

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FELLOWES. INC.,

Petitioner,

v.

TREEFROG DEVELOPMENTS, INC.,

Patent Owner.

Case IPR2020-01543
U.S. Patent No. 8,564,950

**DECLARATION OF T. KIM PARNELL IN SUPPORT
OF PATENT OWNER'S PRELIMINARY RESPONSE FOR
INTER PARTES REVIEW OF U.S. PATENT 8,564,950**

TABLE OF CONTENTS

I.	INTRODUCTION AND QUALIFICATIONS.....	1
II.	EXPERT QUALIFICATIONS AND BACKGROUND.....	1
III.	UNDERSTANDING OF THE GOVERNING LAW	6
	A. Invalidity by Obviousness.....	6
	B. Interpreting Claims.	10
	C. Materials Relied on in Forming My Opinions	10
IV.	THE PERSON OF ORDINARY SKILL IN THE ART OF THE '950 PATENT.....	11
V.	BACKGROUND DISCUSSION OF PROTECTIVE ENCLOSURES FOR ELECTRONIC DEVICES	13
VI.	OVERVIEW OF THE '950 PATENT	13
	A. The Specification of the '950 Patent.....	13
	B. The Claims of the '950 Patent.....	14
	C. The Priority Date of the '950 Patent	16
	D. Prosecution History of the '950 Patent	16
VII.	CLAIM CONSTRUCTION	18
VIII.	GROUND OF INVALIDITY	21
	A. <u>Ground 1</u> : Claims 17, 19, and 21 of the '950 Patent are not obvious over Kuhn in view of the '712 Patent.	21
	1. No motivation to combine Kuhn and the '712 Patent	21
	2. Kuhn and the '712 Patent fail to teach all elements of the challenged claims of the '950 Patent	25
	B. <u>Ground 2</u> : Claims 17, 19, and 21 of the '950 Patent are not obvious over Kuhn in view of the '712 Patent in further view of Richardson...	29

1.	No motivation to combine Kuhn, the '712 Patent, and Richardson	29
2.	Kuhn, the '712 Patent, and Richardson fail to teach all of the elements in the challenged claims of the '950 Patent.	30
C.	<u>Ground 3</u> : Claims 17, 19, and 21 of the '950 Patent are not obvious over Kuhn in view of JP384.	32
1.	No motivation to combine Kuhn and JP384.	32
2.	Kuhn and JP384 fail to teach all of the elements in the challenged claims of the '950 Patent.	35
D.	<u>Ground 4</u> : Claims 17, 19, and 21 of the '950 Patent are not obvious over Kuhn in view of JP384 further in view of Richardson.	37
1.	No motivation to combine Kuhn, JP384, and Richardson.	37
2.	Kuhn, JP384, and Richardson fail to teach all of the elements in the challenged claims of the '950 Patent.	38
E.	<u>Ground 5</u> : Claims 17, 19, and 21 of the '950 Patent are not obvious over Kuhn in view of the '712 Patent in view of Richardson and FR857.	39
1.	No motivation to combine Kuhn, the '712 Patent, Richardson, and FR857.	40
2.	Kuhn, the '712 Patent, Richardson, and FR857 fail to teach all of the elements in the challenged claims of the '950 Patent.	40
F.	<u>Ground 6</u> : Claims 17, 19, and 21 of the '950 Patent are not obvious over Kuhn in view of JP384 in further view of Richardson and FR857.	43
1.	No motivation to combine Kuhn, JP384, Richardson, and FR857.	43
2.	Kuhn, JP384, Richardson, and FR857 fail to teach all of the elements in the challenged claims of the '950 Patent.	44

IX. CONCLUSION	46
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I, T. Kim Parnell, hereby declare as follows:

I. INTRODUCTION AND QUALIFICATIONS

1. I have been retained by counsel for TreeFrog Developments, Inc. (“TreeFrog”) to provide my technical review, analysis, insights, and opinions concerning the validity of the claims of U.S. Patent No. 8,564,950 (EX1001; “the ’950 Patent”) entitled “Housing for Encasing a Mobile Computing Device.” I have been informed the patent is assigned to TreeFrog.

II. EXPERT QUALIFICATIONS AND BACKGROUND

2. I am a trained Professional Mechanical Engineer (PE) 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.

3. I am an ASME Fellow and an IEEE Senior Member. ASME is the American Society of Mechanical Engineers and IEEE is the Institute of Electrical & Electronics Engineers. These are the primary professional organizations for Mechanical and Electrical Engineering. There is significant cross-over in terms of combination electro-mechanical devices that need a multi-disciplinary background. I am a Board Member of IEEE-CNSV (Consultants’ Network of Silicon Valley). I am also a member of IEEE-CE (Consumer Electronics), IEEE-VTS (Vehicular

Technology Society), and IEEE-EPS (Electronics Packaging Society), which focuses specifically on the electronics industry and electronic components, manufacturing, and testing. I have served as an officer for several of these groups including as Chair of the IEEE-SCV Section (over 12,000 members in Silicon Valley), Chair of IEEE-CNSV, and Vice Chair/Treasurer of IEEE-VTS. I am also a Member of ASM and SAE.

4. I currently work as a private consultant through Parnell Engineering & Consulting (PEC). I consult for high-tech industry and legal 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 measurement to understand and solve engineering problems in a variety of industries and applications. Many of my projects involve products with both electrical and mechanical components and require a multi-disciplinary approach and expertise.

5. I began my professional career at Bell Laboratories in Indianapolis, Indiana in 1978 as a Member of Technical Staff (MTS) with a focus on design and development of telephone electro-mechanical components including keypads and keyboards. I worked at Bell Labs before and during 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. I took a leave of absence from Bell Labs and returned

to Stanford in 1980 to pursue a Ph.D. in Mechanical Engineering and completed the degree in 1984. I then joined SST Systems, Inc. as a Principal Engineer for 2 years 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. I worked on a wide range of projects as a consultant including aspects such as product failures, product design, and medical device development. The company went public in 1990 as “The Failure Group”, but then changed its name to Exponent in the mid-1990’s. In 1998 I was promoted to Senior Managing Engineer at Exponent. I joined Rubicor Medical, Inc. in 1999 as Director of Research & Development. When I left in 2000, I started independent engineering consulting under Parnell Engineering & Consulting (PEC). I have been an independent consultant from 2000 to the present. During that time, I also worked for MSC Software as a Senior Manager (2006-2010) in software Product Management.

6. I was a full-time member of the Mechanical Engineering faculty at Santa Clara University from 2010-2012 and taught classes in Manufacturing, Material Science, Mechanical Design, Finite Element Analysis (FEA), Composite Materials, and 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.

7. My project work includes studies for a broad range of consumer products, equipment, and manufacturing methods. My practice encompasses design, failure analysis, and reliability issues. I often serve as an Expert Witness for litigation, and my expert work often involves intellectual property matters.

8. I have consulted and performed inspections on various types of consumer electronic equipment and mobile computing devices (laptop computers, cell phones, keyboards, displays, portable entertainment devices, etc.) during my career. This work has included work on ruggedized electronic equipment, such as waterproof laptop and keyboard technology. I have done additional work on mobile cellular devices that included failure analyses related to mechanical damage, as well as analyzing drop and impact damage to make devices more robust, CPU failure, and heat/thermal issues. I have also studied ruggedization of 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.

9. I also have direct experience with manufacturing in multiple industries during my consulting career. These applications include consumer electronics,

biomedical, medical device, automotive, petrochemical, paper, metal forming, metalworking, specialty materials and others. Equipment at issue often involves injection molding, metal forming and machining, semiconductor packaging, pipelines and piping components, pressure vessels, sensors and control systems.

10. A more comprehensive record of my professional background and technical qualifications is reflected in my *curriculum vitae*, which is attached hereto as Exhibit A. A list of my expert engagements is included in my *curriculum vitae*.

11. I am not and have not been employed by TreeFrog. Counsel for TreeFrog retained me to provide my independent and objective analysis of the issues raised by Petitioner Fellowes, Inc. (“Fellowes” or “Petitioner”) in this *inter partes* review. I am not and have not been employed by Petitioner.

12. My billing rate as a testifying expert for this case is \$425 per hour for consulting and \$550 per hour for testimony.

13. I have not received any compensation for this Declaration beyond my normal hourly rate based on the time I have spent studying the issues in this litigation. I will not receive any additional compensation based on the outcome of this matter.

III. UNDERSTANDING OF THE GOVERNING LAW

14. I am not an attorney. For the purpose of this report, I have been informed about certain aspects of the law that are relevant to my analysis and opinions as presented herein.

A. Invalidity by Obviousness

15. I understand that a patent claim may be unpatentable if the claimed invention would have been obvious to persons having ordinary skill in the art in the field of the technology of the patent at the time the invention was made. A claim that is obvious may be unpatentable even if all of the requirements cannot be found in a single prior-art reference.

16. I understand that obviousness is analyzed from the perspective of a hypothetical person of ordinary skill in the art (“POSITA”) at the time of the alleged invention. I also understand that a POSITA is presumed to have been aware of and be able to understand the disclosures of all pertinent prior art at the time of the alleged invention.

17. As part of this inquiry, I understand and have considered the level of ordinary skill in the art that someone would have had at the time of the invention. To determine the level of ordinary skill, I have considered the levels of education and experience of persons working in the field; the types of problems encountered in the field; and the sophistication of the technology.

18. I understand that an obviousness analysis involves comparing a claim to the prior art to determine whether the claimed invention as a whole would have been obvious to a POSITA in view of the prior art, and in light of the general knowledge in the art at the time the invention was made. I also understand that the invention may be deemed obvious when a POSITA would have reached the claimed invention through routine experimentation.

19. I understand that obviousness can be established by combining or modifying the disclosures of the prior art to achieve the claimed invention. It is also my understanding that where there is a reason to modify or combine the prior art to achieve the claimed invention, there must also be a reasonable expectation of success in so doing to render the claimed invention obvious. I understand that the reason to combine prior art references can come from a variety of sources, not just the prior art itself or the specific problem the patentee was trying to solve, and that it cannot come from hindsight recognition of the benefits or advantages of the combination. I also understand that the references themselves need not provide a specific hint or suggestion of the alteration needed to arrive at the claimed invention; the analysis may include recourse to logic, judgment, and common sense available to a POSITA.

20. I understand that when there is some recognized reason to solve a problem, and there are a finite number of identified, predictable solutions, a POSITA has good reason to pursue the known options within his or her technical grasp. If

such an approach leads to the anticipated success, it is likely not the product of innovation, but of ordinary skill and common sense. In such a circumstance, when a patent simply arranges old elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement, the combination of the elements is obvious.

21. I understand that when considering the obviousness of an invention, one should also consider whether there are any objective indicia that support the non-obviousness of the invention. I further understand that objective indicia of non-obviousness include failure of others, copying, unexpected results, information that “teaches away” from the claimed subject matter, perception in the industry, commercial success, and long-felt but unmet need. I also understand that in order for objective indicia of non-obviousness to be applicable, the indicia must have some sort of nexus to the subject matter in the claim that was not known in the art. I understand that this nexus includes a factual connection between the patentable subject matter of the claim and the objective indicia alleged.

22. Finally, I understand that Patent Examiners at the USPTO rely upon certain exemplary rationales in reviewing patent applications to understand whether the subject matter of the claims is obvious. I understand that the following is the list of exemplary rationales relied upon by Patent Examiners at the USPTO:

- (A) Combining prior art elements according to known methods to yield predictable results;
- (B) Simple substitution of one known element for another to obtain predictable results;
- (C) Use of a known technique to improve similar devices (methods, or products) in the same way;
- (D) Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;
- (E) “Obvious to try” – Choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;
- (F) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; and
- (G) Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

B. Interpreting Claims.

23. I understand that *inter partes* review is a proceeding before the United States Patent & Trademark Office (“USPTO”) for evaluating the validity of issued patent claims. In this *inter partes* review, I understand that a claim term is construed as it would be understood by a POSITA in view of the specification and prosecution history of the patent. I understand that the patent “specification” includes all the figures, discussion, and claims within the patent. I understand that the USPTO will look to the specification and prosecution history to see if there is a definition for a given claim term, and if not, will apply the understanding of a POSITA at the time in which the alleged invention was made. I present a more detailed explanation of certain claim terms in the ’950 Patent in Section VII (“Claim Construction”) below.

C. Materials Relied on in Forming My Opinions

24. In forming my opinions expressed in this declaration, I have relied on my own knowledge, experience, and expertise, as well as the knowledge of a POSITA (defined below) in the relevant timeframe. In addition, I have reviewed and relied upon the following list of materials, and any other references cited in this declaration:

- Fellowes, Inc.’s Petition for *Inter Partes* Review of U.S. Patent No. 8,564,950 with exhibits;
- the ’950 Patent (EX1001);

- Declaration of Dr. Charles Garris (EX1010);
- Prosecution History of the '950 Patent (EX1002);
- European Patent Application No. EP 1,583,251 A1 to Kuhn (EX1004, Kuhn);
- United States Patent Application Publication No. 2008/0316687 to Richardson *et al.* (EX1005, Richardson);
- United States Patent Number 7,050,712 (EX1006, the '712 Patent);
- Japanese Patent 2002 823384 (EX1007, JP384);
- French Patent 2,705,857 (EX1008, FR857);
- and the documents cited herein.

IV. THE PERSON OF ORDINARY SKILL IN THE ART OF THE '950 PATENT

25. The '950 Patent discloses and claims a housing for encasing a mobile computing device. (EX1001, Title.) A person of ordinary skill in the art at the time of the invention would have needed to understand how to design protective enclosures to fit “adverse environmental conditions” (i.e., to design ruggedized protective enclosures for an electronic device). (*See* EX1001, 2:15-18 (The mobile device is in “need of protecting from one or more adverse environmental conditions, inclement weather, mishandling and/or damage, such as from contacting a fluid, such as water”).)

26. In my opinion, a person of ordinary skill in the art at the time of the invention of the '950 Patent would have possessed at least a bachelor's degree in mechanical engineering (or an equivalent degree/experience) with at least two years of experience in designing ruggedized enclosures for electronic devices.

27. I have used my education and experience as described above, as well as my understanding of the knowledge, creativity, and experience of a person having ordinary skill in the art, in forming the opinions expressed in this report, as well as any other materials discussed herein.

28. Based on my education, professional experience, and expert experience, I believe that I qualify as understanding the knowledge and skills of a POSITA as of October 12, 2010 (the earliest priority date of the '950 Patent, see Section VI.C), and I have a sufficient level of knowledge, experience, and expertise to provide an expert opinion in the field of the '950 Patent.

29. Petitioner contends that a person of ordinary skill in the art ("POSITA") at the time of the invention would have "possessed at least a bachelor's degree in mechanical engineering (or an equivalent degree/experience) with at least two years of experience in designing cases for electronic devices." (Pet. at 24.)

30. I do not believe Petitioner's proposed knowledge and skills of a POSITA would have prepared an individual to invent the protective enclosures of the '950 Patent. Knowledge and experience designing cases does not inform the

knowledge and experience necessary to design any such cases for use in “adverse environmental conditions” (i.e. ruggedizing). Which is to say, “experience designing cases” is overinclusive and overly simplistic, as it encompasses at least aesthetic design not relevant to the teachings of the ’950 Patent, and experience for which would fail to inform issues related to the teachings and objectives of the ’950 Patent.

V. BACKGROUND DISCUSSION OF PROTECTIVE ENCLOSURES FOR ELECTRONIC DEVICES

31. To better illustrate my opinions on the validity of the claims of the ’950 Patent, I provide some further background in this section.

32. The ’950 Patent addresses the need for protective enclosures for electronic devices (in particular mobile devices) that are ruggedized and provide protection against physical damage from shocks and exposure to moisture and liquids. (EX1001, 2:15-18.) The title of the ’950 Patent is: “Housing for Encasing a Mobile Computing Device”.

VI. OVERVIEW OF THE ’950 PATENT

A. The Specification of the ’950 Patent

33. The ’950 Patent claims a protective enclosure for a mobile computing device designed to allow the devices to be used in “adverse environmental conditions.” (EX1001, 2:15-18.) These environments are considered “adverse” to the various types of mobile computing devices. By providing a protective enclosure,

the reliability and usability of these devices may be greatly enhanced, avoiding the need to repair or replace the device.

34. The protective housing is configured to assist with the performance of the electronic device, including use of a touch screen interface. (EX1001, 1:28-31, 2:51-59.)

B. The Claims of the '950 Patent

35. The '950 Patent includes 29 claims. Claims 1, 9, 17, and 22-28¹ are independent claims. Independent Claim 17 recites as follows:

An apparatus for covering at least part of a mobile computing device having a touch screen display, the mobile computing device further having at least one switch that is actuated by a motion that is at least in part lateral to a surface of a housing that houses the mobile computing device, the apparatus comprising:

an encasement that enables operation of the touch screen display and covers at least part of the mobile computing device that includes the at

¹ Claims 1, 9, and 22-28 are not addressed in this Response because the Petition did not challenge the patentability of Claims 1, 9, and 22-28 or any claim that depends from it.

least one switch, the encasement having an outer surface and an inner surface, the encasement is comprised of:

a bottom member comprising a front surface and a back surface, and surrounded by a perimeter portion defined by a proximal end portion, a distal end portion, and opposing side portions, the perimeter portion of the bottom member having a channel formed by an interior perimeter portion and an exterior perimeter portion, the channel including a compressible gasket positioned therein; and

a top member having an inner perimeter defined by a rigid frame that corresponds to an outer perimeter of the electronic device and the perimeter portion of the bottom member, the rigid frame extending to a ridge that is adapted to clasp within the channel of the bottom member and seal against the gasket, the top member further including a membrane that overlays the rigid frame opposite the ridge, the membrane having a transparent area, the top member further including a switch mechanism; and

the switch mechanism including a switch actuator at the outer surface of the encasement, and a switch interface being provided proximate the inner surface of the encasement to contact the at least one switch of the mobile computing device and being coupled with the switch actuator

such that a movement of the switch actuator controls a movement of the switch interface to actuate the at least one switch of the mobile computing device.

C. The Priority Date of the '950 Patent

36. The 950 Patent was filed as U.S. Patent Application No. 13/681,342 (“the ’342 Application”) on November 19, 2012. (EX1001, Cover Page.)

37. I understand that the ’342 Application claims priority ultimately to two provisional patent applications filed on February 17, 2011 and October 12, 2010. (EX1001 at 1.) I have, therefore, analyzed obviousness based on the priority date of October 12, 2010.

D. Prosecution History of the '950 Patent

38. The ’950 Patent issued from U.S. Patent Application No. 13/681,342 filed on November 19, 2012. (EX1001 at 1.)

39. The Examiner issued a non-final rejection on February 26, 2013, rejecting claims 1-4, 8, 11-14, 18, 21-24, 29 and 30. (EX1002 at 599-607.)

40. Claims 21 and 23 were rejected under 35 U.S.C. §102(a or e) as anticipated by Wilson (US8,286,789). (EX1002 at 604.)

41. Claims 1-3, 8, 11-13, 18, 21-24, and 29-30 were rejected under 35 U.S.C. §102(b or e) as anticipated by Orr (US7,772,507). (EX1002 at 604.)

42. Claims 4 and 14 were rejected under 35 U.S.C. §103(a) as obvious over Orr. (EX1002 at 605-606.)

43. Claims 5-7, 9-10, 15-17, 19-20, and 25-26 were objected to as depending from a rejected independent claim but were patentable if rewritten in independent form. (EX1002 at 606.)

44. Applicant traversed the Examiner's rejection on May 2, 2013. (EX1002 at 242-266.)

45. Applicant amended Claim 21 (which issued as independent Claim 17) to add the following limitations:

. . . the encasement is comprised of:

a bottom member comprising a front surface and a back surface, and surrounded by a perimeter portion defined by a proximal end portion, a distal end portion, and opposing side portions, the perimeter portion of the bottom member having a channel formed by an interior perimeter portion and an exterior perimeter portion, the channel including a compressible gasket positioned therein; and

a top member having an inner perimeter defined by a rigid frame that corresponds to an outer perimeter of the electronic device and the perimeter portion of the bottom member, the rigid frame extending to a ridge that is adapted to clasp within the channel of the bottom member and seal against the gasket, the top member further including a membrane that overlays the rigid frame opposite the ridge, the membrane having a transparent area, the top member further including a switch mechanism...

(EX1002 at 251-252.)

46. Following the Applicant's response, the Examiner withdrew the rejection and issued a Notice of Allowance on July 17, 2013. (EX1002 at 211-215.) No reasons for allowance were provided. (*Id.*)

47. The '950 Patent issued on October 22, 2013. (EX1001 at 1.)

VII. CLAIM CONSTRUCTION

48. Petitioner has identified two terms that it seeks claim construction for: "a mobile computing device having a touch screen display" and "an encasement that enables operation". (Pet. at 13-14.) The Petitioner tries to read the claim limitations out of the claim. In my opinion, this attempt is improper.

49. I understand that Petitioner identifies the claim term for construction as "a mobile computing device". Petitioner then argues the device need not have "a touch screen display." (Pet. at 13-14.) The proper term for construction is the term as found in the preamble of Claim 17—"a mobile computing device having a touch screen display."

50. Petitioner proposes construing the term "mobile computing device," which is found in Claim 17's preamble as not being part of the claim, i.e., being non-limiting. (Pet. at 13-14.) The term "mobile computing device having a touch screen display" is not in need of further construction. It is readily understandable by a POSITA at the time of the '950 Patent's invention. Petitioner's proposal to read

“mobile computing device having a touch screen display” out of Claim 17, however, would remove context that a POSITA would need to understand the rest of the Claim’s limitations. Indeed, the claimed invention of Claim 17 of the ’950 Patent is “[a]n apparatus for covering at least a part of a mobile computing device having a touch screen display.” (EX1001, Claim 17.)

51. Specifically, it is my understanding that language in a claim’s preamble, while generally not limiting, should be construed as part of the claim where the language gives life, meaning, or vitality to the claim. In my opinion, “mobile computing device having a touch screen display” performs such a function and provides necessary context for the claimed “apparatus for covering at least a part of a mobile computing device having a touch screen display.”

52. A POSITA reading Claim 17 would understand that the claimed invention is “[a]n apparatus for covering at least a part of a mobile computing device having a touch screen display.” A POSITA would understand that the mobile computing device having a touch screen display is not simply what the claimed protective encasement is used for, but would actually understand that the mobile computing device having a touch screen display is a foundational structure that the protective encasement must be adapted to fit and which would inform the structure, materials, and mechanical design of the encasement described by Claim 17.

53. Claim 17 further requires the “encasement that enables operation of the touch screen display.” The “mobile computing device having a touch screen display” of the preamble provides both the antecedent basis and the context for this later structural requirement, and informs that the preamble is limiting.

54. Likewise, the limitation “an encasement that enables operation” provides structural requirements for the claimed invention. It should not be read out of Claim 17.

55. Claim 17 requires that the encasement enable operation. A structure that completely (i.e. fully or 100%) encloses the mobile computing device would not enable operation. Furthermore, a POSITA would understand that enabling operation of a mobile computing device that was installed within an enclosure would require inclusion of structures and modifications not required or implicated by other encasements. Therefore, the limitation provides a POSITA with structural requirements to understand the claimed invention. For example, a POSITA would understand that certain materials used for membranes would be inadequate because they would not “enable operation” of an enclosed device, or recognize that certain configurations and designs for an enclosure would occlude or impede use of various buttons, switches, or other features of the enclosed device.

VIII. GROUNDS OF INVALIDITY

56. Fellowes argues in its Petition and the Garris Declaration that Claims 17, 19, and 21 of the '950 Patent are rendered obvious based on prior art identified in the Petition and the Garris Declaration. (Pet. at 25-66; EX1010, ¶¶ [0044]-[0119].) I disagree with this assertion. The sections that follow provide facts and reasons to support my opinion that a POSITA would not find that the claims of the '950 Patent are obvious as of the priority date in light of any of the arguments raised by Fellowes or Dr. Garris.

A. Ground 1: Claims 17, 19, and 21 of the '950 Patent are not obvious over Kuhn in view of the '712 Patent.

57. Petitioner alleges Claims 17, 19, and 21 of the '950 Patent are obvious over Kuhn (EX1004) in view of the '712 Patent (EX1006). A POSITA would not have been motivated to combine Kuhn and the '712 Patent. Moreover, Kuhn and the '712 Patent fail to teach all of the limitations of Claims 17, 19, and 21 of the '950 Patent.

1. No motivation to combine Kuhn and the '712 Patent

58. The Petition fails to provide a motivation to combine the embodiments of Kuhn with the '712 Patent.

59. I understand that a POSITA must have a motivation to combine embodiments within a given reference to achieve the claimed invention. The Petition

does not provide any motivation to combine certain aspects of the embodiments of Kuhn. (*See* Pet. at 27, 29-32.)

60. Additionally, Kuhn’s teachings would have discouraged a POSITA from combining it with the ’712 Patent.

61. This is because Kuhn criticizes protective enclosures designed to encase specific models or device types. (EX1004, ¶¶ [0009]-[0010].) Instead, the invention of Kuhn is intended “to overcome the aforementioned disadvantages [of needing a special enclosure for each model or device]”, i.e. to specify an enclosure for a mobile phone..., which is designed waterproof and that *can be used for a variety of different device types.*” (EX1004, ¶ [0011] (emphasis added).) This design concept promoted by Kuhn does simplify issues such as design, manufacture, and inventory by virtue of needing fewer models of the protective enclosure relative to the large number of different device sizes and types. However, a POSITA would recognize that Kuhn’s teachings have the negative effect of an increased size (relative to a device-specific enclosure) because the enclosure needs to be large enough to accommodate a “variety of different devices” that necessarily present different sizes and dimensions. (EX1004, ¶ [0011].) As a result, the enclosure of Kuhn would be ‘bulky’ relative to the devices it is intended to protect, and the frame of the enclosure would not “correspond” to the outer perimeter of any particular enclosed device. (*e.g.*, EX1001, Claim 17.)

62. This intention or purpose of Kuhn to create a “universal” or multi-functional enclosure is not shared by the ’950 Patent, which discloses an enclosure adapted for use with a specific device. (*See, e.g.*, EX1001, 3:1-11.) This intention of Kuhn is incompatible with creating a “frame that corresponds to the outer perimeter of the electronic device,” because no frame could “correspond” to the perimeter of every single device. A POSITA would understand that modifying any putative frame of Kuhn to correspond to the outer perimeter of the device, as required, would result in an enclosure that had poor, if any, correspondence to other devices. In my opinion, a POSITA would see this as incompatible with Kuhn’s goal of creating an enclosure for use with different devices. (EX1004, ¶ [0011].)

63. Further modifying Kuhn to include the switch mechanism of the ’712 Patent would negate the express “task” of Kuhn to “specify an enclosure for a mobile phone equipped with a camera ... that can be used for a variety of different device types.” (EX1004, ¶ [0011].) Indeed, a POSITA would understand that modifying the enclosure claimed by Kuhn to include the device-specific switch feature in the specific location required to properly engage with a particular device’s button or switch would make the resulting enclosure incompatible with the buttons or switches of “different devices.” (*See id.*)

64. The claims and limitations of the ’950 Patent are not compatible with the stated purpose of the invention in Kuhn, and any combination of Kuhn with the

secondary references to achieve the claimed invention would have negated the purpose for which Kuhn was invented.

65. Petitioner argues that an “additional” motivation to combine is provided by Kuhn’s “stat[ed] desire for the user to ‘have use of the entire control of the mobile phone,’” (*e.g.*, Pet. 47 (Ground 1), 51 (Ground 2), 60 (Ground 3)). But based on Kuhn’s direction that the enclosure is meant to be used with “a variety of different device types,” a POSITA would understand these teachings from Kuhn to teach away from any such combination because the resulting device-specific features would be incompatible with the stated purpose of Kuhn. (*And see* EX1004, ¶ [0011].) In my opinion a POSITA would clearly understand that Kuhn teaches away from combination with the ’712 Patent presented in Ground 1.

66. Moreover, the ’712 Patent also teaches away from the combination with Kuhn. The ’712 Patent expressly criticizes Kuhn’s configuration of a rear member. (EX1006, 1:22-67.) The ’712 Patent contends that use of a rear door, instead of a smaller side door, makes the case susceptible to deformation from water pressure.

67. A POSITA would further have been discouraged from combining Kuhn and the ’712 Patent because the combination would not have yielded the invention of the ’950 Patent. Specifically, the switch mechanism of the ’712 Patent would not have physically worked with or been compatible with the separated, dual perimeter walls of Kuhn. The membrane of Kuhn could not include a switch because it is not

thick/strong enough and because it would obscure part of the screen and would again obviate the express purpose of Kuhn to create an enclosure for a variety of different devices by positioning such a feature in a particular location.

2. Kuhn and the '712 Patent fail to teach all elements of the challenged claims of the '950 Patent

68. Kuhn fails to teach “a mobile computing device having a touch screen display”. (Claim 17[a].) Petitioner’s argument that the display of the mobile device can be used under the transparent and/or elastic material (Pet. at 36 (citing EX1004, [0019])) does not say or otherwise inform that the display of Kuhn is a touch screen. Rather, use of the display merely means that the entire display can be seen through the transparent membrane. (And *e.g.*, EX1004, FIG 3 (illustrating mobile phone with physical keys installed in enclosure.))

69. Petitioner concedes that Kuhn does not teach a touch screen. Rather, Kuhn cites to a reference—U.S. Patent Publication No. 2003/0095374 (EX1017, “the '374 Publication”) that teaches a touch screen. (EX1004, ¶¶ [0009].) But Kuhn does not incorporate by reference the teachings of the '374 Publication. Moreover, Petitioner does not provide any motivation (besides obvious hindsight) to combine the teachings of Kuhn and the '374 Publication. In fact, Kuhn expressly criticizes the '374 Publication. (EX1004, ¶¶ [0006]-[0011] (criticizing protective enclosures for being device-specific and not waterproof due to inlets not remaining tight).)

70. Because Kuhn does not teach “a mobile computing device having a touch screen display” (Claim 17[a]), Kuhn cannot teach Claim 17[b] (“an encasement that enables operation of the touch screen display and covers at least part of the mobile computing device that includes the at least one switch”).

71. Petitioner further argues that the combination of Kuhn and the ’712 Patent teaches “a mobile computing device having a touch screen display” because the ’712 Patent works with a touch screen. (*See* Pet. at 37-38.) But Petitioner does not describe how Kuhn could or would be modified in the combination to arrive at the claimed invention.

72. Kuhn further fails to teach claim limitation 17[g] (“a top member having an inner perimeter defined by *a rigid frame that corresponds* to an outer perimeter of the electronic device and *the perimeter portion of the bottom member*” (emphasis added)).

73. Even to the extent that Element 40 of Figure 3 corresponds to the “outer perimeter of the electronic device” it does not correspond to “the perimeter portion of the bottom member.” A gap exists between element 40 (perimeter of sealing frame) and element 16 (perimeter of bottom member). Moreover, as discussed earlier in Paragraphs 61-62, Element 40 of Figure 3 does not correspond “to the outer perimeter of the electronic device,” as creating such a correspondence for any particular device would obviate Kuhn’s purpose of creating an enclosure for use with

a variety of devices with different shapes and sizes. In addition, I note that Dr. Garriss states that “*A key consideration in designing a protective encasement for a device is that the features of the device dictates the features of the encasement, such as its dimensions, access to control features, etc.*” (emphasis added (EX1010, ¶ 52.)) In my opinion, the oversized, universal-type enclosure of Kuhn does not meet this “key consideration” for the design of the claimed “protective enclosure” of Dr. Garriss’ own definition.

74. That element 40 and element 16 are both “rectangular shapes” (Pet. at 41) is of no significance in this comparison. The elements correspond to different structures contrary to the structure required in Claim 17 of the ’950 Patent.

75. Kuhn fails to teach limitation 17[h] (“the rigid frame extending to a ridge that is adapted to clasp within the channel of the bottom member...”).

76. The interaction of elements 50 and 51 (Pet. at 30-31 (citing Kuhn (EX1004) Figure 12)) does not occur within the channel as required by Claim 17 of the ’950 Patent. As shown in Figure 12, the clasping of 50/51 is external to the channel. Moreover, Kuhn consistently teaches that the housing parts are secured by external mechanisms – not by a structure within the channel that is not described or illustrated by Kuhn. (See EX1004, ¶[0052] (“The connection between the first housing part 10 and the second housing part 11 is secured by two locking clamps 12.”), ¶[0053] (“The water tightness of the closure . . . is made by means of the

rubber seal 17 *and two locking clasps 12.*”), ¶[0084]) (“The connection between the first housing part 10 and a second housing part 11 *is held or rather secured by means of closure elements 50, 51 . . .*”) (emphasis added).) In my opinion, a POSITA would have understood from these teachings that any “form-lock” or “form-fitting” referenced by Kuhn related to the alignment of the top and bottom members such that the members could be engaged by the external mechanisms actually described by Kuhn. This use of “form-fitting” as referring to alignment of parts is consistent with its use elsewhere in Kuhn. (See, e.g., EX1004, ¶[0088] (referring to a “form-fitting” engagement as a means of achieving “precise positioning” before an “ultrasound weld” is used to make the engagement permanent).) That is, a POSITA would have understood securement elements 50/51 or 12/13 as necessary to accomplish any closure of Kuhn’s housing.

77. A POSITA would further not have understood the frame element 39 to be “clasp[ing],” much less that it “clasp[ed] *within the channel* of the bottom member” as required by Claim 17.

78. Furthermore, Petitioner’s own dictionary citation makes clear that the plain and ordinary meaning of clasping requires a structure—“a device (such as a hook)” —to hold the objects together. (Pet. at 43.) Element 39 of the frame does not include a hook mechanism that may be understood to be a clasp.

79. A POSITA would not have been motivated to combine the teachings of Kuhn and the '712 Patent to teach all of the limitations of Claims 17, 19, and 21 of the '950 Patent. In my opinion, the teachings of Kuhn and the '712 Patent do not render Claims 17, 19, and 21 of the '950 Patent obvious.

B. Ground 2: Claims 17, 19, and 21 of the '950 Patent are not obvious over Kuhn in view of the '712 Patent in further view of Richardson.

80. Petitioner alleges Claims 17, 19, and 21 of the '950 Patent are obvious over Kuhn (EX1004) in view of the '712 Patent (EX1006) in further view of Richardson (EX1005). A POSITA would not have been motivated to combine Kuhn, the '712 Patent, and Richardson. Moreover, Kuhn, the '712 Patent, and Richardson fail to teach all of the limitations of Claims 17, 19, and 21 of the '950 Patent.

81. The addition of the Richardson reference does not fill the deficiencies present in Claims 17 and 21 (and by dependency, Claim 19).

1. No motivation to combine Kuhn, the '712 Patent, and Richardson

82. As described above (see Paragraphs 58-67), there is no motivation to combine Kuhn and the '712 Patent, let alone further combining these two references with Richardson.

83. Kuhn expressly criticizes references like the '712 Patent and Richardson because they are device specific and not capable of being used on multiple devices with different shapes or structures. (EX1004, ¶¶ [0006]-[0011].)

84. The '712 Patent expressly criticizes references like Kuhn and Richardson that have full-sized rear members that are susceptible to deformation from water pressure. (EX1006, 1:22-67.)

85. Petitioner argues it would be obvious to combine the teachings of Richardson, which teaches use with a device having a touch screen, with Kuhn. (Pet. at 51-52.) Petitioner, however, provides no motivation, besides hindsight, to combine the Kuhn and Richardson references. Nor does Petitioner explain how Kuhn and Richardson could be combined to accommodate a mobile device having a touch screen. In my opinion, there is no logic or motivation that supports this combination.

2. Kuhn, the '712 Patent, and Richardson fail to teach all of the elements in the challenged claims of the '950 Patent.

86. As described in Ground 1 (see Section VIII.A, the combination of Kuhn and the '712 Patent fails to teach elements of the challenged claims.

87. Richardson fails to teach limitation 17[h]. Richardson does not teach “the rigid frame extending to a ridge that is adapted to clasp within the channel of the bottom member and seal against the gasket.” Petitioner and Dr. Garriss initially point to “precisely manufactured male and female snaps,” citing to EX1005, ¶ [0047]. But Richardson contains no teaching that places these male and female snaps “within the channel of the bottom member” as required, nor is any such teaching asserted by Petitioner. I further note that Fig. 13 of Richardson clearly

places these snaps *outside* any putative channel. *E.g.*, (EX1005, Fig. 13, at elements 1336 and 1338 (female snaps).) Nor does Richardson’s reference to a “snap fit” suggest that Richardson’s putative ridge is “adapted to clasp *within the channel*.” (EX1001, Claim 17.) Instead, it is my opinion that a POSITA would understand Richardson’s discussion in context to reference the “snap fit [created] using precisely manufactured male and female snaps,” rather than suggest a clasping mechanism not otherwise described or illustrated anywhere in Richardson. (*See* EX1005, ¶ [0047].)

88. Richardson further fails to teach a channel of a bottom member, as arranged in Claim 17. (EX1005, ¶ [0047]; Pet. at 53.) Limitation 17[h] requires the clasping to occur *within the channel of the bottom member*. But Richardson does not teach such a channel *of the bottom member*. Richardson teaches a groove in the top member, not a groove in the bottom member. (EX1005, ¶ [0047]; Pet. at 53.)

89. Petitioner’s argument that a POSITA would have been aware of connection structures (Pet. at 54) does not provide the necessary motivation to combine or the teaching required to render the claims obvious. The Petitioner clearly fails to identify why a POSITA would have been motivated to use any such connection structures to modify the existing structures of Kuhn.

90. A POSITA would not have been motivated to combine the teachings of Kuhn, the ’712 Patent, and Richardson to teach all of the limitations of Claims 17,

19, and 21 of the '950 Patent. In my opinion, the teachings of Kuhn, the '712 Patent, and Richardson do not render Claims 17, 19, and 21 of the '950 Patent obvious.

C. Ground 3: Claims 17, 19, and 21 of the '950 Patent are not obvious over Kuhn in view of JP384.

91. Petitioner alleges Claims 17, 19, and 21 of the '950 Patent are obvious over Kuhn (EX1004) in view of JP384 (EX1007). A POSITA would not have been motivated to combine Kuhn and JP384. Moreover, Kuhn and JP384 fail to teach all of the limitations of Claims 17, 19, and 21 of the '950 Patent.

1. No motivation to combine Kuhn and JP384

92. The Petition fails to provide a motivation to combine the embodiments of Kuhn and JP384.

93. I understand that a POSITA must have a motivation to combine embodiments within a given reference to achieve the claimed invention. The Petition does not provide any motivation to combine certain aspects of the embodiments of Kuhn with JP384. (*See* Pet. at 59-60.)

94. Additionally, the teachings in Kuhn would clearly discourage a POSITA from combining it with JP384.

95. A POSITA would recognize that Kuhn criticizes protective enclosures designed to encase specific models or device types. (EX1004, ¶¶ [0009]-[0010].) Instead, the invention of Kuhn is intended “to overcome the aforementioned disadvantages [of needing a special enclosure for each model or device]”, i.e. to

specify more universal type of enclosure for a mobile phone..., which is designed waterproof and that *can be used for a variety of different device types.*” (EX1004, ¶ [0011] (emphasis added).) This design concept promoted by Kuhn does simplify issues such as design, manufacture, and inventory by virtue of needing fewer models of the protective enclosure relative to the large number of different device sizes and types. However, a POSITA would recognize that Kuhn’s teachings have the negative effect of an increased size (relative to a device-specific enclosure) because the enclosure needs to be large enough to accommodate a “variety of different devices” that necessarily present different shapes, sizes, and dimensions. (EX1004, ¶ [0011].) As a result, the enclosure of Kuhn would be ‘bulky’ relative to the devices it is intended to protect, and the frame of the enclosure would not “correspond” to the outer perimeter of the enclosed device. (*e.g.*, EX1001, Claim 17.)

96. This intention or purpose of Kuhn to create a “universal” or multi-functional enclosure is not shared by the ’950 Patent. The ’950 Patent discloses an enclosure adapted for use with a specific device. (*See, e.g.*, EX1001, 3:1-11.) This intention of Kuhn is incompatible with creating a “frame that corresponds to the outer perimeter of the electronic device,” because no frame could “correspond” to the perimeter of every single device that represents a spectrum of sizes. A POSITA would understand that modifying any putative frame of Kuhn to correspond to the outer perimeter of the device, as required, would result in an enclosure that had poor,

if any, correspondence to other devices. In my opinion, a POSITA would see this as incompatible with Kuhn's goal of creating an enclosure for use with different devices. (EX1004, ¶ [0011].) In addition, I note that Dr. Garris states that “...*a key consideration in designing a protective encasement for a device is that the features of the device dictates the features of the encasement, such as its dimensions, access to control features, etc.*”. (emphasis added (EX1010, ¶¶52, 89).) In my opinion, this statement by Dr. Garris further shows that the oversized, universal-type enclosure of Kuhn does not meet this “key consideration” for the claimed protective enclosure under his own definition.

97. Further modifying Kuhn to include the switch mechanism of JP384 would negate the express “task” of Kuhn to “specify an enclosure for a mobile phone equipped with a camera ... that can be used for a variety of different device types.” (EX1004, ¶ [0011].)

98. Petitioner concedes that the location of the switch on the cover is “dictated” by the location of the switch on the enclosed device to allow the cover switch to actuate the device switch. (Pet. at 57.) A POSITA would understand that modifying Kuhn's enclosure to include the device-specific switch feature in the specific location required to properly engage with a particular device's button or switch would make the resulting enclosure incompatible with the buttons or switches of “different devices.” (See EX1004, ¶ [0011].)

99. The claims and limitations of the '950 Patent are not compatible with the stated purpose of the invention in Kuhn, and any combination of Kuhn with the secondary references to achieve the claimed invention would have negated the purpose for which Kuhn was invented.

100. Petitioner argues that an “additional” motivation to combine is provided by Kuhn’s “stat[ed] desire for the user to ‘have use of the entire control of the mobile phone,’” (*e.g.*, Pet. 47 (Ground 1), 51 (Ground 2), 60 (Ground 3)). However, based on the teaching in Kuhn that the enclosure is meant to be used with “a variety of different device types,” a POSITA would understand these teachings from Kuhn in fact teach away from any such combination because the resulting device-specific features would be incompatible with the stated purpose of Kuhn. (*And see* EX1004, ¶ [0011].) In my opinion a POSITA would clearly understand that Kuhn teaches away from the combination with JP384 presented in Ground 3.

2. Kuhn and JP384 fail to teach all of the elements in the challenged claims of the '950 Patent.

101. As described in Paragraphs 68-79, Kuhn does not teach Claim elements 17[a], 17[b], 17[g], or 17[h].

102. The Petition makes no reference to whether JP384 teaches Claim elements 17[a], 17[b], 17[g], or 17[h] or whether Kuhn and JP384 would be combined to teach Claim elements 17[a], 17[b], 17[g], or 17[h].

103. JP384 does not teach a touch screen. (EX1007, ¶ [0017].) Kuhn does not teach “a mobile computing device having a touch screen display”. (Claim 17[a]; *see* Section VIII.A.2, ¶¶68-69.)

104. Kuhn also does not teach “an encasement that enables operation of the touch screen display and covers at least part of the mobile computing device that includes the at least one switch”. (Claim 17[b]; *see* Section VIII.A.2, ¶ 70.)

105. Kuhn does not teach limitation 17[h] (“the rigid frame extending to a ridge that is adapted to clasp within the channel of the bottom member...”). (*See* Section VIII.A.2, ¶¶ 75-78.)

106. JP384 does not teach clasping within the channel, and Petitioner does not claim that JP384 teaches this feature. (Claim 17[h].) Petitioner further does not argue that JP384 cures the failure to teach 17[h] in Kuhn. (Pet. at 56-60.) Indeed, JP384 does not teach (“the rigid frame extending to a ridge that is adapted to clasp within the channel of the bottom member...” (EX1007 at 5, Figure 4.)

107. It is clear from these considerations that Kuhn and JP384 do not teach claim element 17[h].

108. A POSITA would not have been motivated to combine the teachings of Kuhn and JP384 to teach all of the limitations of Claims 17, 19, and 21 of the '950 Patent. In my opinion, the teachings of Kuhn and JP384 clearly do not render Claims 17, 19, and 21 of the '950 Patent obvious.

D. Ground 4: Claims 17, 19, and 21 of the '950 Patent are not obvious over Kuhn in view of JP384 further in view of Richardson.

109. Petitioner alleges Claims 17, 19, and 21 of the '950 Patent are obvious over Kuhn (EX1004) in view of JP384 (EX1007) in further view of Richardson (EX1005). A POSITA would not have been motivated to combine Kuhn, JP384, and Richardson. Moreover, Kuhn, JP384, and Richardson fail to teach all of the limitations of Claims 17, 19, and 21 of the '950 Patent.

1. No motivation to combine Kuhn, JP384, and Richardson

110. Petitioner relies extensively on its description of Ground 3 to validate its challenges in Ground 4.

111. As described above (see Paragraphs 92-100), there is no motivation to combine Kuhn and JP384, let alone to further combine Kuhn and JP384 with Richardson.

112. Kuhn expressly criticizes references like JP384 and Richardson because they are device specific and not capable of being used on multiple devices with different shapes or structures. (EX1004, ¶¶ [0006]-[0011].)

113. Petitioner argues it would be obvious to combine the teachings of Richardson, which teaches use with a touch screen, with Kuhn. (Pet. at 61.) Except for hindsight, Petitioner provides no motivation to combine the Kuhn and

Richardson references. Petitioner does not explain how Kuhn and Richardson would or could be combined to accommodate a mobile device having a touch screen.

2. Kuhn, JP384, and Richardson fail to teach all of the elements in the challenged claims of the '950 Patent.

114. As described above (see Paragraphs 101-108), Petitioner does not describe how JP384 cures Kuhn's failure to teach Claim elements 17[a], 17[b], 17[g], and 17[h].

115. Moreover, JP384 does not teach claim elements 17[a], 17[b], and 17[h]. (See Section VIII.C.2, ¶¶ 101-108.)

116. Petitioner further relies on its disclosures in Ground 2 for Richardson's teaching of a "touch screen display" and a "clasp within the channel." (Pet. at 60-61.)

117. Petitioner provides no explanation of how Richardson would be combined with the other references—specifically with JP384 for this Ground—to teach an encasement for a mobile device with a touch screen.

118. Richardson further fails to teach limitation 17[h]. Richardson does not teach "the rigid frame extending to a ridge that is adapted to clasp within the channel of the bottom member and seal against the gasket."

119. Richardson teaches a snap fit between two members. (EX1005, ¶ [0047].) Limitation 17[h] requires the clasping to occur *within the channel of the bottom member*. Richardson does not teach a channel *of the bottom member*.

Richardson teaches a groove in the top member, not the bottom member. (EX1005, ¶ [0047].)

120. Kuhn, JP384, and Richardson fail to teach these essential elements, either alone or in combination.

121. A POSITA would not have been motivated to combine the teachings of Kuhn, JP384, and Richardson to teach all of the limitations of Claims 17, 19, and 21 of the '950 Patent. In my opinion, the teachings of Kuhn, JP384, and Richardson do not render Claims 17, 19, and 21 of the '950 Patent obvious.

E. Ground 5: Claims 17, 19, and 21 of the '950 Patent are not obvious over Kuhn in view of the '712 Patent in view of Richardson and FR857.

122. Petitioner alleges Claims 17, 19, and 21 of the '950 Patent are obvious over Kuhn (EX1004) view of the '712 Patent (EX1006) in further view of Richardson (EX1005) and FR857 (EX1008). A POSITA would not have been motivated to combine Kuhn, the '712 Patent, Richardson, and FR857. Moreover, Kuhn, the '712 Patent, Richardson, and FR857 each fail to teach all of the limitations of Claims 17, 19, and 21 of the '950 Patent.

123. Petitioner relies on FR857 to fill a deficiency of Ground 2, namely the teaching of 17[h] (“rigid frame extending to a ridge that is adapted to clasp within the channel.”). (Pet. at 61.)

1. No motivation to combine Kuhn, the '712 Patent, Richardson, and FR857.

124. As described in Ground 1 (Paragraphs 58-67) and Ground 2 (Paragraphs 82-85), there is no motivation to combine Kuhn, the '712 Patent, and Richardson.

125. FR857 teaches an enclosed box. (EX1008 at 16, Figure 1.)

126. The enclosed box of the FR857 patent does not allow for the usage of the mobile device with a touch screen when the device is inside the enclosure. FR857 is designed for a different purpose and is not reasonably pertinent to the problem solved by the '950 Patent. Further FR857 is not analogous art.

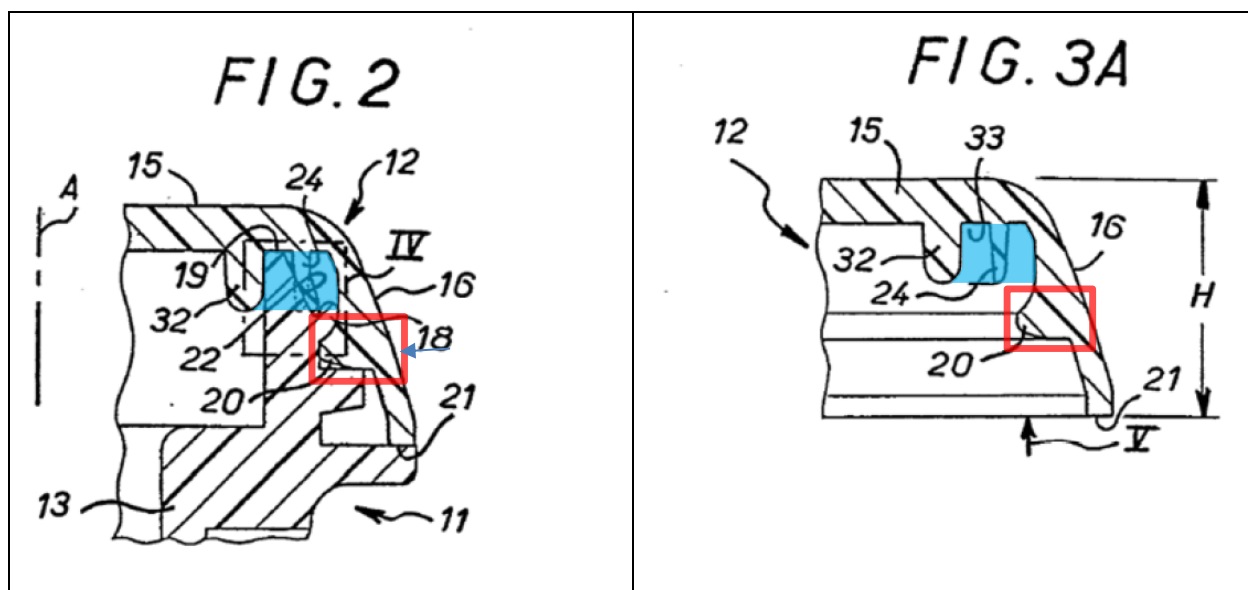
127. In my opinion, a POSITA would not have been motivated to combine FR857 with the other references included in Ground 5.

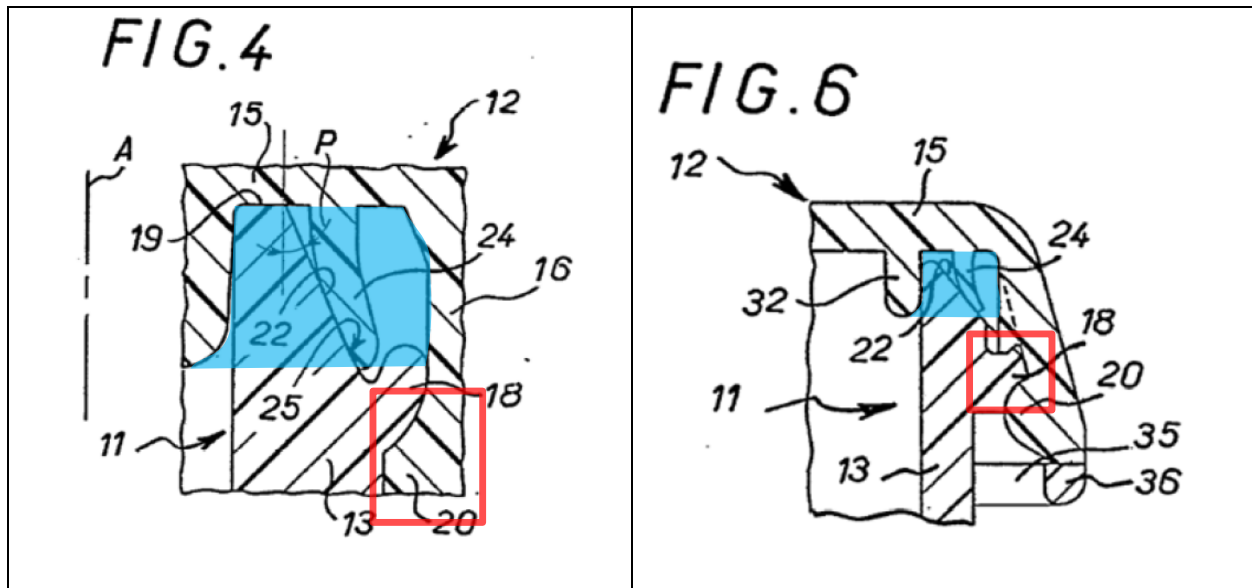
2. Kuhn, the '712 Patent, Richardson, and FR857 fail to teach all of the elements in the challenged claims of the '950 Patent.

128. Petitioner relies on FR857 to teach limitation 17[h]. (Pet. at 62.)

129. FR857 does not teach limitation 17[h]. Specifically, FR857 does not teach a channel in the bottom member as taught by limitation 17[h]. In contrast, FR857 teaches a channel in the top member. (EX1008, Fig. 3A; EX1008, 4:13 (Fig. 3A portrays a cross-sectional view of the lid (i.e., the top member) of the box.) Additionally, the purported ridge of FR857's box is not "adapted to clasp *within the channel* of the bottom member", as required by Claim 17. Petitioner points to

Fig. 3A, and additionally to Fig. 2 and Fig. 6, to show the purported element. As to Fig. 3A, to the extent the area between element 32 and element 16 can be characterized as a channel, that channel would include the space between those two elements. The bulge 20 that Petitioner identifies as a “clasping mechanism” (Pet., 62-63) is not in the area between element 32 and element 16. *See* Fig. 3A (annotated below). The same applies to Petitioner’s argument that sidewall 13 extends to a ridge with clasping mechanism 18 that “clasps within the channel with element 20 and seals against element 24,” as purported “clasping mechanism 18” is not located within the channel. *And see* Figs. 2, 6 (annotated below). Instead, FR857 consistently places the putative clasping mechanism (annotated red, below) outside any channel (blue annotations, below) formed between element 32 and 16:





Thus, any ridge of FR857's purported top member is not "adapted to clasp within the channel of the bottom member," which is required by Claim 17.

130. FR857 further describes a post of the bottom member extending into the top member. (Pet. at 63; EX1008, Figs. 2, 6.) Again, this is not what is claimed in 17[h]. Limitation 17[h] requires "the rigid frame extending to a ridge that is adapted to clasp within the channel of the bottom member...". FR857 teaches a channel in the top member and a post in the bottom member. This configuration in FR857 is exactly opposite of the arrangement described in 17[h].

131. A POSITA would not have been motivated to combine the teachings of Kuhn, the '712 Patent, Richardson, and FR857 to teach all of the limitations of Claims 17, 19, and 21 of the '950 Patent. In my opinion, the teachings of Kuhn, the '712 Patent, Richardson, and FR857 do not render obvious Claims 17, 19, and 21 of the '950 Patent.

F. Ground 6: Claims 17, 19, and 21 of the '950 Patent are not obvious over Kuhn in view of JP384 in further view of Richardson and FR857.

132. Petitioner alleges Claims 17, 19, and 21 of the '950 Patent are obvious over Kuhn (EX1004), in view of JP384 (EX1007), in further view of Richardson (EX1005), and FR857 (EX1007). In my opinion, a POSITA would not have been motivated to combine Kuhn, JP384, Richardson, and FR857. Moreover, Kuhn, JP384, Richardson, and FR857 fail to teach all of the limitations of Claims 17, 19, and 21 of the '950 Patent.

133. Petitioner relies on FR857 to fill a deficiency of Ground 4 (see Section VIII.D), namely the teaching of 17[h] (“rigid frame extending to a ridge that is adapted to clasp within the channel.”). (Pet. at 66.)

1. No motivation to combine Kuhn, JP384, Richardson, and FR857.

134. As described in Ground 3 (Paragraphs 92-100) and Ground 4 (Paragraphs 110-113), there is no motivation to Kuhn, JP384, and Richardson.

135. FR857 teaches an enclosed box. (EX1008 at 16, Figure 1.)

136. The enclosed box of the FR857 patent does not allow for the usage of the mobile device with a touch screen when the device is inside the enclosure. FR857 is designed for a different purpose, is not reasonably pertinent to the problem solved by the '950 Patent, and is not analogous art.

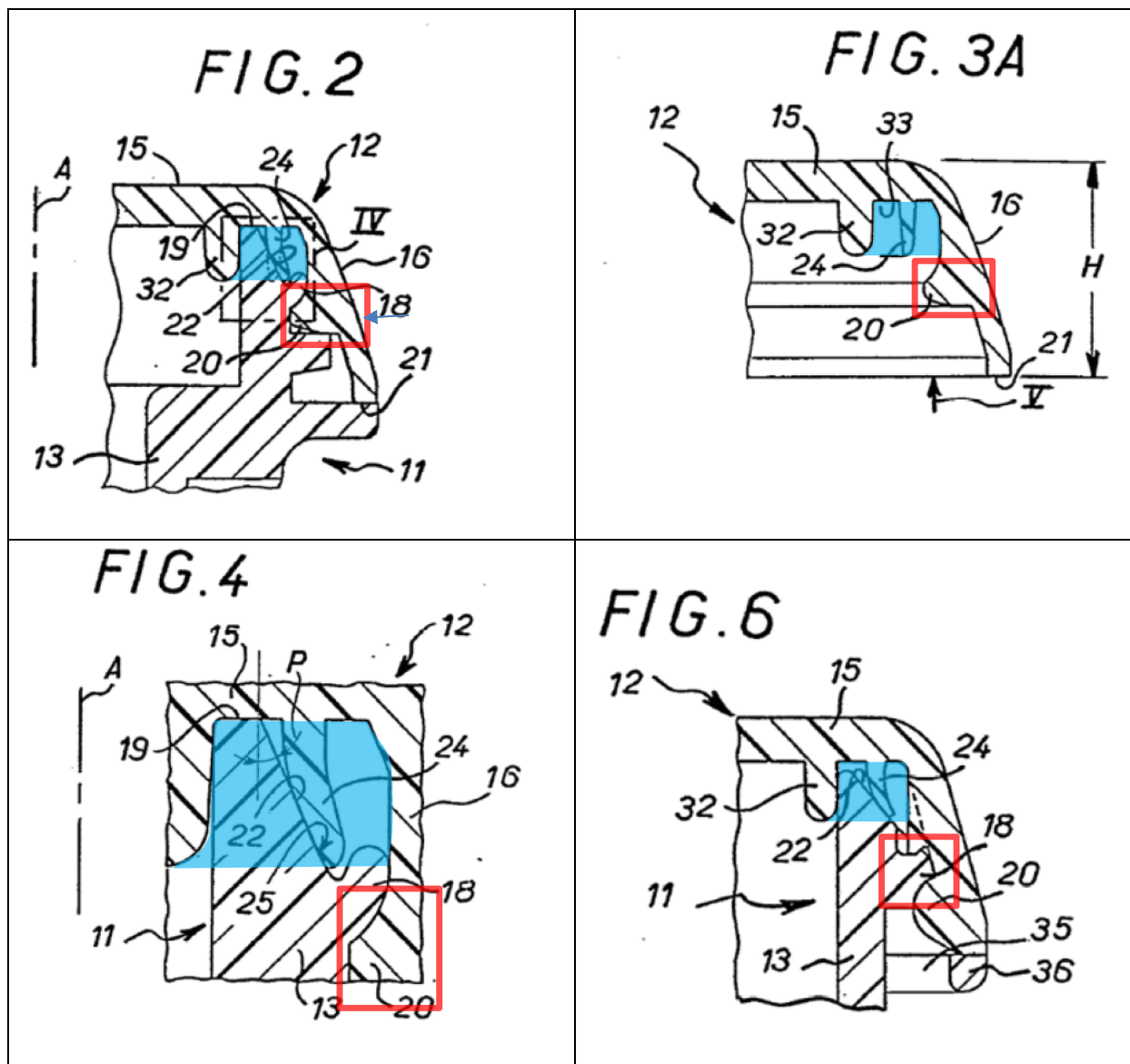
137. A POSITA would not have been motivated to combine FR857 with the other references.

2. Kuhn, JP384, Richardson, and FR857 fail to teach all of the elements in the challenged claims of the '950 Patent.

138. Petitioner relies on FR857 to teach limitation 17[h]. (Pet. at 66.)

139. FR857 does not teach limitation 17[h]. Specifically, FR857 does not teach a channel in the bottom member. FR857 teaches a channel in the top member. (EX1008, Fig. 3A; EX1008, 4:13 (Fig. 3A portrays a cross-sectional view of the lid (i.e. top member) of the box.) Additionally, the purported ridge of FR857's box is not "adapted to clasp *within the channel* of the bottom member", as required by Claim 17. Petitioner points to Fig. 3A, and additionally to Fig. 2 and Fig. 6, to show the purported element. As to Fig. 3A, to the extent the area between element 32 and element 16 can be characterized as a channel, that channel would include the space between those two elements. The bulge 20 that Petitioner identifies as a "clasping mechanism" (Pet., 62-63) is not in the area between element 32 and element 16. *See* Fig. 3A (annotated below). The same applies to Petitioner's argument that sidewall 13 extends to a ridge with clasping mechanism 18 that "clasps within the channel with element 20 and seals against element 24," as purported "clasping mechanism 18" is not located within the channel. *And see* Fig. 2 and Fig. 6 (annotated below). Instead, FR857 consistently places the putative clasping mechanism (annotated red,

below) outside any channel (blue annotations, below) formed between element 32 and 16:



Thus, any ridge of FR857's purported top member is not "adapted to clasp within the channel of the bottom member," which is required by Claim 17.

140. FR857 further describes a post of the bottom member extending into the top member. (Pet. at 63; EX1008, Figs. 2, 6.) Again, this is not what is claimed in 17[h]. Limitation 17[h] requires "the rigid frame extending to a ridge that is

adapted to clasp within the channel of the bottom member...”. FR857 teaches a channel in the top member and a post in the bottom member. This configuration in FR857 is exactly opposite of the arrangement described in 17[h].

141. A POSITA would not have been motivated to combine the teachings of Kuhn, JP384, Richardson, and FR857 to teach all of the limitations of Claims 17, 19, and 21 of the ’950 Patent. In my opinion, the teachings of Kuhn, JP384, Richardson, and FR857 do not render Claims 17, 19, and 21 of the ’950 Patent obvious.

142. A POSITA would not have been motivated to combine the teachings of Kuhn, JP384, Richardson, and FR857 to teach all of the limitations of Claims 17, 19, and 21 of the ’950 Patent. In my opinion, the teachings of Kuhn, JP384, Richardson, and FR857 do not render Claims 17, 19, and 21 of the ’950 Patent obvious.

IX. CONCLUSION

143. It is my opinion that Claims 17, 19, and 21 of the ’950 Patent are not rendered obvious based on prior art identified in the Petition. The basis for my opinion is discussed above in my analysis of Grounds 1-6 proposed in the Petition IPR2020-01543 as Petitioner’s Grounds of Invalidity.

144. I hereby 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.

Executed this 30th day of December, 2020.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "T. Kim Parnell". The signature is written in a cursive, flowing style.

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

EXHIBIT A

T. Kim Parnell, PhD, PE

1150 Kelsey Drive
Sunnyvale, CA 94087

www.parnell-eng.com

(408) 203-9443 (Cell)

kim.parnell@stanfordalumni.org

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- 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
- 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)

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 Senior Member; Institute of Electrical and Electronics Engineers (IEEE)
- Member, Society of Automotive Engineers (SAE)
- ASM International Member; SMST (Shape Memory and Superelastic Technologies) Member; EDFAS (Electronic Device Failure Analysis Society) Member
- 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
- IEEE Vehicular Technology Society (IEEE-VTS); Vice-Chair, 2012-2018; Treasurer 2018-present
- IEEE Consumer Electronics Society (IEEE-CE), IEEE Computer Society, IEEE Engineering in Medicine & Biology (IEEE-EMBS), IEEE Electronics Packaging Society (IEEE-EPS)
- Chinese American Semiconductor Professional Association (CASPA)
- Reviewer: *Journal of Composite Materials (JCM)*; *International Journal of Forensic Engineering (IJFE)*; *International Journal of Technology Transfer and Commercialisation (IJTTC)*.

Employment History

From: 2000
To: Present
Position:

Parnell Engineering & Consulting (PEC)

Sunnyvale, CA;

Web: parnell-eng.com

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
- Application of CAE, FEA, and High-Performance Computing (HPC)

From: 2010
To: 2012
Position:

Santa Clara University

Santa Clara, CA

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, and electronics. Created customer satisfaction via:

- Customer support & analysis process development
- 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 consulting services revenue generation >\$600K.

From: 1995
 To: 1996
 Position: **Stanford University**
 Stanford, CA
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
To: 1986
Position: **SST Systems, Inc.**
Sunnyvale, CA
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
To: 1984
Position: **Stanford University**
Stanford, CA
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.

From: 1978
To: 1980
Position: **AT&T Bell Laboratories**
Indianapolis, IN
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
To: 1977
Position: **General Motors Corporation**
Atlanta, GA
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 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: 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:

2020 to Present	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:	Expert Report, Sep 2020; Deposition, Oct 2020; Ongoing
2020 to Present	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:	IPR Declaration Oct 2020; Ongoing
2020 to Present	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:	IPR Declarations Aug 2020; Patent Infringement; Ongoing
2020 to Present	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)
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:	Ongoing

2020 to Present	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; Ongoing
2019	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:	2020; 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:	Claim construction, invalidity, non-infringement; Claim construction Declaration Aug 2019; Settled
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:	Deposition Aug 2019; Expert Report Aug 2019; Declaration on Motion for Summary Judgement Aug 2019; Settled
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:	Declaration, Oct 2019; Settled

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
	Project:	Confidential
	Status:	Ongoing
2019 to Present	Client:	Rouda Feder Tietjen McGuinn
	Case:	<i>Margo Schein v. Peak Pilates</i>
	Project:	Inspection of Pilates Reformer equipment; Accidental injury root-cause assessment
	Status:	Ongoing
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 Present 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:	Ongoing Settled
2018 to Present	Client:	Maddin, Hauser, Roth & Heller, P.C.
	Case:	<i>Larry Esckilsen and Renie Esckilsen v. Oakland Orthopedic Appliances, Inc.</i> ; Case No. 18-036354-NO-1 Saginaw Circuit Court
	Project:	Alleged failure of orthopedic leg; personal injury
	Status:	Deposition, Sep 2020; Ongoing
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:	Expert Report, Jan 2019; Settled

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:	Expert Report, Feb 2019; Settled
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:	IPR Declaration Dec 2018; Settled
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:	Declaration, Apr 2019; Settled
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
	Project:	Patent IPR associated with solar panel trackers
	Status:	Deposition Dec 2018; IPR Declaration Mar 2018; Settled
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:	Ongoing
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-1</i>
	Project:	Alleged design defect in ATV Rollover Protection System (RoPS); Design and Failure Analysis
	Status:	
2017 to Present	Client:	Troutman Sanders LLP; Vinson & Elkins
	Case:	<i>Blackbird Tech LLC d/b/a Blackbird Technologie 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:	Declaration May 2018; Deposition Feb 2018; Reply Report Dec 2017; Non-Infringement Report Nov 2017; Invalidity Report Sep 2017; Settled
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:	Multiple Patent & Technology dispute associated with Implantable Circulatory Support System Pumps
	Status:	
2017 to Present	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:	Depositions (2) Sep 2018; IPR Response Declarations, Jul 2018 (2), May 2018; Settled
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, IPR2017-yyyy</i>
	Project:	Patent IPR 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:	Ongoing

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:	Deposition Jul 2018; Deposition Apr 2018; IPR Declaration Aug 2017; IPR Reply Declaration Feb 2018; Settled;
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 Present	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:	Ongoing
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:	IPR Declarations (2) Filed Oct.2016;
2016 to 2018	Client:	Plews Shadley Racher & Braun, LLP
	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
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:	
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:	Ongoing;
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:	Ongoing
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>Dineen v. Sprint and Apple</i>
	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: *Gable v. International Truck & Engine Corporation*
 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: *Medtronic Vascular, Inc. vs. Boston Scientific Corp., et al.*
 C.A. No. 98-478-SLR (D-Del)
 Project: Patent case involving Cardiovascular Stent design
 Status: Closed; Expert Report filed; No Deposition.

1997 Client: Grimaldi, Pearson, and Weyand, P.C.
 Case: *Herbolsheimer v. Warner-Swasey*
 Case No. 9357487NP
 Project: Product defect of CNC machine equipment
 Status: Closed; Deposition.

1994 Client: Jones, Jones, Close & Brown
 Case: *Pioneer Chlor-Alkali Co., Inc. v. National Union Fire Insurance*
 Co., 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: *Thomas Fujisaka and Sandra Fujisaka v. Livermore Valley Unified*
 School District, 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 *GEA Power Cooling Systems, Inc. v. Hyspan Precision Products,*
 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 *Bobbie J. Phaneuf v. Edith D. Roman*, Superior Court of the State
 of California County of Alameda, Case No. H - 154330-4
 Project: Product Design.
 Status: Closed; Deposition, Trial.

1993 Case: *Patricia C. Barbera v. H. B. Instrument Company*, 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:

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: 2 IPR Declarations Aug 2020;

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	<p>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</p> <p>Status: IPR Declaration Aug 2017; IPR Response Declaration Feb 2018;</p>
2017	<p>Case: <i>Lenovo (United States) Inc. v. Blackbird Tech d/b/a Blackbird Technologies</i>, Review of U.S. Patent No. 7,129,931;</p> <p>Status: IPR Declaration May 2017;</p>
2016	<p>Case: <i>Olam West Coast, Inc. v. California Fire-Roasted LLC; Inter Partes</i> Review of U.S. Patent No. 6,099,882</p> <p>Status: IPR Declarations (2), Oct 2016;</p>
2016	<p>Case: <i>Johnstech International Corp. v. JF Microtechnology SDN BHD</i>; Action 14-cv-02864-JD, US Federal Court, District of Northern California</p> <p>Status: Testified in Patent Trial, Sep 2016</p>
2007	<p>Case: <i>Strode v. Freightliner, LLC</i>; Civil Action No. 02-132 Circuit Court of Greene County Alabama</p> <p>Status: Testified in Product Liability/Personal Injury case;</p>
1995	<p>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</p> <p>Status: Testified in Product Liability/Personal Injury case;</p>
1994	<p>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</p> <p>Status: Testified in Product Liability case;</p>