
WEEKLY SPONSOR COMMUNICATION

TO: VICTOR NUNEZ, AESCULAP
FROM: BRIAN LOUGHRAN
EDITOR: CASSIE CHRISTMAN
TEAM NAME AND NUMBER: AESCULAP 1
DATES COVERED IN THIS COMMUNICATION: NOVEMBER 20, 2016 TO DECEMBER 4, 2016
WEEK NUMBER: 13 OF 15

Overview

Due to our Thanksgiving break, this brief actually covers two weeks. As we are slowly moving toward the final presentation, we are making final design changes to all components of the distractor, and are integrating all the pieces into a final, comprehensive design.

Accomplishments

1. This week Christian continued design of the ratchet system. The design utilizes sets of adjoining teeth to cause interference in one direction, but not the other. Exhibit 1 shows this design.

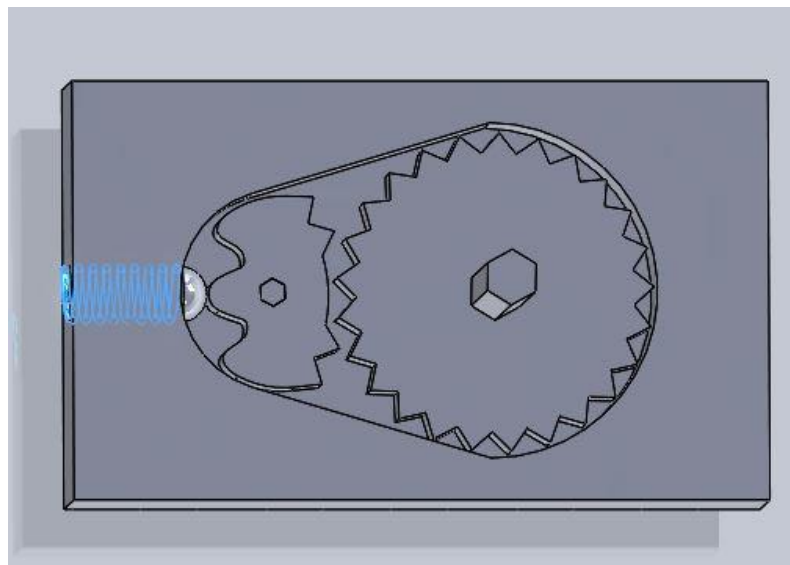


Exhibit 1 – Ratchet System Design

2. As a group, we have been interviewing people on campus to see what they think about our handle and system designs. Alexis interviewed a mechanical

engineering PhD student, who said he liked our wider handle design. Cassie spoke with Professor Cheng, a material science professor with a background in medicine, who was generally excited about the system design, but pointed out a few potential weaknesses in the structural design. We will make sure to keep an eye on these when we do our FEA. I spoke with Professor Dailey, a mechanical engineering professor with medical instrumentation experience, who was concerned with the financial aspect of the project and with design's sterilizability. To account for this, we did some more research on sterilization, and we are now beginning to brainstorm how to design for easy sterilization. In general, the feedback we received was positive, and we think we have some interesting topics to consider.

Next Steps

1. We will be 3D printing a large version of the ratchet system to easily show functionality during the final presentation. We will do this using the printers at Lehigh. Upon finalization of handle design, we will also print one more set of handles.
2. We will work on integrating the ratchet system design into the handles.
3. A second finite element analysis will be done on the whole system. Points of interest for the second finite element analysis include joints, the paddles, the scissor slider mechanism, and the ratchet system.
4. A dFMEA (Design Failure Mode Effects Analysis) will be conducted on the system to determine possible risk scenarios and to brainstorm ways to limit these.

Question(s)

1. Last semester you provided us with a financial estimate for production costs. We did have some design changes this semester, so we were wondering if we should change our cost estimates. Our bill of materials is included below in Exhibit 2 for your convenience.

| Item | Build/Buy | Quantity | Cost per Part |
|----------------------|-----------|----------|---------------|
| Handle | Build | 2 | \$525 |
| Measuring Rod | Buy | 1 | \$300 |
| Ratchet Assembly | Buy | 1 | \$500 |
| Impaction Handle | Build | 1 | \$350 |
| Scissor Sliders | Build | 2 | \$100 |
| Distraction Rods | Buy | 2 | \$100 |
| Paddle Quick Connect | Buy | 2 | \$100 |
| Paddle | Build | 2 | \$350 |

| | |
|--------|------|
| Total: | 3500 |
|--------|------|

Exhibit 2 – Bill of materials