



Unified
Investigations & Sciences, Inc.



Arizona Service Center

Mark R. Cannon, P.E.

Mechanical Engineer

Phoenix, Arizona
(602) 305-7000

EDUCATION:

Bachelor of Science in Mechanical Engineering
Arizona State University, 1979

ACADEMIC HONORS:

Pi Tau Sigma – International Mechanical Engineering Honor Society
Tau Beta Pi – Engineering Honor Society

PATENTS:

Energy-Absorbing Leg Assembly for Aircraft Passenger Seats
United States Patent 04911381

OVERVIEW:

Mark Cannon investigates a wide variety of mechanical and safety issues, including workplace injuries involving machinery, machinery failures, consumer product failures, and automotive accident reconstruction. He has over ten years experience as a forensic engineer. Mr. Cannon holds a Bachelor of Science Degree in Engineering. Prior to becoming a forensic engineer, Mr. Cannon worked as an engineer in the areas of research, design and manufacturing. Mr. Cannon has testified at trial in multiple state and federal venues.

EMPLOYMENT:

UNIFIED INVESTIGATIONS & SCIENCES, INC., 2006 to Present
Senior Engineer - Cause and effect analyses related to consumer and industrial accidents involving machine guarding, equipment operation, structural design, failure mechanisms, and defective conditions. Motor vehicle accident investigation and reconstruction.

ARCCA, INC., 1996 to 2006
Senior Engineer - Cause and effect analyses related to consumer and industrial accidents involving machine guarding, equipment operation, structural design, failure mechanisms, and defective conditions. Motor vehicle accident investigation and reconstruction.

INTESYS TECHNOLOGIES, 1995 to 1996
Senior Manufacturing Engineer - Provided engineering support for high-speed automated assembly and injection molding company. Developed new hospital, surgical and automotive products by evaluating and implementing assembly procedures, designing assembly tooling, training operators, and developing quality control test devices. Investigated failures of high-speed equipment related to machine design and operator use, and provided sustaining engineering for PLC-controlled manufacturing lines.

- Developed process to ultrasonically weld and pressure-test surgical pack for Alcon Laboratories.
- Designed assembly tooling and UV silicone curing fixture for automatic transmission controller for Delphi Packard Electric.
- Reversed-engineered components of high-speed blade inserter and developed technician training package to facilitate repairs and reduce downtime.
- Developed tooling fixtures to manufacture electronic module for Saturn automobile.

AQUAPORE MOISTURE SYSTEMS 1993 to 1995
Engineering and Maintenance Manager - Designed and installed customized processing equipment at a high-volume lawn and garden products manufacturing company. Wrote instructions and trained operators. Created and implemented quality control procedures. Responsible for budgeting and scheduling, and task assignments of mechanics and engineers.

- Designed and developed laser hole-drilling machine, manual hose coiler, web cutter and quality assurance test equipment to manufacture extruded sprinkler hose.

EMPLOYMENT (CON'T):

- Installed and proved-in sprinkler hose manufacturing equipment, developed manufacturing procedures and trained technicians and operators.
- Specified and supervised construction of production facility to house new manufacturing equipment.
- Surveyed and selected injection molding houses to fabricate plastic components.
- Procured and supervised installation, start-up and training for manufacturing facility of Gardena© products which included sonic and spin welders, spring coiler and pad printers.
- Developed optical comparator to facilitate quality control of extrusions.

CHAMBERLAIN GROUP, March to July 1993

Consultant - Performed forensic analyses of manufacturing problems and designed test equipment.

- Performed evaluation of specifications, manufacturing, assembly and quality assurance processes within factory to eliminate garage door opener failures.
- Designed and fabricated equipment to test garage door opener transmitters in environmental chamber.
- Design and fabricated equipment to measure stall torque on electric motors.

ORBITAL SCIENCES CORPORATION 1988 to 1993

Senior Mechanical Engineer - Responsible for the mechanical design and installation of a classified antenna system that tracked military satellites. Designed platforms and structures for antenna installation. Designed and fabricated mobile ground support equipment used to launch meteorological rockets. Designed and tested rocket sections for aerodynamic stresses. Provided engineering support for high-volume manufacturing facility.

- Provided structural analysis support for design of Pegasus launch vehicle.
- Developed and performed test procedures for evaluating aerodynamic loads on rocket sections and explosive release testing of deployable nose sections for Ballistic Missile Office projects.

EMPLOYMENT (CON'T):

- Developed 10-ft and 17-ft parabolic antenna system to track and receive data from polar-orbiting and geosynchronous satellites for Department of Defense.
- Installed antenna systems at facilities in Chandler, Austin, and Denver. Created assembly procedures and trained Air Force personnel.
- Designed mobile launch van for meteorological sounding rockets for Spaceport Florida Authority. Transported equipment to Mexico and launched during solar eclipse.
- Developed production facility for water-activated batteries. Performed start up of equipment including pill press, inking machine, dust collector and assembly jigs. Wrote procedures and trained operators.
- Provided manufacturing support for manufacturing and assembly of meteorological radiosondes and vacuum-thermoformed Mylar balloons.

SIMULA INC., 1982 to 1988

Project Engineer - Designed, developed, and tested safer seats for aircraft and helicopters. Worked with the Federal Aviation Administration, NASA and the Jet Propulsion Laboratory on a full-scale crash test of a Boeing 707, which used fully instrumented anthropomorphic dummies in prototype crashworthy seats. Member of Seat Ad Hoc Committee who participated in the development of dynamic testing requirements for transport seats. Worked with major airline seat supplier to design and manufacture commercial transport seat to pass new 16G test requirements. Investigated seat performance and injury mechanisms in commercial airline accidents, which resulted in justification to mandate stronger, safer seats in commercial and commuter aircraft.

- Responsible for seat experiments aboard four-engine commercial aircraft crash-tested at Edwards Air Force Base. Performed structural analyses, design and qualification tests on prototype seats. Liaison to FAA, NASA and JPL for installation, instrumentation, and documentation of seats and test dummies. Analyzed posttest instrumentation and photographic data. Presented analysis results to FAA and NASA.
- Member of team comprised of FAA, U.S. Army and NTSB personnel that analyzed passenger injury and seat performance in commercial airline crashes and reported results to FAA, resulting in promulgation of stronger passenger seats

EMPLOYMENT (CON'T):

- Member of industry committee that developed dynamic testing requirements for transport seats.
- Headed joint effort with SICMA Aero Seat to develop and market energy-absorbing commercial airline seat. Performed structural design and dynamic qualification tests. Presented technical performance data to engineers at Boeing Aircraft Co., McDonnell Douglas and FAA.
- Designed and fabricated prototype sling kit for aerial lifting downed U.S. Army helicopters. Successfully passed flight tests.
- Developed and fabricated graphite-composite pilot and passenger seats for Messerschmitt-Boelkow-Blohm BO 108 helicopter.

AMERICAN TELEPHONE AND TELEGRAPH 1979 to 1982

Product and Development Engineer - Responsible for the design, installation, prove-in, and operator training of equipment used in the cable jacketing process. Equipment included plastic conveying systems, winders, presses and turntables. Investigated field failures of cable seals and performed in-plant studies and trained operators to reduce defects. Worked with Bell Laboratories in performing evaluations of prototype fiber-optic sheathing materials.

SPECIALIZED TRAINING:

LL.M. in Trial Advocacy, Volunteer Expert - Temple University, 2004

Motor Vehicle Accident Reconstruction - Society of Automotive Engineers, 2001

Statistical Process Control in Extrusion - Society of Plastics Engineers, 1994

Computer Aided Design on Anvil 5000 System - Simula, Incorporated, 1986

Crash Survival Investigators School - Robertson Research, Incorporated, 1984

Array Processing Language - I.P. Sharpe Associates, 1985

Statistics in Manufacturing - American Telephone & Telegraph, 1982

Microprocessors in Controls Applications - American Telephone & Telegraph, 1980

Rheology of Plastics and Extrusion Principles - American Telephone & Telegraph, 1979

PUBLICATIONS AND PRESENTATIONS:

Assessment of Timely Lockup of Web-Sensing Restraint Retractors, SAE Technical Paper 2002-01-1548, presented at Society of Automotive Engineers' General Aviation Technology Conference and Exhibition, Wichita, Kansas, April 2002

Occupant Crash Protection Handbook for Tactical Ground Vehicles (Light, Medium & Heavy), Department of the Army, November 2000

Discussion of Transport Passenger Seat Performance Characteristics, SAE Technical Paper 881378, presented at Society of Automotive Engineers' Aerotech 1988 Conference, Anaheim, CA, October 1988

The Unit Maintenance Aircraft Recovery Kit, USAAVSCOM TR-87-D20, US Army Aviation Applied Technology Directorate, Fort Eustis, VA, April 1988

Crash Dynamics Program Transport Seat Performance and Cost/Benefit Study, DOT/FAA/CT-85/36, Federal Aviation Administration Technical Center, Atlantic City Airport, NJ, December 1986

Seat Experiments Results - Full-Scale Transport Aircraft Controlled Impact Demonstration, DOT/FAA/CT-85/25, Federal Aviation Administration Technical Center, Atlantic City Airport, NJ, December 1985

Seat Experiments for the Full-Scale Transport Aircraft Controlled Impact Demonstration, DOT/FAA/CT-84/10, Federal Aviation Administration Technical Center, Atlantic City Airport, NJ, March 1985

Concepts for Improving Passenger Seats for Large Transport Aircraft, presented at the Sixteenth Seminar, International Society of Air Safety Investigators, Phoenix, AZ, September 1985

Improving the Survivability of Transport Aircraft Seating Systems, presented at the International Aircraft Cabin Safety Symposium, University of Southern California, Los Angeles, CA, February 1985

PROFESSIONAL ORGANIZATIONS:

Society of Automotive Engineers

LICENSES:

Licensed Professional Engineer, Commonwealth of Pennsylvania, No. PE057286E

Registered Professional Engineer in Mechanical Engineering, State of Arizona
No. 23282

FAMILIAR TECHNOLOGIES:

The items listed below have been involved in one or more of Mr. Cannon's forensic investigations. This list is not intended to be comprehensive.

Consumer Products

- rolling school gate
- home heating oil filter
- massage chair
- wood shaping table
- driver seat adjustment switch
- garage vehicle lift
- hand grinding wheel
- shower seat
- table saw guard
- garage door opener
- moving van ramp
- band saw guard
- amusement park ride restraint
- indoor folding bleachers
- water line failure
- orchard ladder
- library ladder
- spring-loaded window balance
- car battery puncture
- stadium seat
- treadmill

Vehicles

- vehicular impact reconstruction
- site line analysis
- vehicle/bicyclist impact
- driver identification
- pedestrian/vehicle impact
- go kart restraint system
- limousine design

Aircraft

- aircraft egress
- aircraft seats
- aircraft restraints
- aircraft engine hoist

Industrial Products

- conveyor belts
- assessment of freight damage during transport
- warehouse storage rack system
- guardrail
- industrial blower
- scissor lift guard
- electric pallet jack
- earth moving equipment
- three-car rollback carrier
- fall protection
- mobile building jack
- leather sammying machine
- steam modulator
- rough terrain forklift
- rolling mill laminating machine
- printing press
- blow molding machine
- pallet truck
- 3-roll calendaring machine
- hand grinding wheel
- paper mill pulp mixer guard
- concrete saw
- grain hauler trailer
- dock cargo sling
- pallet truck battery
- aircraft deicer
- automated paper debaler
- food steamer
- milk processing equipment
- road grinding/milling machine
- skid-steer loader guard
- skid-steer loader with brush clearing attachment
- rock drilling rig
- fire truck nozzle restraint

Industrial Products (continued)

- thermo-vacuum forming machine
- forklift maintenance
- paper baling machine
- well drilling rig
- printing press
- forklift restraint
- dual-mast forklift
- backhoe loader
- modular buildings