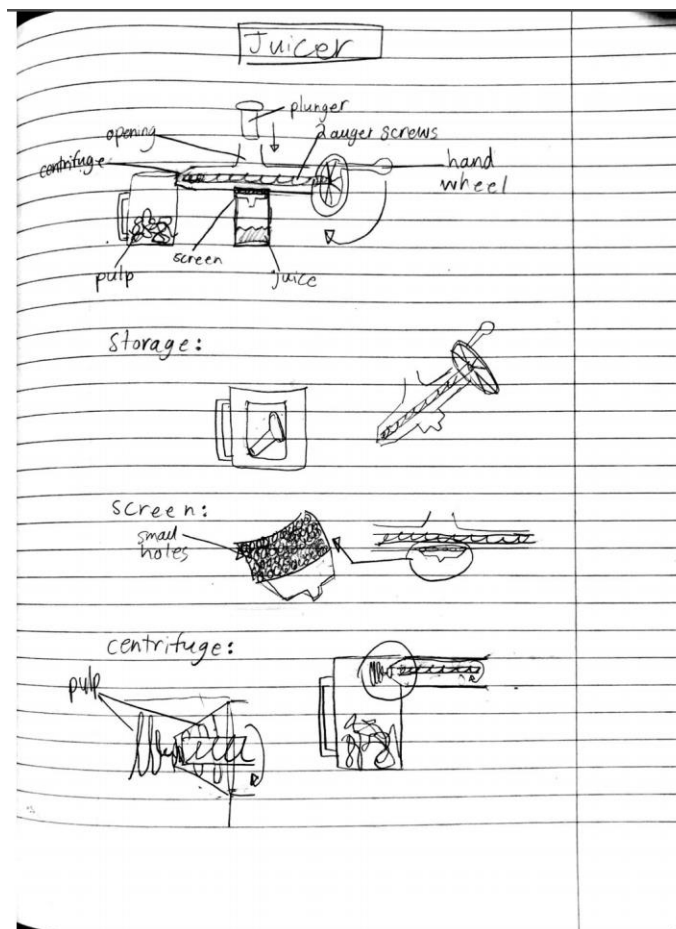


Objective of Design

The objective of this design is to create a manual juicer. The juicer should use an auger screw mechanism to extract juice from fruit and vegetables. In addition, the juicer should have minimal volume, so it is cheap to produce. Furthermore, the juicer should have an appearance that appeals to consumers.

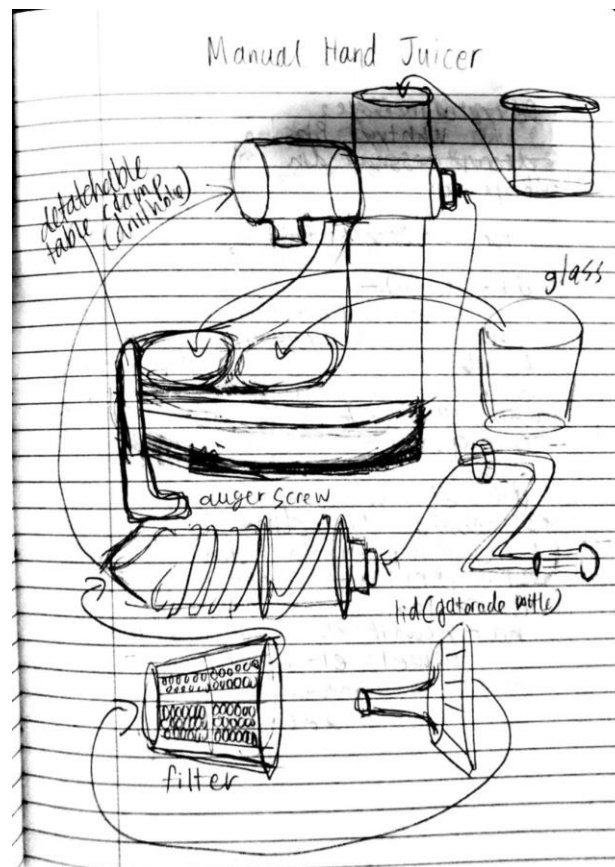
Concept Selection and Functionality

The following picture shows sketches of the original design.



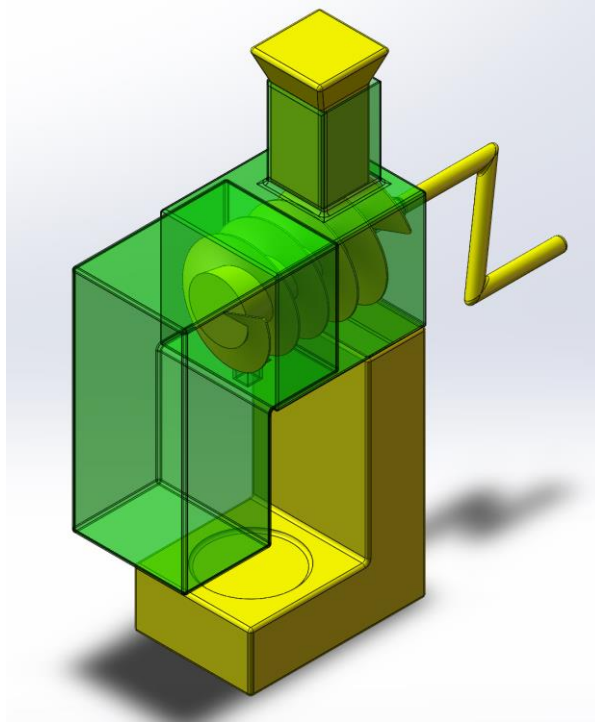
The main goal of the original design was to minimize volume. However, the attempt to minimize volume led to some functionality issues. The design lacked a mounting mechanism, and the hand wheel was an unnecessary accessory. Thus, a new design was created to mitigate

these issues. The following picture shows the conceptual design sketches used to develop the final juicer.



The surface area of the base in contact with the table mitigated the previous need of a mounting mechanism. The use of a simple hand crank instead of a hand wheel decreased the volume and improved the functionality of the auger screw. The auger screw itself was tapered from the previous design, which improved its functionality as well. A filter was also added to this new design to separate the juice from the pulp. Over, the asymmetry and the simplicity of this design significantly improved the aesthetic appeal of the juicer.

This design was used to create the final juicer. The following picture shows the profile of the final juicer with colors added to enhance the juicer's visual appeal.



Assembly Procedure

Most of the parts have a clearance of .1” from each other. As a result, the parts fit together securely during use, and still separate after use for storage. The following animation demonstrates how the juicer is assembled and taken apart.

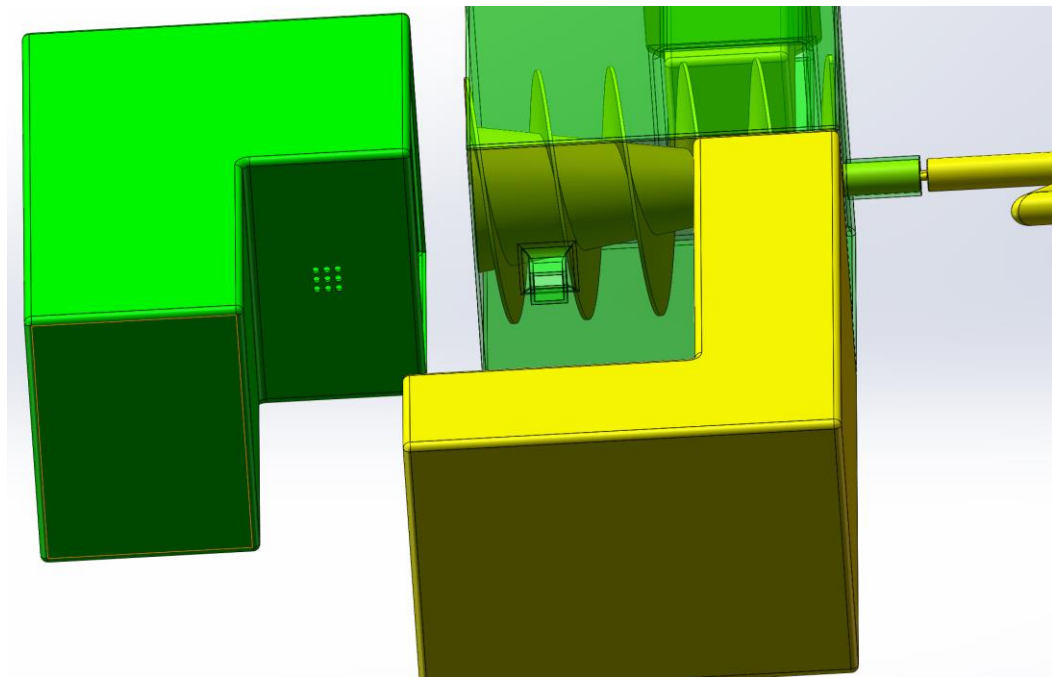
[Smith Bennett juicer exploded animation.avi](#)

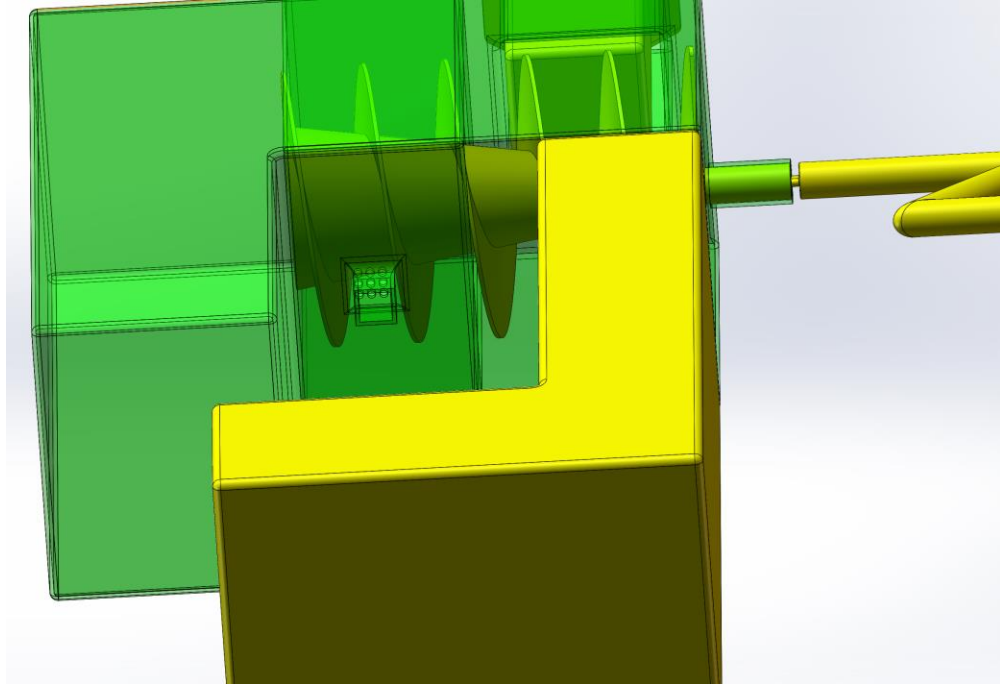
The juicer can be easily operated manually. The user simply pushes fruits or vegetables into the auger chamber with one hand, and simultaneously turns the hand crank with the other hand. The following animation demonstrates how the auger screw mechanism operates.

[Smith Bennett juicer rotate screw.avi](#)

The auger screw cuts up the produce and moves it down the auger chamber toward the filter and the pulp collector. The auger screw tapers out toward the end of the auger chamber, which helps squeeze the juice out of the produce and into the juice hole. The juice hole is located 1” away from the end of the auger chamber, and by the time the produce reaches the

juice hole its juices have been extracted. The filter covering the juice hole ensures that the juice is pulp free. The continuous circular motion of the auger screw ensures the pulp gets pushed into the juice collector. The pulp collector can be removed easily from the auger chamber because the two parts have a clearance of .1". The pulp can then be disposed, and the filter can be cleaned. The filter is simply holes cut into the face of the pulp collector that contacts the bottom face of the auger chamber. The location of the holes is such that when the pulp collector is slid into the auger chamber, the holes are positioned over the top of the juice hole. The following pictures illustrate this process clearly.





Conclusion

The design of the final juicer accomplishes many of the initial design objectives. The volume of the juicer is minimal, the appearance of the juicer is enticing to consumers, and the operation of the juicer is simple and safe. The geometry of the parts ensures the juicer will be easy to clean and maintain. One potential flaw is that the juicer lacks a mounting mechanism. However, the surface area of the base in contact with the table should enable the juicer to be functional without a mounting mechanism.