

Mechanical Aid for Traction on Ice

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Background

Ice causes injuries due to slips and falls in the winter months. Maine Dept. of Labor estimates:

- Ice related falls are 6 times more common than ladders, buildings, and structures
- Ice accidents leads to 25,000 days of lost work time
- \$2.3 million costs each year to Maine state employees



Current ways to minimize slippage:

- Special footwear with built in traction - costly
- Additional Traction devices (e.g. Crampons) – messy and inconvenient to use



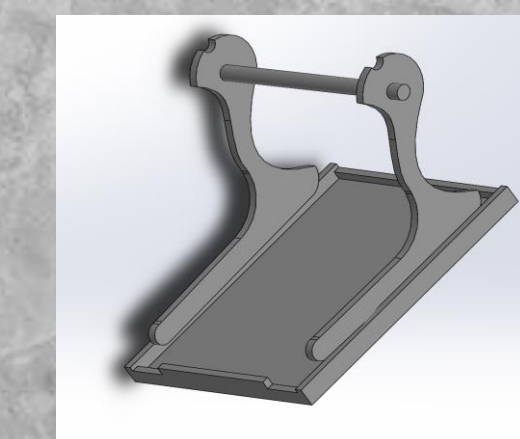
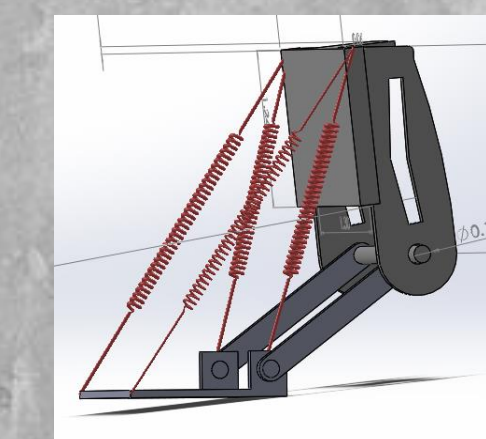
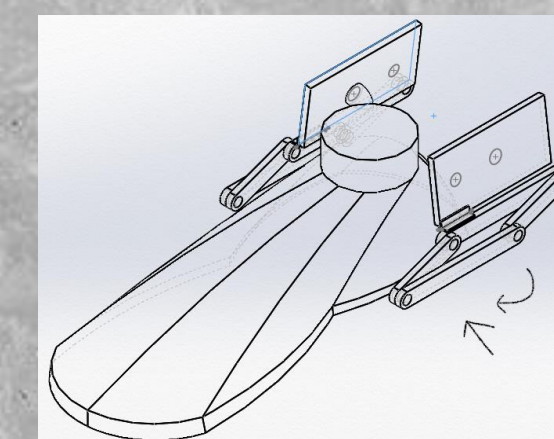
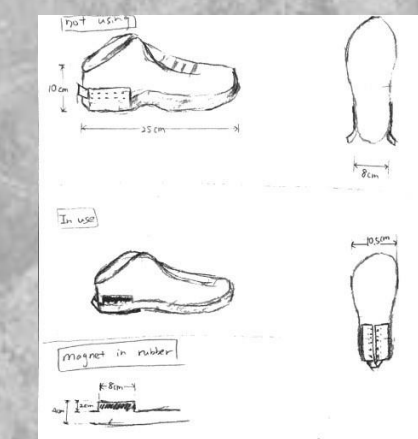
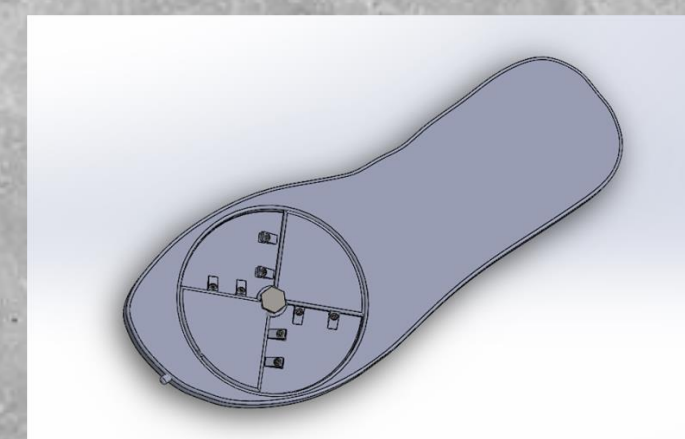
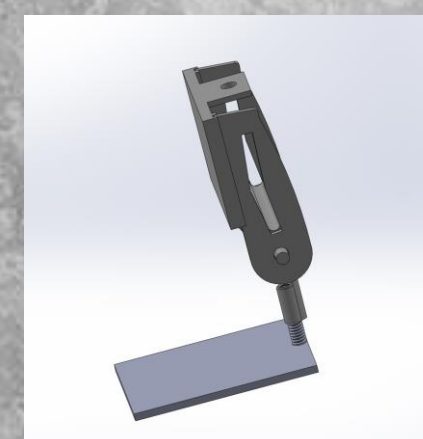
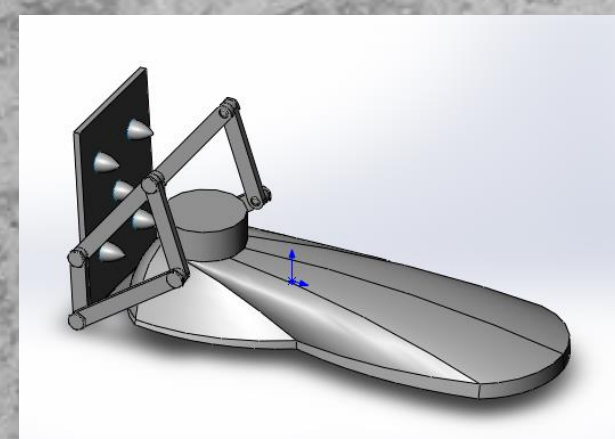
Goal

Design and prototype mechanical ice traction device that is secured to the footwear once and left on.

Requirements

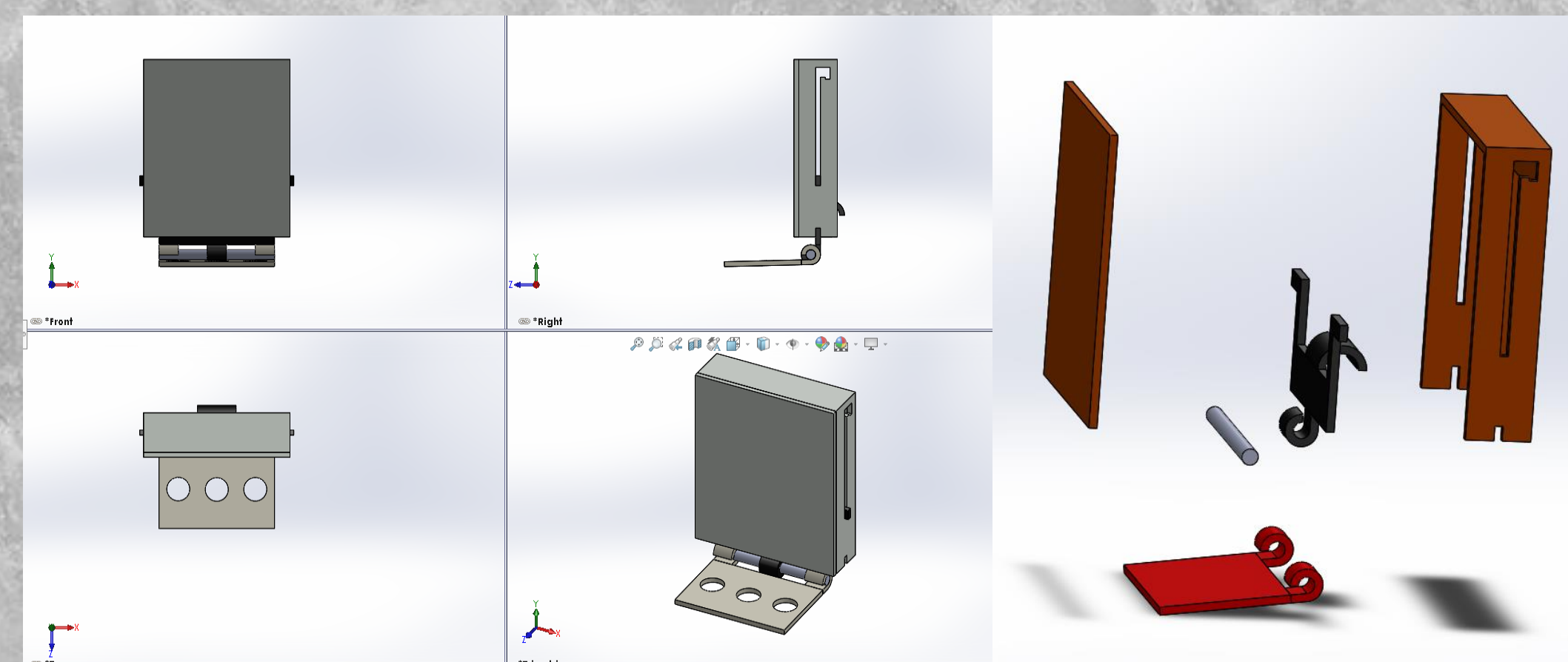
- The method providing the traction for the device needs to be easily engaged and disengaged
- When the traction device is disengaged it must not interfere with the performance of the shoe
- When the traction device is disengaged it must not damage the surface that the user walks on (e.g., hardwood floors)
- The traction device must not interfere with clothing (i.e., long pants)
- The target price is \$100
- Maximum weight of device is 1 lb
- The device must be able to fit all shoe sizes or have variations of small, medium, and large

Design Concepts

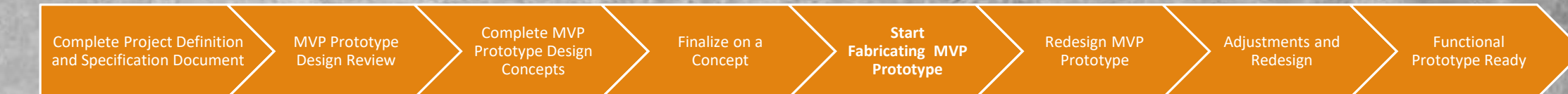


The finalized design is composed of four parts below, one torsion spring and two extension springs.

- Disengage mode: traction plate is inside the cover box while springs attach to it are in tension.
- Engage Mode: After extension and torsion springs are released by click on the button on two sides, traction plate slides down and turns 90 degree to the bottom of the footwear.

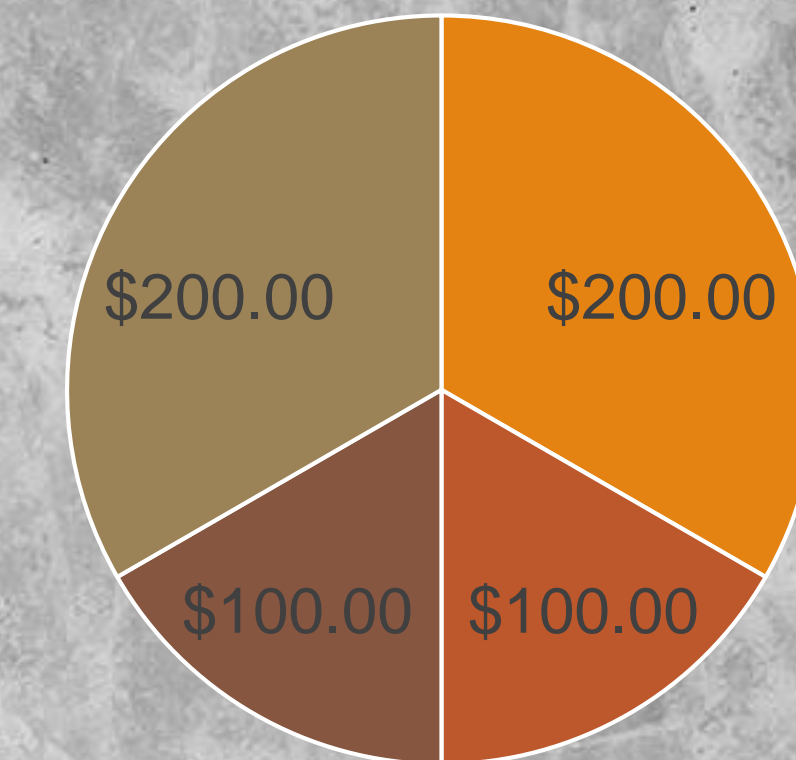


Timeline



Budget

- 3-D Printing
- Test Equipment
- Materials
- Miscellaneous



Total Cost for Project: \$600 | Available Funding from Student Fees: \$900

Next Steps

- Design traction device to shoe securing method
- Create manufacturing drawings and test procedures
- Manufacture and assemble all components
- Test and evaluate prototype
- Analyze and redesign

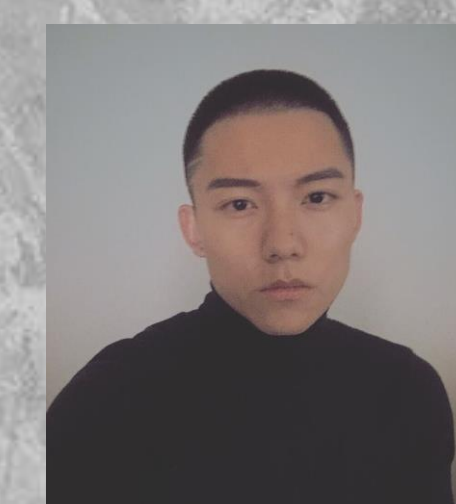
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