Problem Statement

- Develop a way to transition Cultivated Cocktail’s various bottles from the air and alcohol cleaning phases to the filling and capping phases of their manufacturing process. The goal is to create a one-stop solution that will allow the labor of one person to: place a bottle in the loading station, move to an air rinse, then alcohol rinse station, a station with a robotic arm to flip the bottles to right-side up, and lastly to a station to be filled with a precise measure of product. The table must fit within a 36” x 48” area and be moveable with a forklift. The goal is to produce more than 900 bottles in 40-man hours, since this is the current rate of production for H&H Distillery.

Requirements

- 36” x 48” Footprint (✔)
- Moveable with Forklift (✔)
- Air Rinse (✔)
- Proofing Alcohol Rinse (✔)
- Flip Bottles Right Side Up (X)
- Precise Fill Bottles (✔)
- FDA Approved Components (✔)

Electrical

- The variables declared and libraries called at the begging of the code are needed to set the inputs and outputs that will be used in the commands to control different stations of the table.

Final Design/Results

- The final design used concepts from the previous year’s team, as well as ideas from this team. This year’s team was given a bin of materials that were picked from last year’s team. The base table was welded together then sent off for powder coating. The powder coating was done by CMT Metal Finishes in Waynesville, NC. They applied a coating that will be wear-resistant to high-proof alcohol. The team then finished designing and assembling all components for the four stations. The electrical members of the team constructed an Arduino program that spins the table-top, stops in the designated area, rinses the bottles, and fills the bottles with the desired alcohol amount.

- Final Assembly of Bottling Table
- Final CAD Model of Bottling Table
- Bottle Nest
- Drive Hub
- Motor Assembly
- Test Wiring

Summary

- Fabrication began in the Fall of 2020 but was slow due to limited in-person meetings.
- At the final state of the project, all concepts were achieved except the bottle flipping mechanism due to feasibility constraints.
- Collaboration with H&H Distillery has proved to be very helpful during the project.
- The bottle flipping mechanism was not completed due to time constraints. The design has been completed and all necessary parts will be passed to the sponsor to order and assemble.

Team & Acknowledgements

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