

Assignment # 1

Problem Overview:

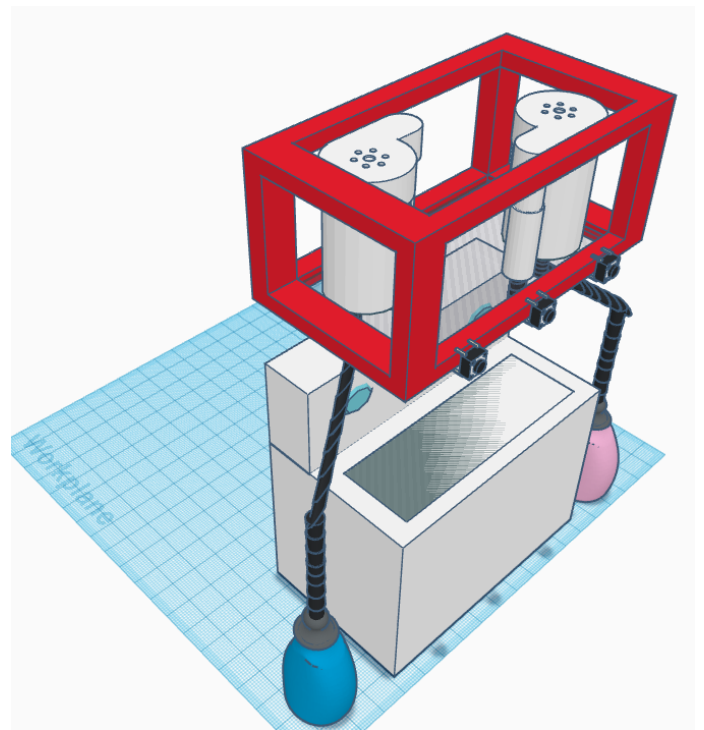
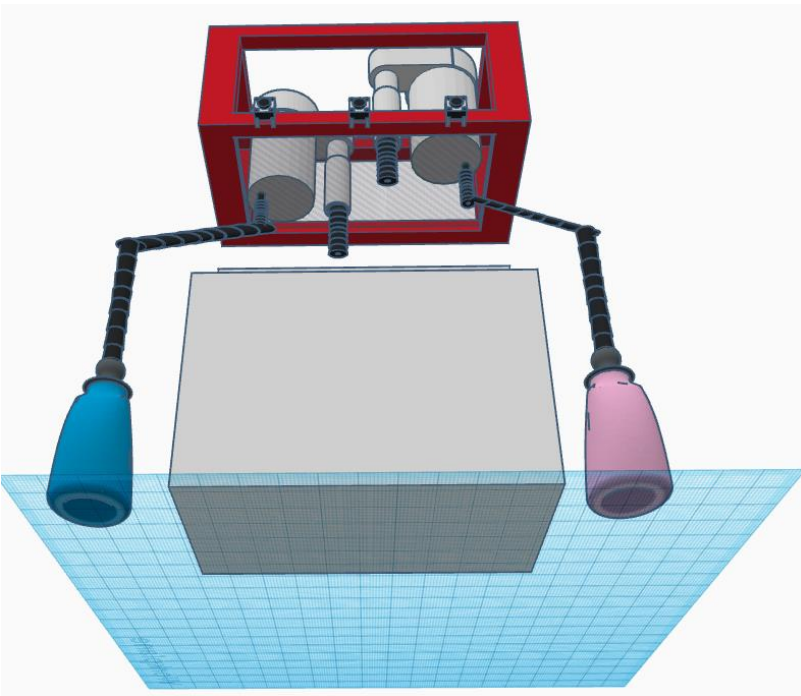
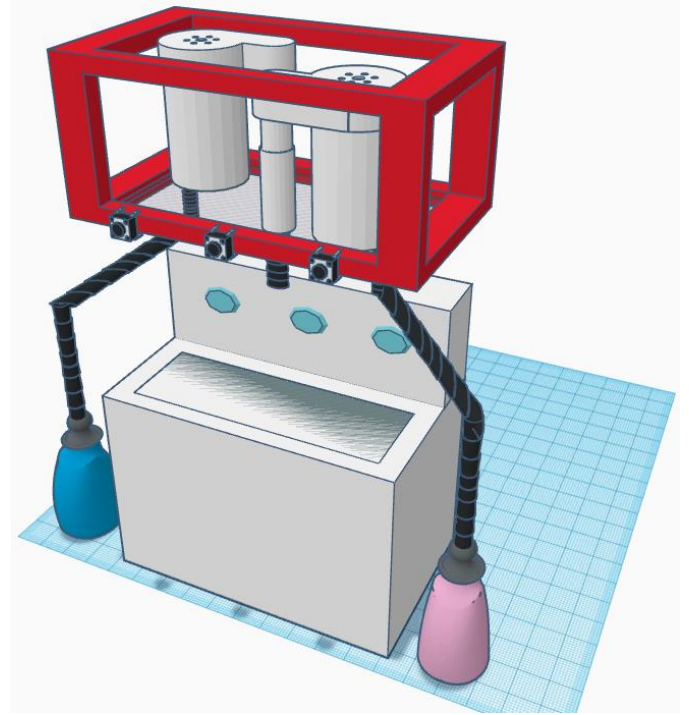
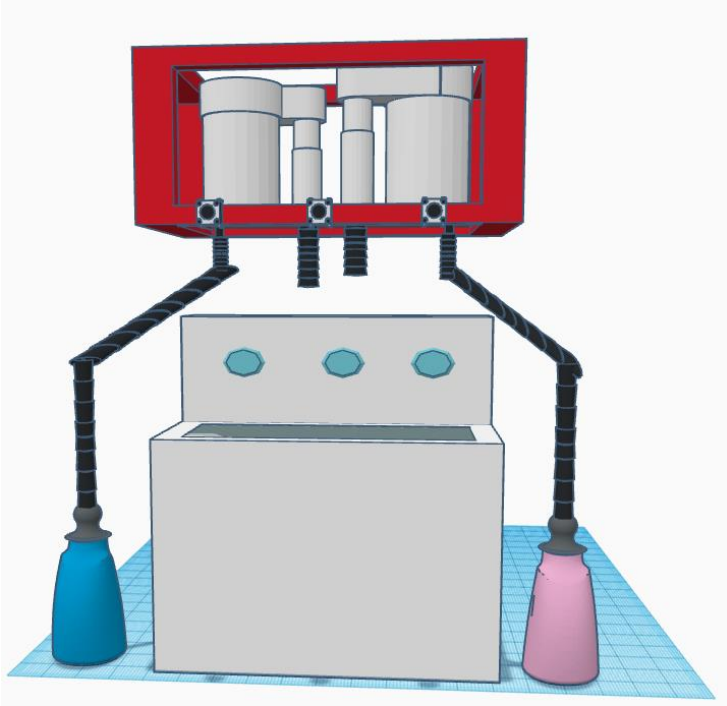
As my mother ages and due to recent health issues, although she still has mobility, joint pain and muscle weakness has created a challenge for her to do routine activities. One of these routine activities is laundry. The specific problem revolves around the process of lifting the laundry detergent and fabric softener containers (weighing anywhere between 5 to 12 lbs) for storage, and then articulating them to pour into the cap or directly into the washing machine. In observations, I notice the laundry stacking up often and she complains that her wrist pains her from trying to hold the weight and keeping it steady while loading the detergent. Buying the containers with the spout and mounting them on a shelf above, where she would only have to press down the trigger was a solution, but once they were empty lifting new containers into place is also an issue. As she is retired and her routines are the bulk of her activity, it frustrates her to neglect it over being unable to lift a simple container.

Initially, suggestions were made to switch to smaller containers, but then economically it was unfeasible for her because she purchases in bulk, therefore buying more to get the same quantity was not motivating. In her math for example, \$19 for 146 Fl oz (\$0.19/Load) vs. \$13 for 48 Fl oz (\$0.27/Load) and reduced wrist pain is not worth the sacrifice to the budget. Another alternative, why not switch to the lightweight pods, unfortunately she felt it did not deliver the same results as her favorite liquid detergent, especially for larger loads. My brother presented the

option of a newer washing machine with additional detergent storage capacity (not including fabric softener) , however her response was “this machine is still working and I will not spend thousands on a new machine just for comfort”. As a cheap jerry-rigged solution my father cobbled together a wood fram shelf with a pulley that raises the container to waist level, then allows her to tilt and pour when no ones around to help, however although the weight issue is slighly resloved; the turning of the wheel to crank it upwards still leads to discmfort with here wrist joints. So, currently she still struggles in pain to be self-sufficient.

Proposed Solution:

Lifting, balancing and articulating large detergent containers can be impactful on the wrist, back and other joints within the body, especially if you are older or in a vulnerable condition like my mother. My design proposes to alleviate a portion of that burden, eliminating a majority of the manual work, all while leaving the containers on the floor. The product design will utilize two pumps (she can operate individual or in parallel) mounted in a protective casing, which she can mount to the wall or place on the countertop. Connected to the source end of each pump will be a three inch diameter flexible accordion style hose, then connected to a siphon through a flexible rubber cap with a snap collar. The siphon end of the hose will enter the mouth of the detergent bottle, while the collar goes over the neck and secured with the collar. At the output end will be another three inch diameter flexible accordion style hose with an output end that she will be place over the detergent compartment of the washing machine when in use, and then retracts back underneath the pump compartment. The outside of the compartment will have three control buttons, one button per individual pump, one button to control both simultaneously. When pressed the pumps will activate for set time period to draw approximately 1.5 Fl oz of detergent/fabric softener or both, while avoiding overfilling.



Conclusion:

In researching my proposed solution, I found other methods which were more manual in their operation. These products required transferring the contents from the detergent bottle to another device container, while others required pumping of the contents manually or only offered individual pumps requiring purchasing multiple units. I find my solution to be more effective for my mom, as it will not require lifting the containers leading to wrist pain or injury. All while allowing her to continue purchasing the sizes that fit her budget and preference.