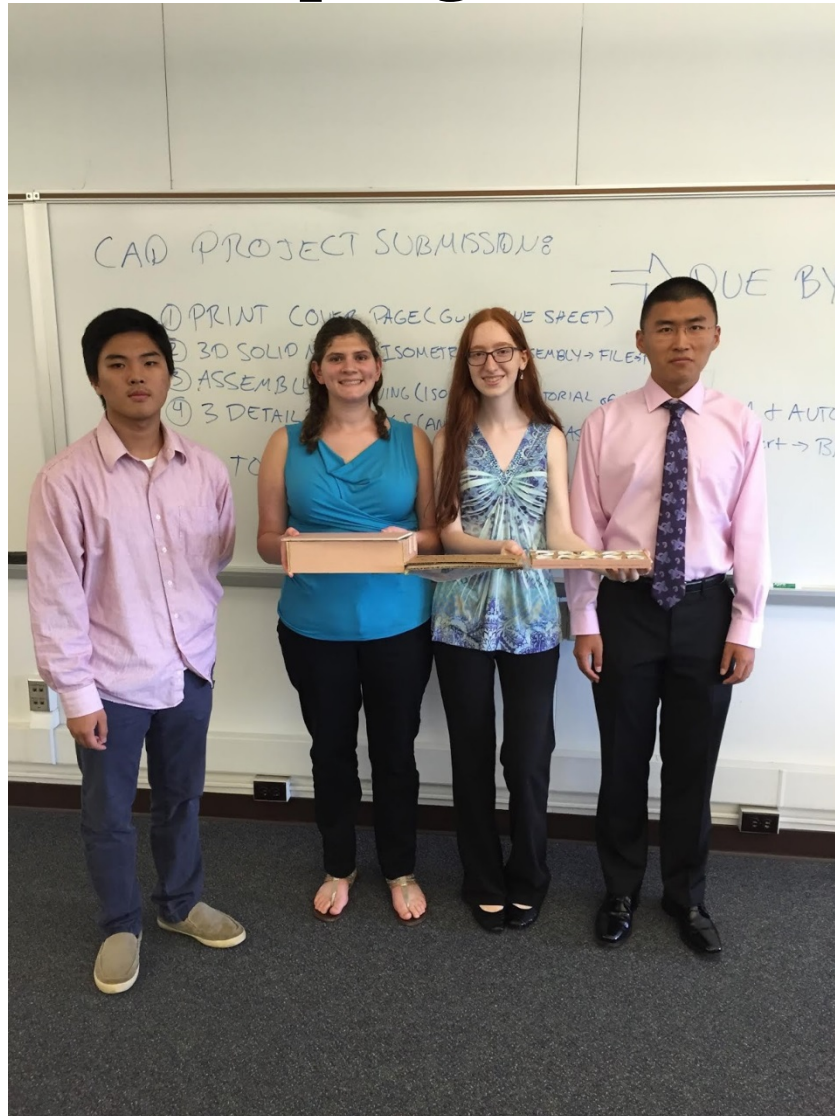


Engineering Design 100
Section: 204
Professor: [Xinli Wu](#)
Group 7

Dumplmatic: Semi-Automatic Dumpling Maker



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Introduction:

In this Section 204 Engineering Design 100 class, Professor Xinli Wu instructed seven groups to build either an automatic or semi-automatic dumpling maker. The dumpling makers had instructions on what it should be like. The criteria for the dumpling makers were that it had to produce at least 10 dumplings per minute, make its own dough, should cost at most two-hundred dollars, be dishwasher safe, easy to use, and easy to maintain. Each group was to follow the guidelines of the engineering design process (research, brainstorm, test out ideas, select an approach, build, etc.) to come to their final dumpling maker. At the end, each group should have developed their own prototype and a final report, showing their individual process to come to their design.

Abstract:

Group 7 constructed a semi-automatic dumpling maker called Dumplmatic, which exceeds in the requirement of making fresh dumplings in under a minute and being easy to use. Dumplmatic can efficiently make dough with the bowl and whisk. Furthermore, it can take that dough and make it into the perfect dumpling dough with its three roller system and cutters. Finally, it can make the dumplings with the two filler system for the filling and sealers to close the dumpling into a nice shape. It is semi-automatic only for the part where the user would have to pull the cutters down and sealers up. After going through the engineering process, group 7 decided this was their best design. Here it there Dumplmatic.

Problem Statement:

The problem was that people were spending too much time and effort to make and cook dumplings for either their household or restaurant.

Mission Statement:

Our mission was to create an automatic dumpling maker that would cook at least ten decent dumplings in under a minute, cost under \$200, and would be dishwasher safe and easy/safe to use.

Design Specifications

1. Either automatic or semi-automatic.
2. Produce at least 10 dumplings per minute.
3. The cost for the dumpling maker should be at most \$200
4. Should be dishwasher safe
5. Easy to maintain and safe to use

Customer Needs Assessment

Would you prefer a semi-automatic or an automatic dumpling maker? Why?

Person 1: I would rather have a semi-automatic dumpling maker because it allows for more control.

Person 2: Either one if it didn't take too much time to make a dinner size amount of dumplings.

How much would you be willing to pay for a dumpling maker?

Person 1: \$15-\$20

Person 2: \$50-\$100

Would you buy an automatic dumpling maker (if you enjoy dumplings)?

Person 1: Yes, but I would prefer semi-automatic.

Person 2: Yes

Does the appearance of the dumplings matter? Do you prefer wrinkled edges or flat edges?

Person 1: Wrinkled edges, but appearance doesn't matter that much.

Person 2: Would be nice if a variety of shapes could be made.

Do you prefer smaller dumpling, average size dumplings or large dumplings?

Small--width=1.5in Medium—width=2-2.5in Large=3+ in

Person 1: Small to medium

Person 2: Average to large

How small would you like the dumpling maker? (Compared to an average waffle maker)

Person 1: About the same size as a waffle maker, if not a bit smaller.

Person 2: About the size of a large coffee brewer.

What do you look for in a dumpling maker?

Person 1: Control/not relying entirely on the maker; having it be simple and easy to use but still efficient.

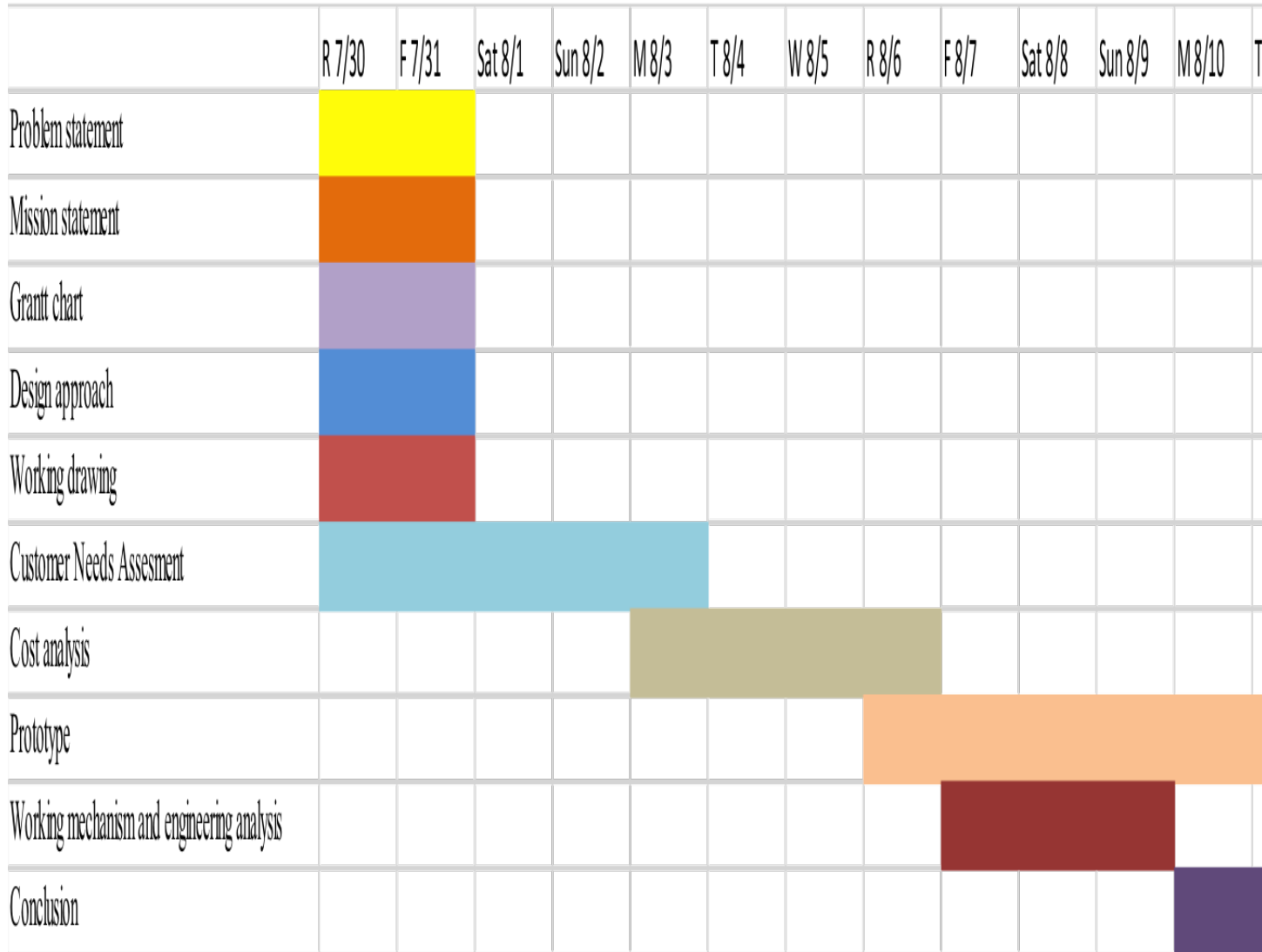
Person 2: Ease of operation, and how well the dumpling's turn out.

Would you like the dumpling maker to make the filling?

Person 1: No

Person 2: That would be an added convenience.

Gantt Chart:

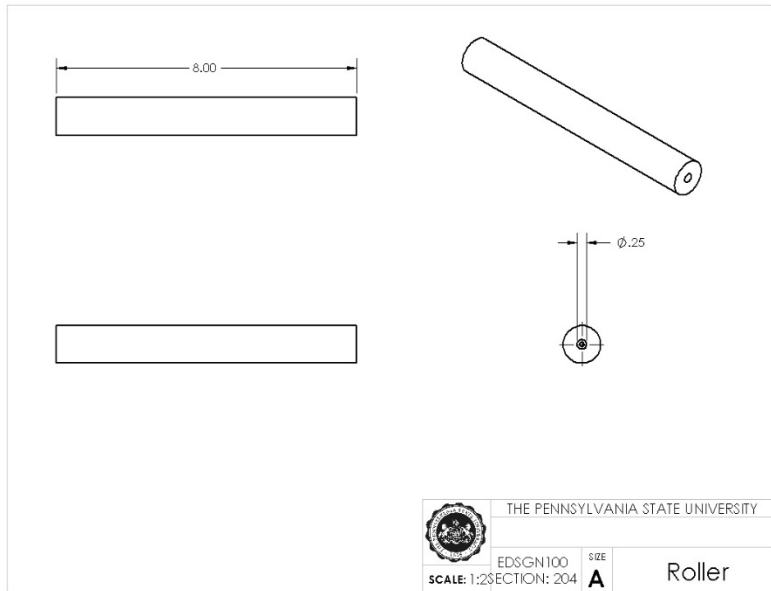
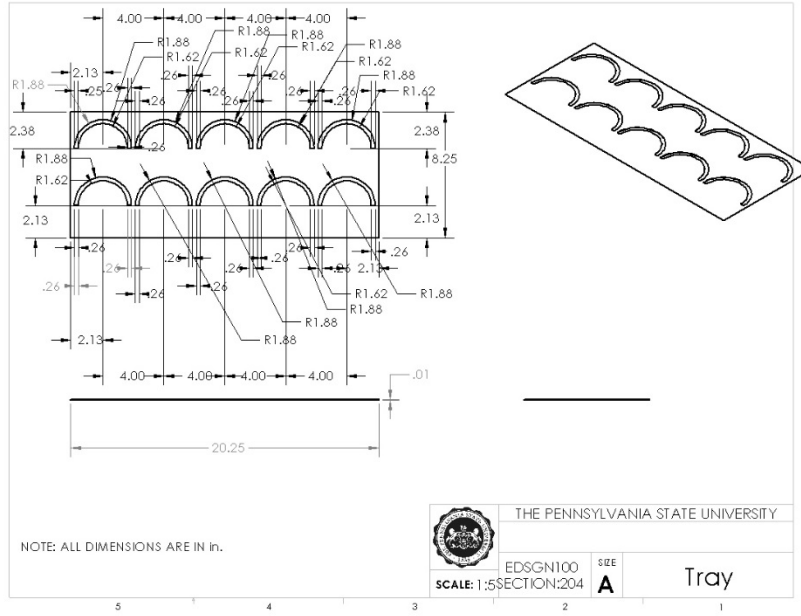


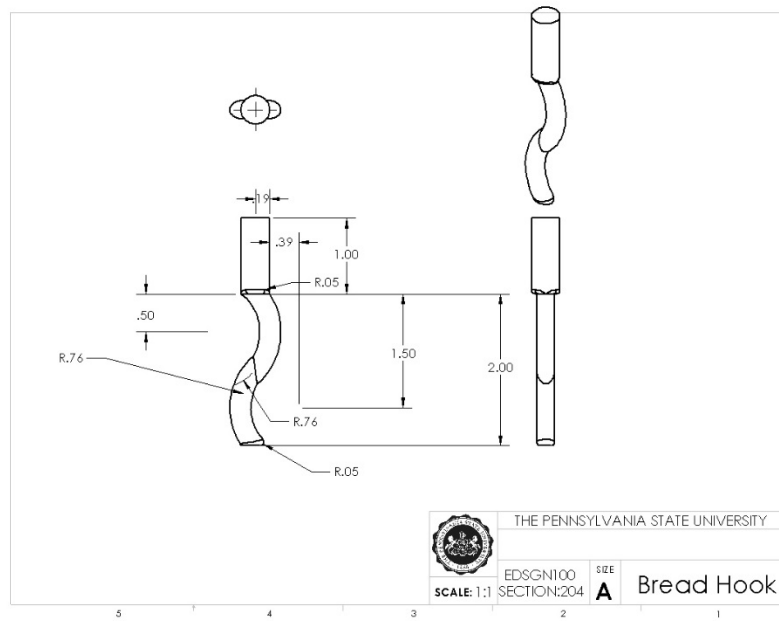
Design Matrix:

	The Towering Dumpling Maker	The Bulk	The Clamper	Pull the lever Krank	The Dumper	Dumplmatic
Ease of use	-	0	+	0	+	
10 dumplings per minute	-	-	+	-	-	
Cost under \$200	0	0	0	+	-	
Dishwasher safe	+	0	+	+	0	
Easy to move	-	-	-	+	+	
Appearance	0	0	-	+	+	
Makes the dough	-	+	0	-	-	
Safe to use	0	0	+	+	+	
Sum of -'s	-4	-2	-2	-2	-3	
Zeros	3	5	1	2	1	
Sum of +'s	1	1	4	5	5	
Total	-3	-1	2	3	2	
Rank	5	4	3	2	3	
Continue?	No	No	Yes	Yes	No	Yes

	Weight		Pull the lever Krank		Dumplmatic		The Clamper
		Rating	Weighted Score	Rating	Weighted Score	Rating	Weighted Score
Ease of use	25%	1	4	1	4	1.25	
10 dumplings per minute	25%	0.75	3	1.25	5	1	
Cost under \$200	20%	0.8	4	0.75	3	0.75	
Dishwasher safe	10%	0.5	3	0.3	3	0.3	
Easy to move	5%	0.2	4	0.15	3	0.15	
Appearance	5%	0.2	4	0.2	4	0.1	
Makes the dough	5%	0.1	2	0.25	5	0.15	
Safe to use	5%	0.25	5	0.15	3	0.2	
Total Score		3.8		4.05		3.9	
Rank		3		1		2	

Working Drawings

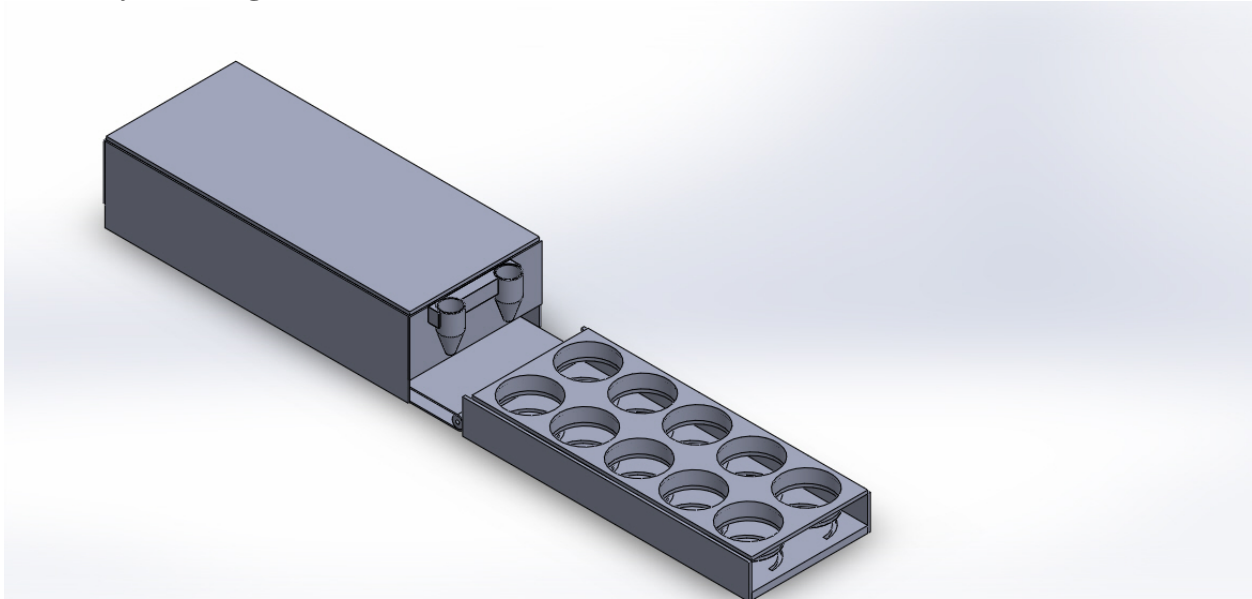




Prototype



Assembly Drawing



Cost Analysis

Item	Cost
Bread hook	\$50
Filling	\$3
Dispensers	\$12
Conveyer belt	\$55.00
Walls	\$22.00
Tray	\$4.00
Rollers	\$24.00
Cutters	\$3.39
Bowl	\$26.47
Sealers	\$199.86
Total	

Working Mechanism and Engineering Analysis

The first compartment of our team's dumpling maker is automatic with timers for the mixing bowl, rollers, and filling dispensers. First, the ingredients for the dough go into the mixing bowl. Once the dough is made it is dropped down onto a thin tray and is rolled out by a conveyer belt to the next compartment. In between the compartments are filling dispensers that pump filling onto the dough on its way to the next compartment. The final compartment is semi-automatic. On the top is a bar that must be pushed down to push down cutters that are at the top of the compartment. The sealers are at the bottom, which work by the user pulling a lever. In the bottom of the tray are holes for the sealers to go through so the sealers can do their job to seal

the dumplings. On the right side of the last compartment is a slit for the tray so the user can take out the dumplings.

Conclusion

This report has discussed the development of a semi-automatic dumpling maker capable of producing at least 10 dumplings per minute. The objectives of this project were to develop an automatic or semi-automatic dumpling maker that was safe to use, cost under \$200 in materials, dishwasher safe, and produced at least 10 dumplings per minute. All objectives were met.

References

"McMaster-Carr." *McMaster-Carr*. Web. 30 July 2015. <<http://www.mcmaster.com/>>.