

Scott O. Ganaja, P.E.
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Curriculum Vitae

Mechanical Engineering Consultant

Scott Ganaja provides new product development engineering support for businesses, including mechanical design engineering, manufacturing engineering and prototyping. He specializes in the design and manufacture of medical equipment, exercise equipment, bicycles and consumer products.

Mr. Ganaja also has considerable experience as a forensic engineer and expert witness in litigation matters that involve product design, manufacturing, and patents.

Professional Experience

Mechanical Engineer, President

PROgressiv Engineering, Inc., San Luis Obispo, CA

1989-present

- Mechanical Design Engineering: Design complex mechanisms, components and systems. Determine the most appropriate materials and processes for making products. Conduct design reviews and improve product performance.
- Designed several hundred metal parts and more than 1,200 plastic parts that were manufactured using injection-molding, machining, stamping, forming, welding and many other processes.
- Computer-Aided Design/Engineering (CAD/CAE): Generate computer solid models, 2D engineering drawings and renderings. Perform computer-assisted finite-element stress analysis (FEA), motion simulation and reverse engineering.
- Manufacturing Engineering: Perform manufacturing cost analysis, tool and mold design. Assist with quality control and production troubleshooting. Work with domestic and off-shore manufacturers.
- Thermal and Optical Engineering: Design miniature cooling systems for electronics. Design custom optics and color-sensing systems.
- Prototyping: Construct high-quality engineering prototypes for pre-production validation and evaluation. Create physical visual models for demonstration.
- Forensic Engineering: Perform failure analysis, product design and manufacturing analysis, patent analysis, and provide expert witness testimony for litigated matters.

Manufacturing Engineer

Swedlow Incorporated, Composites Division, Garden Grove, CA

1987-1989

Directed manufacturing processes for rocket and aircraft components that were constructed using advanced composites including carbon fiber, Kevlar and fiberglass. Produced parts using prepreg and wet layup techniques, compression molding, machining and bonding processes. Closely involved with estimating, tooling and mold design, as well as with quality control.

Forensic Engineering / Expert Witness

- Bicycles & E-bikes (120+ cases)
- Exercise/Fitness equipment
- Mobility devices
- Electric commuter scooters
- Medical equipment
- Consumer products
- Carbon fiber products
- Plastic products

Product Liability – Analysis of the design and manufacture of products. Address questions of proper use, maintenance, repair, assembly, industry standards, warnings, testing and material selection. Perform physical and computer-based failure analysis, reverse engineering, and accident reconstruction.

Intellectual Property – Analysis of mechanical devices for patent infringement. Analysis of patents for validity. Experience with inter partes reviews. Address questions related to trade secrets, copying, reverse engineering and design-arounds.

Manufacturing Disputes – Address questions relating to manufacturing customs and practices, and quality control involving domestic and off-shore manufacturing.

Ability to explain technical concepts to laypeople using non-technical language, informational graphics, annotated photographs, 3D computer models and physical demonstrative exhibits where appropriate.

Retained as an engineering expert witness in more than 260 cases in more than 25 states. Approximately 65% of these cases were for the plaintiff and 35% for the defense.

State and Federal Court trial experience. Deposed more than 55 times.

Education

Bachelor of Science, Mechanical Engineering 1986
California Polytechnic State University, San Luis Obispo, California (Cal Poly)
Focus: Design, manufacturing processes, and composites/carbon fiber.

Licenses and Registration

Professional Mechanical Engineer, California, Registration No. M27275

Professional Manufacturing Engineer, California, Registration No. MF4807

Professional Engineer, Texas, License No. 130177

Professional Engineer, Florida, License No. 84842

Professional Engineer, Illinois, License No. 062.070387

Professional Mechanical Engineer, Washington, Registration No. 55989

Professional Affiliations

American Society of Mechanical Engineers (ASME), member

Society of Manufacturing Engineers (SME), senior member

Society of Plastics Engineers (SPE), senior member

ASTM International (standards organization), voting member
F08.10 Bicycles subcommittee
F08.30 Fitness Products subcommittee

Certifications and Training

Certified SolidWorks Associate, Dassault Systèmes. Also worked more than 8,000 professional hours using SolidWorks 3D computer-aided design (CAD) and analysis software.

Certified Bicycle Mechanic, United Bicycle Institute. Also spent thousands of nonprofessional hours repairing, assembling and maintaining bicycles.

“Pedestrian / Bicycle Crash Investigation”, Institute of Police Technology and Management (IPTM). 40 hour training course.

“Professional Repair and Shop Operation”, United Bicycle Institute. 80 hour training course.

Certified “E-Bike” Technician, Light Electric Vehicle Association (LEVA). 2-Day training course and certification exam for E-Bikes, E-Scooters, mobility scooters and similar light electric vehicles.

“AutoCAD and Mechanical Desktop”, Autodesk. 48 hour training course.

Continuing Education in the fields of mechanical engineering, engineering design, failure analysis and manufacturing on at least a yearly basis.

Product Development Engineering Examples

Medical and Dental Devices:

Cell-Freezing Devices – Consulted on the design of cryopreservation devices used to precisely control the freezing and thawing rates of IVF and stem cells.

Dental Laser – Consulted on the design of a hand-held laser used for gingival modification and similar soft-tissue dental surgery.

DVT / Cold Therapy Device – Consulted on the design of a portable, electro-mechanical device used to reduce the occurrence of deep vein thrombosis as well as for reducing pain and swelling after orthopedic surgery.

Product Development Engineering Examples (continued)

Obstetrical Chair – Co-designed an electro-mechanical chair that raised the patient and rotated her rearward allowing for various birthing positions.

LED Light-Curing Device – Co-engineered a hand-held device that uses high-intensity blue light to rapidly cure dental composites like fillings. Engineered custom optics and a compact cooling system for the high-powered LEDs.

Positioning Arm – Engineered an articulating arm that allows manual multi-axis positioning of a hand-held dental device.

Oral Cancer Screening Device – Co-engineered a hand-held device that utilized engineered optics and autofluorescence to aid in oral cancer screening.

Special-Purpose Eye Drop Dispenser – Co-designed and prototyped a device that administers a precisely metered dose of ophthalmic solution horizontally onto the user's eye.

Blood Testing Device – Consulted on the design of a portable hematocrit testing device that utilizes a novel ultrasonic transducer (transmitter/receiver).

Breast Pump – Consulted on the design of a low-cost, user-friendly breast pump.

Conformal Wheelchair Seat – Designed and prototyped a support structure for wheelchair seats that utilized an array of pivoting, mechanical elements to conform to the user's body.

Wearable Hand Sanitizer – Co-designed a compact hand sanitizer dispenser for health care professionals that can be clipped onto garments or attached to a lanyard.

Bicycle-Related Products:

Trailing Arm for a Suspension Mountain Bicycle – Consulted on the design of a rear swing arm using advanced composites.

Mountain Bicycle Seatpost – Designed a lightweight, welded 7005 aluminum seatpost.

Bicycle Saddle Positioning Device – Designed a slider mechanism that allows for saddle adjustments while in motion.

Carbon Fiber Bicycle Crank Arms – Engineered light and stiff crank arms designed for light weight and stiffness as well as for manufacturability.

Cargo E-Bikes – Consulted on the design of safety-related components on electric, cargo bicycles.

Electric Kick-Type Scooters – Consulted on the design of the braking system and the steering system on electric commuter scooters.

Product Development Engineering Examples (continued)

Bicycle Cargo Trailer – Engineered components for a rugged, bicycle-towed, single-wheeled cargo trailer.

Child-Carrying Bicycle Trailer – Engineered components for a bicycle-towed, child-carrying trailer.

Pivoting Bicycle Trainer – Consulted on a bicycle trainer that pivots laterally allowing the rider to lean the bicycle to simulate unseated (out-of-the-saddle) pedaling.

Exercise Equipment:

Underwater Treadmill – Consulted on the design of an institutional, underwater treadmill that is used in swimming pools for post-surgical rehabilitation as well as for training.

Elliptical Machine – Consulted on the design of a walking-type exercise machine in which the user's feet follow an elliptical path rather than a linear or circular path.

Hiker/Treadmill – Consulted on the design of an institutional treadmill in which the incline of the deck can be changed up to 25 degrees to simulate hiking as well as traditional walking and jogging.

Strength Trainer – Consulted on the design of an institutional strength-training unit that includes weight stacks, cables, and adjustable pulley positions.

Adjustable Hand Weights – Co-designed and prototyped hand weights that are adjustable from five to forty pounds through a button in the handle.

Integrated Spurs – Engineered and prototyped a spur system that is integrated into equestrian riding boots. This system eliminates traditional spur straps and provide better control for the rider.

Ball Throwing Training Aid – Engineered a portable electronic device that is worn on the arm that indicates when a baseball is thrown incorrectly.

Abdominal Exerciser – Co-designed and prototyped a contoured bar that uses elastic bands to provide resistance to torso twisting.

Consumer Products:

Massage Chair – Engineered and prototyped a shiatsu-type, reclining, massage chair that utilizes an internal mechanism that rolls up and down the user's back with the option of also massaging in circles.

Ballhead for Photography – Co-engineered a professional-quality ballhead for use on tripods that allows photographers to precisely position and pan cameras.

Product Development Engineering Examples (continued)

Hole Digging Attachment – Co-engineered an attachment for string trimmers used to dig holes for planting. Used with gas-powered devices, capable of 12,000 RPM.

Weather-Tight Pet Doors – Engineered a line of premium, double-walled, energy-efficient pet doors.

Low Tire-Pressure Indicator – Designed and prototyped a tire valve cap that provides a visual indication that the air pressure in a tire is low.

Marine Stereo Cover – Engineered a water and weather resistant accessory that allows a conventional car radio/CD player to be installed into a boat or similar environment.

Manufacturing Engineering

Involved in the production start-up of more than 80 new products.

Vendor qualification – Performed in-person assessments of the capabilities of dozens of manufacturing facilities in the United States, China, Taiwan and South Korea.

Design For Manufacturability (DFM) reviews – Reviewed product designs, manufacturing processes and mold designs, helping to ensure that parts would be manufactured consistently and cost-effectively.

Technical Presentations

“Using Failure Analysis Techniques To Improve Production of Composite Parts”, Presentation, SAMPE Europe Conference, organized by the Society for the Advancement of Materials and Process Engineering, Stuttgart, Germany, 2017.

“Carbon Fiber Bicycle Failure Analysis: Destructive Examination Techniques”, Presentation, Cyclitech International Conference on Bicycle Technology, organized by the Society of Plastics Engineers and JEC Group, Brussels, Belgium, 2015.

“Carbon Fiber Bicycle Failures”, Guest lecture, California Polytechnic State University, San Luis Obispo, Mechanical Engineering Department, 2014, 2016.

“Plastic Part Design”, Guest lecture, California Polytechnic State University, San Luis Obispo, Mechanical Engineering Department, 2002, 2006, 2012.

“Design for Metal Stamping”, Guest lecture, California Polytechnic State University, San Luis Obispo, Mechanical Engineering Department, 2011.

“Part Design for Machining”, Guest lecture, California Polytechnic State University, San Luis Obispo, Mechanical Engineering Department, 2003, 2004, 2010.

“Plastic Part Design for Injection Molding”, Presentation, ICON Health and Fitness, Inc., R&D group, 1999.

Patents

Named as an inventor in 20 United States patents:

- 10,295,268 “Phase Change Thermal-Sink Apparatus”, May 21, 2019.
- 10,215,673 “Ventillation Assisted Passive Cell Freezing Device”, Feb 26, 2019.
- 9,566,187 “Cold Therapy Systems and Methods”, Feb 14, 2017.
- 9,534,992 “Ventilation Assisted Passive Cell Freezing Device”, Jan 3, 2017.
- 9,114,055 “Deep Vein Thrombosis and Thermal/Compression Therapy Systems, Apparatuses and Methods”, Aug 25, 2015.
- 7,814,956 “Pet Door”, Oct 19, 2010.
- 7,410,283 “Dental Light Guide”, Aug 12, 2008.
- 6,733,290 “Dental Illumination Device”, May 11, 2004.
- 6,610,036 “Eye Drop Dispensing System”, Aug 26, 2003.
- 6,162,234 “Adjustable Button Cinch Anchor Orthopedic Fastener”, Dec 19, 2000.
- 6,126,677 “Suture Fastener and Instrument”, Oct 3, 2000.
- 6,125,574 “Fishing Line Fastener”, Oct 3, 2000.
- 6,116,573 “Packing System for Valves”, Sep 12, 2000.
- 5,964,388 “Coin Roll Wrapper Cutter”, Oct 12, 1999.
- 5,806,959 “Illuminated Skate Roller”, Sep 15, 1998.
- 5,664,830 “Child Safety Seat Assembly”, Sep 9, 1997.
- 5,582,127 “Rescue Device and Method”, Dec 10, 1996.
- 5,480,076 “Clothes Hanger with Retractable Arms”, Jan 2, 1996.
- 5,174,576 “Portable Golf Practice Mirror”, Dec 29, 1992.
- 5,149,034 “Saddle Positioning Device for Bicycles”, Sep 22, 1992.

Named as an inventor in eight international patents:

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|--------------------------|---------------------------|
| DK 2710347, Nov 30, 2020 | DK 2689200, May 22, 2018 |
| EP 2710347, Aug 26, 2020 | EP 2689200, Mar 14, 2018 |
| CA 2866698, Apr 28, 2020 | DE 69719915, Apr 24, 2003 |
| EP 2825140, Jul 18, 2018 | EP 0842811, Mar 19, 2003 |

Other patents pending.

Personal

Born in Los Angeles, California.

Mountain Bike Unit, volunteer - Patrolled multi-use trails for the National Parks Service and California State Parks, 1989-1994.

Mountain Bike Racing - National Off-Road Bicyclists Association (NORBA), 1989-1996.

International Mountain Bicycling Association (IMBA), member, 1989-present.

Motorcycle license, California class M1, 1977-present.

Altered the wheelbase of an early-model Ford Mustang.

First Aid and CPR Certified - American Red Cross, regularly since 1982.

Adaptive Ski Instructor, volunteer - Taught individuals with developmental disabilities or spinal cord injuries to ski using adaptive equipment. California Handicapped Skiers, 1990-1994.