



Rexnord Automatic Deburring Machine

Mid-Term Report

Corp 9 Project Group

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MISSION OBJECTIVE

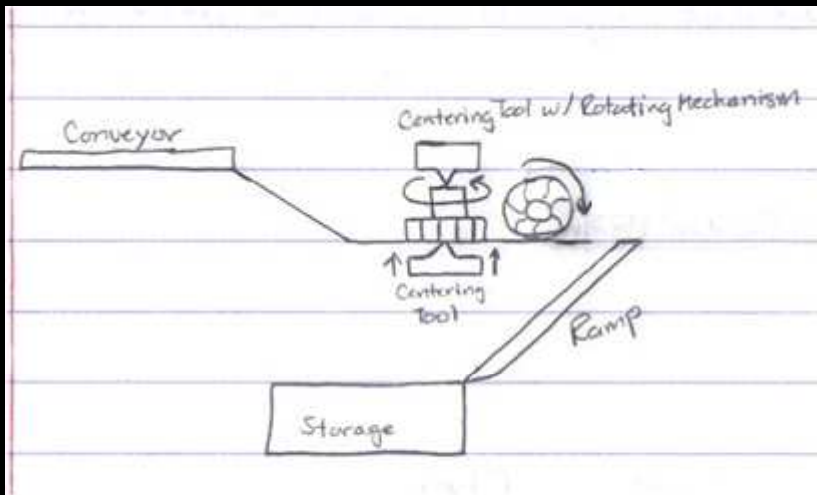
Our mission is to:

- Create an automated deburring and transport system while:
 - Reducing production time
 - Improving overall quality of the finished product
 - Improving the efficiency of the waste removal process

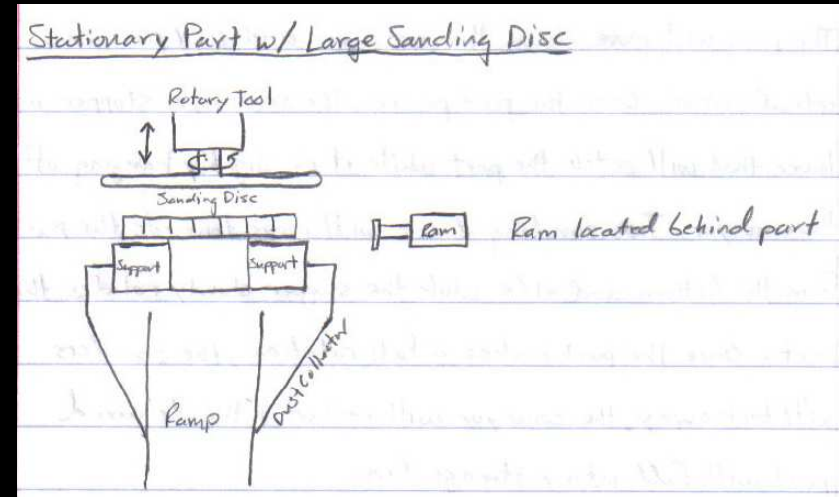
THE BREAKDOWN

- Part must be deburred to a desired finish
- System must be fully automatic from beginning to end, including loading and unloading
- Must have active vacuum system for metal dust removal
- Must store part at end of operation for pickup
- Must adapt to different part sizes with minor adjustments

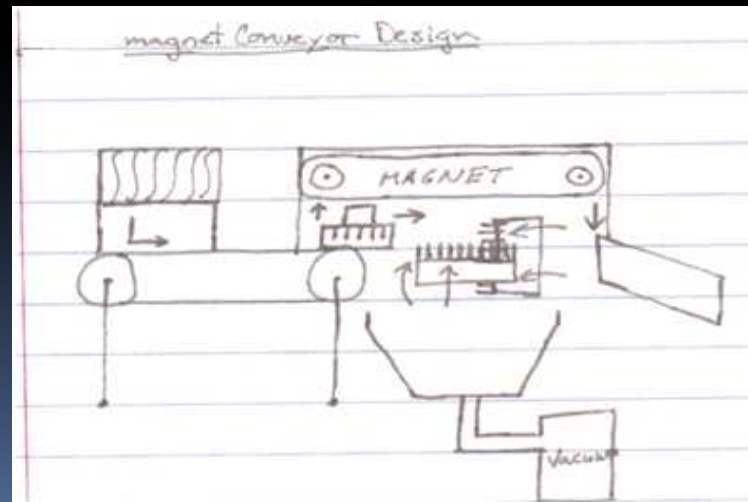
ARCHITECTURAL DESIGN AND DEVELOPMENT



Center-Holding



Large Sanding Disc



Magnetic Conveyor

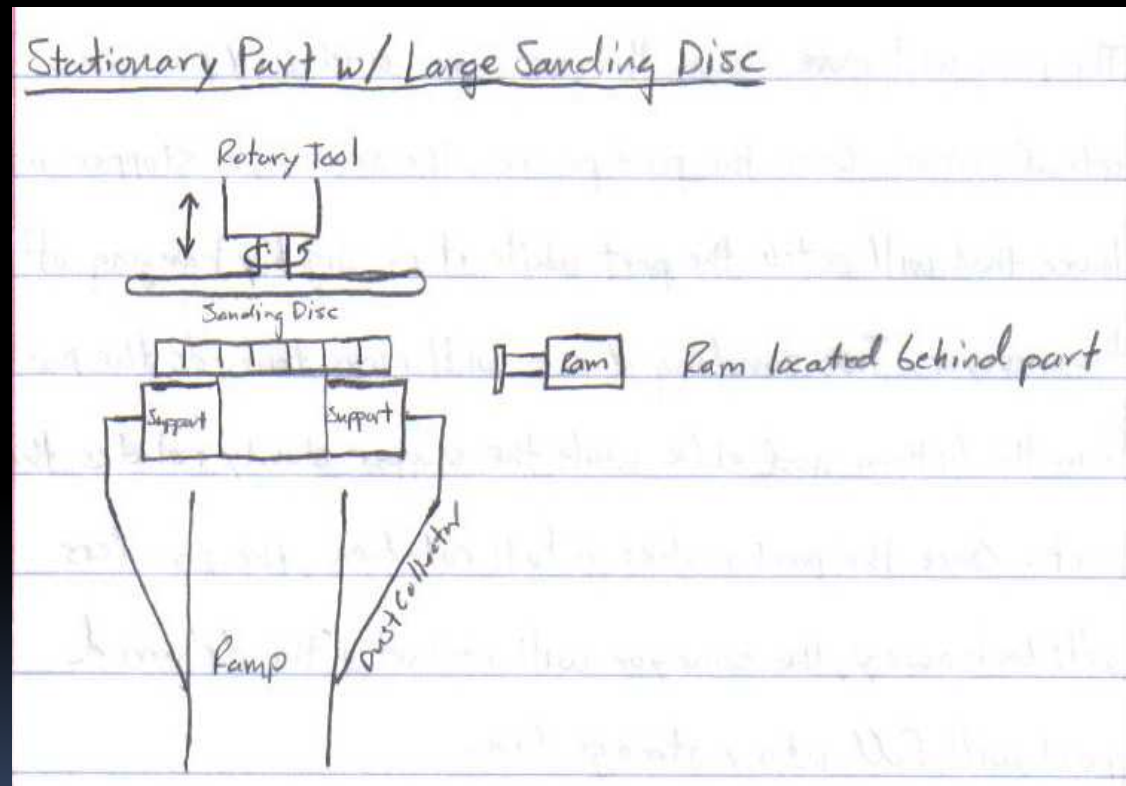
Large Sanding Disc Design

Advantages

- One disc
- Stationary part
- Cheapest
- one motor
- less space

Disadvantages

- One surface
- Sanders wear out
- Securing part
- Auto load complex
- Have to flip part



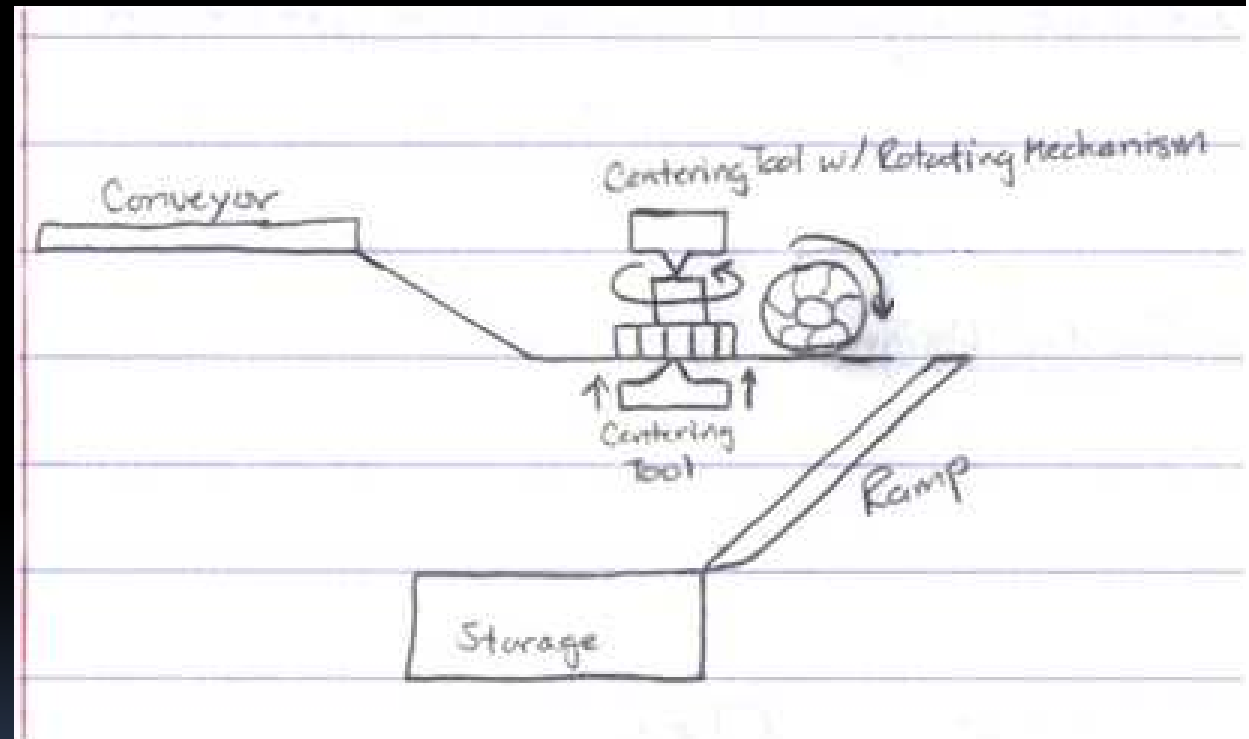
Center Holding with Rotation Design

Advantages

- Top and sides
- more thorough
- more polished finish

Disadvantages

- Difficult to auto-load
- More expensive
- Difficult to rotate
- Have to lift the part
- More moving parts
- Sanders wear out



Magnetic Conveyor Design

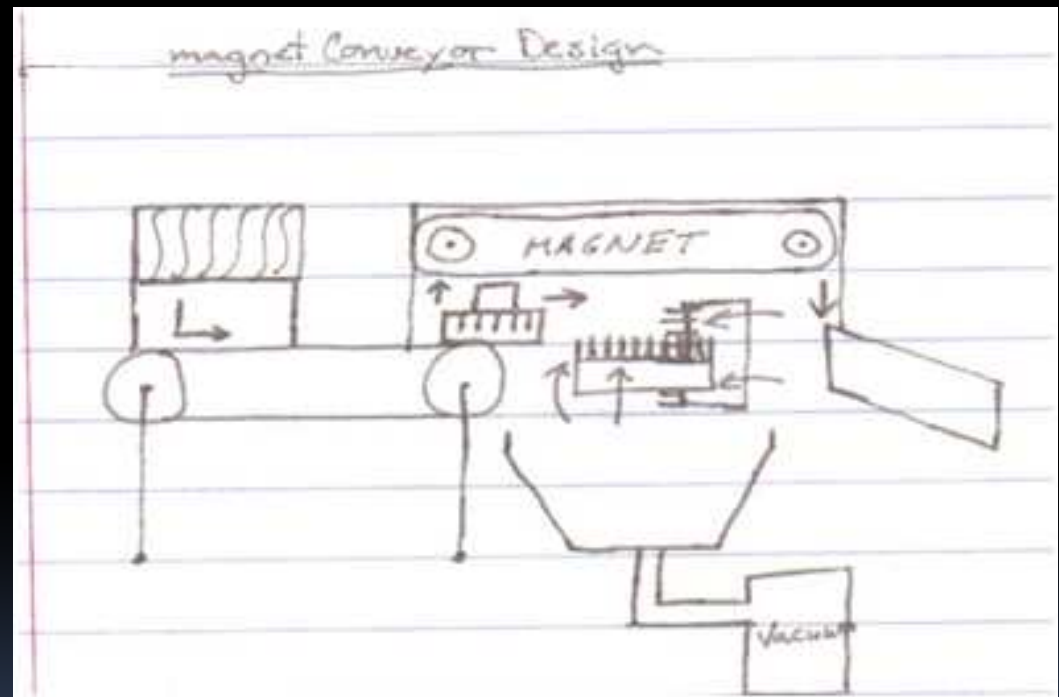
(chosen design)

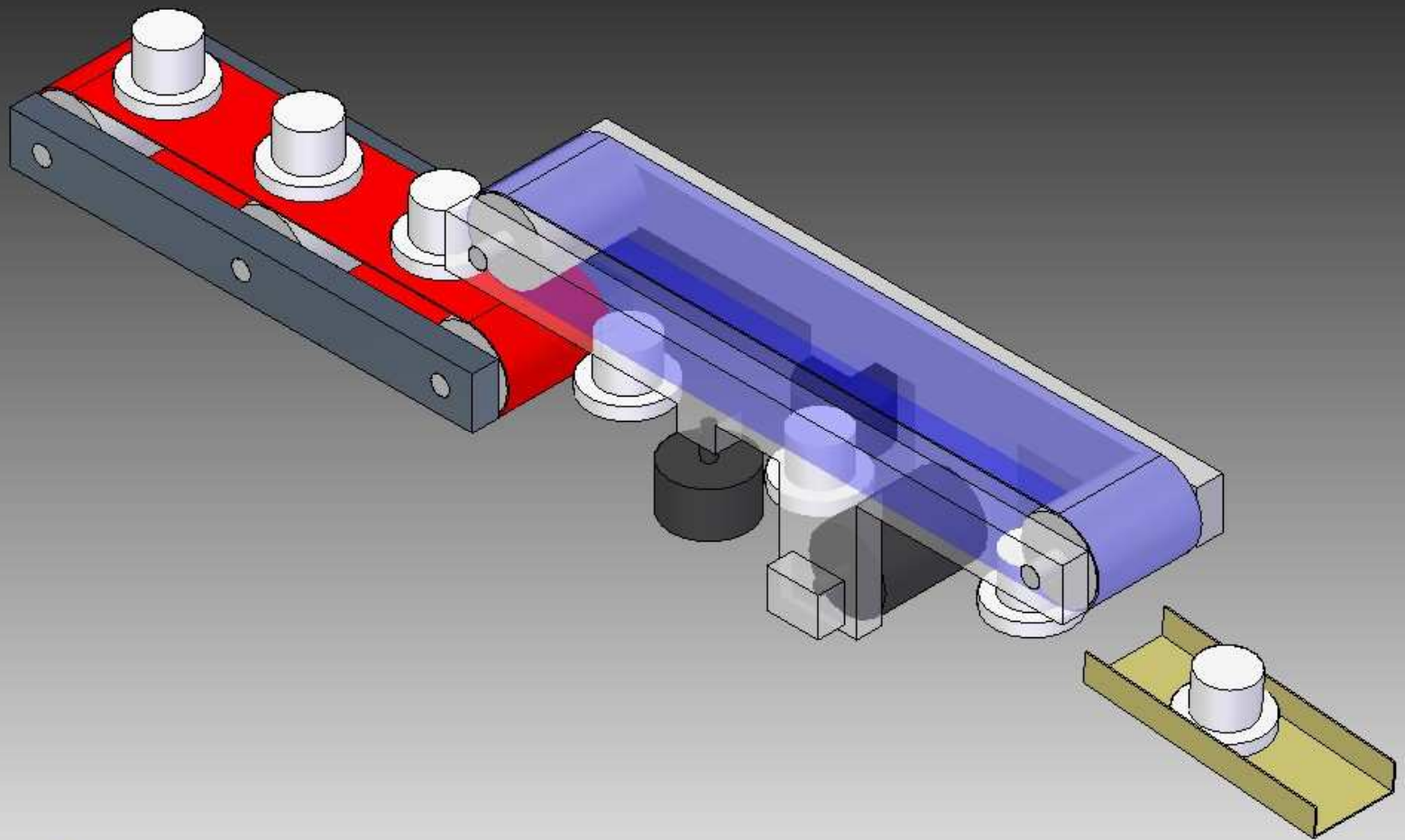
Advantages

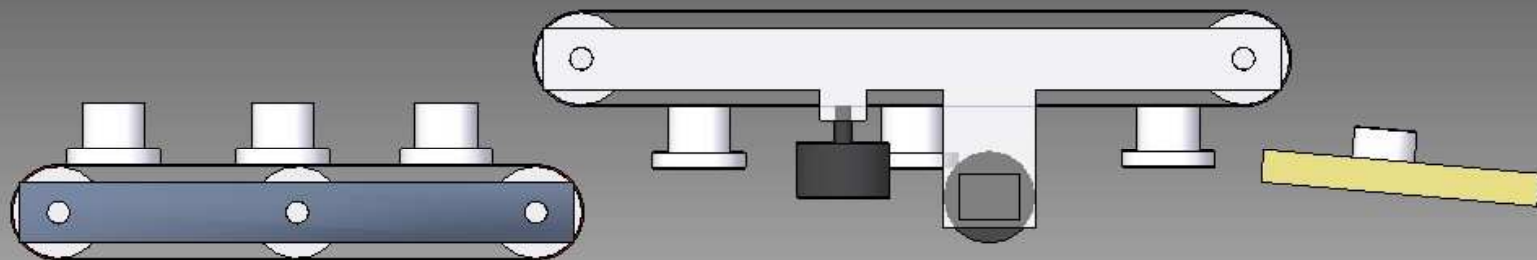
- less moving parts/sensors
- Easy part loading
- Optimum polish
- Auto Unload
- Use Existing conveyor
- on/off switch

Disadvantages

- Burs not removed
- Burs build-ups on conveyor
- More expensive





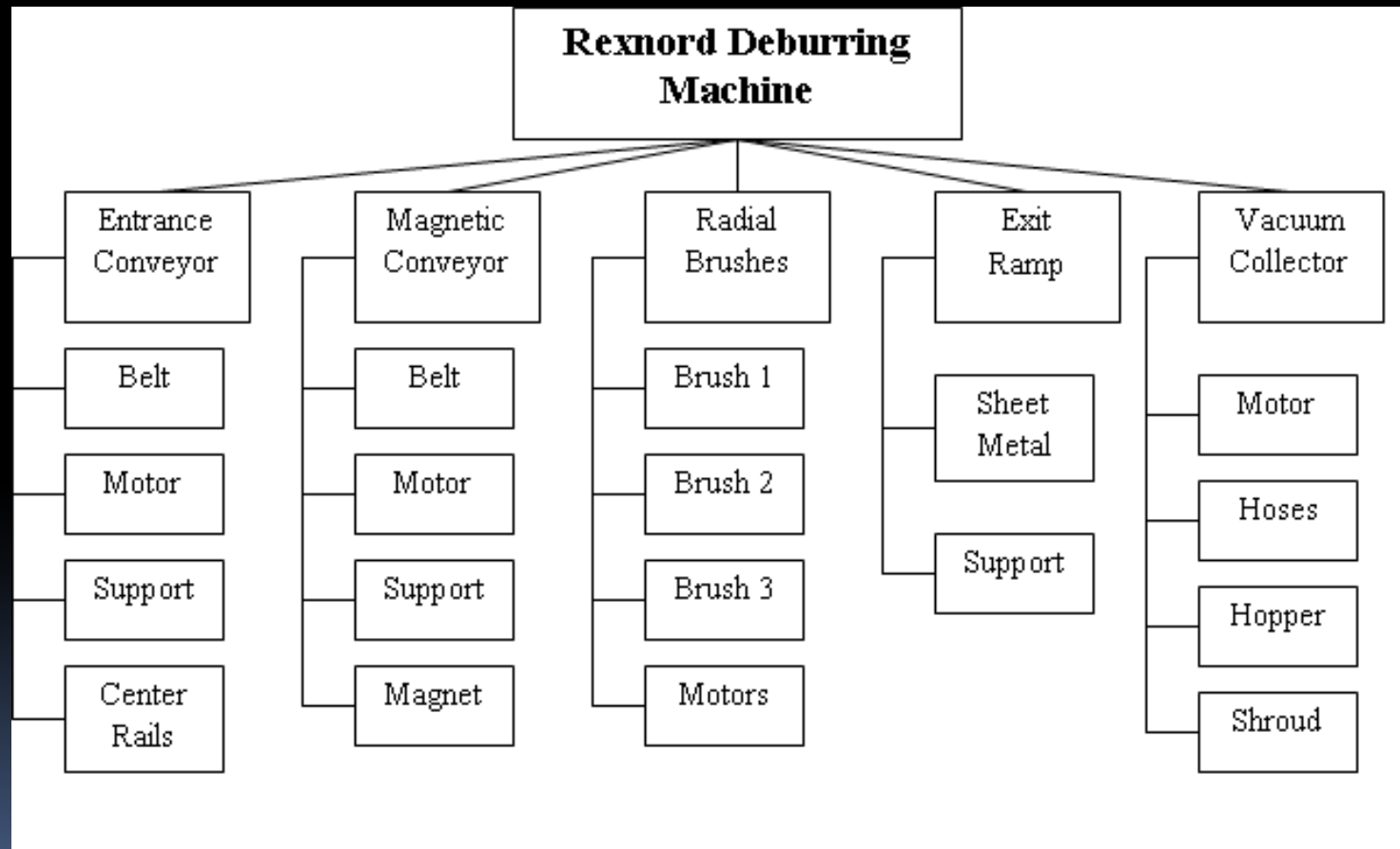


Physical Description

- Volume
 - Less than 4 feet tall
 - 1.5 feet wide
 - 9 feet long
 - Over all volume 54 cubic feet
- Weight
 - ~200 lbs
- Power
 - Electrical motors
 - 120 Volt source, 60 Hertz cycle.
- Brushes
 - Radial Axial brushes
 - Carbon steel
 - Tubular shape



Product Hierarchy



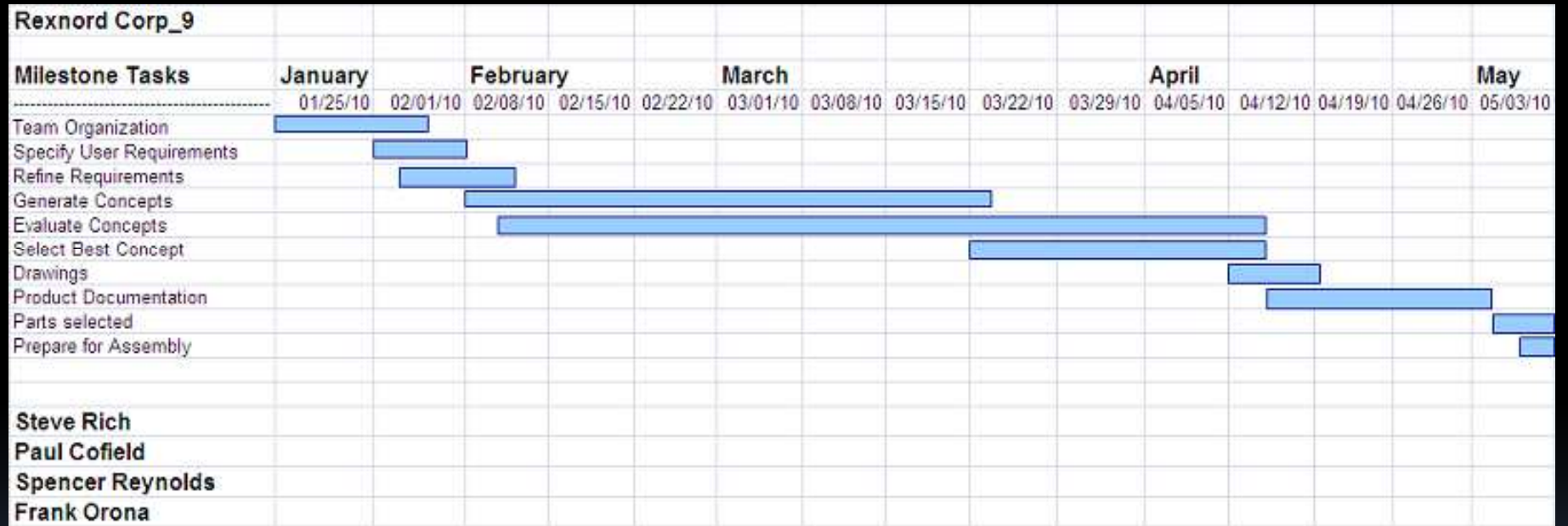
Bill of Materials (est.)

Design Type	Component	Quantity (While design in use)	Estimated Cost (Dollars)
Large Sanding Disc	Rotary Motor	1	750
	Sanding Disc	1	50
	Anti-slip Supports	2	5
	Pneumatic Ram	1	50
	Storage Ramp	1	20
	Vacuum System	1	66
	Total		941
Center Held with Rotation	Component	Quantity (While design in use)	Estimated Cost (Dollars)
	Centering Tool	2	30
	Rotary Motor	3	2,250
	Sanding Discs	2	50
	Storage Ramp	1	20
	Vacuum System	1	66
	Total		2416
Electromagnetic Conveyor	Component	Quantity (While desing in use)	Estimated Cost (Dollars)
	Conveyor Belt	2	2000
	Deburring Brushes	3	120
	electric motor	3	360
	Vacuum System	1	66
	Storage Ramp	1	20
Total		2566	

Risk Assessment

Rank	Risk Title	Risk Exp	Action	Risk Type	Status
1	Part leaves magnetic conveyor during deburring	Likelihood: Low Consequence: Hi	Research	Safety/ Technical	Magnetic conveyor strength is sufficient for all conditions
2	Part not centered on conveyor	Likelihood: Low Consequence: Mod	Research	Technical	Centering rails will correct path.
3	Part not deburred sufficiently	Likelihood: Low Consequence: Mod	Research/ Watch	Technical/ program	Speed adjustment on conveyor and brush motors
4	Brush wear	Likelihood: Low Consequence: Low	Watch	Organization	Brushes will need checking and replacement on scheduled intervals
5	Dust collector blocked	Likelihood: Mod Consequence: Low	Watch	Organization	Hopper will need to be emptied on a timely basis for proper maintenance

Estimated Timeline



Questions?

