

Concept Generation and Selection

Dental Hygiene 3

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ME476C

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March 22nd 2017

Introduction

- i. Project Description.
- ii. Designs Considered .
- iii. Designs selected .
- iv. Schedule and Budget.

Project Description

- ▶ A dental triturator mixes dental capsules content.
- ▶ Dental capsules are used for dental fillings.
- ▶ Existing dental triturators are electrical
- ▶ Project aims to make a manual dental triturator that is hand driven.
- ▶ Project black box is shown in the next slide.

Black box Model

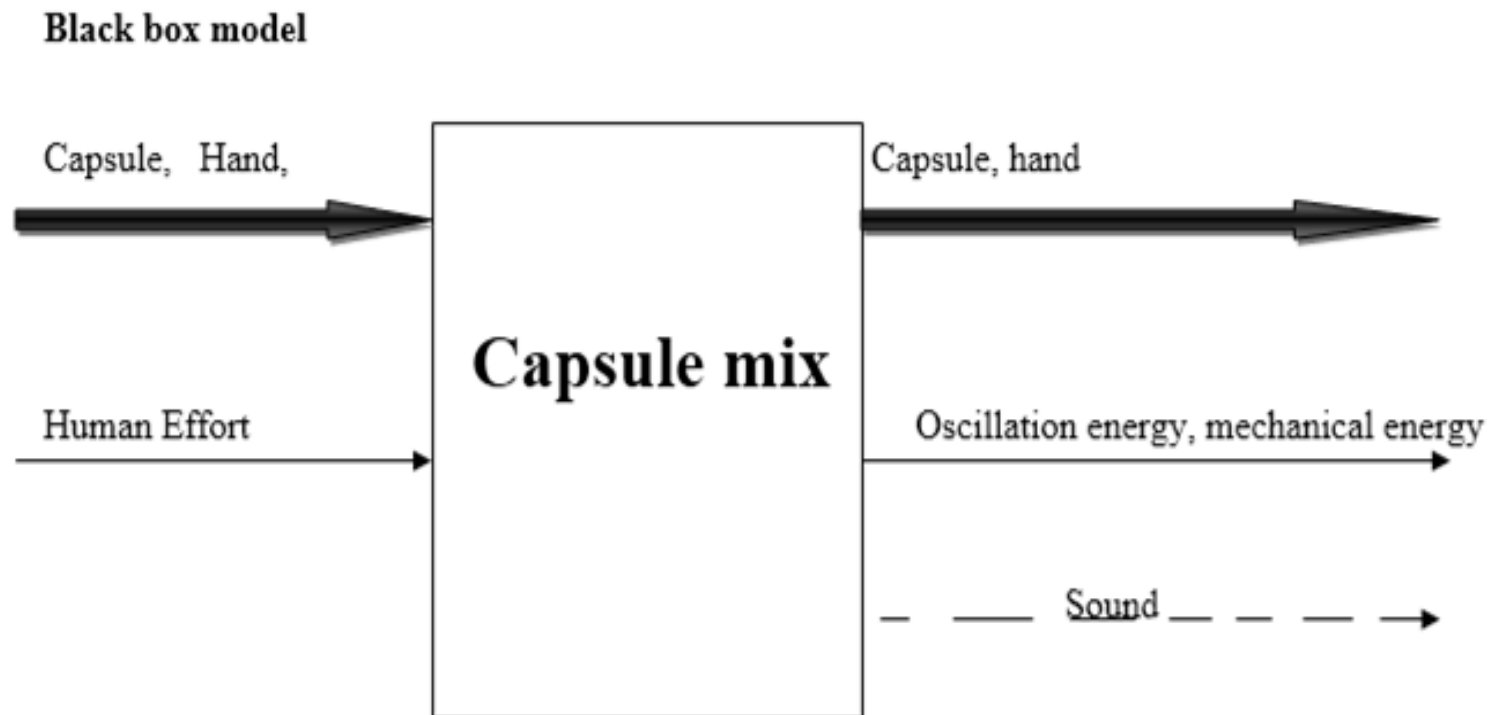


Figure 1

Designs Considered

Mixacap dental triturator

- ▶ Uses a spring for effort transmission and a screw as effort lever
- ▶ The side screw is turned by hand to transmit a vibration of the capsule

Disadvantage:

- ▶ Needs lots of effort
- ▶ Takes time before it mixes capsule

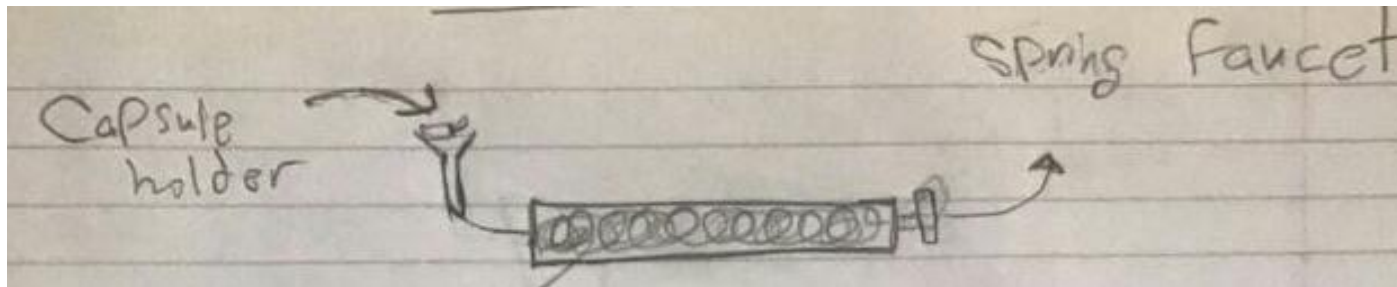


Figure 2

Vibratory model

Made of a metal frame that stands on springs

Operated through side displacement by hand effort

Disadvantage

Little mixing power

Large Size

Advantage

Stability when being used

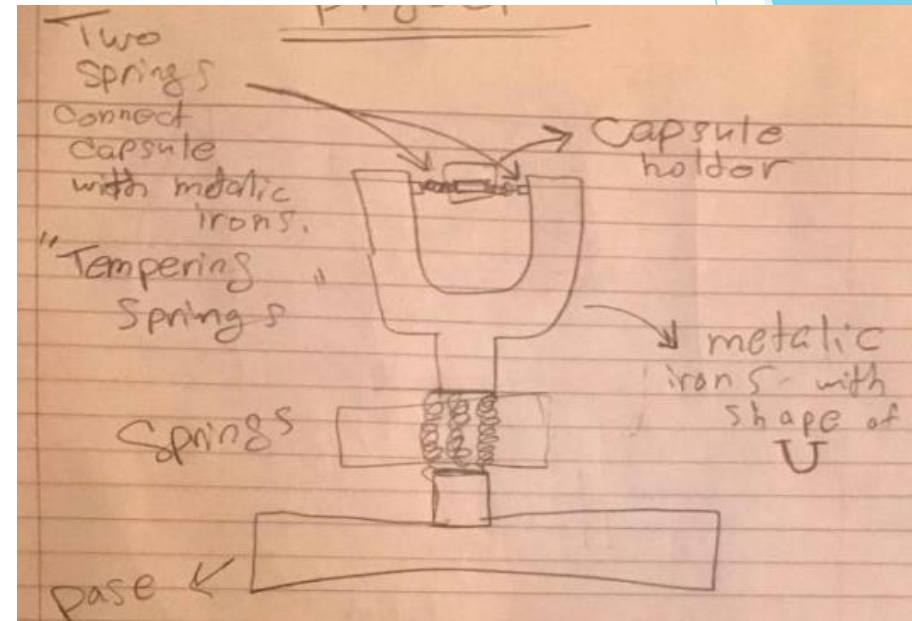


Figure 3

Gear Triturator

This model use gears to operate.
Initial effort is provided by human energy.

Advantages:

Takes less time to mix
Multiplication of effort

Disadvantage:

Huge and big size.

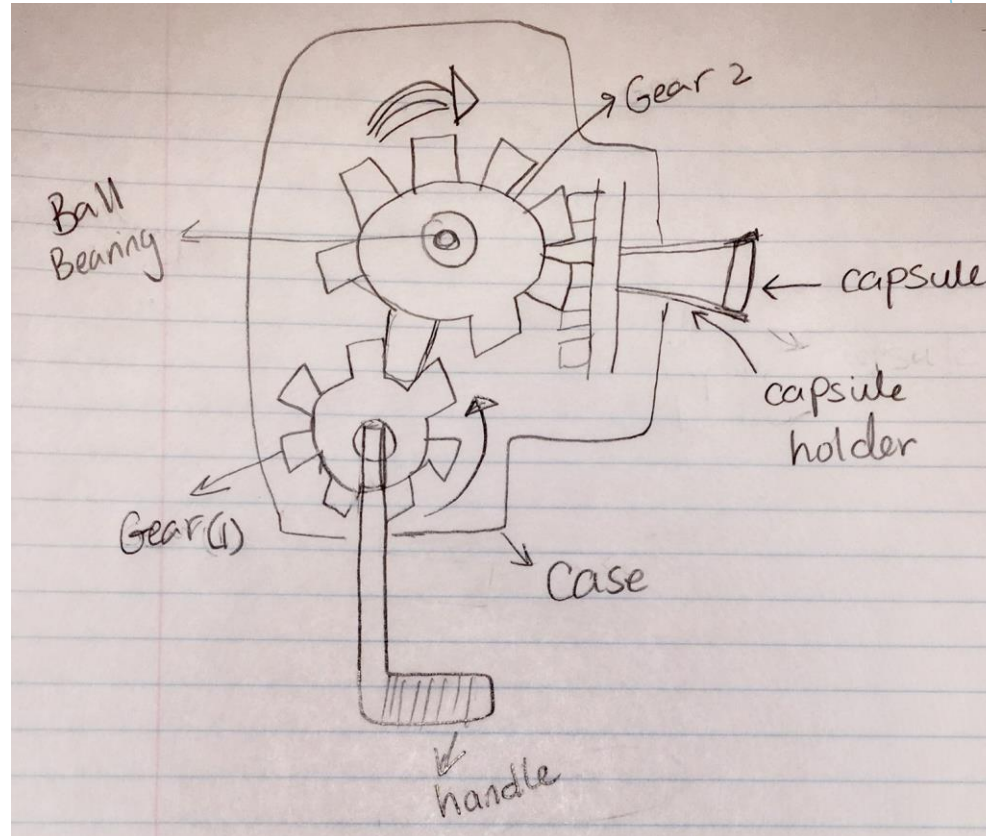


Figure 4

Solar Panels Triturator

This model is about to connecting the original triturator which is in the market, to work with solar energy instead of electric.

Disadvantage

Large size

Advantage

- Easy to use
- Satisfies the engineering & customer requirements

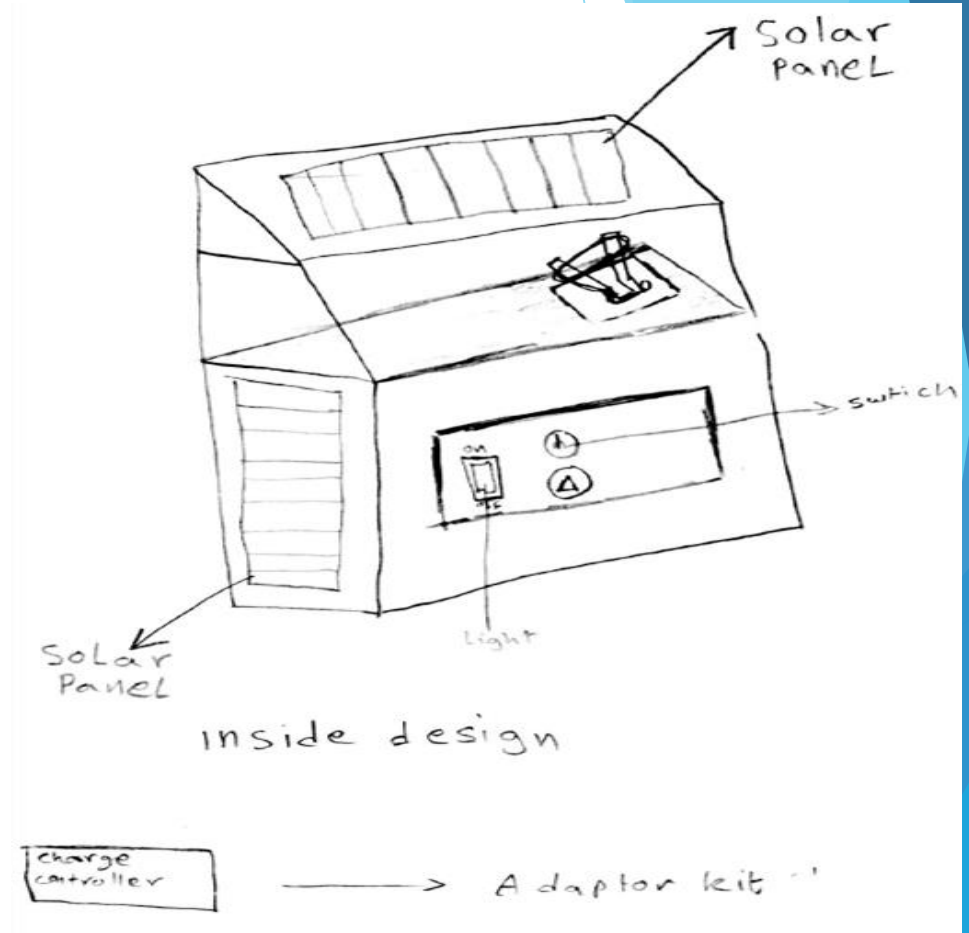


Figure 5

Spring Triturator

Spring box model is about an clear box cover uses two springs in two opposite corners. Using tension and expression power.

Disadvantage

Time consuming

Advantage

light weight, easy to use

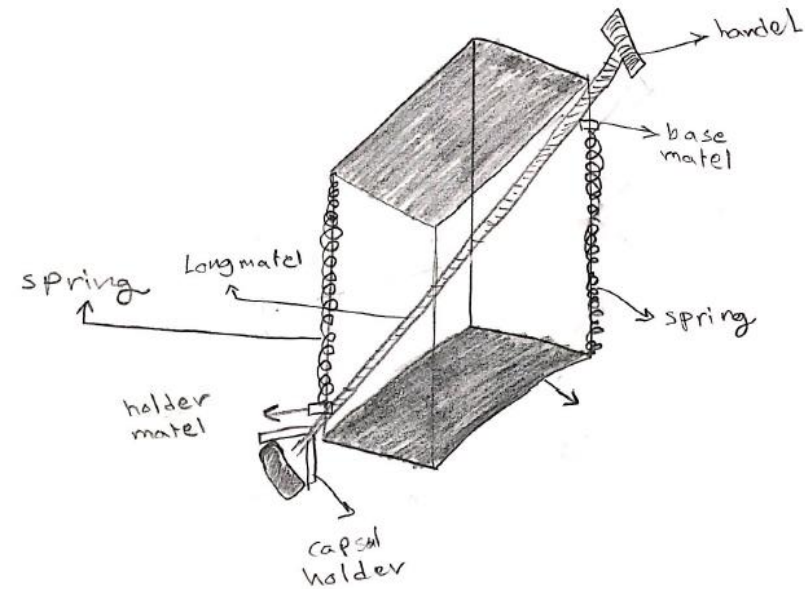


Figure 6

Design Selected

Gear Triturator

This is one of the best models considered

Selection qualifications

- ▶ Uses human energy to operate
- ▶ Portable for use
- ▶ Uses minimal effort
- ▶ Light in weight
- ▶ Transparent compartment

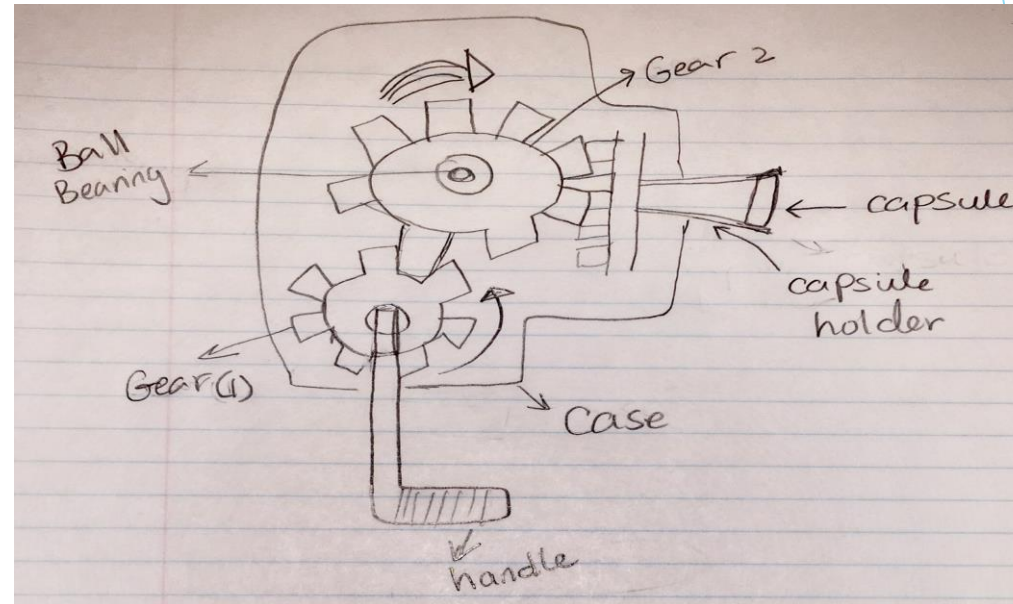


Figure 7

Design Selected

Solar panels triturator

Selection qualifications

- ▶ Easy to use and convenient
- ▶ Portable for use
- ▶ Operates using a renewable energy.
- ▶ Light weight
- ▶ Dependable

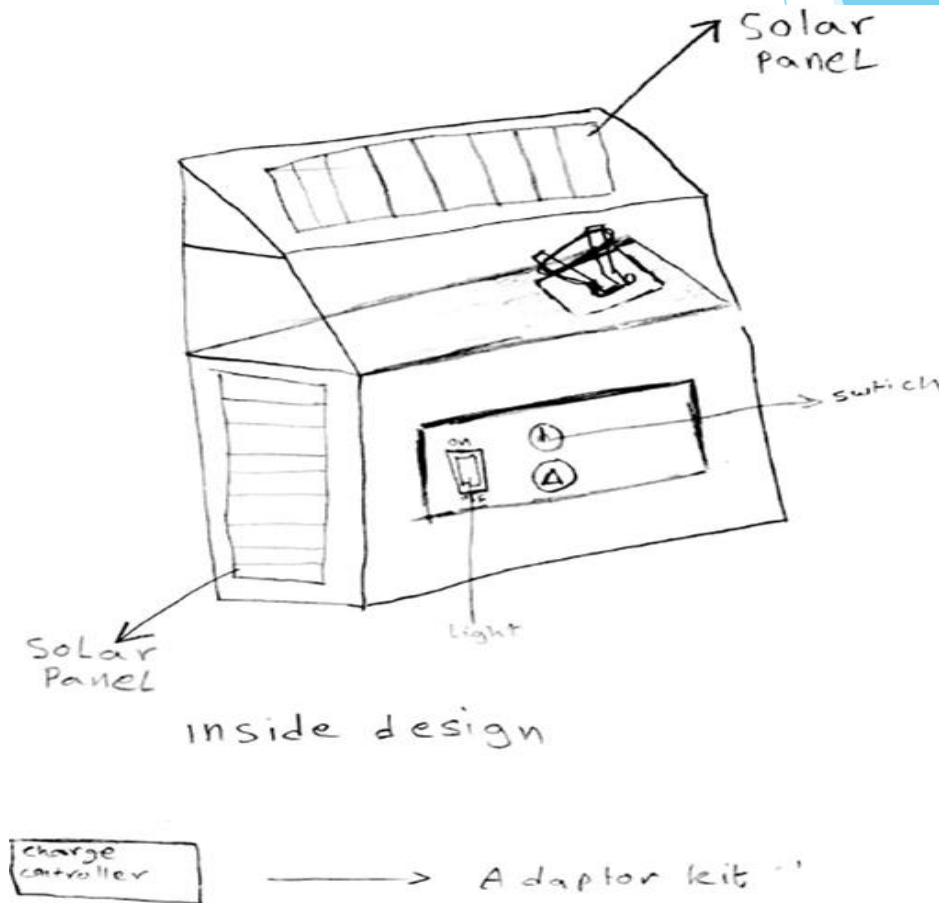


Figure 8

Schedule & Budget

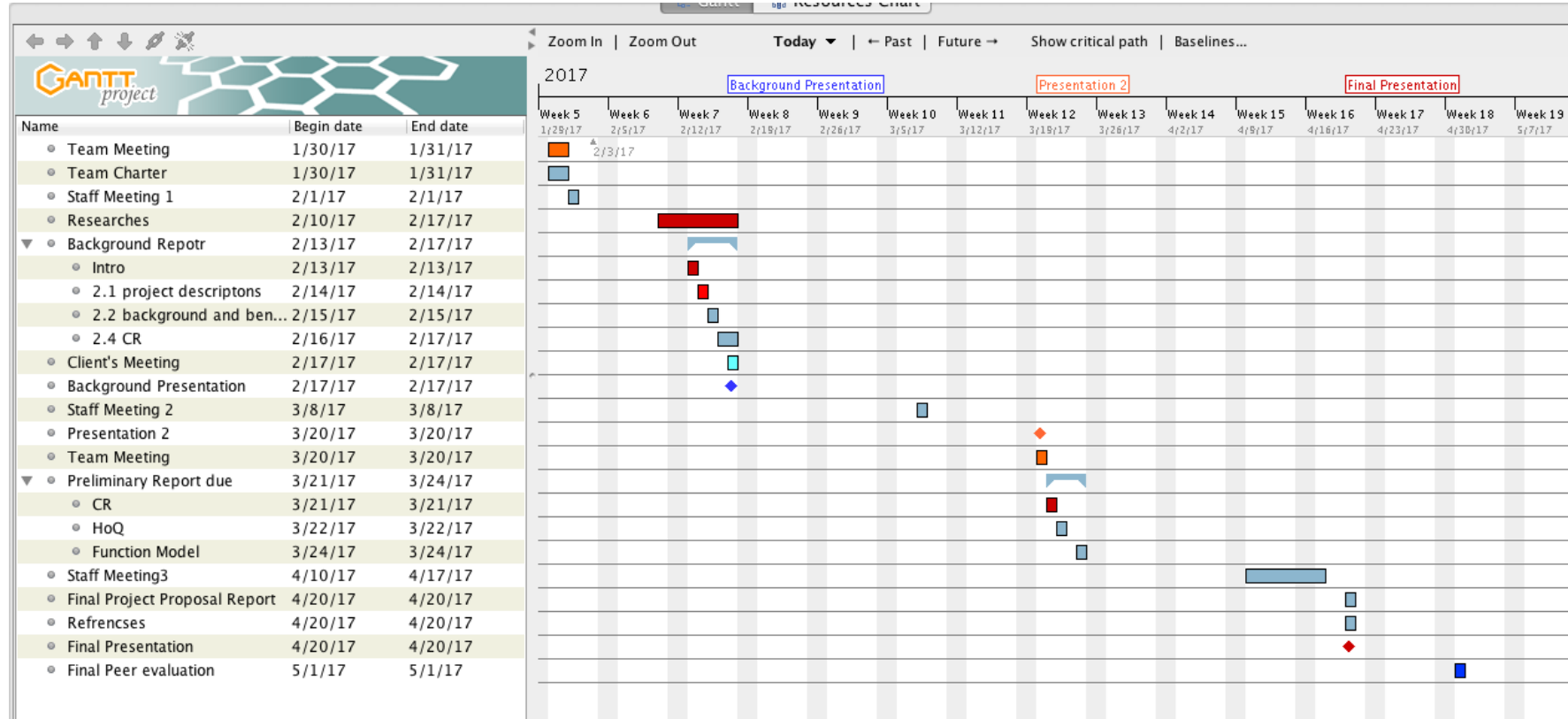


Figure 9

Budget

- ▶ Overall Budget us \$750
- ▶ The market price is capped at \$250 for dental triturator
- ▶ Our estimates are at \$250 for the total materials needed for the device
- ▶ Manufacturing parts is estimated to be \$150
- ▶ Remaining \$350, and it will be used for urgent changes in our design.

Any Questions?