



The Dolly Llama

America F.Y., Inc.

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“PIVOT!!!!”



Moving is stressful and exhausting

Deficient Designs

Lifting Straps

- ▶ Heavy objects
- ▶ Compact storage
- ▶ Potentially harmful to health
- ▶ Inconvenient





Deficient Designs

Manual Dollies

- ▶ Require more equipment for bulkier loads (straps, breaks, etc.)
- ▶ Potential hazard caused by slipping down an egress.

Our Product

The Dolly Llama

- ▶ DC 36V Motor
- ▶ Lithium Ion Battery Pack
- ▶ Worm Gear Box
- ▶ 15 in Wheels
- ▶ 4 “hooves” for lifting legs



Market Analysis

Available Market

- ▶ Over 10,000 Electric dollies Sold each year
- ▶ Average Electric Dolly Costs exceeds \$5000
- ▶ Mostly warehouse use

Our Aim

- ▶ Our Target Market is moving industry and housing Rental Companies.
- ▶ Selling Price is to be \$1500

Benchmarking

Wesco Power LiftKar HD Truck

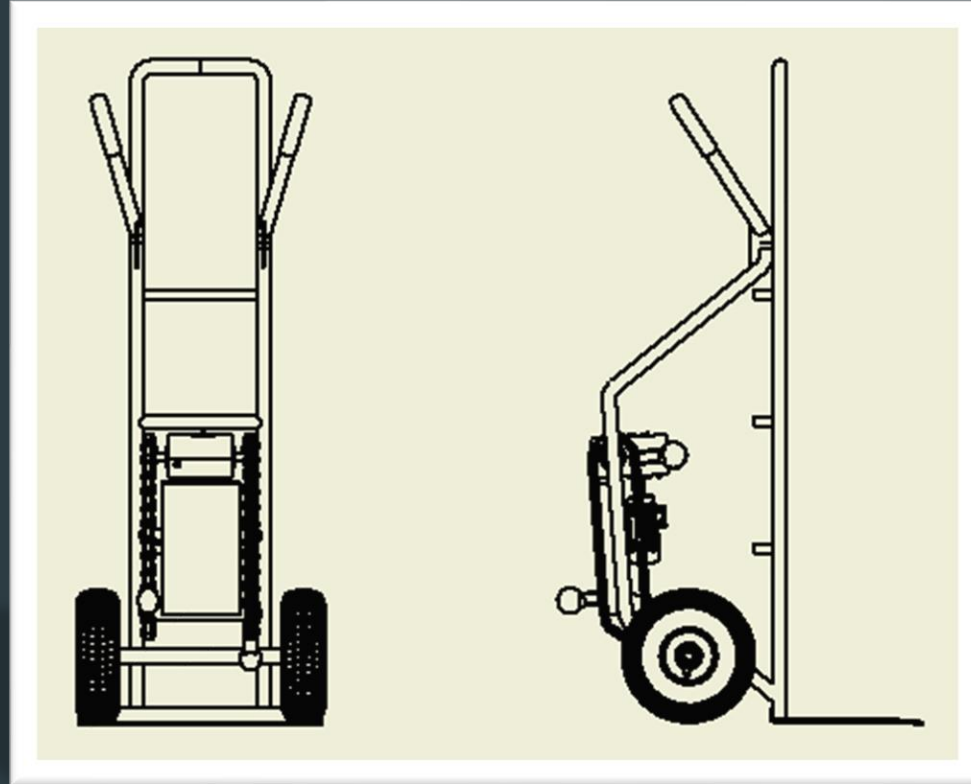
- ▶ Straight frame that can accept a 4-wheel support
- ▶ Upper handle angle can be adjusted
- ▶ Edge-of-step braking system - automatically applies brake when wheels are at edge of step
- ▶ Brake can be shut off for use on level ground
- ▶ 24 V Quick-Charge battery pack
- ▶ 725 lb. load capacity
- ▶ 47" Tall Frame
- ▶ Noseplate Width - 21"
- ▶ Noseplate Depth - 7.25"
- ▶ Maximum vertical clearance - 8.25"
- ▶ 97 lb. unloaded weight
- ▶ Cost ranges from \$4,629.00 to \$6,249.48

Magliner Appliance Truck

- ▶ 59" Tall Frame
- ▶ Straight back
- ▶ Dual Shepherd handle with vinyl sleeve
- ▶ Noseplate Width - 23"
- ▶ Noseplate Depth - 5.32"
- ▶ 10" wheels
- ▶ Optional 4th-wheel attachment
- ▶ 600 lb. Capacity (2 Wheel)
- ▶ 800 lb. Capacity (4 Wheel)
- ▶ 70 lb. unloaded weight

Dolly Llama's Advantages

- Greater load capacity - 800 lb.
- Greater nose plate depth - 12"
- Greater vertical clearance - 15"
- Lighter unloaded weight
- Lower cost



Customer Requirements

- ▶ “My stairwells are too tight to move furniture by myself.”
- ▶ “My apartment is on the 7th floor and moving is difficult.”
- ▶ “I have bad joints and lifting is painful.”
- ▶ “My fridge is huge and heavy.”
- ▶ “I don’t want my husband throwing out his back.”
- ▶ “A dolly slipped from my hand once while going down stairs.”
- ▶ “Stand up dollies are hard to maneuver.”

Engineering Characteristics

- ▶ Able to turn 180° while carrying objects
- ▶ Have a “hoof system” to help up and down stairs
- ▶ Will lift up to 800 lbs.
- ▶ Large enough to maintain stability when moving large items
- ▶ Materials used will be safe and strong enough to balance and support loads tied to it
- ▶ Hand grips to grab
 - ▶ This, used with the hoof system will deter the dolly from slipping
- ▶ Have a drive-assist system to rotate with a load in standing position

Functional Requirements

- ▶ Total height of the dolly system should be less than 55 inches
- ▶ The lifting system can lift up to 800 lb. to at least 7 inches, and maintain stability for the duration of the movement
- ▶ Structural components of the dolly can support 1200 lb. without failure and has a safety factor of at least 3
- ▶ Human force input to operate the lifting should be no more than 6 lbf.
- ▶ Wheels should work on all types of surfaces and stairs (and a stair height of 7 inches, which is the average stair height in America)
- ▶ The dolly system is reusable










Target Specifications

Metric Number	Metric	Units	Target	Actual
1	Weight of the Dolly	lb	50	25
2	Carrying Capacity	lb	800	800
3	Width of Dolly	in	20	20
4	Height of Dolly	in	52	51
5	Length of Dolly	in	26	26
6	Safety Factor	-	3	3
7	Torque	ft-lb	409	409
8	Step Clearance	in	15	15
9	Turn ability	Degrees	90	180

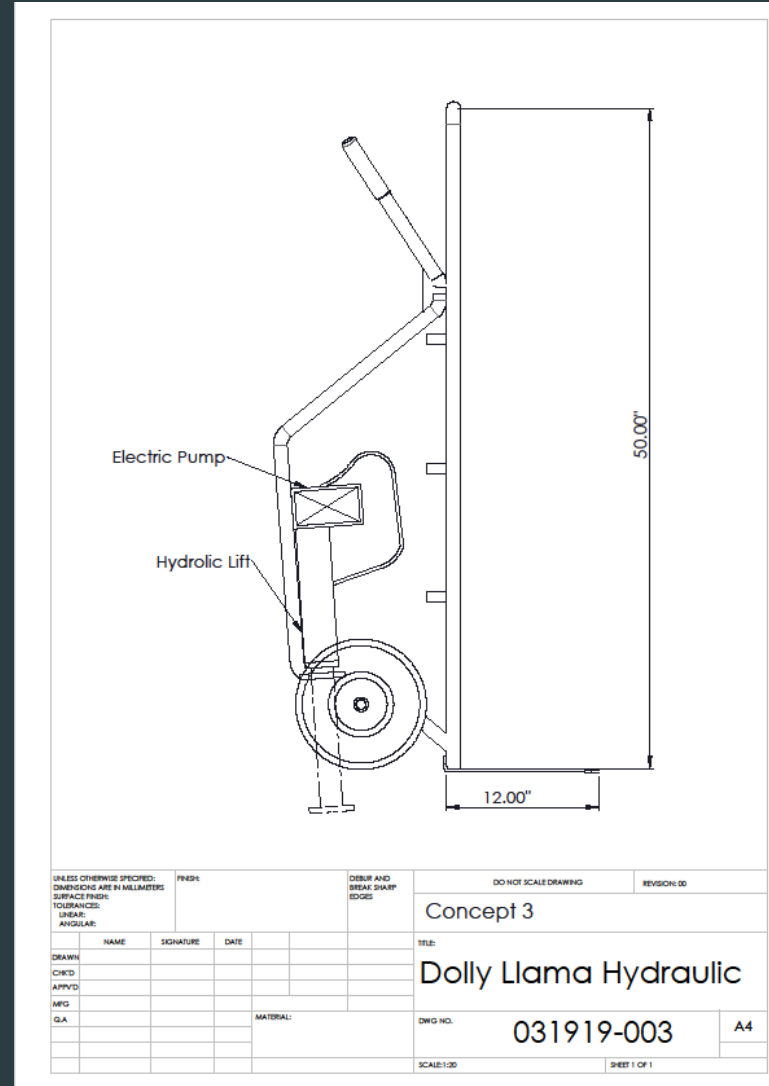
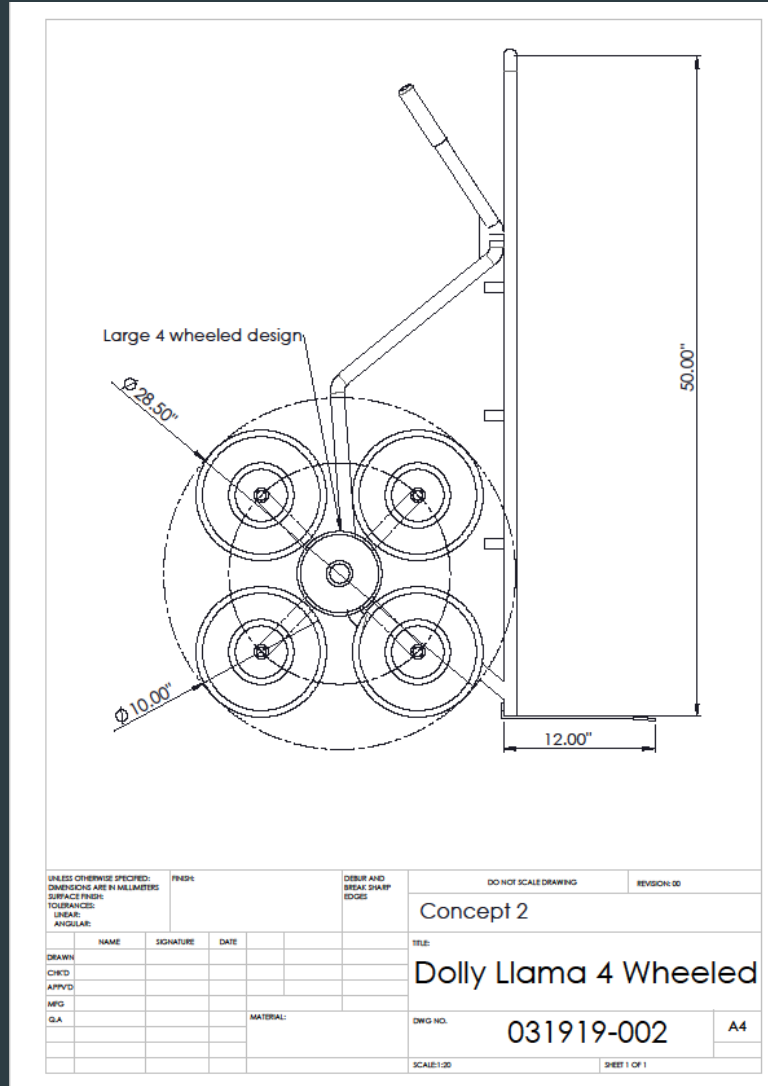
Functional Requirements

Row #	Weight Chart	Relative Weight	Customer Importance	Maximum Relationship	Customer Requirements	Column #									Customer Competitive Assessment					
						1	2	3	4	5	6	7	8	9						
						Direction of Improvement														
						▲	◇	◇	◇	▲	▲	▼	▼	◇						
						Functional Requirements	1. Weight of the Dolly	2. Load Capacity	3. width of Dolly	4. Height of Dolly	5. Length of Dolly	6. Safety factor	7. Horse Power	8 Step Clearance	9. Turn ability	Our Product	Competitor #1: Trecco LiftCar	Competitor #2: Magliner Appliance		
1		18%	6	1	1. My Stairwells are too tight to move furniture by myself			▽	▽	▽					3	2	2			
2		15%	5	9	2. My apartment is on the 7th floor and moving is to hard		○					○	●		5	4	4			
3		9%	3	9	3. I have bad joints and lifting is painful	●	○								1	2	3			
4		6%	2	9	4. My fridge is huge and heavy		●								5	5	4			
5		12%	4	9	5. I don't want my husband throwing out his back safety		○				●	○			3	4	4			
6		27%	9	3	6. A dolly slipped from my hand once while going down stairs								○		4	4	3			
7		12%	4	9	7. Stand up dollies are hard to maneuver									●	4	4	3			

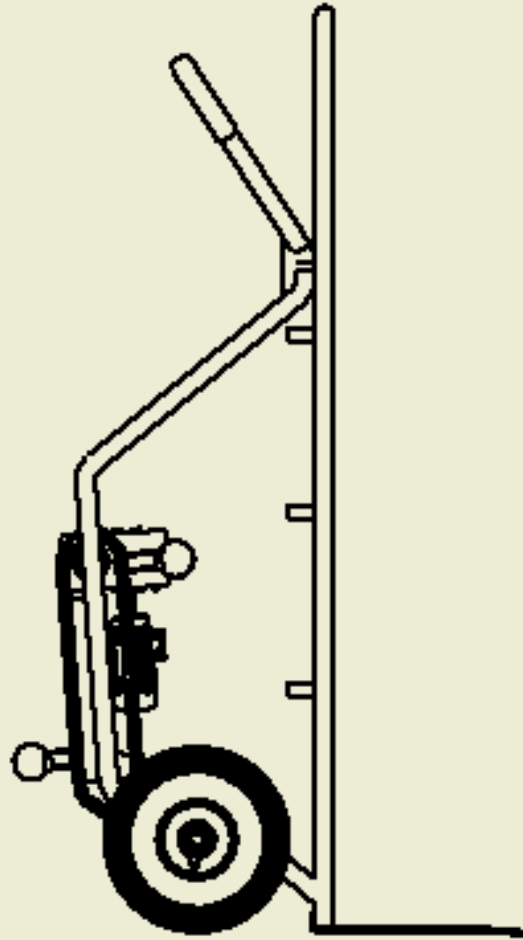
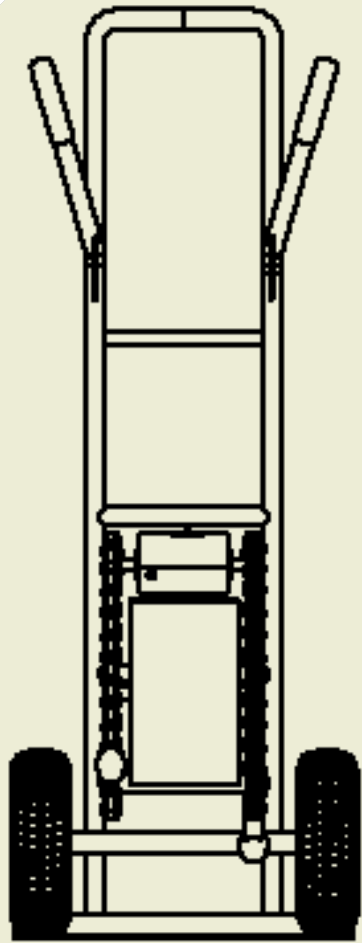
Target Specifications Benchmarking

Target	less than 50 lbs	Max lift 800 lbs	less than 20 ins wide	Height Less than 50 in	less than 30 in	Softer Factor of 3	max torque at 400 HP	clear 15 in	make 180°
Max Relationship	9	9	1	1	1	9	3	9	9
Technical Importance Rating	81.82	163.6	18.18	18.18	18.18	109.1	81.82	218.2	109.1
Relative Weight	10%	20%	2%	2%	2%	13%	10%	27%	13%
Weight Chart									
Our Product	5	5	5	5	5	5	5	5	5
Competitor #1: Wesco LiftKar	2	4	4	4	5	4	4	3	5
Competitor #2: Magliner Appliance Truck	4	3	4	4	4	4	4	3	5

Two Concept Designs



Final Design



Questions?