ITEM NO.	PART NUMBER	MATERIAL	QTY.
1	Base for Paint Bucket and Tray	PP COPOLYMER	1
2	Paint Tray	PLAIN CARBON STEEL	1
3	Paint Can	PLAIN CARBON STEEL	1
4	Wheel Bracket	PLAIN CARBON STEEL	4
5	Paint Cart Wheel	PLAIN CARBON STEEL	4
6	Paint Can Lid	PLAIN CARBON STEEL	1
7	Paint Mixer	PLAIN CARBON STEEL	1
8	Paint Stopper	PLAIN CARBON STEEL	1
9	Pin for Bracket	PLAIN CARBON STEEL	4

All of the parts displayed have a tolerance of +/ .001 except the Pin for Bracket and the Paint Can Lid which needs +/- 0.0005

DRAWN BY: Justin Donovan	SHEET #: -	# OF SHEETS: -	DATE: 4/23/2021	SCALE: 1:8
PART NAME: -	PART #: -	MATERIAL:		

Computer Graphics and Design
The Paint Pal
By Justin Donovan

I. INTRODUCTION

Anyone who has ever painted knows how tedious it is, and how painful the process can be. Ironically, the most relaxing part of painting is the actual painting itself and not the process. Although painting can be cathartic, everything that leads up to it is quite the opposite. Having to pour paint in a tray usually leads to as much paint in the tray as it does on your hands and floor. To avoid this, I am proposing an automated dispenser that has a tray attached to the bottom of a reusable can, where all you have to do is click a button! Once this is clicked, paint will pour into the bed of the tray. The whole apparatus will sit and lock into a board where you can wheel it wherever you go, and the bonus is that you can lock the wheels whenever you decide on a location.

The other main inconvenience that comes with painting is the mixing. It requires having to take the lid off then put a paint stick in the can, mix it (only briefly because the paint is usually premixed at the store) and then put the paint covered stick in a location where it will not drip or get paint on anything else. That is why we are introducing a mechanical crank that is attached to the lid, where all you have to do is spin it a few times every 5 minutes and it will spin two rods to make sure the paint does not settle. This way, when you are painting you do not have to worry about the paint stick ruining the house by getting paint everywhere, and you do not have to take the lid off of the can to mix paint. All you have to do is twist the crank for 10-20 seconds and your paint is dispensed as creamy mixed paint.

II. BACKGROUND MARKET RESEARCH

This design was ideally to combine all of the preparatory processes of painting to both speed and
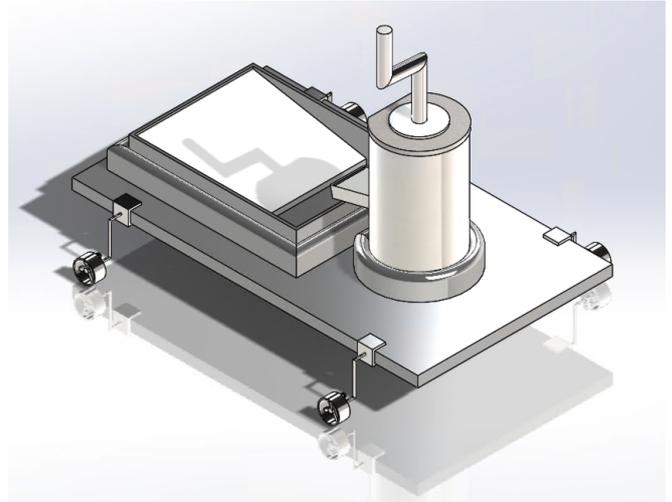

Fig. 1. Paint Pal

Fig. 2. Real Setup

ease the process. Consisting of a reusable paint can, a mixer, a paint dispenser, and a paint can, this apparatus sits on lockable wheels so you can bring it all around the house with you and not have to worry about picking up all of your materials to bring them with you.

To begin, there is no apparatus currently on the market that does all of these tasks in one. Although there are many paint trays and paint mixers, there are none that render this level of convenience to the user. The assembly stands as the first household

device that is able to mix, dispense, and carry paint all at once. We recognize that there are plenty of disposable inner linings for reusable paint trays, so our paint tray is designed so that the common disposable tray fits over it in case you want a quick and easy cleanup. If you do not have access to this, do not fear! The snap into place assembly allows the user to take parts out and place them back in easily, allowing for a successful and easy cleaning process.

To summarize, this is the first of its kind! It is the first household mixing device that can hold paint, mix it when necessary, and dispense it into a rolling tray for the user's immediate use. It is based off of anecdotal experience, and has a crank that conveniently emulates the motion of a paint stick, so the mixing can be easy and hands-free. This product is truly one of a kind. Although there are designs that are intended to allow the user to spray the paint with a hose, there are none that are able to mix the paint concurrently. Some of the individual parts, such as a dolly cart for paint, or an electronic mixer, exist, but, there is no device that takes all of the preparatory work of painting and turns it into one simple motion.

III. Design Intent

Although the majority of my background research comes from my childhood experiences working summers in construction, I also can assure you that I have done substantive research into finding the perfect dimensions for the tray, paint can and mixer. I have also researched different mechanisms such as the wheel locking mechanism, and the paint dispenser. Finally, the paint tray is designed so that it can either be used and cleaned as is, or a liner can be placed in this. The tray is the standard 11.5" by 15.5", so finding a liner to fit it will be no problem.

Two very common issues that are involved in painting are the splatters and the drips. This is designed so that all the potential drips will go into the tray (their desired location) and that all the mixing is done in the can, so it is splatter free.

IV. Mechanical Design Challenges

The wheels on this design are very important, because they make this painting setup mobile while most setups take a longer time to move the tray,
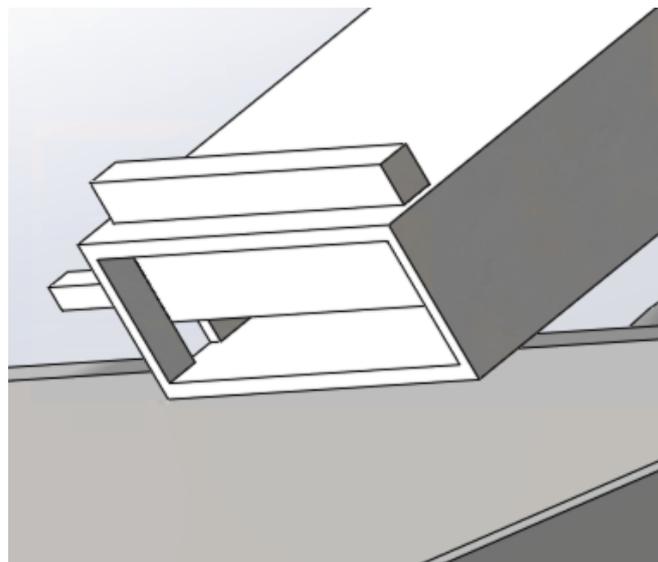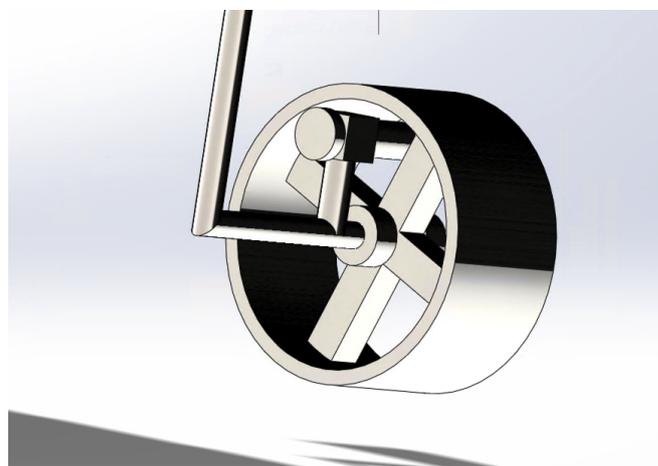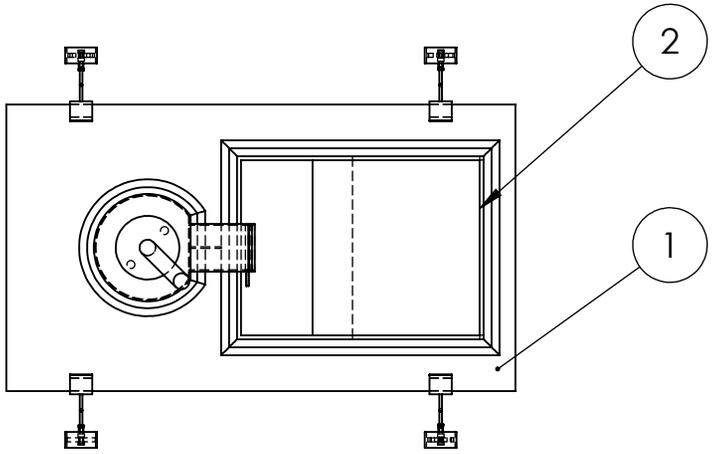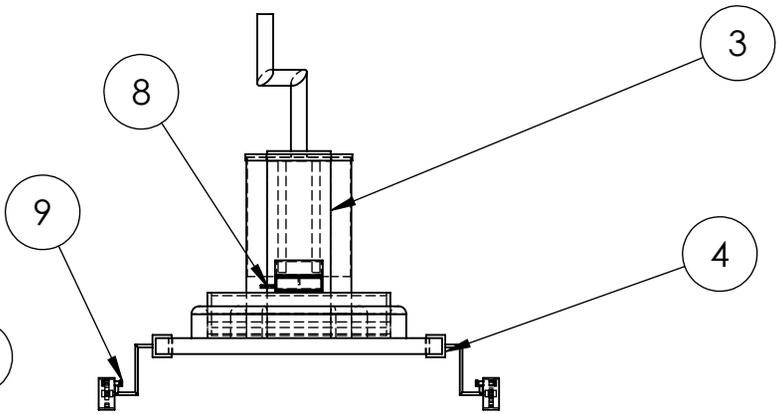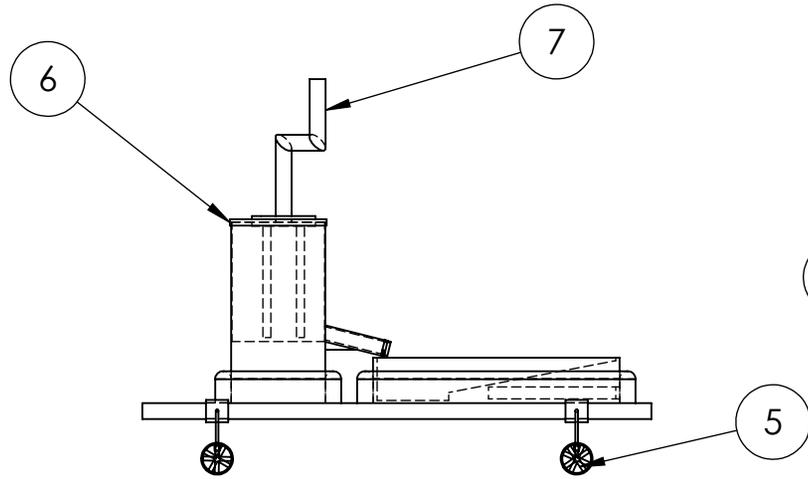

Fig. 3. This is the Paint Stopper

Fig. 4. This is the Wheel Lock Mechanism

paintbrush, paint stick, paint can, canvas etc. With this, all you have to do is simply push the cart. When you want to lock the wheels into place, you can easily just snap the pins on the wheels into their locking position.
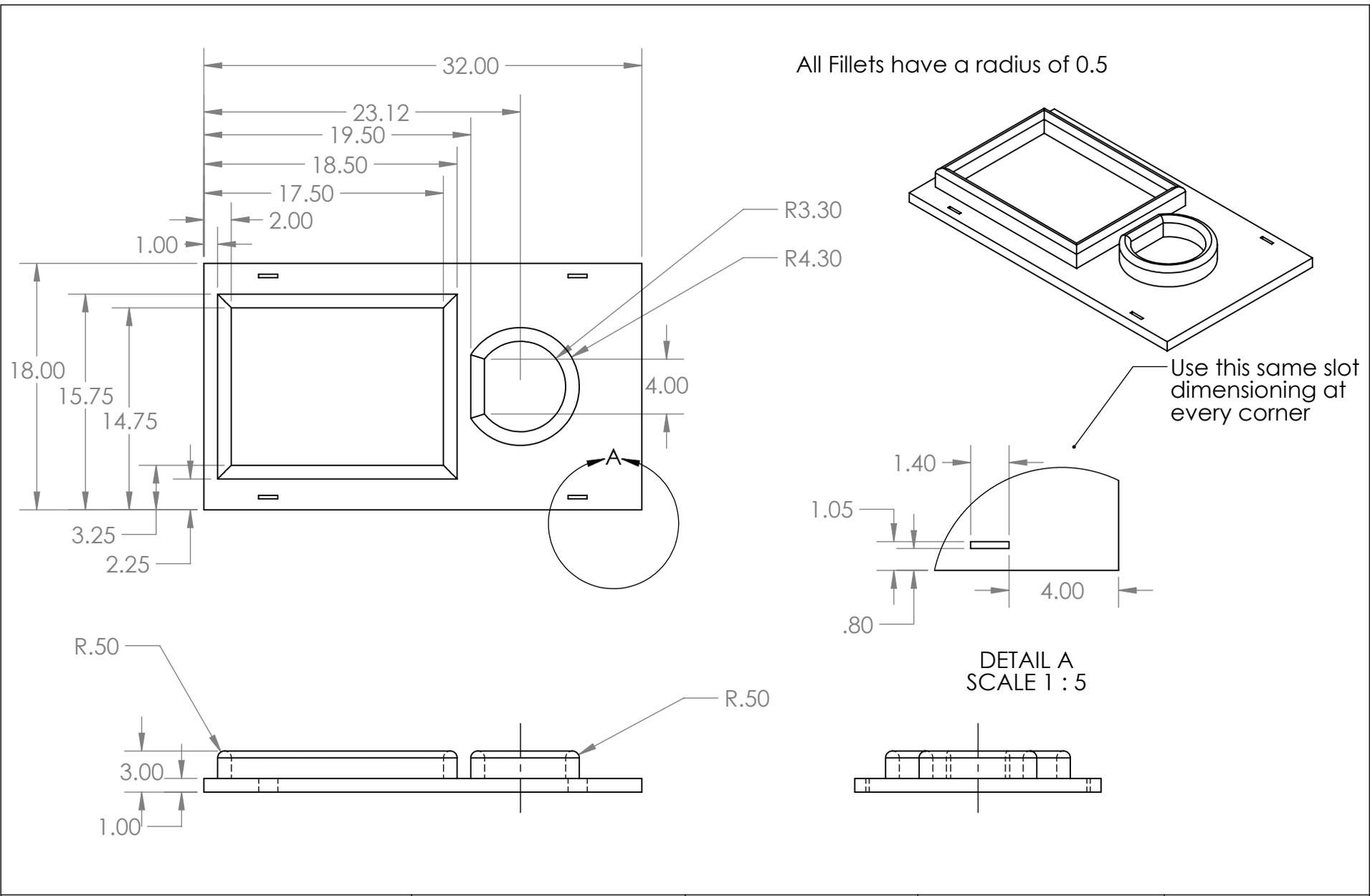
There were two main challenges to consider when creating the Paint Pal. The first is creating a design that disassembles easy for cleaning. The second issue was creating some of the mechanisms, however, with some research I believe I found the most optimal designs. That you can see in the photos below
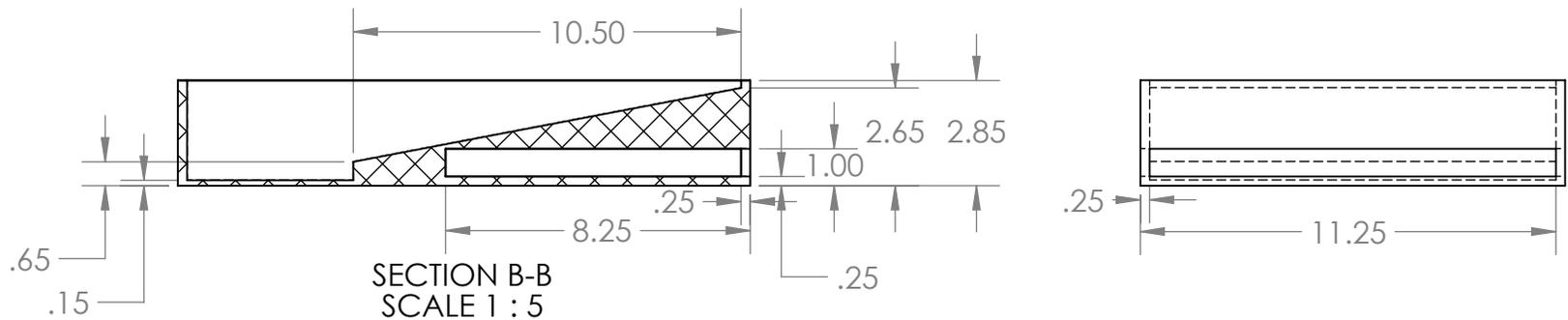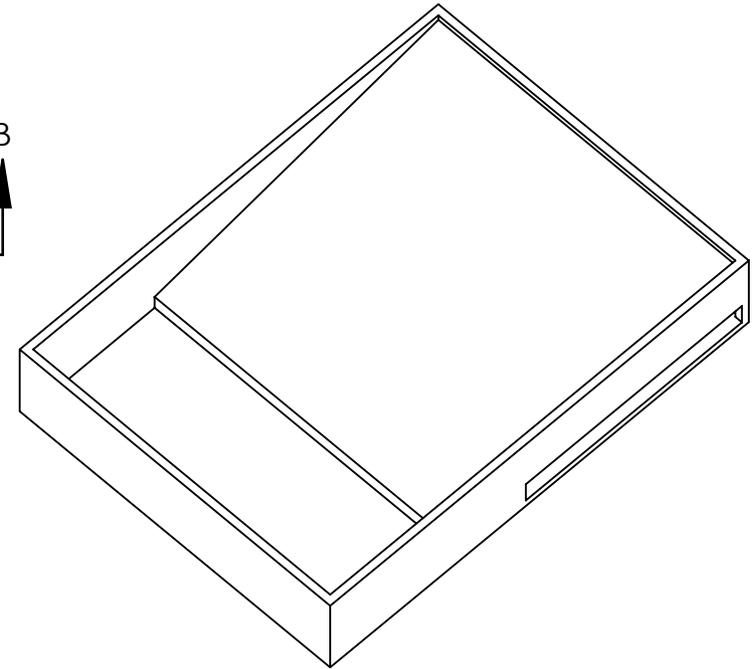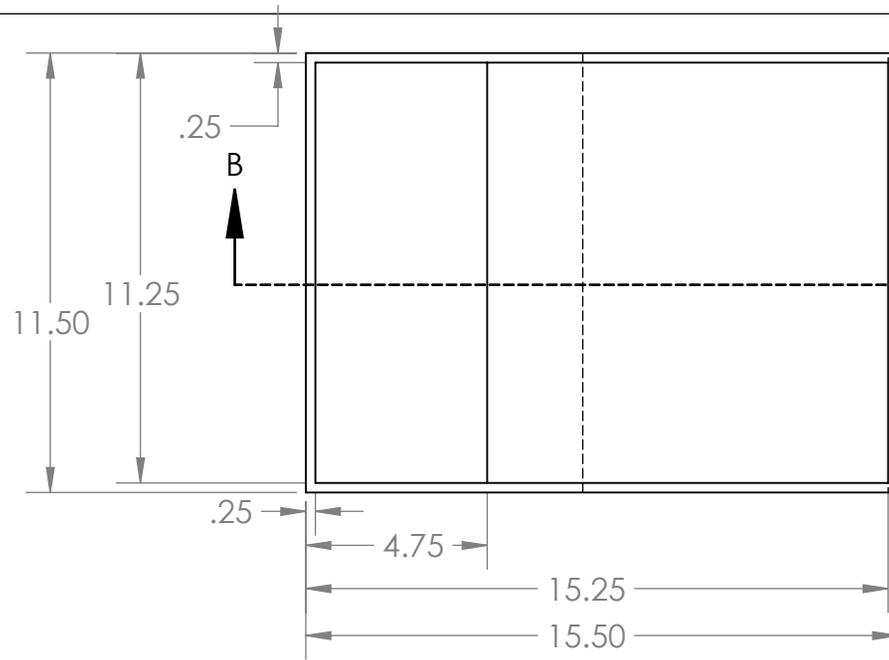
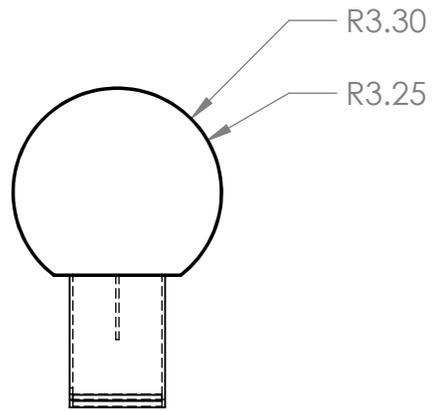| ITEM NO.	PART NUMBER	MATERIAL	QTY.
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5	Paint Cart Wheel	PLAIN CARBON STEEL	4
6	Paint Can Lid	PLAIN CARBON STEEL	1
7	Paint Mixer	PLAIN CARBON STEEL	1
8	Paint Stopper	PLAIN CARBON STEEL	1
9	Pin for Bracket	PLAIN CARBON STEEL	4

DRAWN BY: Justin Donovan	SHEET #: 1	# OF SHEETS: 10	DATE: 4/23/2021	SCALE: 1:12
PART NAME:	PART #:	MATERIAL:		

All Fillets have a radius of 0.5

32.00
23.12
19.50
18.50
17.50
2.00
1.00

R3.30
R4.30
4.00

18.00
15.75
14.75
3.25
2.25

A

R.50
3.00
1.00

R.50

Use this same slot
dimensioning at
every corner

1.40
1.05
.80
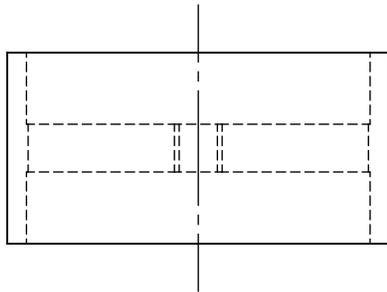4.00

DETAIL A
SCALE 1 : 5

DRAWN BY: Justin Donovan	SHEET #: 2	# OF SHEETS: 10	DATE: 4/23/2021	SCALE: 1:10
PART NAME: BASE FOR PAINT BUCKET AND TRAY	PART #: 1	MATERIAL: PP COPOLYMER		

.25

B

B

11.25

11.50

.25

4.75

15.25

15.50

10.50

2.65   2.85

1.00

.25

8.25

.25

.65

.15

SECTION B-B
SCALE 1 : 5

.25

11.25

R3.30

R3.25

4.25

.40

.20

3.00 2.90

.10

VIEW F-F
SCALE 1 : 6

4.00

1.80

VIEW D-D
SCALE 1 : 6

3.00

4x.10

1.45

1.00

1.49

F

F

D

D

C

C

11.35

3.85

SECTION C-C
SCALE 1 : 6

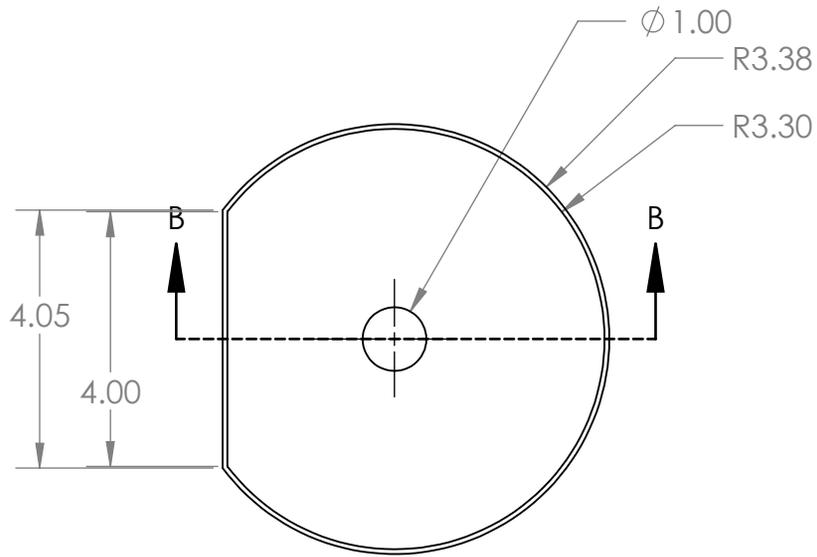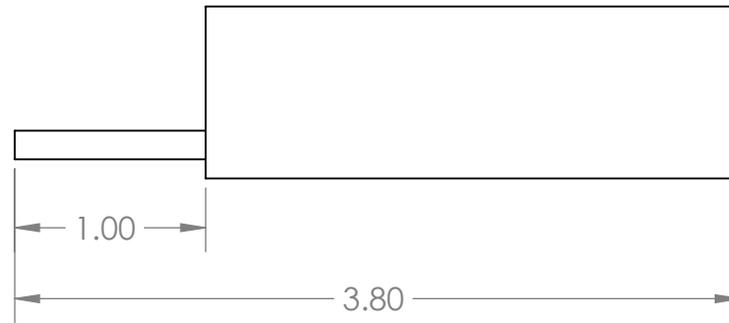| DRAWN BY: Justin Donovan	SHEET #: 4	# OF SHEETS: 10	DATE: 4/233/2021	SCALE: 1:6
PART NAME: PAINT CAN	PART #: 3	MATERIAL: PLAIN CARBON STEEL		
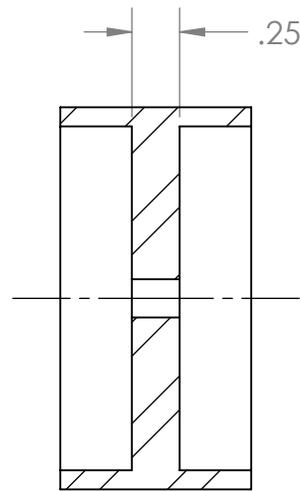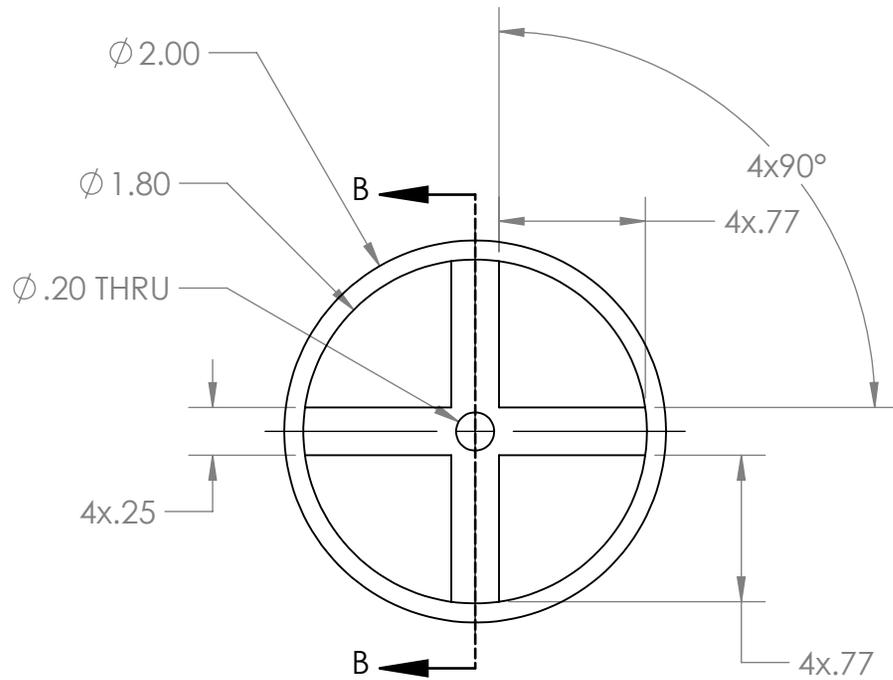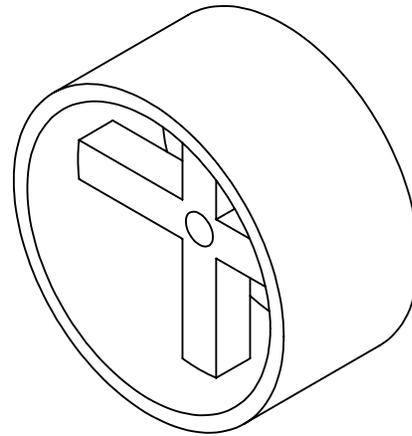
4.40

3.20

2.11

1.10
1.05
.85
.80
.70

.50
.20

2x.20

2x.20

3.70

2.30

.50

∅ .18

2x ∅ .40

E

E

.30

∅ .25

.30

VIEW E-E
SCALE 1 : 2

DRAWN BY:Justin Donovan	SHEET #: 5	# OF SHEETS: 10	4/23/2021	SCALE: 1:2
PART NAME: WHEEL BRACKET	PART #: 4	MATERIAL: PLAIN CARBON STEEL		

Ø2.00

Ø1.80

Ø.20 THRU

B

4x90°

4x.77

.25

4x.25

B

4x.77

SECTION B-B

Ø 1.00
R3.38
R3.30

B — B

4.05
4.00

SECTION B-B
SCALE 1 : 3

.20

.40
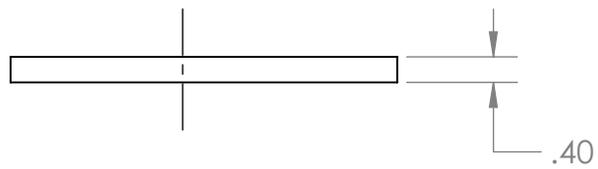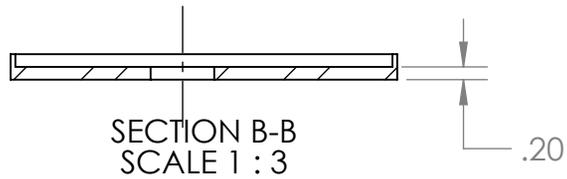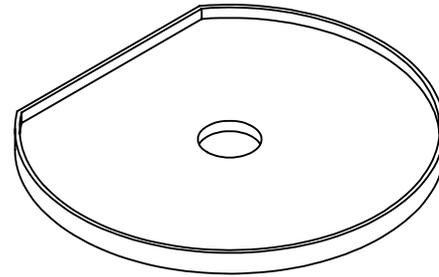
DRAWN BY: Justin Donovan	SHEET #: 7	# OF SHEETS: 10	4/23/2021	SCALE: 1:3
PART NAME: PAINT CAN LID	PART #: 6	MATERIAL: PLAIN CARBON STEEL		

Ø 1.00

2x Ø 4.00

Ø 1.00

3.00

16.25

11.75

7.65

7.45

7.25

7.00

2x Ø .50

1.25

2.50
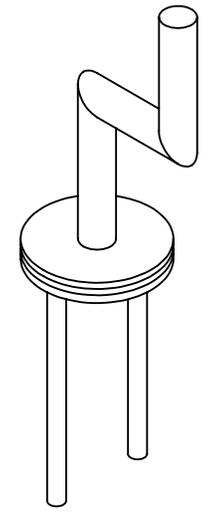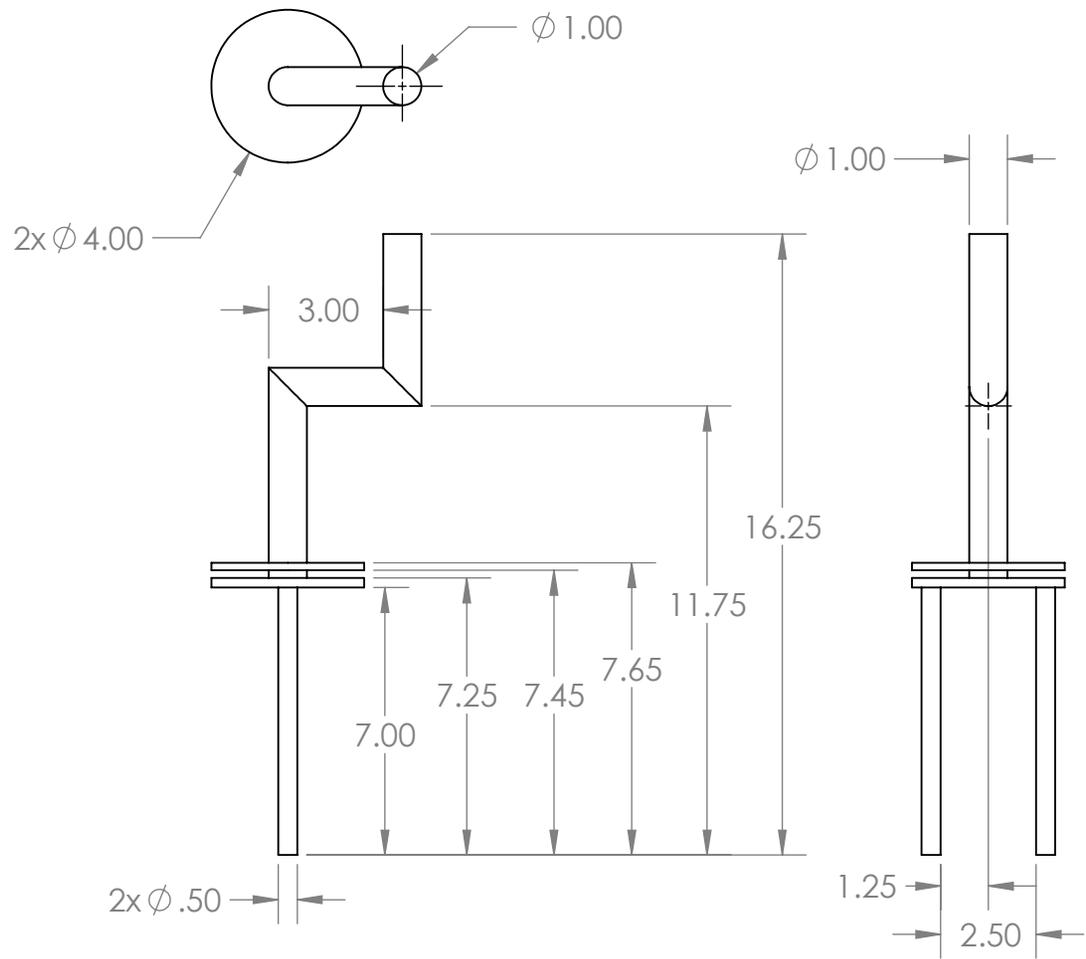
DRAWN BY: Justin Donovan	SHEET #: 8	# OF SHEETS: 10	4/23/2021	SCALE: 1:5
PART NAME: PAINT MIXER	PART #: 7	MATERIAL: PLAIN CARBON STEEL		
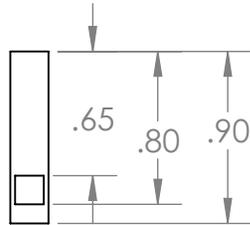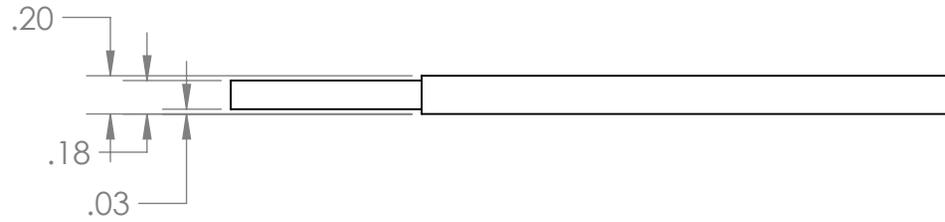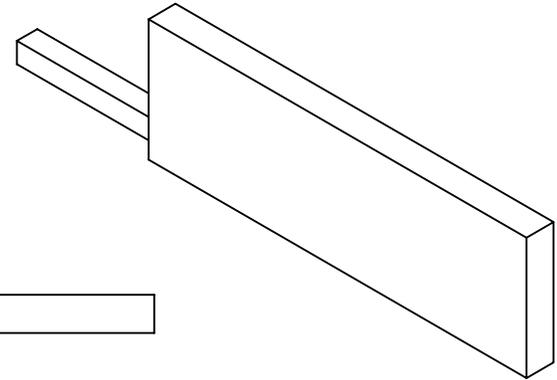
.20

.18

.03

.65 .80 .90

1.00

3.80

A   A

1.25

1.15

.10

2x ∅ .35

∅ .25

SECTION A-A
SCALE 2 : 1
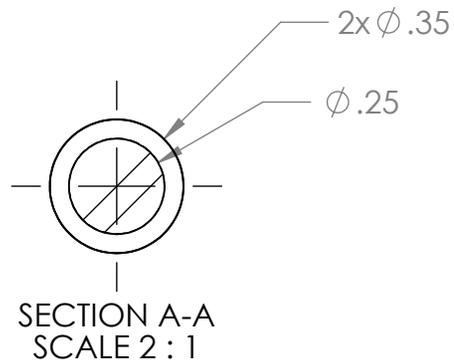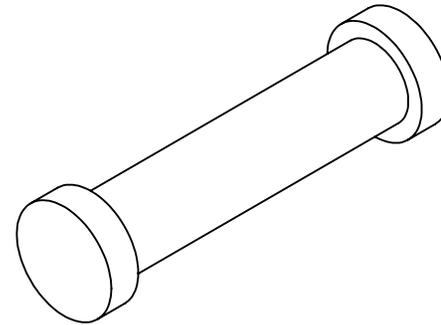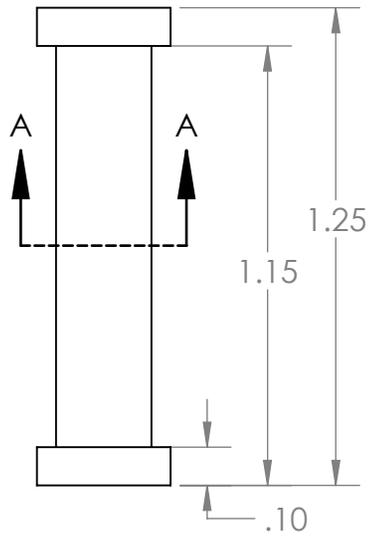
DRAWN BY: Justin Donovan	SHEET #: 10	# OF SHEETS: 10	DATE: 4/23/2021	SCALE: 2:1
PART NAME: PIN FOR BRACKET	PART #: 9	MATERIAL: PLAIN CARBON STEEL		