

SYEN 2233. CAD Project Description
Spring 2015
Assigned: 3/30/2015, Due: 5/4/2015

Force amplification is a common necessity in mechanical engineering.

Loppers, which cut small tree branches, have a variety of designs. One method uses a simple lever. Other methods use a four-bar linkage, called a compound-action, double-pivot.

Create Solidworks assemblies for the three configurations shown in Figure 1 (lever), Figure 2 (compound action, double pivot old school), and Figure 3 (compound action, double pivot new and improved). Perform a force analysis using a "branch" of 1/8", 1/4", 1/2", 1". Using excel, plot the contact force between the lopper jaw and the "branch" versus each of the "branch" diameters.

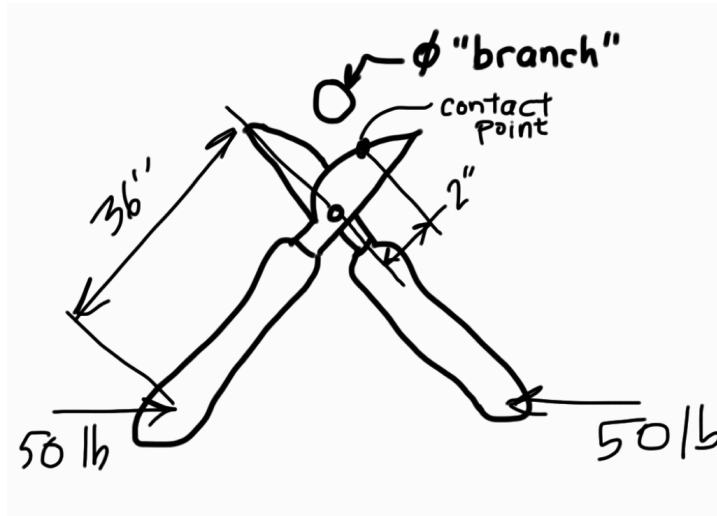


Figure 1. Simple Lever

Provide an assembly drawing for each of the loppers, using exploded views and part labels, to detail the model.

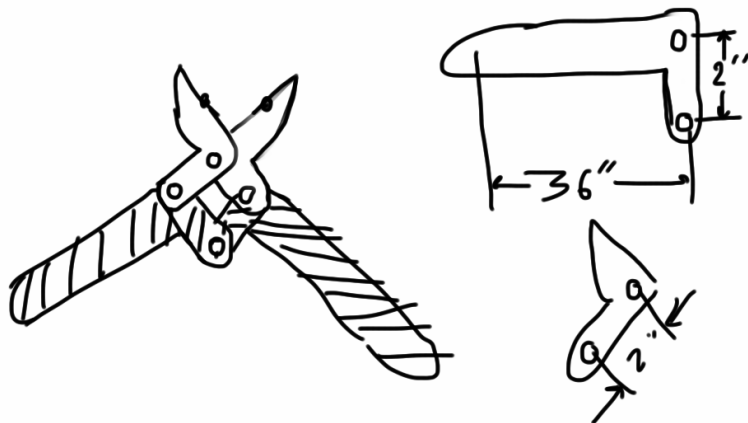


Figure 2. Compound Action, Double Pivot Old School

Provide a report, in PDF, that includes the figures detailed above in the following format:

Introduction

Lopper Designs (where your assembly drawing goes)

Force Analysis (where your force graph goes)

Conclusions (remark on the effectiveness of each of the designs)

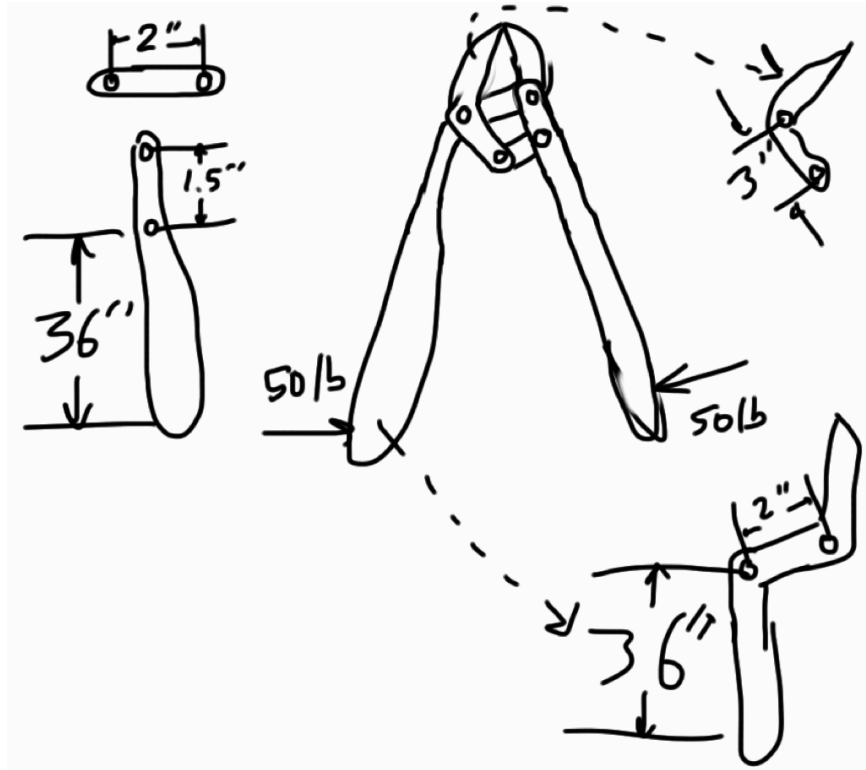


Figure 3. Compound Action, Double Pivot New and Improved