Wheels-On-Anything

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Abstract

Through our group brainstorming, design research, and our own experiences, our group found that the best method of doing this is to create a dolly that has an expandable base. This method will not only be the cheapest method, it will be the easiest for us to build, and the easiest for our customers to use. Our group found this idea to be the best idea through researching other dolly models, surveying potential future customers, experimentation, and our own experiences. The design of the dolly was hard to come up with, but we followed what our customers wanted, and what we thought would be most essential parts of the dolly (i.e. strength, durability, price, etc…). We found that our customers want the dolly to be portable, strong, collapsible/expandable, and durable.

How it works

Our dolly is made up of Aluminum 6061 and ABS Plastic. It dolly is assembled so that it can expand to carry bigger loads, but then the handle and sides collapse so it is easier to store when you go to put it away. The handle will be able to collapse by tightening bolts to keep the bar in place, similar to that of a lawn mower. The sides will be able to flip out from the center by a hinge at the edge of the base and it will be supported by wedges that are attached to the expanding piece.

Conclusion

This dolly is unique because it can expand and collapse as needed to be more useful to the user. Our team believes that this dolly will actually work and quickly become one of the highest selling dollies on the market. This is because we designed the dolly keeping in mind what our customers wanted and what the dolly was going to be used for.

Criteria	Ey (psi) 10^3	Norm.	E(psi) 10^3	Norm.	d(lb/in^3)	Norm.	Total
Weights	0.5	0.5	0.2	0.2	0.3	0.3	
Steel 1010	44.2	1	29000	1	0.28	0.15	0.75
Aluminum 6061	8	0.18	10000	0.34	0.1	0.43	0.29
Lexan 9334	9	0.2	330	0.01	0.043	1	0.42

Figure 1 Design Matrix for the Base of the dolly

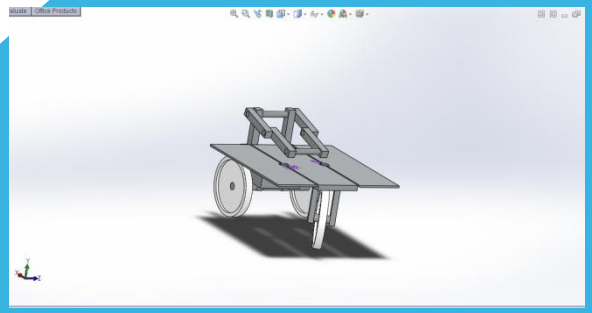

Figure 2 Solidworks Model of Dolly

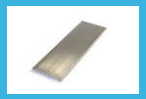

Figure 3 & 4 Aluminum 6061 metal (left) and ABS plastic wheel (right)

	Retail Cost	Accessories	Durability	Strength	Appearance	Collapsable/ Expandable	Ease of Assemble	Ease of Use	Portability	Total	Weighted
Retail Cost	1	1/4	1/5	1/4	4	1/4	2	2	1/6	10.12	0.0724
Accessories	4	1	1/2	1/8	2	1/4	1/5	1/5	1/6	8.44	0.0604
Durability	5	2	1	1	3	1/5	3	3	1/2	18.70	0.1339
Strength	4	8	1	1	7	1/2	3	3	2	29.50	0.2112
Appearance	1/4	1/2	1/3	1/7	1	1/2	1/5	1/5	1/4	3.38	0.0242
Collapsible/Expandable	4	4	5	2	2	1	1	1	3	23.00	0.1647
Ease of Assemble	1/2	5	1/3	1/3	5	1	1	1/3	1/3	13.83	0.0991
Ease of Use	1/2	5	1/3	1/3	5	1	3	1	1/3	16.50	0.1182
Portability	6	6	2	1/2	4	1/3	3	3	1	24.83	0.1778

Figure 5 Customer Needs Assessment

1. Cost (0.1328,0.1328)
    a. Retail Cost (0.0724,0.5452)
    a. Accessories included (0.0604,0.4548)
1. Design Features (0.5340,0.5340)
    a. Durability (0.1339,0.2507)
    a. Strength (0.2112,0.3955)
    a. Appearance (0.0242,0.0453)
    a. Collapsible/Expandable (0.1647,0.3084)
1. Use (0.3945,0.3945)
    a. Ease of assemble (0.0991,0.2512)
    a. Ease of use (0.1182,0.2996)
    a. Portability (0.1772,0.4492)

Figure 6 Weighted Hierarchal Chart