PLC-Controlled Volleyball Launcher with Adjustable Ball Trajectory, Velocity, and Spin

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1 Design Requirments

1.1 Immediate Priorities

Use PLC ladder logic as a fundamental part of th design, using a program such as OpenPLC on the Arduino. Slide open and close the blinds and rotate open and close using the existing hardware via time of day or button input. Open and close the screen door, allowing for a "neutral" mode during waking hours using simple button input and time of day commmands.

1.2 Secondary Priorities

Add Homekit module as an input to the PLC, permitting the blinds to be controlled from the PLC in response to commands from Siri.

2 Conceptual Development

Several ideas were bounced around as to how to launch the ball. A catapult-style launcher was completely ruled out since the moving parts required to hit the ball at 40 mph would be quite hazardous with numerous pinch and crush points. Thus, it was decided to design a launcher with dual opposite-direction wheels which shoot the ball out, similar to a tennis ball launcher.

2.1 Motor Torque Calcs

3 Component Selection

3.1 Motor