M1.01 Punch Cap Vibratory and Feeding System

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Introduction

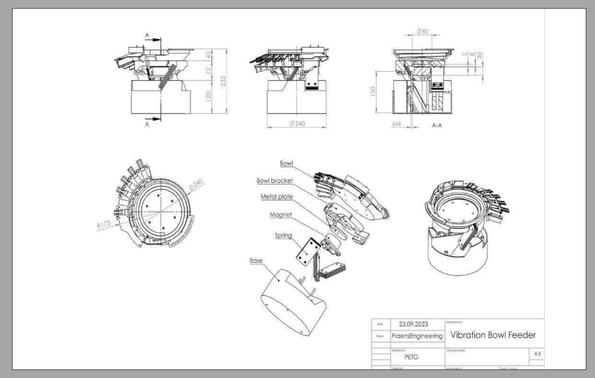
The Lighthouse Bend EZ Cap Punching Machine Project aims to enhance the efficiency of the cap punching process by implementing a feeding system to easily grab caps in the correct orientation. This involves designing and modeling an effective feeding system that will increase the productivity of the punching process by decreasing down time in the cap loading stage.

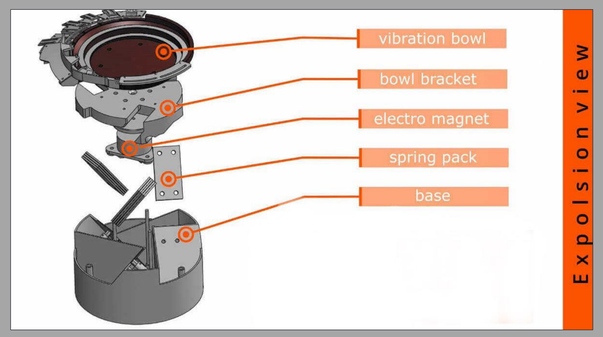
Preliminary Studies

- Our overall goal was to improve safety and optimization
- Conducted a time study to find:
  - Cycle Time
  - Throughput
- The main issue was in the loading stage
- Various optimization options:
  - Vibratory Feeder
  - Belt Feeder
  - Rotary Feeder

Current Setup & Process

3D Vibratory Feeder CAD Files





Vibratory Feeder Design and Function

- **Vibrations will cause punch caps to position in the same direction.**

12V Electromagnet

- **Vibration generated by strong electromagnet using NVIDIA Jetson Nano.**

Plans for Next Semester

- Refine and Finalize Vibratory Feeding System 3D Printing Files
- 3D Print and assemble the Vibratory Feeding System
- Use Jetson Nano to send signals through the circuit control frequency of electromagnet.

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Meet the Team