

Wegmans Tray Lift Assist



Senior Design Project P13712

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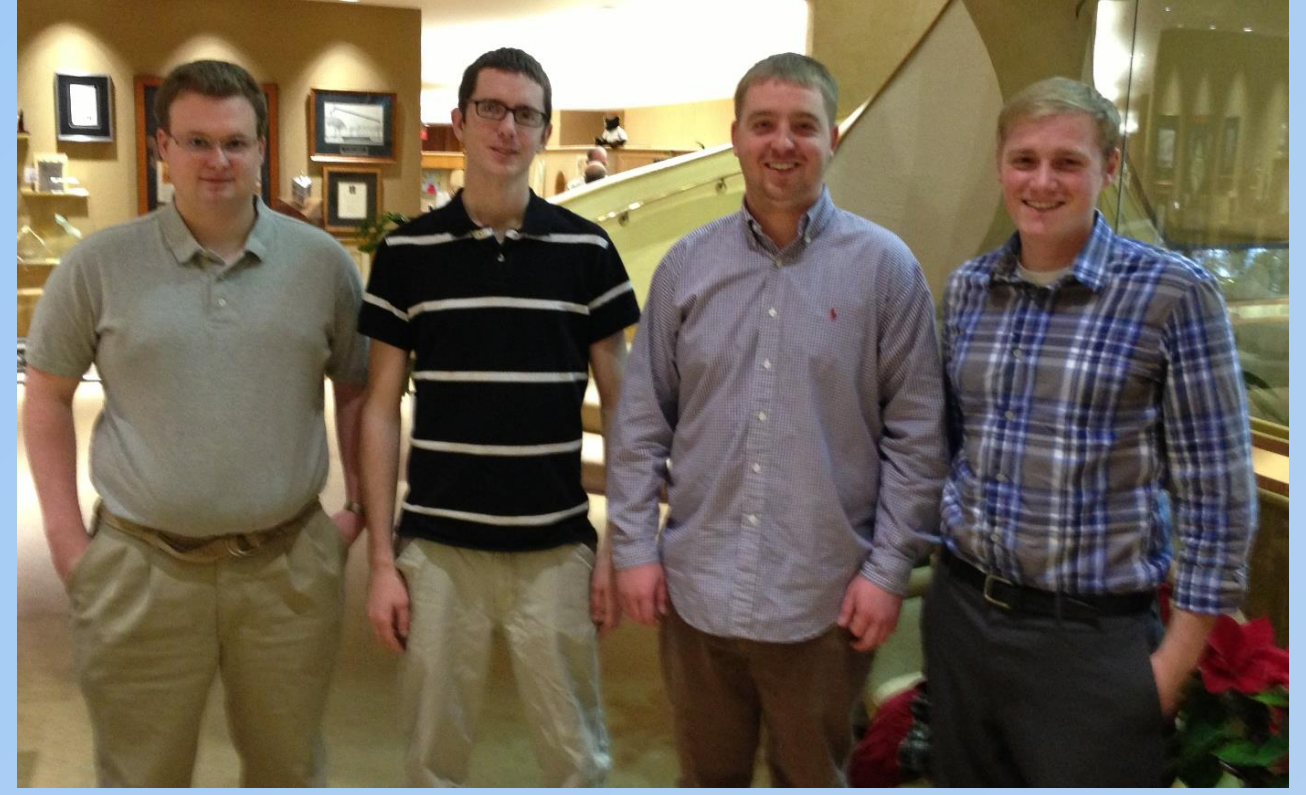
Sponsor : Wegmans Warehouse Markets, Mike Least

Problem

Workers at the Wegmans' Bake shop currently stack trays of product onto dollies by hand. This process involves repetitive bending and lifting of heavy trays. The goal of this project was to eliminate the need for the workers to bend over thus reducing back strain and possibly preventing injury.

Primary Design Concerns

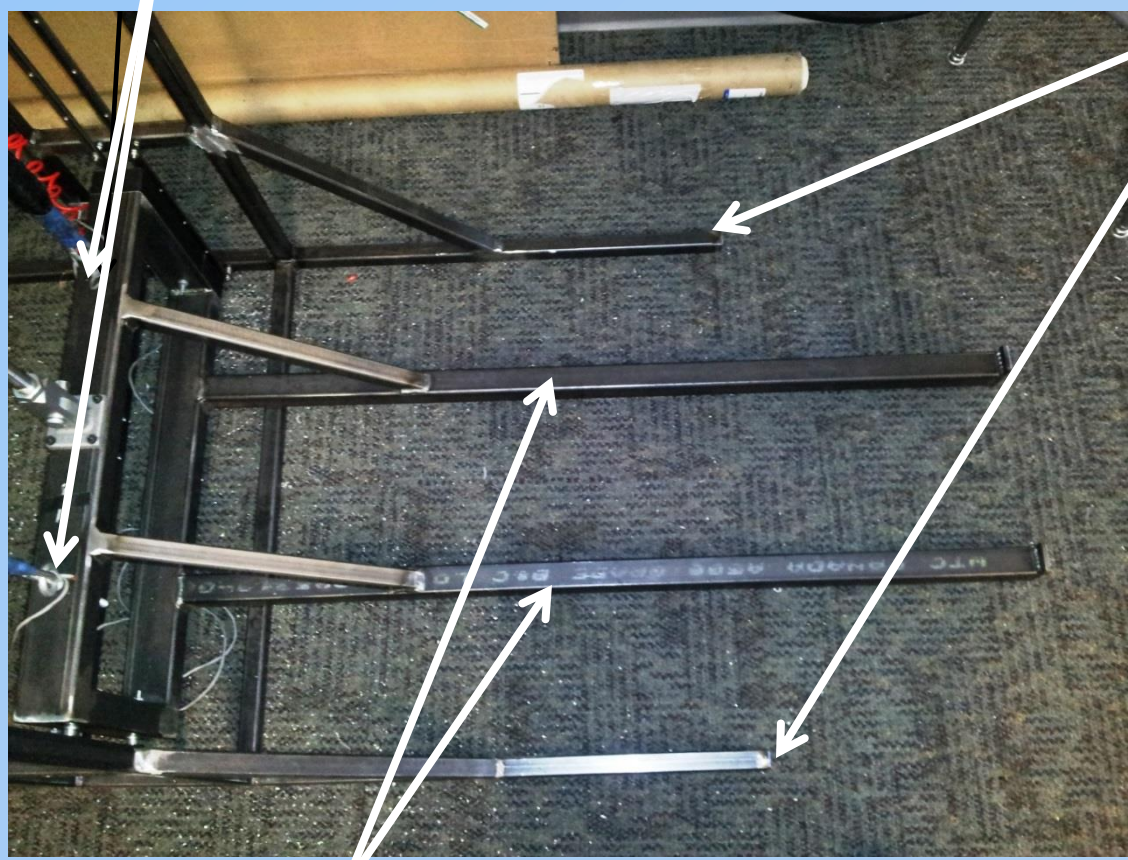
- Meet Wegmans safety requirements in terms of mechanical operation and physical aspects (sharp edges, pinch points). Enable good ergonomic practices in terms of lifting and body position
- Ease of use – setup time between products, positioning the equipment at the start of each run should be able to done very quickly so productivity is not adversely impacted
- The unit should be durable and reliable
- Repair and maintenance processes should be inexpensive, not require specialized, expensive tooling or specialized process or equipment knowledge



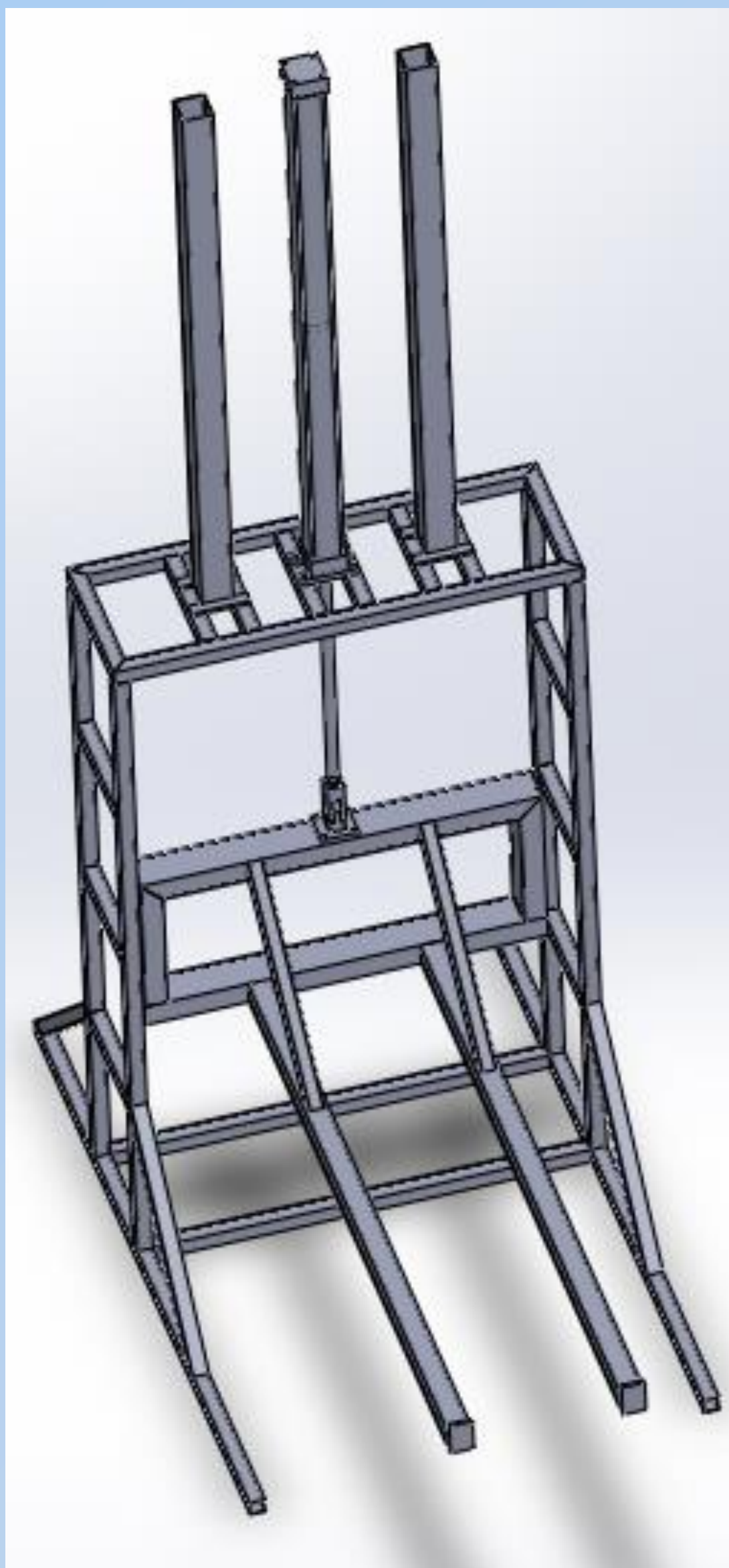
Key Specifications

Spec. #	Importance	Function	Specification (metric)	marginal value	ideal value
S1	1	Safety	Safety methods used on lifter		
S2	2	Ergonomics	The indexing of the height as each tray is added		6 inch
S3	3	Operation	Max lifter height loaded	+/- 0.5 inch	2 inch
S4	4	Operation	Max lifter height unloaded	+/- 3 inch	33 inch
S5	5	Effeciency	Startup of system prior to start of each stacking activity is to minimize setup time		
S6	6	Safety	Should minimize amount of floorspace used		
S7	7	Food and Health Regulation	Mechanical components are acceptable materials		

Springs and air piston attachment points

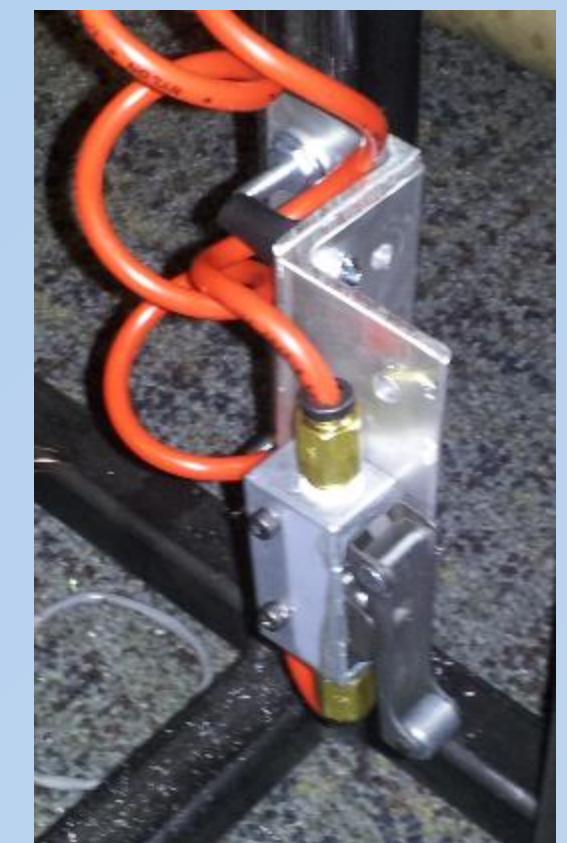


Leg extensions for stability



Forks: Support dolly and trays

Limit switch to automatically lower and lock forks down



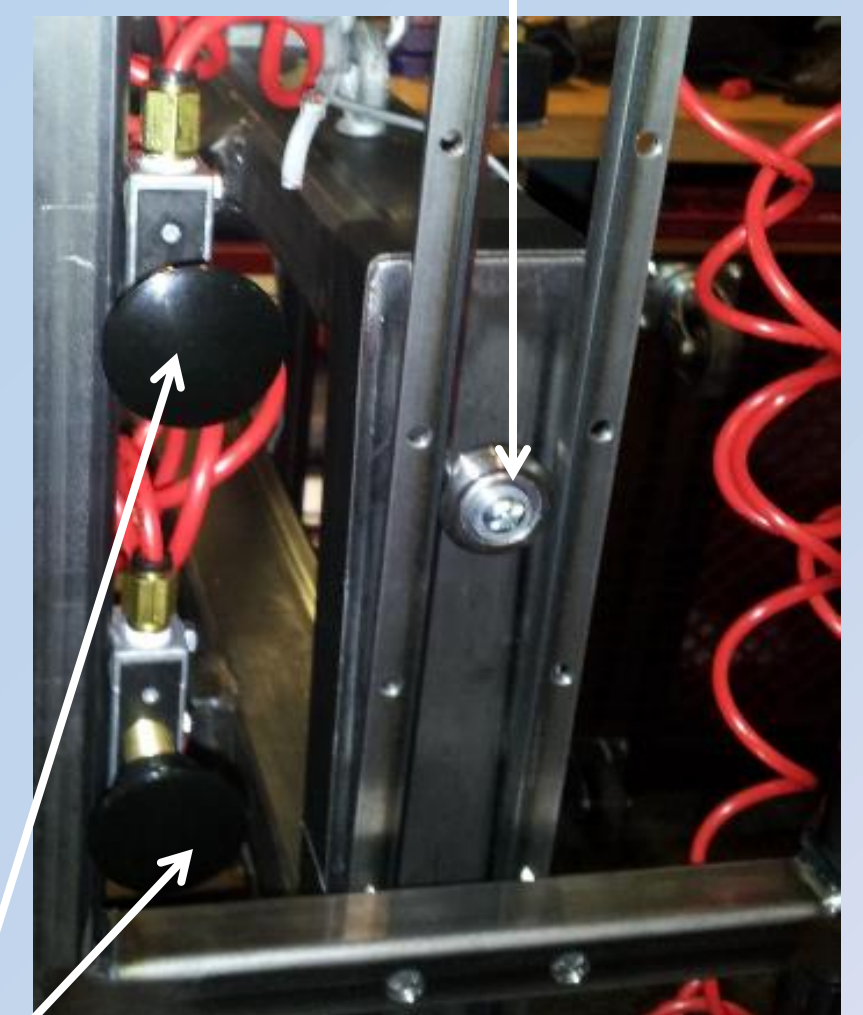
Air Piston: Used as Damper and to lower and lock down forks

Wheel and track system for smooth movement and guidance of forks



Springs Towers: House springs and provide support for the springs to lower trays and return forks to home position

Push buttons to raise and lower forks using the pneumatic system



System loaded with 5 out of 13 trays

