354-NO-1 Saginaw Circuit Court
	Project:	Alleged failure of orthopedic leg prosthetic; personal injury
	Status:	Settled; Deposition, Sep 2020;
2018 to 2019	Client:	Klein, DeNatale, Goldner, LLP
	Case:	<i>H&M Gopher Control, Allen Hurlburt v. Benchmark Pest Control, Inc., Andrew Ozanich.</i> Case No. 1:17-CV-01700-JLT, United States District Court for the Eastern District of California
	Project:	Patent technology for control of rodents
	Status:	Settled; Expert Report, Jan 2019;

2018 to 2019	Client:	Cypress LLP
	Case:	<i>Kore Essential, Inc v. Nexbelt, LLC</i> . Case No. 3:17-CV-02129-CAB-JMA, United States District Court for the Southern District of California
	Project:	Patent technology for Ratchet Belt system
	Status:	Settled; Expert Report, Feb 2019;
2018 to 2019	Client:	Pillsbury Winthrop Shaw Pittman, LLP
	Case:	<i>Lite-On Technology Corp v Darfon Electronics Corp</i> , Case No. 3:18-cv-02776, United States District Court, Northern District of California.
	Project:	Keyboard technology patents
	Status:	Settled; IPR Declaration Dec 2018;
2018 to 2020	Client:	Honigman Miller Schwartz & Cohn LLP
	Case:	<i>Tim A. Fischell, Robert E. Fischell, and David R. Fischell v. Cordis Corp, Abbott Laboratories and Abbott Cardiovascular Systems, Inc.</i> , United States District Court for the District of New Jersey; Civil Action No. 3:16-cv-00928-PGS-LHG
	Project:	Patent family associated with cardiovascular stents
	Status:	Settled; Declaration, Apr 2019;
2018	Client:	Akerman, LLP
	Case:	<i>Qbex Computadores S.A v. Intel Corporation</i> , United States District Court, Northern District of California, San Jose Division.
	Project:	Cellular phone ARM microprocessor, alleged product design defect associated with CPU overheating
	Status:	Settled
2018 to 2019	Client:	Davidson, Davidson & Kappel LLC
	Case:	ArcelorMittal Project; <i>Inter Partes Review Proceeding Against Array Technologies Inc. U.S. Patent 8,459,249</i>
	Project:	Patent IPR associated with solar panel trackers
	Status:	Settled; Deposition Dec 2018; IPR Declaration Mar 2018;
2018 to 2019	Client:	Ropes & Gray LLP
	Case:	<i>CPI Card Group, Inc. v. Multi-Packaging Solutions, Inc</i> , United States District Court for the District of Colorado
	Project:	Patent associated with secure packaging of transaction/gift cards; Testing
	Status:	Resolved
2017 to 2018	Client:	Rimon Law
	Case:	<i>Imogene D. Johns v. Invacare Corporation</i> , Tulare County Superior Court Case No. 270201
	Project:	Alleged medical equipment product defect
	Status:	Settled

2017 to 2018	Client:	The Scranton Law Firm
	Case:	<i>Cesar Lopez & Moses Sepulveda v. DOES-I</i>
	Project:	Alleged design defect in ATV Rollover Protection System (RoPS); Design and Failure Analysis
	Status:	Resolved;
2017 to 2018	Client:	Troutman Sanders LLP; Vinson & Elkins
	Case:	<i>Blackbird Tech LLC d/b/a Blackbird Technologies v. Lenovo (United States) Inc.</i> ; C.A. No. 16-cv-140-RGA, United States District Court for the District of Delaware
	Project:	Patent infringement allegations around laptop computer screen display technology
	Status:	Settled; Declaration May 2018; Deposition Feb 2018; Reply Report Dec 2017; Non-Infringement Report Nov 2017; Invalidity Report Sep 2017;
2017	Client:	White & Case LLP
	Case:	<i>Maquet Cardiovascular LLC v. Abiomed Europe GmbH and Abiomed R&D, Inc.</i> ; C.A. No. 1:16-CV-10914, United States District Court for the District of Massachusetts
	Project:	Resolved; Multiple Patent & Technology dispute associated with Implantable Circulatory Support System Pumps
2017 to 2018	Client:	Baker & Hostetler, LLP
	Case:	<i>SCA Hygiene Products AB et.al., SCA Tissue North America, LLC v. Tarzana Enterprises, LLC</i> ; United States District Court, Western District of Wisconsin, No. 3:16-cv-00728
	Project:	Patent infringement claims associated with paper goods manufacturing, stacking, folding, and packaging methods and equipment
	Status:	Settled; Depositions (2) Sep 2018; IPR Response Declarations, Jul 2018 (2), May 2018;
2017	Client:	Vinson & Elkins
	Case:	<i>Inter Partes Review of U.S. Patent No. 7,129,931; Lenovo (United States) Inc. v. Blackbird Tech LLC d/b/a Blackbird Technologies; Blackbird Technology LLC v. Lenovo, Civil Action No. 1:16-cv-00140 in the District of Delaware</i>
	Project:	Patent IPR and alleged infringement involving laptop computer display apparatus
	Status:	Deposition Feb 2018; Expert Report; IPR Declaration May 2017;
2017 to Present	Client:	The Joe C. Savage Law Firm
	Case:	<i>Bauer v. Parks, Hyundai Motors America, and Deskins Motor Company and other related cases</i> ;
	Project:	Vehicle Accident Investigation, Design, Crashworthiness, Fire
	Status:	Settled

2017 to 2018	Client:	Hill, Kertscher & Wharton, LLP
	Case:	<i>Trans Technologies Company v. Hendrickson USA LLC, et.al.</i> , United States District Court for the Northern District of Georgia, Atlanta Division, Civil Action No. 1:16-cv-01778-AT
	Project:	Patent litigation involving heavy-truck tire inflation/deflation technology
	Status:	Settled; Deposition Jul 2018; Deposition Apr 2018; IPR Declaration Aug 2017; IPR Reply Declaration Feb 2018;
2017 to 2018	Client:	Morgan, Lewis & Bockius LLP
	Case:	<i>Advanced Circulatory Systems, Inc. v. AutoMedx, Inc.</i> , and <i>AutoMedx, Inc v. ZOLL Medical Corp.</i> , <i>Advanced Circulatory Systems, Inc.</i> ; CPR Institute for Dispute Resolution, CPR File No. G-16-07
	Project:	Medical Ventilator Technology Development; Medical equipment
	Status:	Settled
2017	Client:	Dorsey & Whitney LLP
	Case:	<i>Hovik Nazaryan v. FemtoMetrix Inc.</i> , Superior Court of the State of California for the County of Orange Case No. 34-30- -2015- 00795246-CU-BC-CJC
	Project:	Semiconductor lithography equipment technology development
	Status:	Settled
2016 to Present	Client:	Casper, Meadows, Schwartz & Cook
	Case:	<i>Rovner v. Medtronic, Inc. et.al.</i> Contra Costa Superior Court, Case No. C16-01768
	Project:	Medical Device defect of NSC spinal lumboperitoneal (LP) Shunt/Valve for hydrocephalus shunting of excess cerebrospinal fluid (CSF); associated personal injury
	Status:	Settled
2016 to 2018	Client:	Rimon Law
	Case:	<i>Heather Ciechanowski v. Invacare Corporation, Folsom Care Center, Bluff Enterprises, Inc. and Calvin Callaway</i> , Sacramento County Superior Court Case No. 34-2016-00188724
	Project:	Alleged medical equipment product defect
	Status:	Settled
2016 to 2017	Client:	Rucka, O'Boyle, Lombardo & McKenna
	Case:	<i>Concepcion Hernandez v. Helen of Troy, Inc.</i> ;
	Project:	Medical equipment personal injury
	Status:	Settled

2016 to 2017	Client:	Quinn Emanuel Urquhart & Sullivan, LLP
	Case:	<i>TriReme Medical LLC v. AngioScore, Inc.</i> , Northern District of California; Case No. 14-cv-2946
	Project:	Patent litigation involving cardiovascular medical device
	Status:	Deposition, Dec.2016; Expert Reports, Nov.2016 & Dec.2016; Settled
2016 to 2017	Client:	Baker Manock & Jensen, PC
	Case:	<i>California Fire-Roasted LLC v. General Mills Operations, LLC</i> ; Sacramento County Superior Court Case No. 34-2014-00170784-CU-BC-GDS
	Project:	Patent licensing and royalty case for food-processing equipment
	Status:	Settled
2016 to 2017	Client:	DLA Piper, LLP
	Case:	<i>Inter Partes</i> Review of U.S. Patent No. 6,099,882; <i>Olam West Coast, Inc. v. California Fire-Roasted LLC</i>
	Project:	Patent IPR involving food-processing equipment
	Status:	Settled; IPR Declarations (2) Oct.2016;
2016 to 2018	Client:	Plews Shadley Racher & Braun, LLP; Bradshaw Law, LLC
	Case:	<i>Rick C. Sasso, M.D., and SEE LLC v. Warsaw Orthopedic, Inc., Medtronic Inc., Medtronic Sofamor Danek, Inc.</i> , Indiana State Court, Case No. 43C01-1308-PL-44.
	Project:	Patent litigation involving coverage for spinal medical device
	Status:	Deposition Aug 2018; Patent Trial Testimony Nov 2018 ; Jury Verdict for Plaintiff; Upheld on Appeal Dec 2020;
2016 to Present	Client:	Christensen Fonder, P.A.
	Case:	<i>Willis Electric Co., Ltd v. Polygroup Limited (Macao Commercial Offshore), Polygroup Macau Limited (BVI), Polytree (H.K.) Co. Ltd.</i> , 15-cv-3443, 3:15-cv-00552, United States District Court for the District of Minnesota.
	Project:	Patent litigation involving modular mechanical and electrical connectors
	Status:	Settled
2016 to Present	Client:	Locke Lord LLP
	Case:	<i>Denneroll Holdings Pty Limited and Denneroll Industries International Pty Limited v. ChiroDesign Group, LLC and Marie L. Webster, Individually and D/B/A ChiroDesign Group</i> ; Civil Action No. 4:15-cv-740; United States District Court for the Southern District of, Houston Division.
	Project:	Patent litigation involving chiropractic pillows
	Status:	Settled; Infringement Expert Report, May 2016; Validity Expert Report, June 2016

2016 to Present	Client:	Mass Montes LLP
	Case:	<i>Logan W. Hensley vs. Michael J. Skyhar, MD.; Cayenne Medical, Inc., and DOES 1 thru 40, inclusive</i> ; Case no. 37-2015-00005140-CU-MM-NC, Superior Court for the State of California for the County of San Diego, North County Division.
	Project:	Personal injury involving failed medical device and medical practice
	Status:	Settled
2016 to Present	Client:	Hamrick & Evans, LLP
	Case:	<i>Laurence Johnson vs. Raytheon Company, Systems XT, Inc. Brownco Construction Company, Inc., Power Edge Solutions, Inc. (aka PES Controls), et.al.</i> United States District Court for the Central District of California; Case No. 2:15-cv-00132-MWF-E.
	Project:	Personal Injury; Product Performance & Product Liability
	Status:	Settled
2015 to 2016	Client:	Nixon Peabody LLP
	Case:	<i>Johnstech International Corp v. JF Microtechnology SDN BHD</i> United States District Court for the Northern District of California; Case No. 3:14-cv-02864-JD
	Project:	Patent litigation involving semiconductor test technology
	Status:	Invalidity Expert Report, Non-Infringement Expert Report – Dec 2015; Patent Trial Testimony – Sep 2016. Jury Verdict.
2015	Client:	Susman Godfrey LLP
	Case:	<i>Bonutti Skeletal Innovations, LLC v. Globus Medical, Inc</i>
	Project:	Patent litigation involving spinal medical devices
	Status:	Settled
2015	Client:	Richardson, Patrick, Westbrook, & Brickman, LLC
	Case:	<i>Smart v. PACCAR</i>
	Project:	Heavy-Truck Rollover & Crashworthiness
	Status:	Settled
2014 to 2018	Client:	Harris and Graves, P.A.
	Case:	<i>Raven N. Dineen v. Sprint Corp, Asurion Protection Services, LLC and Apple, Inc.</i> , District Court, Greenville Division, District of South Carolina, No. 6:16-cv-01549-MGL
	Project:	Investigation of alleged cellular telephone defect and Lithium-Ion battery breach; Personal injury (victim sustained burns) due to ignition & combustion of cell phone; Non-Destructive & Destructive Inspections
	Status:	Settled; Deposition Oct 2017; Expert Report, July 2015, July 2017;

2014 to 2019	Client: Law Offices of David McQuade Leibowitz, P.C. Case: <i>Ricardo Garza v. Daimler Truck of North America (DTNA), Freightliner LLC</i>; Texas Circuit Court, Bexar County, Texas Project: Heavy Truck Crashworthiness Status: Trial Testimony Sep 2019; Deposition Jul 2018; Expert Report Apr 2018; Jury Verdict;
2014	Client: Kolisch Hartwell, P.C. Case: <i>TMI Products, Inc. v. Rosen Entertainment Systems, L.P</i> United States District Court for the Central District of California; Case No. EDCV12-02263 RGK (SPx) Project: Patent case involving consumer electronics & vehicle entertainment applications Status: Settled; Deposition March 2014; Declaration & Report March 2014; Declaration & Rebuttal Report March 2014;
2014 to 2018	Client: Corsiglia, McMahon, & Allard Case: <i>Avalos v. Balt, Stanford Hospital & Clinics, et.al.</i> Project: Personal Injury during Medical Procedure & Medical Device Product Liability; Failure analysis of micro-catheter for neurovascular treatment; embolization of a cerebral AVM during procedure at Stanford Hospital Status: Settled
2014 to 2015	Client: The Previant Law Firm, S.C. Case: <i>Kaminski v. DongGuan, et.al.</i> Project: Personal injury (eye damage) due to failure of consumer product (elastomeric strap tie-down); Failure analysis, material testing, and evaluation of elastomeric material components Status: Settled; Expert Report, July 2014
2013 to 2015	Client: Guajardo & Marks, LLP Case: <i>Bertha A. Flores Individually and as Representative of the Estate of Jose Flores, et.al. v Daimler Trucks North America, LLC.</i> United States District Court for the Southern District of Texas, Corpus Christi Division, and is Civil Action No. 2:13-cv-87 Project: Heavy-Truck Rollover & Crashworthiness Status: Settled, Mar 2015 Deposition, Feb 2015; Report, Oct 2014
2012 to 2014	Client: Edwards Life Sciences; Kilpatrick, Townsend & Stockton, LLP Case: <i>Medtronic v. Edwards</i> Case No. 11-CV-1650-JNE/JSM (D. Minn.) Project: Medical device patent claims, infringement & invalidity Status: Settled Invalidity Report Aug 2013; Non-Infringement Report Oct 2013; Deposition Oct 2013, Oct 2012

2013 to 2014	Client:	US Securities and Exchange Commission
	Case:	<i>Securities and Exchange Commission (SEC) v. Inteligentry, Ltd., Plasmerg, Inc., PTP Licensing, Ltd., and John P. Rohner in Civil No. 2:13-CV-00344-GMN-NJK</i>
	Project	Securities associated with “Plasmic Transition Process Engine” technology; Technology assessment
	Status:	Resolved
2013 to 2015	Client:	Beasley, Allen, Crow, Methvin, Portis & Miles, P.C.
	Case:	<i>Walker v. PACCAR, Inc.</i> Alabama Circuit Court, Barbour County; 06-CV-2013-900032.00
	Project:	Heavy-Truck Rollover & Crashworthiness
	Status:	Settled
2013	Client:	Retained in a metal component manufacturing technology patent litigation case.
	Case:	<i>Confidential</i>
	Project:	Metal manufacturing process patent for smart-phone and consumer electronics applications
2013 to 2015	Client:	Beasley, Allen, Crow, Methvin, Portis & Miles, P.C.
	Case:	<i>Lacy v. Freightliner</i>
	Project:	Heavy-Truck Rollover & Crashworthiness
	Status:	Settled Mar 2015
2013 to 2015	Client:	Beasley, Allen, Crow, Methvin, Portis & Miles, P.C.
	Case:	<i>Jones vs. Daimler Truck North America (DTNA)</i> Alabama Circuit Court
	Project:	Heavy Truck Rollover & Crashworthiness
	Status:	Settled Nov 2015; Deposition Jan 2014
2012	Client:	Smart-phone technology patent litigation case involving embedded electro-mechanical components
	Case:	<i>Confidential</i>
	Project:	Patent issues associated with specific user-feedback technologies
	Status:	
2010 to 2015	Client:	Warren & Associates, LLC
	Case:	<i>Jones vs. MSE Hauling</i>
	Project:	Heavy Truck Rollover
	Status:	Settled Nov 2015; Deposition Jan 2014
2009 to 2014	Client:	Schwarz & Mongeluzzi; Nelson, Levine, DeLuca & Horst
	Case:	<i>Carrera v. Navistar</i>
	Project:	Heavy-Truck Rollover & Crashworthiness
	Status:	Settled 2014; Deposition Feb 2013

2010	Client:	Sico, White, Hoelscher & Braugh L.L.P.
	Case:	<i>Ramirez v. Sterling Truck</i>
	Project:	Heavy-Truck Rollover & Crashworthiness
	Status:	Settled; Expert Report; Deposition May 2010
2008 to 2010	Client:	Beasley, Allen, Crow, Methvin, Portis & Miles, P.C.
	Case:	<i>Thibadeaux vs. PACCAR</i>
	Project:	Heavy-Truck Rollover Accidents
	Status:	Settled; 2010.
2008 to 2010	Client:	Beasley, Allen, Crow, Methvin, Portis & Miles, P.C.
	Case:	<i>Price vs. Navistar</i>
	Project:	Heavy-Truck Rollover Accidents
	Status:	Settled; 2010.
2008 to 2009	Client:	Beasley, Allen, Crow, Methvin, Portis & Miles, P.C.
	Case:	<i>Martin vs. Kenworth</i>
	Project:	Heavy-Truck Rollover Accidents
	Status:	Settled; 2009.
2007	Client:	Beasley, Allen, Crow, Methvin, Portis & Miles, P.C.
	Case:	<i>Strode v. Freightliner, LLC</i> ; Civil Action No. 02-132 Circuit Court of Greene County Alabama
	Project:	Heavy-Truck Rollover Accident
	Status:	Settled; 2007. Testified at trial.
2006	Client:	Gibson, Dunn, & Crutcher
	Case:	<i>Jang v. Boston Scientific Corp., et.al.</i> United States District Court, Central District of California; Eastern Division – Riverside; Case No: EDCV 05-00426 VAP (SGLx)
	Project:	Patent case for matters involving design features of Cardiovascular Stents.
	Status:	
2005	Client:	Beasley, Allen, Crow, Methvin, Portis & Miles, P.C.
	Case:	<i>Mongan vs. MACK Truck</i>
	Project:	Retained as fact witness in heavy truck rollover accident.
	Status:	Settled, 2005
2005	Client:	Lucas Wash Petway Tucker & Stephens, P.C.
	Case:	<i>Gable v. International Truck & Engine Corporation</i> United States District Court, Middle District of Pennsylvania; Civil Action No: 3:03-CV-01353
	Project:	Heavy-Truck Rollover Accident
	Status:	Closed; Deposition June 2005.

2004	Client: Kenyon & Kenyon Intellectual Property Law Firm Case: <i>Medtronic Vascular, Inc. vs. Boston Scientific Corp., et al.</i> C.A. No. 98-478-SLR (D-Del) Project: Patent case involving Cardiovascular Stent design Status: Closed; Expert Report filed;
1997	Client: Grimaldi, Pearson, and Weyand, P.C. Case: <i>Herbolsheimer v. Warner-Swasey</i> Case No. 9357487NP Project: Product defect of CNC machine equipment Status: Closed; Deposition.
1994	Client: Jones, Jones, Close & Brown Case: <i>Pioneer Chlor-Alkali Co., Inc. v. National Union Fire Insurance Co.</i> , United States District Court, District of Nevada, Case No. CV-S-93-276-HDM (RLH) Project: Accident investigation, insurance claim. Status: Closed; Deposition.
1994	Client: Clapp, Moroney, Bellagamba, Davis and Vucinich Case: <i>Thomas Fujisaka and Sandra Fujisaka v. Livermore Valley Unified School District</i> , Superior Court of the State of California In and For the County of Alameda, Case No. 700921-1 Project: Accident Investigation, Personal Injury Status: Closed; Deposition.
1994	Client: GEA In-House Counsel Case: <i>GEA Power Cooling Systems, Inc. v. Hyspan Precision Products</i> , Superior Court of the State of California for the County of San Diego, Case No. 669769 Project: Product Liability; Failure analysis root cause. Status: Closed; Deposition.
1993	Case: <i>Bobbie J. Phaneuf v. Edith D. Roman</i> , Superior Court of the State of California County of Alameda, Case No. H - 154330-4 Project: Product Design. Status: Closed; Deposition, Trial.
1993	Case: <i>Patricia C. Barbera v. H. B. Instrument Company</i> , Superior Court of the State of California In and For the County of Marin, Case No. 138929 Project: Product Design. Status: Closed; Deposition, Trial.

1990 Client: Chevron In-House Counsel
 Case: *Secretary of Labor v. Chevron U.S.A, et al.*, Occupational Safety
 and Health Review Commission, Region 9,
 OSHRC Docket No. 89-3125
 Project: Accident investigation; Failure analysis root cause.
 Status: Closed; Deposition.

Trials & IPRs:

2024 Status: *Bote LLC v Twitch LLC*
 Status: IPR Declarations May,Jun, 2024;

2020 Case: *NEXTracker vs. Solar FlexRack and Northern States Metals Co.,.*
 United States District Court, District of Delaware
 Status: IPR Declaration Oct 2020;

2020 Case: *Otter Products, LLC and Treefrog Developments, Inc. vs Fellowes,*
 Inc. United States District Court, Northern District of Illinois,
 Eastern Division.
 Status: IPR Declarations 2-Aug 2020; 2-Dec 2020; 1-Jan 2021;

2019 Case: *Ricardo Garza v. Daimler Truck of North America (DTNA),*
 Freightliner LLC; Texas Circuit Court, Bexar County, Texas
 Status: Testified in Trial, Sep 2019

2018 Case: *Lite-On Technology Corp v Darfon Electronics Corp*, Case No.
 3:18-cv-02776, United States District Court, Northern District of
 California.
 Status: IPR Declaration Dec 2018;

2018 Case: *Rick C. Sasso, M.D., and See LLC v. Warsaw Orthopedic, Inc.,*
 Medtronic Inc., Medtronic Sofamor Danek, Inc, Indiana State Court,
 Case No. 43C01-1308-PL-44.
 Status: Testified in Patent Trial, Nov 2018

2018 Case: *SCA Hygiene Products AB et.al., SCA Tissue North America, LLC*
 v. Tarzana Enterprises, LLC;
 United States District Court, Western District of Wisconsin,
 No. 3:16-cv-00728
 Status: IPR Response Declarations, July 2018 (2), May 2018;

2018 Case: Davidson, Davidson & Kappel LLC; ArcelorMittal Project
 Status: IPR Declaration, Mar 2018;

2017	Case: <i>Trans Technologies Company v. Hendrickson USA LLC, et.al.</i> , United States District Court for the Northern District of Georgia, Atlanta Division, Civil Action No. 1:16-cv-01778-AT
	Status: IPR Declaration Aug 2017; IPR Response Declaration Feb 2018;
2017	Case: <i>Lenovo (United States) Inc. v. Blackbird Tech d/b/a Blackbird Technologies</i> , Review of U.S. Patent No. 7,129,931;
	Status: Deposition Feb 2018; Expert Report; IPR Declaration May 2017;
2016	Case: <i>Olam West Coast, Inc. v. California Fire-Roasted LLC; Inter Partes</i> Review of U.S. Patent No. 6,099,882
	Status: IPR Declarations (2), Oct 2016;
2016	Case: <i>Johnstech International Corp. v. JF Microtechnology SDN BHD</i> ; Action 14-cv-02864-JD, US Federal Court, District of Northern California
	Status: Testified in Patent Trial, Sep 2016
2007	Case: <i>Strode v. Freightliner, LLC</i> ; Civil Action No. 02-132 Circuit Court of Greene County Alabama
	Status: Testified in Product Liability/Personal Injury case;
1995	Case: <i>Bobbie J. Phaneuf v. Edith D. Roman</i> ; Superior Court of the State of California County of Alameda, Case No. H-154330-4
	Status: Testified in Product Liability/Personal Injury case;
1994	Case: <i>Patricia C. Barbera v. H. B. Instrument Company</i> ; Superior Court of the State of California In and For the County of Marin, Case No. 138929
	Status: Testified in Product Liability case;