



Bagging Buddy

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Background

Cottonwood Industries is a non-profit manufacturing and packaging facility located in Lawrence, KS. An estimated 85% of the 140 person work force experience mental and/or physical disabilities. Because of these disabilities, many workers have poor motor skills or are limited to the use of only one hand. This can lead to inefficiency and great frustration when performing jobs pertaining to packaging items. Cottonwood's two greatest outputs are a military strap and a party bag of toys.



- Bag sizes and packaging details:
- Small: 5 small wheels
 - Medium: Small toys and cardboard insert
 - Large: 5 lb military strap or 25 large wheels
- Difficulties faced by workers:
1. Keeping bag open while inserting items
 2. Bag sliding on table while packaging
 3. Inserting cardboard cut-out
 4. Zip-locking small and medium sized bags

Design Criteria

- Table top device
- Height from 6-18 inches
- Volume no more than 8 square feet
- Weigh no more than 20lbs
- Footprint no bigger than 4 square feet
- Jig compatible with 3 predetermined bag sizes
- Improve efficiency
- Decrease frustration
- Operation by physically and mentally limited
- Bonus: Zip-locking feature for small and medium sized bags

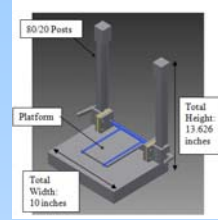
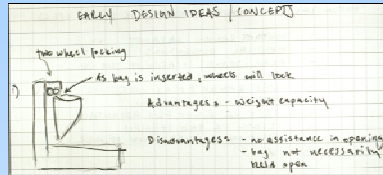
Problem Statement

“Use one-on-one interaction with physically and mentally disabled Cottonwood employees to ascertain a need, then design and fabricate an assistive bagging device to increase the workplace productivity and decrease frustration of the employees.”

Design Process

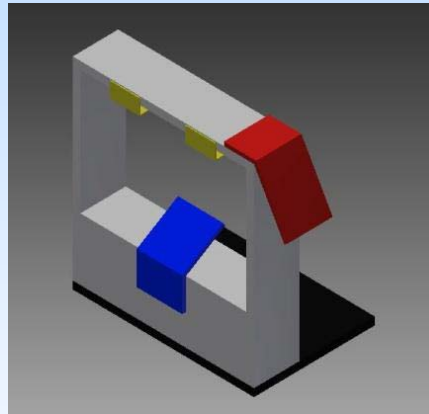
Key Brainstorming

- Horizontal loading to meet weight capacity of strap
- Simple design that could be used by anyone
- Magnets provide easy and forgiving toggle method



- First design attempt
- 'Fork lift' method
- Failed at the prototype stage
- Complicated concept

Final Design



Discussion

The most important objectives in this project were to decrease frustration and improve efficiency of workers. Both of these were successfully met with the Bagging Buddy.

In addition to being a workplace assistive device the potential market beyond this specific application could be significant. The device could be manufactured far cheaper if implemented into mass production as well as designed around a plastic frame. This could then be commercialized for use in the home as well. This is where the market opens up dramatically for the device. There is a significant number of physically and mentally limited people that could find the Bagging Buddy helpful for day-to-day use, in addition to those with congenital defects, amputations, strokes, or other neurological disorders.

Initial Engineering Specifications	Did we do it?
Table Top Design	✓
6" < Height < 18"	✓
Volume < 8 ft ³	✓
Weight < 20lb	✓
Footprint < 4 ft ²	✓
3 Bag Compatible	✓
Improve Efficiency/Decrease Frustration	✓
Operation by Physically And Mentally Limited	✓
Zip-locking Feature	✓
User-Manual	In Progress

Bill of Materials

Item	Quantity	Unit Price	Total
Steel Base	1	8.82	8.82
Frame (bottom)	1	21.73	21.73
Frame (sides and top)	3	2.72	8.16
120° Clip	2	.30	.60
90° Clip	2	.15	.30
Magnets	16	.27	4.32
Rubber Pad	1	.97	.97
Welding	.5 hours	40 / hour	20

Total Cost 1 Device \$64.90

Manufacturing Process

- Device Frame**
1. Cut stock steel to size
 2. Face for accuracy and prep for welding
 3. Weld frame and base plate
 4. File edges, attach rubber pad, paint
- Clips**
1. Cut from sheet metal
 2. Bend clips to appropriate size
 3. Clean the edges
 4. Glue magnets and paint

Testing: Employee Trials

Efficiency	Without	With	Percent Improvement
Employee 1	1 min 15 sec	45 sec	40%
Employee 2	1 min	37 sec	38%



Frustration
“The Bagging Buddy is exceeding expectations and has the potential to make this a more productive, more enjoyable task.”
– Steve Steinbach – Workplace Manager Project Sponsor

Acknowledgments

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