Automated Water Bowl Filler By Shaurya Dave

Introduction

Pets are an integral part of our lives, providing us with companionship, love, and joy. As responsible pet owners, it is our duty to ensure their well-being and comfort. One essential aspect of pet care is providing a continuous supply of fresh water. Recognizing the need for a convenient and efficient solution, I embarked on a journey to design and create an automated water bowl filler. I had a lot of fun when creating this design. Thinking about all the possible contingencies and potential faults for the water filler really stretched my brain into thinking like an engineer.

Motivation for This Project

The initial spark for developing an automated water bowl filler stemmed from my personal experience as a pet owner. I realized that constantly monitoring and refilling my pet's water bowl was time-consuming and inconvenient, often leading to inconsistencies in their water supply. Additionally, concerns about dehydration and the limited availability of commercial solutions compelled me to take matters into my own hands. I wanted to create a reliable system that would alleviate the challenges faced by pet owners like me, while ensuring the health and well-being of their beloved companions.

Design

My design can be broken down into two distinct parts; the feedback component and the filler component. Both components work together in harmony to run this automation. The feedback component like the name provides information to the Arduino in the filler component. The feedback component will relay the weight of the of the bowl every second to the Arduino inside. The Arduino will then compute the information and control the controller module inside the filler to allow water to pass through. There have been many design decisions I have made in accordance with my thinking. The main idea behind my choices was cost. Trying to mitigate the price can allow for more people to build this on their own. Powering the modules inside is going to be done off a battery power. I did have the idea of using a the concept of hydropower. Installing a turbine into the pipes can generate its own power. Although that may be true. The power output produced won’t be enough to sustain the modules over long durations.

Thinking

While creating the automated Water Bowl Filler, I was thinking more about the day to day use and how it could be more efficient. At the end of the day dogs are still animals and could try biting the filler or get scared by the automations. Keeping the ease of resupplying the water and the animal factor I created my design to be more simpler. There is a funnel like basin out of the filler component that will connect to the tank. This will help the refilling process so the user do not have to open the filler up risking a spill.

Contingency Planning

I have planned for the off chance that something goes wrong and there is a spill. The times when a spill is most possible is during the opening of the valves or refilling process. I have created contingencies for those times. There is a one way valve right before the tank connecting the basin and the tank. In case of tipping no water gets spilled out. Taking inspiration from a mammals heart; the one way valves in the heart are activated by the atriums and ventricles, using the pressure they open the valves but don't allow for any back flow. Using one way valves insures no water comes out of the top. To control the ball valve in the bottom I situated a spring. In case of a electronic failure, the spring will pull the valve to its closed position.