

Scott O. Ganaja, P.E.
sganaja@pro-gressiv.com

Curriculum Vitae

Mechanical Design Engineering Consultant

Scott Ganaja is an experienced, licensed, professional mechanical engineer that provides new product development engineering support for his clients. His services include mechanical product design, manufacturing engineering and prototyping. He specializes in the design and manufacture of bicycles, exercise equipment, medical equipment, and consumer products.

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

Professional Experience

Mechanical Engineer, President

PROgressiv Engineering, Inc., San Luis Obispo, CA

1989-present

- Mechanical Design Engineering: Design complex mechanisms, components, and mechanical systems. Determine the most appropriate materials and processes for manufacturing new products. Conduct design reviews, and make recommendations to improve product performance and safety.
- Designed more than 800 metal parts, and more than 1,200 structural/mechanical plastic or composite parts that were produced using injection-molding, machining, stamping, forming, welding and many other manufacturing 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.
- Prototyping: Construct high-quality engineering prototypes for pre-production validation and evaluation. Create physical and virtual models for demonstration.
- Forensic Engineering: Perform failure analysis, product design and manufacturing analysis, testing, patent analysis, reverse engineering, and provide expert witness testimony for litigated matters.

Manufacturing Engineer

Swedlow Incorporated, Composites Division, Garden Grove, CA

1987-1989

Directed manufacturing processes for aircraft and rocket components that were produced using advanced composites including carbon fiber, Kevlar and fiberglass.

Manufactured parts using prepreg, wet layup and compression molding techniques, as well as machining and bonding processes. Closely involved with estimating, tool and mold design, and with quality control/assurance.

Forensic Engineering / Expert Witness

- Bicycles & e-bikes (150+ cases)
- Exercise/fitness equipment
- Electric stand-up scooters
- Medical equipment
- Mobility aids
- Carbon fiber parts
- Structural plastic parts
- Complex mechanisms

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

Intellectual Property – Analysis of mechanical devices for patent infringement. Analysis of patents for validity. Address questions relating to trade secrets, copying, reverse engineering and design-arounds. More than 40 IP cases.

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

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

Retained as an engineering expert in more than 300 cases in more than 30 states. Approximately 70% of these cases were for plaintiffs and 30% for the defense.

State and Federal Court trial experience. Deposed more than 65 times.

Education

Bachelor of Science, Mechanical Engineering 1986
California Polytechnic State University, San Luis Obispo (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 Mechanical Engineer, Washington, Registration No. 55989

Professional Engineer, Illinois, License No. 062.070387

Professional Affiliations

American Society of Mechanical Engineers, member
Society of Manufacturing Engineers, senior member
ASTM International (standards organization), voting member
 F08.10 Bicycles subcommittee
 F08.30 Fitness Products subcommittee
Society of Plastics Engineers, senior member

Certifications and Training

Certified SolidWorks Associate, Dassault Systèmes. Also worked more than 8,000 professional hours designing products 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, Ashland, OR. 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

Bicycle-Related Products:

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

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

Electric Commuter Scooters – Consulted on the design, manufacture and specification of bicycle-type mechanical disc brakes and steering systems on electric, kick-type, stand-up scooters.

Carbon Fiber Bicycle Crank Arms – Designed light and stiff crank arms that were engineered for high performance as well as for manufacturability.

Product Development Engineering Examples (continued)

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

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.

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

Pivoting Bicycle Trainer – Consulted on the design of a stationary, indoor bicycle trainer that pivots laterally which closely simulates 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 commercial walking-type exercise machine in which the user's feet follow an elliptical path.

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

Strength Trainer – Consulted on the design of a commercial strength-training machine 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.

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

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 of the horse.

Medical and Dental Devices:

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.

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

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 – Designed and 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 over-driven, high-powered LED.

Positioning Arm – Designed and engineered an articulating arm that allows for manual, multi-axis positioning of a hand-held dental device.

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

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

Special-Purpose Eye Drop Dispenser – Co-designed and prototyped a device that administers a single drop 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 custom-engineered ultrasonic transducer.

Conformal Wheelchair Seat – Designed and prototyped a support structure for wheelchair seats that utilized an array of pivoting, mechanical elements that 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.

Consumer Products:

Massage Chair – Designed, engineered and prototyped a shiatsu-type, reclining, massage chair that utilizes an internal mechanism that rolls up and down the user's back while massaging in circles.

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

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

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

Manufacturing Engineering

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

Vendor qualification – Performed on-site evaluations of the capabilities of dozens of contract manufacturing facilities in the United States, China, Taiwan and South Korea.

Manufacturing Tools and Fixtures – Designed machining, drilling, punching, sawing, assembly and bonding fixtures, and inspection gages to improve quality, throughput, and safety on production lines.

Design For Manufacturability (DFM) reviews – Reviewed product designs, manufacturing processes and mold designs, helping clients to ensure that parts would be manufactured properly, 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

21 United States Patents:

12,508,177 “Transport Apparatus for a Person and Method”, Dec 30, 2025

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.

Eight International Patents:

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 are pending.

Personal

Born in Los Angeles, California, in 1961.

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 a 1967 Ford Mustang.

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

Adaptive Ski Instructor, volunteer – Taught skiing to individuals with developmental disabilities or spinal cord injuries. California Handicapped Skiers, 1990-1994.