

Project Update #1

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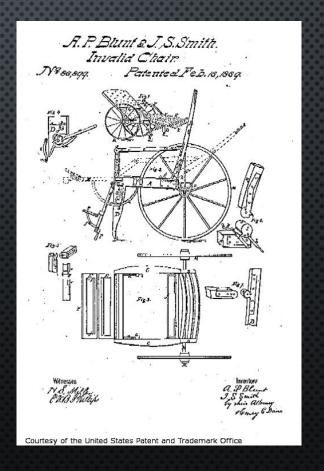


Wheelchairs have experienced little innovation

BATH WHEELCHAIR, 1783



PATENT FOR REAR-PUSH WHEEL, 1869





SELF-IMPOSED ENGINEERING AND DESIGN REQUIREMENTS

- Wheels must be lightweight, under 7 pounds each
- Wheels must be quick release an easy to take on and off
- Wheels must be rugged/durable (over 1 million average cycles per year)
- Design must allow for easy use of multiple wheel sizes (22 inch, 24 inch, 25 inch, 26 inch)
- Develop Components and Use manufacturing processes need to be design to lower cost of production as much as possible
- ROLLING RESISTANCE AND FRICTIONAL LOSSES MUST BE MINIMIZED
- ALWAYS DFM/DFA
- Wheels must be visually appealing



Rowheeling is the right way to roll





Integrate multi-gear capability with existing

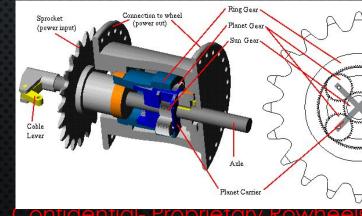
Rowheels

Develop a 3-speed bicycle hub-like system that allows the user to switch between high (4:3) and low (3:4) gear rowheeling and 1:1 push-wheeling

- Evaluate the feasibility of Inverting high and low GEAR RATIOS WHILE MAINTAINING THE 1 TO 1 DIRECT DRIVE
- REDESIGN THE PLANETARY GEAR SYSTEM SO THAT THE HIGH AND LOW GEARS ARE REVERSE DRIVE
- Design a Sturmey-Archer style three speed hub THAT, WHEN FEASIBLE, REUSES AS MANY COMPONENTS FROM A STANDARD COMMERCIAL THREE SPEED HUB AS POSSIBLE OR INCORPORATES STANDARD OFF-THE-SHELF PARTS/COMPONENTS



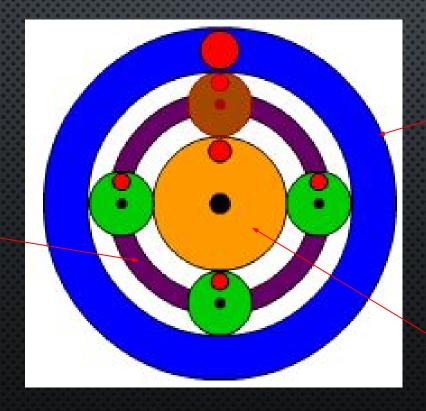






HOW ROWHEELS REV WHEELS WORKS

Planet carrierfixed connected to chair



Ring gear-Input (High gear) Connected to handrim Output (Low gear) Connected to wheel

Sun gear-Input (Low gear) Connected to handrim Output (High gear) Connected to wheel



Needs Assessment

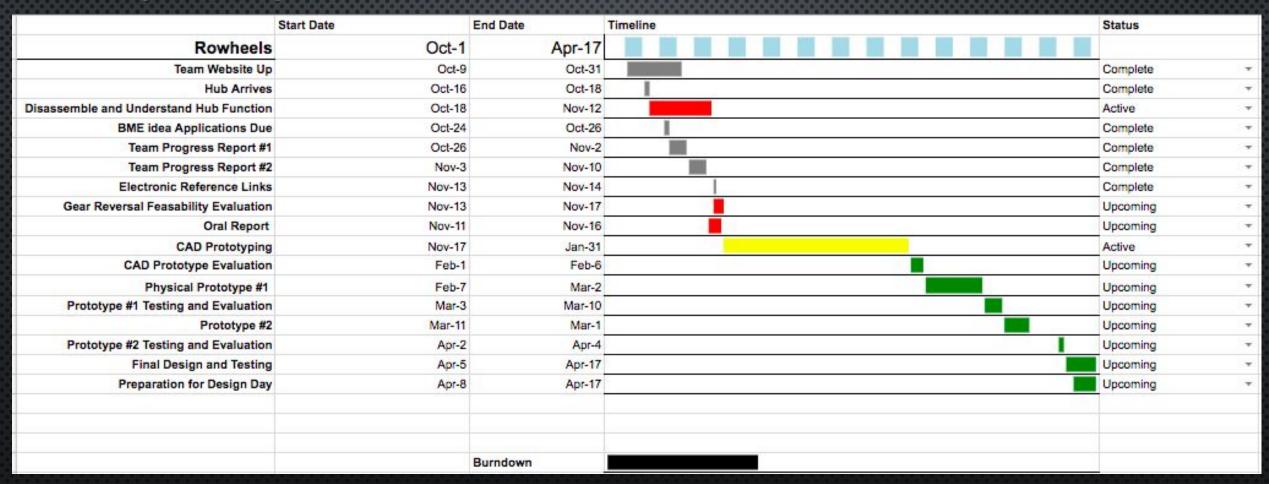
- Physical Features
 - SWAP BETWEEN
 HIGH(1.33:1) AND
 LOW(0.75:1) GEAR RATIOS
 - MINIMIZE ROLLING
 RESISTANCE/FRICTIONAL
 LOSSES
 - SHOULD FIT CURRENT ROWHEEL MODELS
 - ACCESSIBILITY FOR MAINTENANCE

- Cost
 - LONGLIFESPAN/DURABILITY
 - Low Maintenance
 - Mass Production

- SAFETY
 - ENCLOSED GEARS
 - GEARS SHOULDN'T JAM



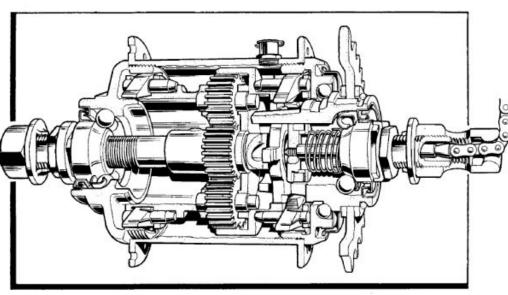
Gantt Chart





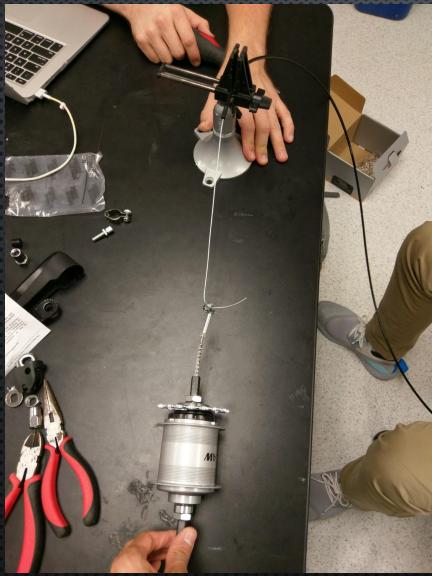
Sturmey-Archer 3-speed Hub

























THANK YOU!

