Portable Motorized Earth Auger for Tree Planting
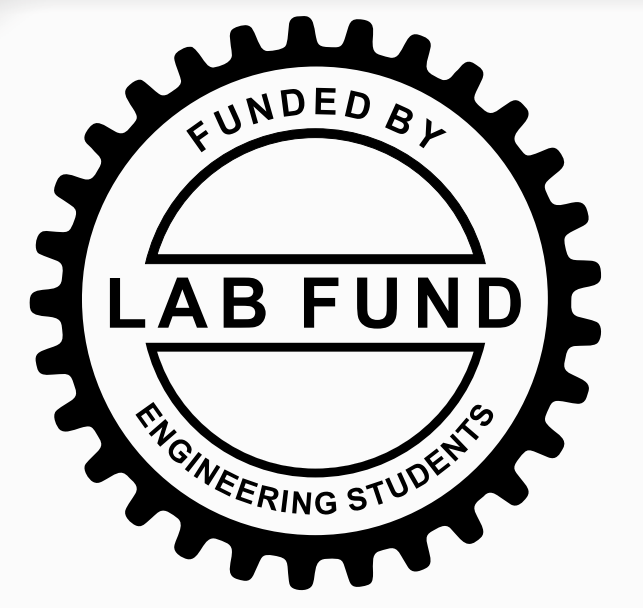
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Problem Statement

- Reforestation is the act of replanting an area with trees
- Often roots of pre-existing trees will slow down this process as it inhibits planters from being able to easily dig
- Proposed solution to this issue is to design a device that will be able to mechanically dig the holes while simultaneously mulching the roots and surrounding soil into a more ideal mixture for planting

Design Objectives

- Increase efficiency of planting trees in suboptimal conditions
- Increase overall safety of design in comparison to competitor products
- Reduce the amount of strain inflicted on operator / tree planter
- Have a design that is mobile and is able to be operated by one person

Design Solution

The following prototype has been designed to dig a 10" diameter hole, 8" deep into the ground. Unlike competitor products, the proposed design focuses on the safety of it's users as its robust frame provides the support required for the drill while digging. This will reduce the amount of stress inflicted onto the operator. The auger will also have a special drill bit at the tip of the auger that will allow the drill to mulch any roots that are preventing planting.
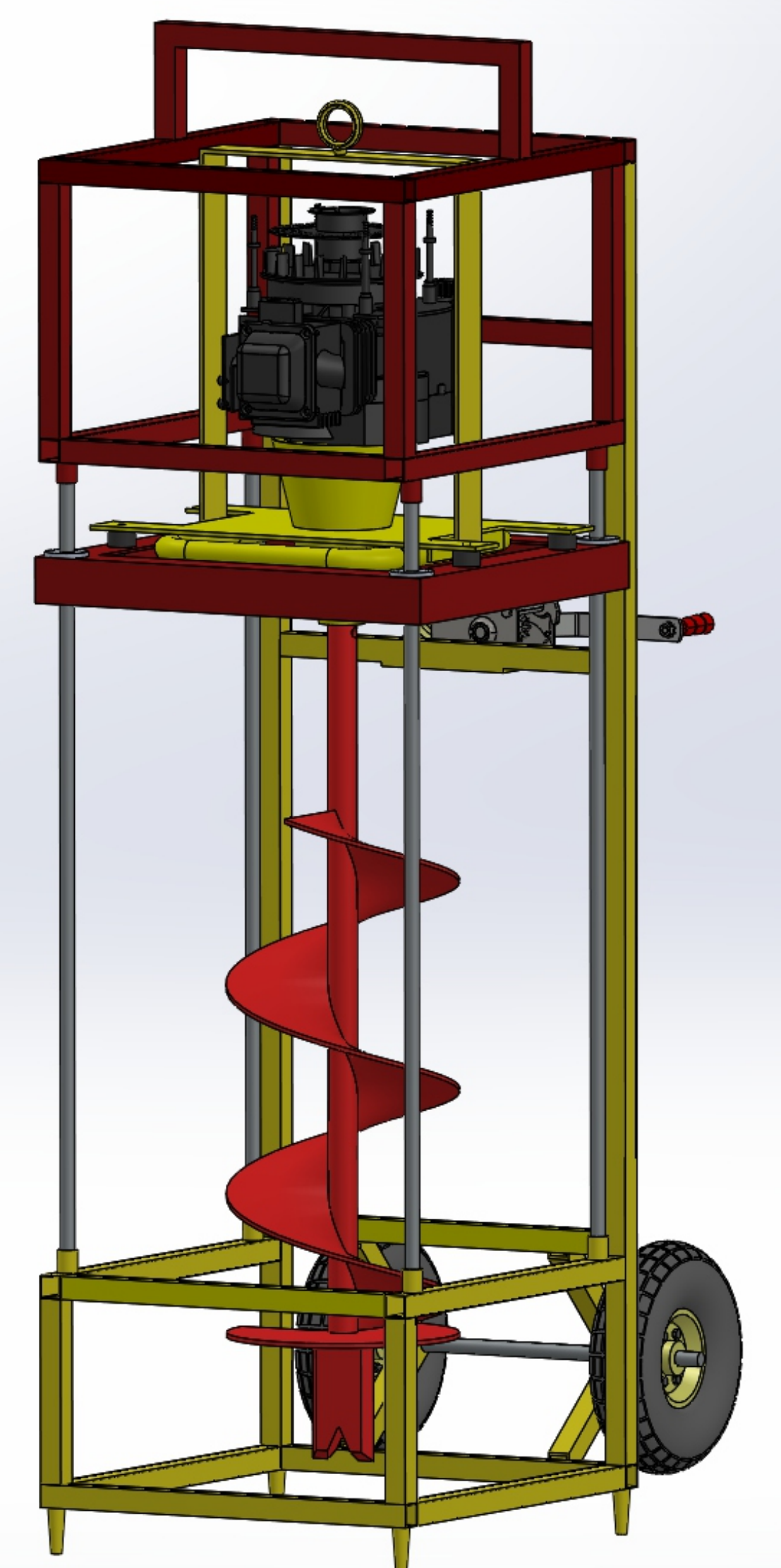
The Design Specifications
- 10" Diameter Earth Auger
- Mobile Frame
- 5/8" Diameter Support Bars
- 600 lbs Hand Winch

Engine Specifications
- 2.9 HP @ 3200 rpm
- 5.9 lb ft @ 3200 rpm

Output Specifications
- 2.9 HP @200 rpm
- 94.4 lb ft @200 rpm

Usage Scenario

The following prototype was designed for suboptimal planting conditions. These conditions mainly consist of areas where the surrounding soil is infested with roots of pre-existing trees. In this scenario, the proposed model will not only save time for the planters, but will also reduce the amount of stress inflicted on their body.

Conclusions

The prototype was successfully able to increase the efficiency of planting trees in non-ideal conditions. Due to the frame, the model can operate without any exterior support, thus reducing the amount of operators required for function in addition to a reduction of stress imposed on said operator.

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Mechanical

Environmental