

Problem Statement:

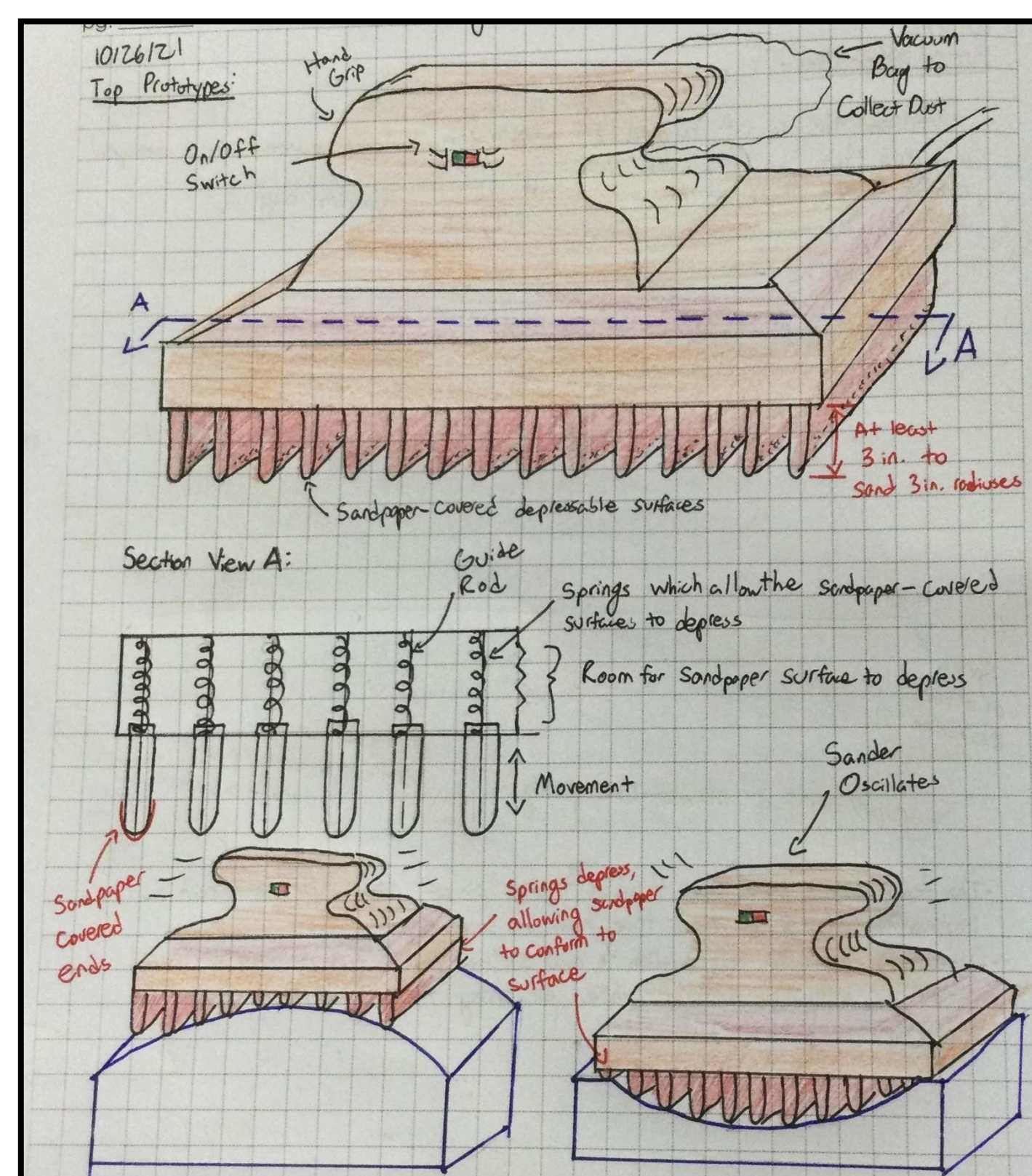
Design and construct an electrically powered sander capable of sanding tight-radius convex and concave surfaces. There is not an all-in-one, versatile power tool to sand circular surfaces of various radii. Current solutions, such as palm sanders and belt-sanders, are not equipped to sand tight-radius curves efficiently.

Design Constraints:

- Sand both concave and convex curves as small as 3 inches in radius
- Use general, store-bought sandpaper
- Have an adjustable radius to conform the sanding surface to variable curves
- Weigh less than 8 pounds
- Have a dust collection system

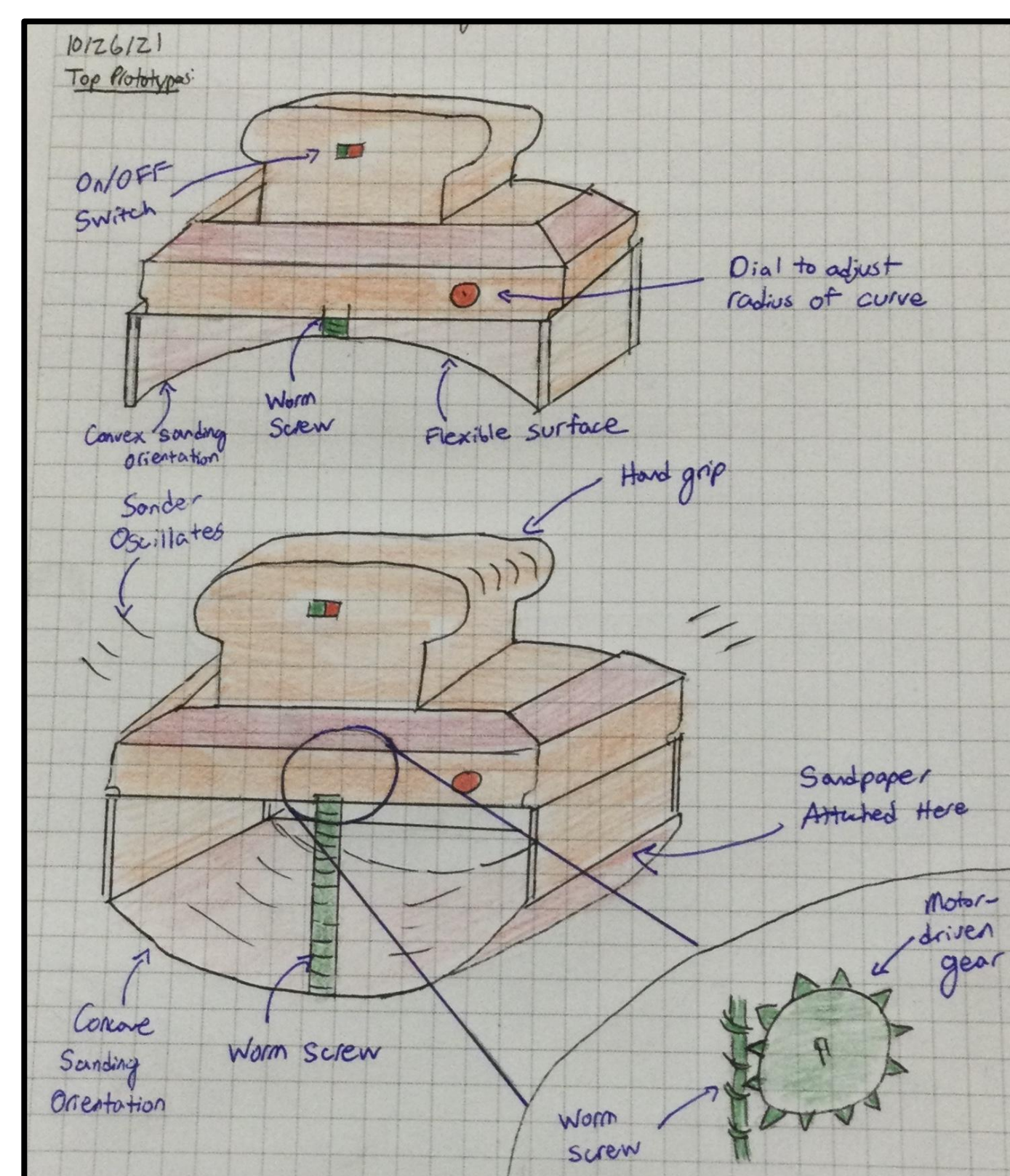
Design 1: Pin Sander

- Has parallel, depressible strips of sandpaper
- When the sander is pressed against a curved or irregular surface, the springs holding the grid lines compress and conform to the surface's shape
- Includes dust-collection bag as a safety measure



Design 2: Curved Palm Sander

- Modified palm sander to include a flexible base
- A dial allows users to select the radius of the curve and either concave or convex curvature
- A worm screw attached to the dial extends and retracts to mechanically adjust the radius



Design 3: Orbital Sponge Sander

- Modified palm sander with a custom head
- Uses an abrasive sponge head to sand tight spaces
- Has a vacuum attached to collect dust
- Cordless to ease access to tight corners

