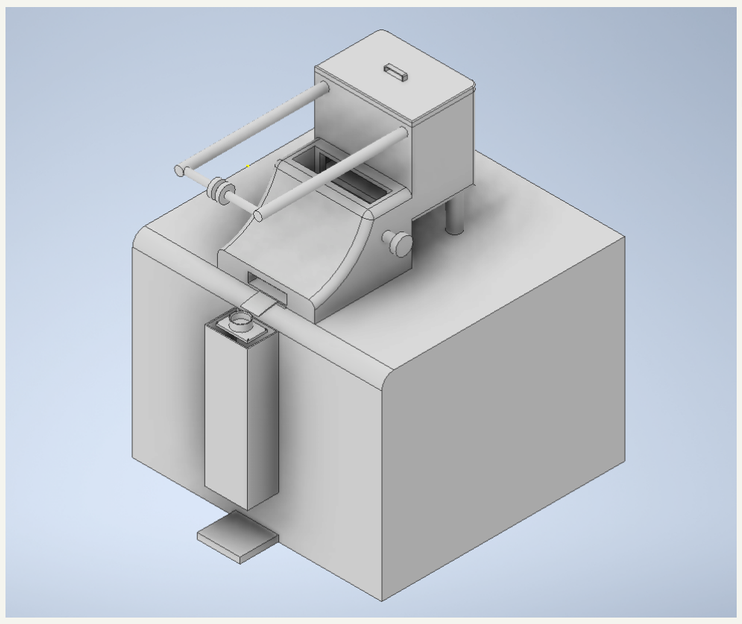
Team Household Maniacs

Pet Ability Dispenser

AKA P.A.D Bot



Hillcrest High School Robotics Club

Design Description and Previous prototypes:

Faced with the task of designing an easy to follow robot with accessible materials, we looked for ways to simplify the process of building our feeder whilst maintaining the complexity of its mechanics. However, as the robot's design progressed, our previous constructions proved to be needlessly complex and led to multiple revisions of our robot. Ultimately a few mechanics were removed to improve the functionality. First, we withdrew a lever which would activate a spinning handle which would drop the food. This design was changed to a button and eventually replaced by a handle which elevates and deposits the food item instead. Additionally, a plastic construction was discarded in favor of recyclable cardboard so the robot can eventually be recycled and have less of a negative impact on the environment.

Despite the physical limitations of our robot, we have managed to include various amenities to aid those with disabilities.

Our robot incorporates several components which contribute to the dispenser's function including a storage compartment, dispenser handle, pulley, and other features that guide the food properly. The storage compartment holds the owner's food of choice and can hold a variety of food. Next, the dispenser handle is made out of cardboard and allows the owner to dispense the food by spinning. The pulley was created with a plastic bottle and string to manage lowering the food bowl.

- **The door that controls the food that dispenses**
- **The tube that guides the food into the bowl**
- **Foldable tube and also something that can protect the food while it goes down**

Over the thousands of years mankind has existed, evolution has never fixed an issue that plagues almost every person alive. Back issues have existed for centuries and show no signs of leaving, most commonly people would develop these issues as a result of aging but some are less fortunate and become impaired in their line of work. A statistical analysis, from the Bureau of Labor Statistics, displays the percentage distribution of the specific work-related injuries among labor workers. On average, about 62% of labor workers experience back injury. Experts estimate that up to 80% of the population will experience back pain at some time in their lives. These injuries can overcomplicate even the most simplest tasks. While there are machines made to automate many inconveniences, a largely ignored area is feeding your dependent domesticated house pet.

Idea behind the design:

The design of the robot places an emphasis on ease of access and space efficiency. Through the use of the Fundamentals of Mechanics and extensive knowledge of simple machines, our team has designed a product that simplifies the process of nourishing your domestic animal. Serving a simple purpose of moving food up and down from a human standing position to the level of your animal. This simple design uses few moving parts to ensure its reliability for long periods of use. Through the implementation of household materials when building our robot, anyone with access to a living quarters can build this machine without much effort (in theory).

The goal of our robot is to not only help people with disabilities but to make it accessible for them. By choosing materials that are recyclable and easy to obtain we are able to make our robot accessible for everyone. The robot consists of recycled components for its construction, these components are all suitable and permitted for this competition. We had to consider many factors such as: durability, porous, and how it would interact with other components of different materials. For example, using cardboard with certain adhesives was impossible because the adhesive would damage the cardboard. In addition to this, working without motors or electronics meant that we would have to rely on the laws of physics and motion to achieve the goal of dispensing food. For the compartment part of the robot we used cardboard for its structural soundness. The compartment to hold food has a built-in ramp that slides pet food down to the lid that holds the food back until the handle is moved by a person. Opening the lid requires turning a cardboard roll to release the food into the cardboard chute. Scotch tape and Elmer's school glue was used to hold all the components together. The pulley system is made to bring food back u