An Assistive Wheelchair-Mounted Frisbee Launcher

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Problem

Due to mobility issues in the shoulder and elbow, those who use wheelchairs cannot throw a frisbee autonomously to play with their dog, friends, or family.

Features

- Launches frisbees up to 55 feet
- Supports a large range of frisbee sizes
- Switch adapted and accessible
- Tested with precision machining
- Made with easily obtainable materials (wood, cardboard, acrylic, metal)

Final Prototype

Objective

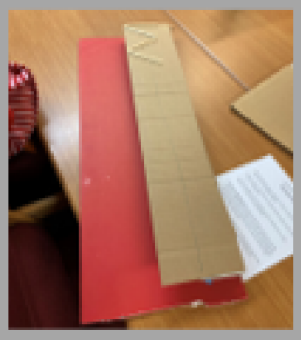
Design a wheelchair-mounted projectile-launching device to assist clients with throwing frisbees.

Design Studies

1. **Clip Testing**
   Measured launching distances of prototype with and without clip to improve stability without sacrificing power.
2. **Spring Testing**
   Observed the impact of spring constant on launch distance by testing the launcher with springs of varying levels of strength.
3. **Mount Stability Study**
   Tested the stability of two mounting systems by considering how well they supported weight.

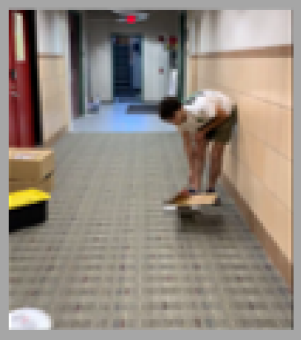
Designs

1



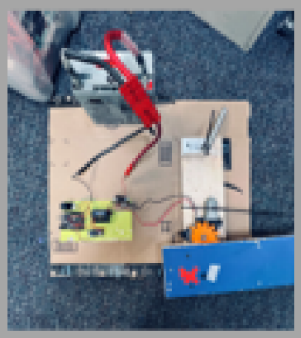
Initial cardboard launcher

2



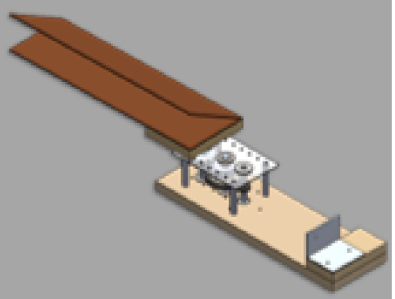
Manually-operated spring-powered launcher

3



Motorized launcher with plastic gears

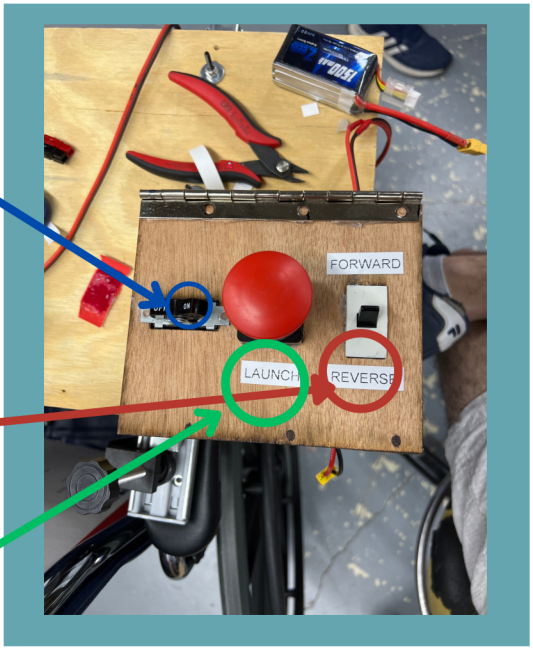
4



Motorized launcher with aluminum gears

Operation of Device

1. Mount the launching device to the wheelchair.
2. Turn the electronic control system switch to "on"
3. Insert the frisbee into the cardboard arm.
4. Make sure that the direction of the motor is correct: "forward" for launching and "reverse" to un-tension
5. Press and hold the "LAUNCH" button until the arm is flung and the frisbee is launched forward.

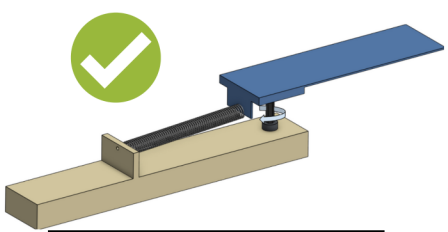


Safety

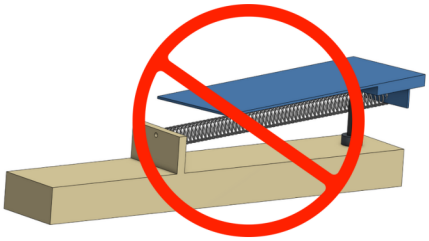
- Wear safety glasses when launching

Extend

- Extend the launcher away from you using the slides when launching.



Un-tensioned Spring



Tensioned Spring

- When not in use, the launcher must be stored in an un-tensioned state. Turn the electronic control system off and disconnect the battery.