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Curriculum Vitae

DAVID G. SMITH, MSME, MBA, PE, CSP

MECHANICAL ENGINEERING EXPERT

David G. Smith is a Mechanical Engineer, a registered Professional Engineer and a Certified Safety Professional. As the Vice President of Alpine Engineering and Design, Inc. he specializes in new product development, product design, patents, mobile equipment, heavy equipment, structural analysis, designing to standards, safety, and expert witness work.

EDUCATION

- MBA, Brigham Young University, Emphasis in Product Development (2011)
- Masters of Science, Mechanical Engineering, Brigham Young University (2011)
 - Thesis: Off-axis Stiffness and Piezoresistive Sensing in Large-displacement Linear-motion MEMS
 - Areas of study: Compliant Mechanisms, Springs, Structural Analysis, MEMS, Stress and Deflection analysis, FEA, Machine Design, Product Development
- Bachelors of Science, Brigham Young University - Idaho, Mechanical Engineering
 - Cum Laude Graduate

REGISTRATIONS AND CERTIFICATIONS

- Professional Mechanical Engineer (PE), Utah license # 8645497-2202
- Certified Safety Professional in Comprehensive Practice (CSP), License # CSP-30707
- Certified Forklift Operator
- Certified Counterbalanced Forklift Operator Trainer
- Certified Rough Terrain Telehandler Operator Trainer
- Certified Aerial Boom Lift Operator Trainer
- Certified Aerial Work Platform (scissor lift) Operator Trainer
- Certified Mobile Crane and Rigging Inspector

PUBLICATIONS

- Off-axis Stiffness and Piezoresistive Sensing in Large-displacement Linear-motion MEMS
- Piezoresistive Encoders for Ratcheting Actuation Systems
- Design Optimization of a Linear-motion Large-displacement Micro Mechanism for High Off-axis Stiffness
- Metrics for Evaluation and Design of Large-displacement Linear-motion Compliant Mechanisms
- An Engineering Guide for Trailer Safety Chain Installation, Attachment and Use

EXPERT WITNESS

Mr. Smith has been retained as an expert on over 20 patent, product liability, and personal injury cases and has testified in a number of these. He has worked as a senior associate on an additional 45+ patent cases and an additional 75+ product liability/personal injury cases. Mr. Smith has attended SEAK expert witness training and has experience and competency in the following areas:

Patent Invalidity/Non-infringement
Patent Infringement/Validity
Prior Art Searching
Claim Construction

Product Liability
Personal Injury
Accident Reconstruction
Safety

PATENTS

During his time at Alpine Engineering and Design, Inc., Mr. Smith has become familiar with patent prosecution and patent litigation. He has written several provisional patent applications, and has worked with attorneys in writing the specifications, creating drawings and drafting claims for utility patents on products he has helped design. As part of the product development process, he has performed patent searches, both for information loading purposes and to lessen the likelihood that new developments would infringe other's intellectual property. Mr. Smith has two issued patents with multiple patents pending.

- 9,387,788 - Combination Trailer
- 9,616,799 - Pneumatic Tank Trailer

As an expert, Mr. Smith has also been involved in patent litigation in the areas of claim construction, finding prior art through patent searches and in other published material, infringement/non-invalidity analyses and non-infringement/invalidity analyses on over 45 cases. The following are a few of the categories of patent issues Mr. Smith has consulted on:

Semi Trailers
Mobile Equipment
Vehicle Mounted Equipment
Agricultural Equipment
Trailer Tarping Systems
Oil/Gas Drilling Equipment
Weight Machines
Athletic equipment

Plastic Components
Office Supplies
Food Processors
Blenders
Coffee and Tea makers
Camera Mounts
Hospital Equipment
Marching Band Equipment

Hinges
Seating
Hand Tools
Springs
Car seat gap fillers
Light Fixtures and Connectors
Baby bottle warmers
Cooler Latching Systems

DESIGN AND ANALYSIS PROJECTS

During his years as a consultant, Mr. Smith has been involved in hundreds of design and analysis projects. A sampling of projects broken down into some of the major areas of expertise are listed below.

Aerial Lifts

- 37 foot insulated aerial lift with material handling system
- 55 foot insulated aerial lift with material handling system
- 40 foot insulated aerial lift with material handling system
- Non-insulated boom outer boom failure analysis
- Boom Lift Tip Over Analysis
- Insulated Aerial Lift Turret Bolt Failure Analysis
- Aerial lift malfunction and operator electrocution analysis
- Aerial boom lift brake failure analysis
- Scissor lift tip-over analysis
- Analysis of scissor lift transportation failure
- Analysis of boom lift that pinned operator
- Digger Derrick bracket analysis
- Boom lift "basket drop" analysis
- Aerial lift bolt failure analysis
- Vertical mast lift gas spring failure analysis
- Insulated aerial lift boom ear failure analysis
- Scissor lift platform drop analysis
- Aerial lift bucket leveling system failure analysis
- Analysis of aircraft deicing machine failure

Refuse/Garbage Trucks

- Automated Front Loader Container Dumper Design
- Container Swing Restraint for rear load garbage truck design
- Automated side load garbage truck lift mechanism design
- Runaway rear loader garbage truck wiring and brake analysis
- Analysis of safety devices for the hopper (person riding on the back of a rear loading garbage truck)
- Rear loader guarding and pinch point analysis
- Rear loader dumpster swing analysis
- Side loading (automated) refuse truck accident analysis
- Roll-off truck hoist analysis
- Rear loader hopper guarding analysis

Trailers

- End dump trailer with pneumatic drop side
- Pneumatic trailer weight reduction design
- Pneumatic trailer aerodynamic analysis
- Analysis of weldless end dump subframe
- Travel mounting analysis for 250,000 lb heat exchanger
- Subframe analysis for quarter frame end dump trailer
- Livestock trailer hazard analysis
- Multiple cargo tank trailer and frame analyses
- Jeep dolly design
- Aluminum end dump trailer analysis
- Belly dump trailer analysis
- Side dump trailer frame analysis
- Analysis of trailer loading for trailer sway
- RV sway and wheel failure analysis
- End dump cylinder failure analysis
- Tanker trailer manhole cover failure analysis
- Trailer decoupling and safety chain failure analysis
- Frac water trailer crash analysis
- Trailer stair and handrail analysis
- RV trailer frame failure analysis
- End dump trailer design for weight reduction
- Trailer with hydraulically lifted doghouse section

Other Mobile Equipment

- Semi-truck entrance and egress analysis
- Design of dumping system for passenger trucks
- Hitch mounted picnic table and cargo rack
- Safety chain adjustment system for class 2- class 4 trailers
- Aluminum lift gate design
- Semi-truck towing device design
- Semi-trailer king pin mounting plate re-design for space
- Bike rack for truck bed design
- Concrete and asphalt material placer (conveyor system)
- Flip tarp system
- Roll-off tarping System
- Side roll tarping system
- Hand cart design
- Rear impact guard design and analysis
- Analysis, testing and certification of new liquid natural gas tank design
- Pintle hook mounting analysis
- Dock leveler safety analysis
- Cement mixer chute storage failure analysis
- Tow truck incident analysis

Forklifts and Telehandlers

- Forklift crash, switch and wiring analysis
- Forklift analysis for carrying granite slabs
- Telehandler accident analysis (operators head pinned)
- Forklift container tipping analysis
- Telehandler tip-over analysis
- Forklift wheel guarding analysis

Drilling, Oil and Gas

- Pipe rack trailer
- Pipe clamp for forklift
- Rig design for core drilling
- Drill rig pipe handling platform design
- Tong guarding analysis
- Pipe racking system hazard analysis
- Drill pipe unloading telehandler incident analysis

Cranes

- Crane operator electrocution analysis
- Crane tip-over analysis
- Crane boom failure and vertical auger analysis
- Crane headache ball failure analysis

Other Heavy Equipment

- Personnel hoist (construction elevator) analysis
- Concrete pumper valve failure analysis
- Fire truck auxiliary door design analysis
- Mini excavator tip over analysis and testing
- Fire hose and pump testing analysis
- Horizontal boring machine accident analysis
- Excavator grapple incident analysis
- Asphalt paver hopper failure analysis
- Rail car low-boy tipping analysis
- Horizontal earth boring machine tip-over analysis
- Roller press guarding analysis
- Crop sprayer transport and visibility hazard analysis

Scaffolding

- Analysis and certification of aircraft maintenance scaffolding
- Mobile scaffolding tip-over analysis
- Roof powered line suspension platform failure analysis
- Temporary guard rail and scaffolding system design

Specialty Projects

- Sound and vibration isolating Cross-Fit floor
- Analysis of zip line systems, cables, towers, braking systems, seats, etc.
- Light bulb changing device
- Folding picnic table
- Guarded scraper attachment for indoor brooms
- Cell phone water proofing automated kiosk
- Patient lifting and moving system for hospitals and homes
- Modular simulator classroom
- Coffee mug with built in creamer injector
- Single page manual printing press
- Hidden compartment smart safe
- Pressure smoker system
- Press for manufacture of composite wall sections
- Hydraulic pressure test bay hazard analysis
- Analysis of fixed floating ladder design
- Table bussing tub analysis
- Pushup handle and slider bar analysis
- Saw horse certification
- Pool cover extrusions analysis
- Folding chair tip-over analysis
- TV and audiovisual cart tip-over analysis
- TV wall mounting unit analysis
- Shower chair failure analysis
- Blender motor design of experiments and analysis
- Plastic tile advertising claim testing and analysis
- Jointer guarding and shop safety analysis
- Pneumatic pipe plug testing and analysis