ME 486C Kinetic Sculpture 2018-2019 Team 18F02 Kinetic A

MIDPOINT PRESENTATION

Holden Chapin, Joshua Glenn, Dylan Lovato, Jonathan Walgren

PROJECT DESCRIPTION

Dylan Lovato March 11, 2019 Kinetic Sculpture Team 18F02 Kinetic A

- Create a kinetic sculpture that showcases at least 3 engineering characteristics
- Main CR's: represent engineering characteristics, aesthetically pleasing, and reliable



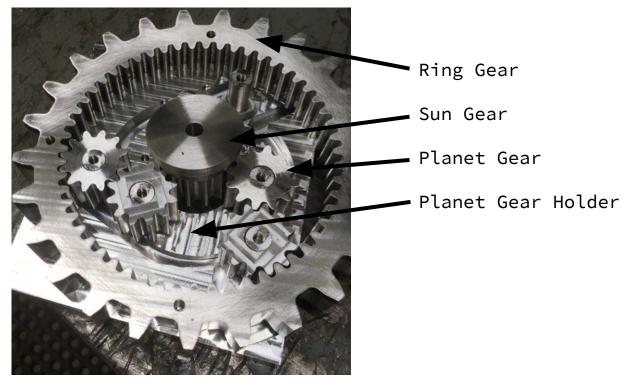




Worm Gear

PROJECT DESCRIPTION (CONT.)

Dylan Lovato March 11, 2019 Kinetic Sculpture Team 18F02 Kinetic A





UPDATES

Joshua Glenn March 11, 2019 Kinetic Sculpture Team 18F02 Kinetic A

- Melted 1480 aluminum cans into 42 (around) ½ pound aluminum ingots
 - \circ 7 hour process
 - \circ $\,$ Created 34 lbs of slag $\,$
- CnC process has been initiated for the major components and is over half way complete





UPDATES (CONT.)

Joshua Glenn March 11, 2019 Kinetic Sculpture Team 18F02 Kinetic A



- 2 week setback
- \circ $\;$ Inner walls of foundry destroyed
- \circ Third flawed crucible given by supplier
- Redesign: ½ Scale Model
 - \circ Options were to 3D print or scale down project
 - \circ $\,$ Client (Dr. Oman) chose to half scale the project





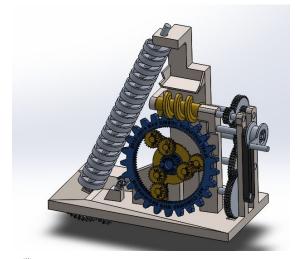






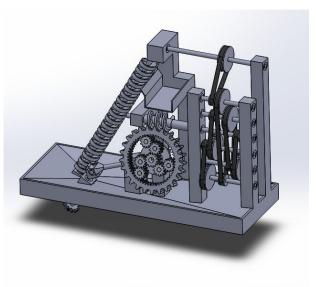
UPDATES (CONT.)

Old Model



Joshua Glenn March 11, 2019 Kinetic Sculpture Team 18F02 Kinetic A

New Model





MOVING FORWARD

Jonathan Walgren March 11, 2019 Kinetic Sculpture Team 18F02 Kinetic A

Analytical Analysis

- Belt Life Cycle Analysis Shortest belt life is 406 hours and longest is 10,700 hours
- Scissor Lift Analysis Allows us to find the force required for a hydraulic to lift the sculpture
- Surface Treatment Analysis Carburizing and Tempering are not time effective, Shot Peening is likely to Create added friction throughout system
- Main Gear Set Power Analysis Allows us to control the flowrate of the oil in the Archimedes Screw



MOVING FORWARD (CONTD.)

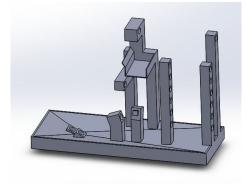
Manufacturing Left

Archimedes Screw – Manufactured with sheet metal and a steel rod

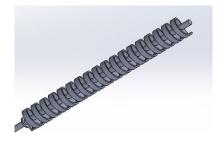
Frame - Manufactured with 1.5" X 1.5" square tubing and plexiglass

- Stand Manufactured with 1.5" X 1.5" square tubing and sheet metal
- Gears Some gears still need to be Machined from Aluminum

Plaque - Engraved with engineering principles with CNC mill



Jonathan Walgren March 11, 2019 Kinetic Sculpture Team 18F02 Kinetic A





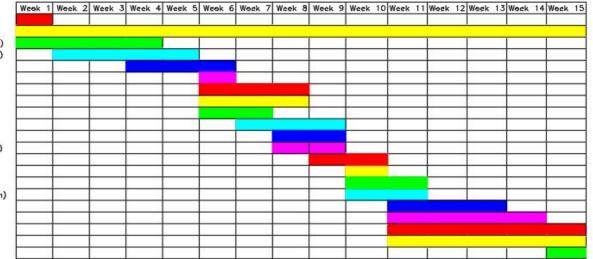


Schedule and Budget

Holden Chapin March 11, 2019 Kinetic Sculpture Team 18F02 Kinetic A

Previous Gantt Chart

Individual Post Mortem (All) Website Generation (Josh) Aluminum Can Collection (Josh) Aluminum Ingot Production (All) Casting of Components (All) Initial Test Run (All) Anodize Parts (Dylan) Machine Parts (Jonathan) Analytical Analysis (All) Construct Stand (Jonathan) Engrave Plague (All) Construct Remaining Parts (All) Final Assembly (Jonathan) Final Test Run (All) Design Poster (Holden) Design Operation Manual (Dylan) Final Report (All) Final Poster (All) Bill of Materials (Holden) CADD Package (Jonathan) Peer Evaluation (All)





SCHEDULE AND BUDGET (CONT.)

Holden Chapin March 11, 2019 Kinetic Sculpture Team 18F02 Kinetic A

Updated Gantt Chart

Individual Post Mortern (All) Website Generation (Josh) Aluminum Can Collection (Josh) Aluminum Ingot Production (All) Attempted Costing of Components (All) Complete Redesign (Jonathan) Redesign Approval (All) Analytical Analysis (All) Machine Main Gear Set (All) Machine Other Gears (Jonathan) Construct Stand and Frame (AI) Engrave Plague (All) Final Assembly (Jonathan) Final Test Run (All) Design Paster (Holden) Design Operation Manual (Dylan) Final Report (All) Final Poster (All) Bill of Materials (Holden) CADD Package (Jonathan) Peer Evoluction (All)





SCHEDULE AND BUDGET (CONT.)

Currently Spent

Total: \$1699.24 Prototype: \$190.01 Foundries: \$213.91 Casting Process: \$402.60 Can Collection: \$21.94 Raw Materials: \$349.42 Timing Pulleys and Belts: \$413.75 Plaque: \$27.31 Wheels and Bearings: \$80.30



Holden Chapin March 11, 2019 Kinetic Sculpture Team 18F02 Kinetic A

Anticipated Expenses

Archimedes Screw: \$50.00 Steel For Frame: \$100.00 Plexiglass: \$100.00

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Total Budget: $2525
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Anticipated Total: \$1949.24

Remaining Budget: \$575.76

THANKS & SPONSORS



Special Thanks To:

Dr. Constantin Ciocanel, Dr. Stephanie Hurst, Dr. Michael V. Lee, Dr. Sarah Oman, Kay Pinto, Singne Slayton, Dr. Jennifer Wade

QUESTIONS?

