

JACK**THRUN**
INDUSTRIAL DESIGN 2015

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School Address:
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EDUCATION

University of Cincinnati (DAAP)
Industrial Design
Class of 2019 (BS)

GPA: 3.725
Dean's List

Mount Olive High School
Flanders, New Jersey
Class of 2014

GPA: 3.7
Honor Role
Scholar-Athlete



WORK EXPERIENCE

Farm Design, Inc.
Hollis, NH
Industrial Design Coop, Spring 2016

Responsible for brainstorming, sketching, 3D modeling, rendering, photoshop UI storyboarding, and volumetric foam modeling for internal component architectures.

*Contributed to projects for several clients.

SKILLS

Software

Photoshop, Illustrator, InDesign, Alias, SolidWorks, Keyshot, Inventor, Premiere Pro, FinalCut Pro, HTML + CSS, Word, Excel, PowerPoint, Outlook

Hands On

Foam modeling, pattern making, casting, marker rendering, brainstorming, sketching, digital sketching, wood shop, metal shop

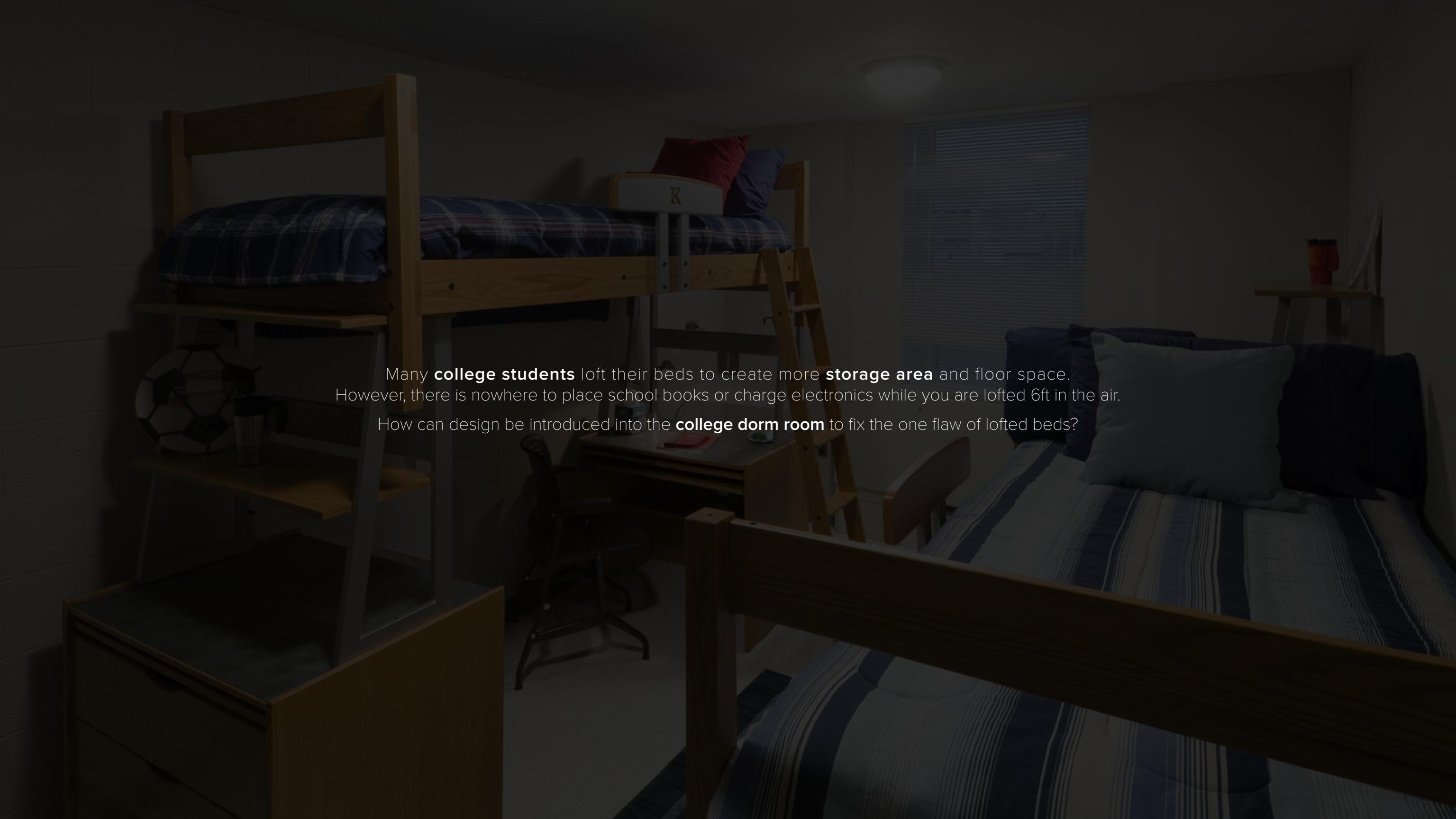
ACTIVITIES

IDSA (UC Student Chapter)
Habitat for Humanity
Greater Cincinnati, OH
Taos, New Mexico
Morris County, NJ
DAAP Bowling
Ice Hockey
Golf

Bedmate

lofted bed shelf for college dorm rooms





Many **college students** loft their beds to create more **storage area** and floor space. However, there is nowhere to place school books or charge electronics while you are lofted 6ft in the air. How can design be introduced into the **college dorm room** to fix the one flaw of lofted beds?

WHAT THEY WANT



CHRIS D.
RUTGERS UNIVERSITY

"It would be nice to watch movies in bed without having to worry about my **laptop** crashing to the floor when I fall asleep mid movie."



MICHAEL J.
VIRGINIA TECH

"I need a place to charge my **phone** and put my **alarm clock**...Oh and **food!**"



KATIE B.
CLEMSON UNIVERSITY

"I love to read. It would be nice to have a space to place my **books** when I get tired. They usually end up falling to the ground in the middle of the night... Then I end up loosing my place!"



JESSIE F.
WAKE FOREST

"I actually use one of the bunk shelves that are already on the market but I **can't fit much** on them at all. Plus I'm a little **skeptical** about putting too much weight on them. They don't seem **sturdy**."

CURRENT MARKET



flimsy

little support holds limited weight



crowded

no room for laptop and books



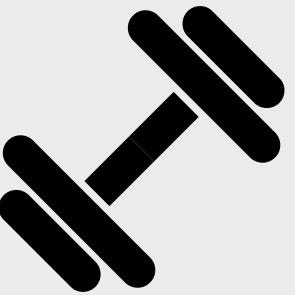
limiting

a simple hook does not fit a variety of beds

DESIGN GOALS



The design needs to have a **large surface area** to fit a laptop, books, and other necessities.



In order to support a laptop and heavy books, the design needs to be **strong**.



With a variety of head board thicknesses, the design needs to be **adjustable**.

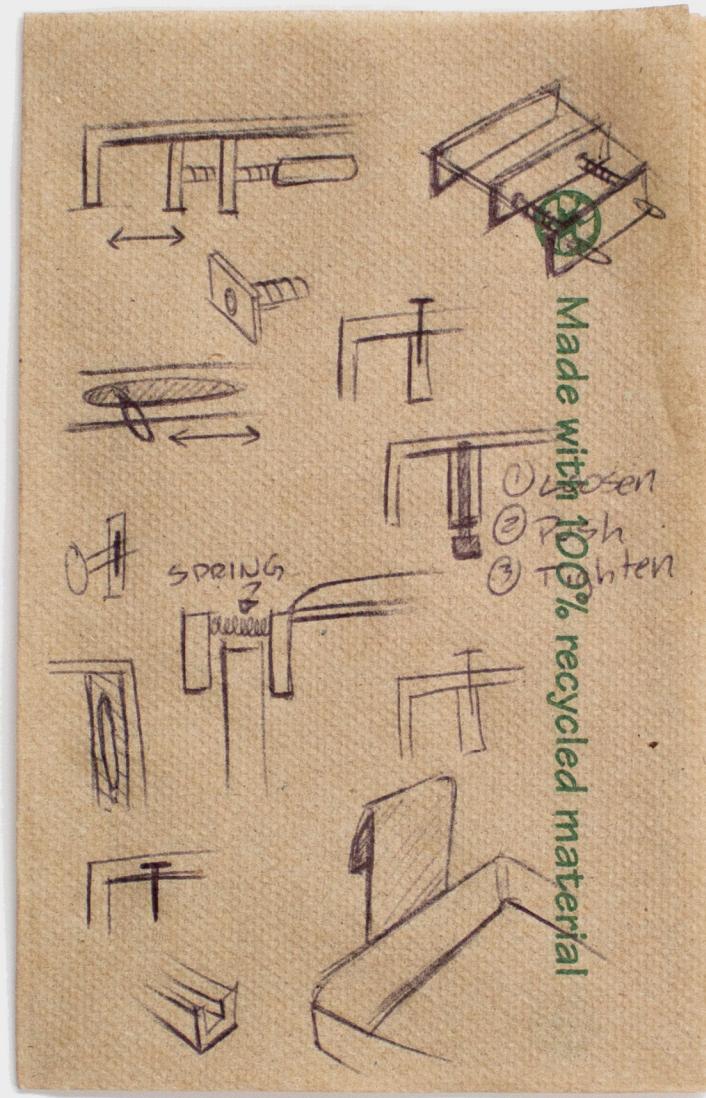
INSPIRATION

By adding a bit of color to the design philosophies of Dieter Rams, high quality design can be introduced into college dorm rooms.



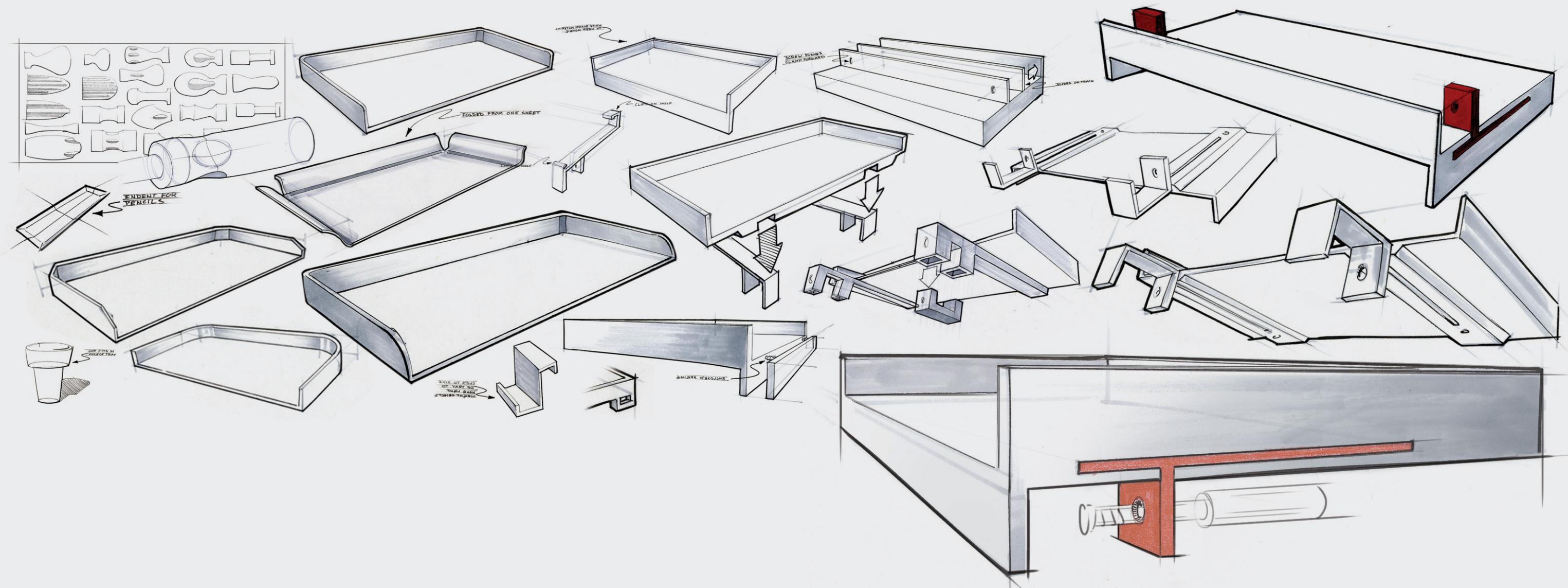
WHERE IT ALL BEGAN

During lunch one day in the school's dining hall, I had some ideas for the clamping mechanism.

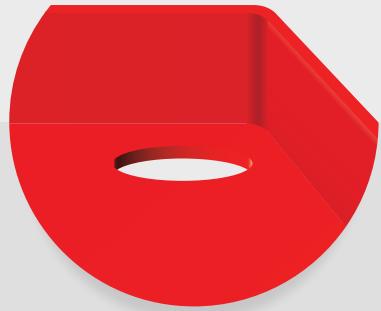


IDEATION

Starting with basic forms, I then continued to explore the engineering further. Different handle forms were also explored as well as special features.



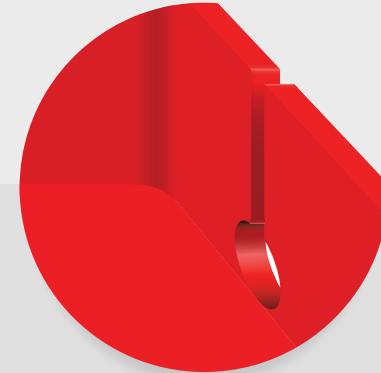
CORD MANAGEMENT



Version one provides **two cord holes** to accommodate both sides of the room.



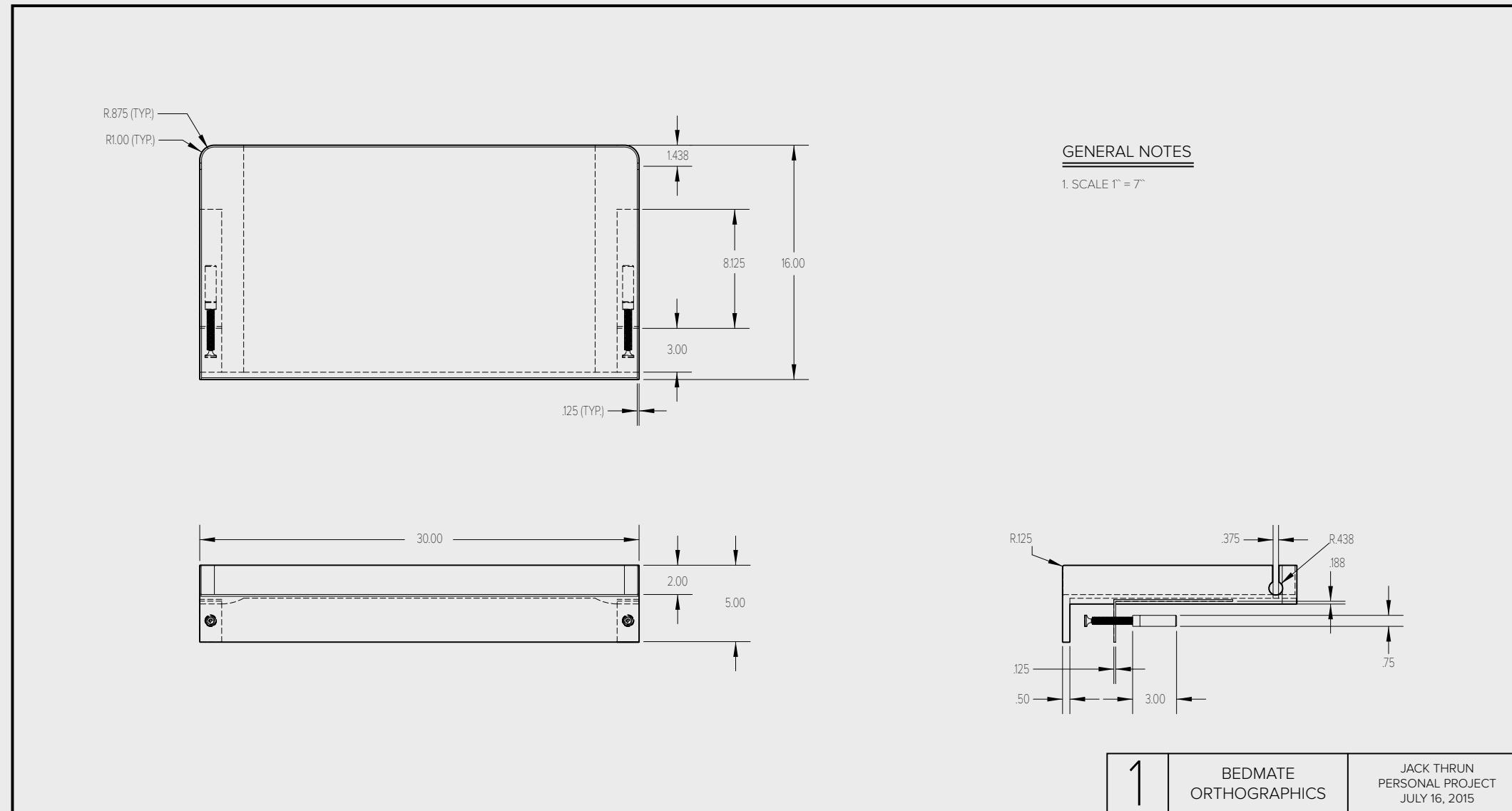
Version two simplifies the two cord holes into **one central hole**.



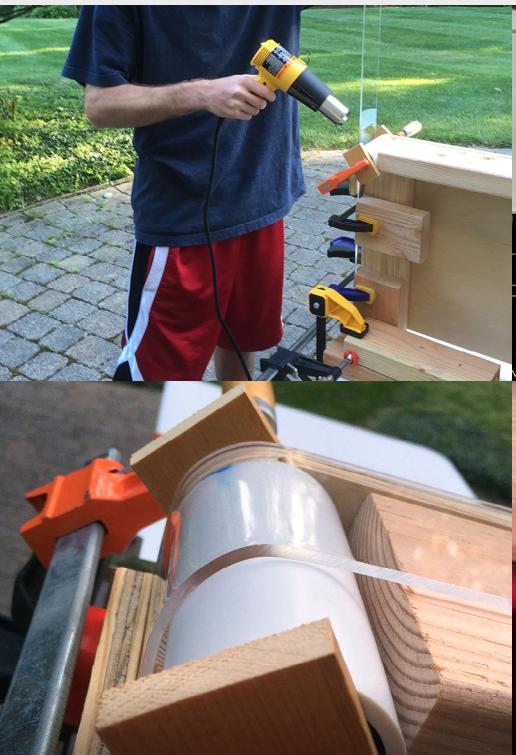
Version three places the cord holes on the lip to **avoid holes in the tray**.



TECHNICAL DRAWING



THE BUILD_001

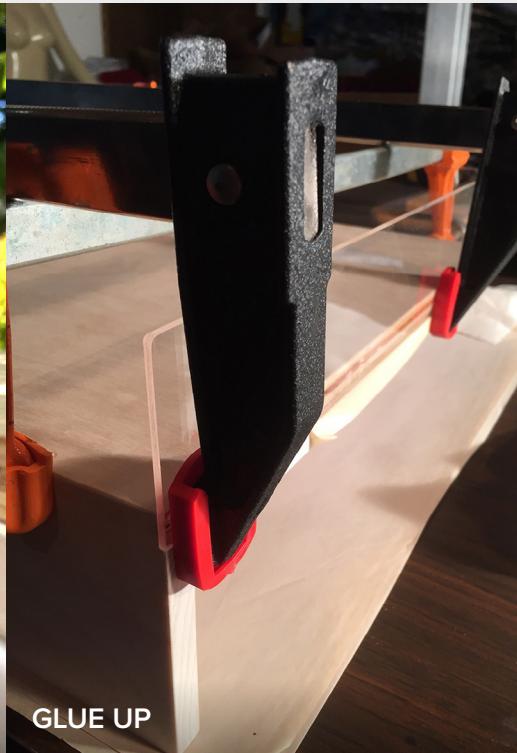


PREPPING MATERIAL

BENDING ACRYLIC

DRILLING ACRYLIC IS SCARY!

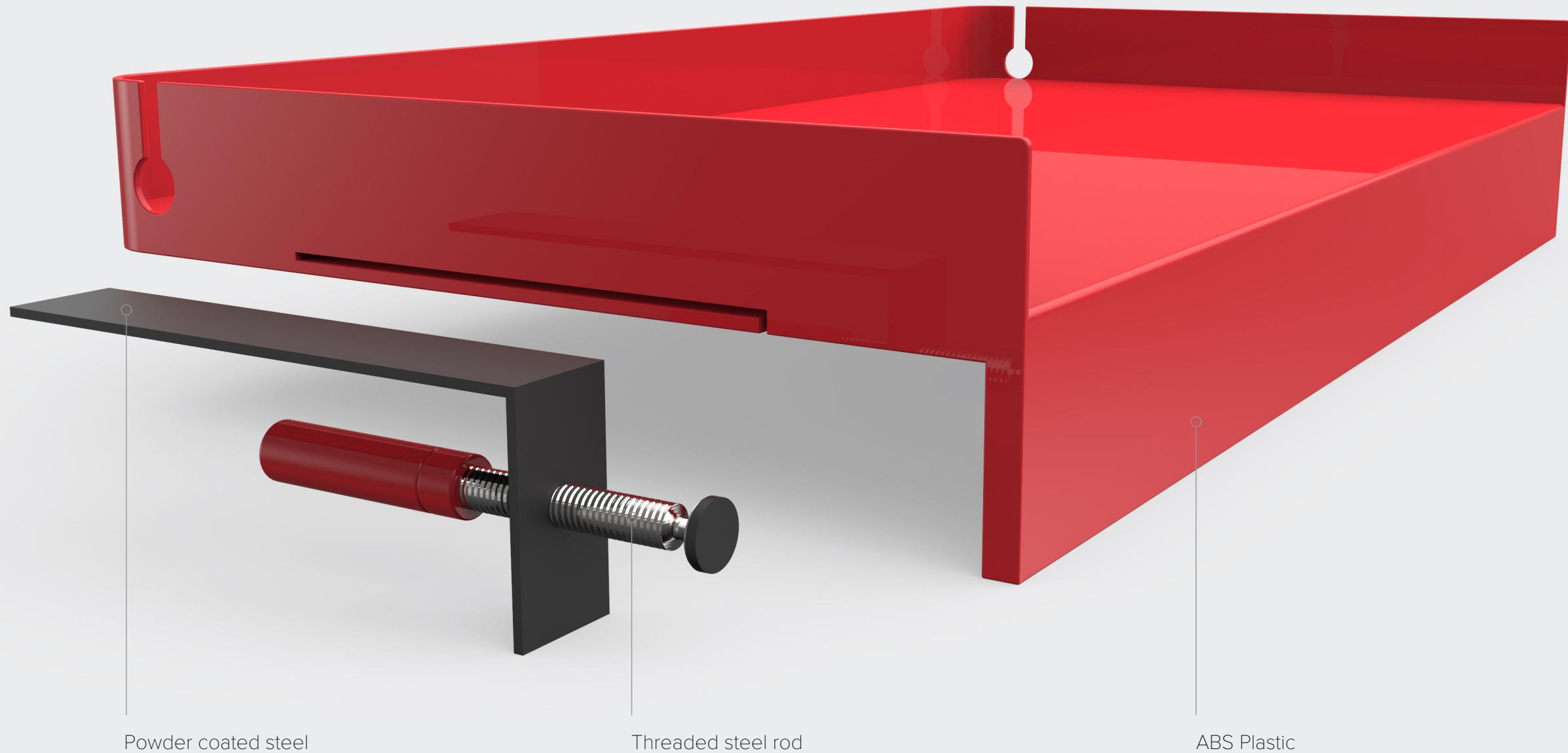
THE BUILD_002





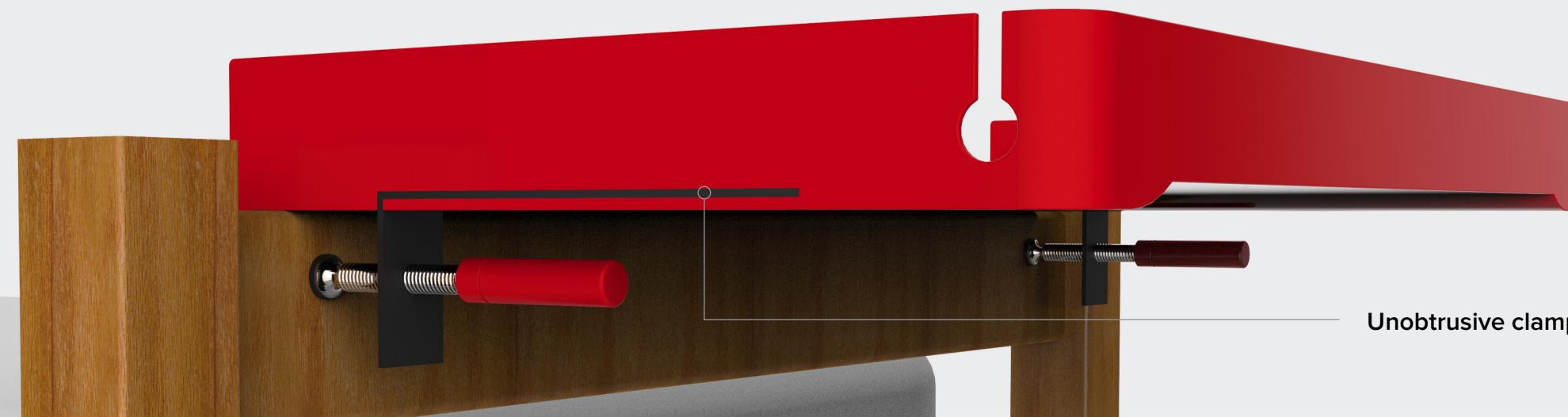


MATERIALS





Attaches to the **head of any bed**.



Unobtrusive clamp slides into body of shelf.



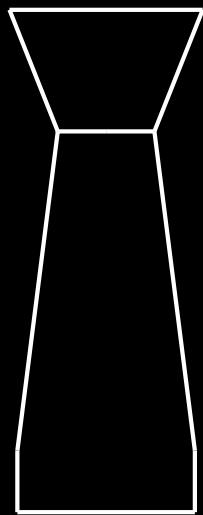
Easy access cord slot for electronic necessities.



NO STRINGS ATTACHED

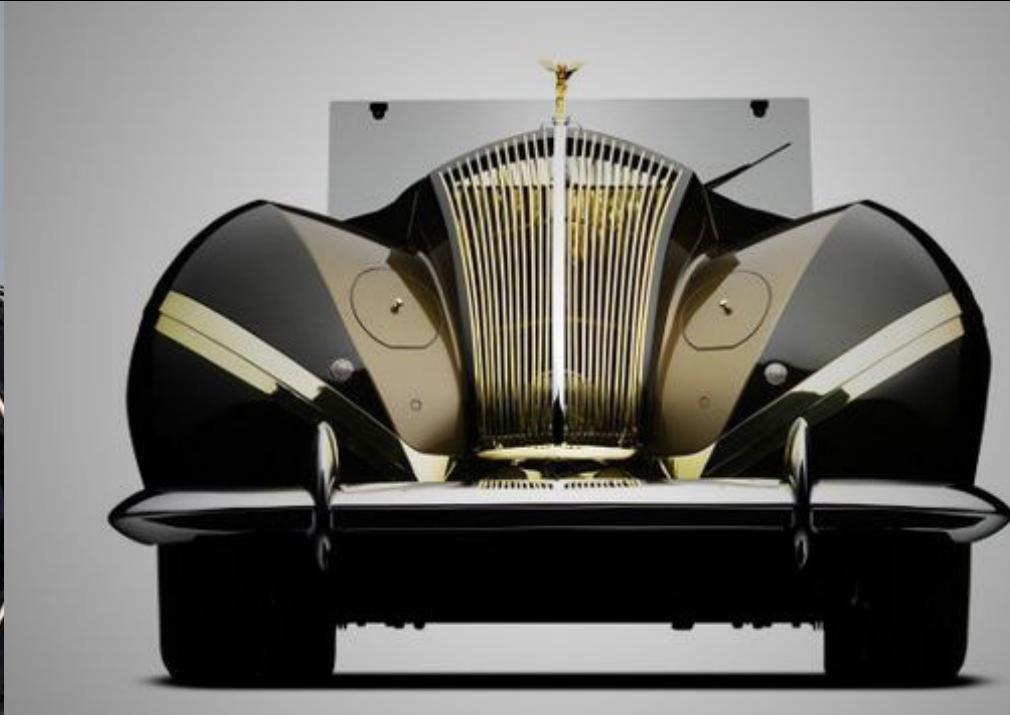
Opulent Peril

luxurious chess set focused on family of form



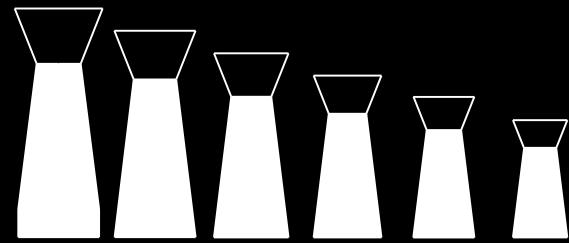
INSPIRATION

Opulent Peril is inspired by a luxurious yet edgy and bad-ass aesthetic very similar to steam punk.



DESIGN INTENT

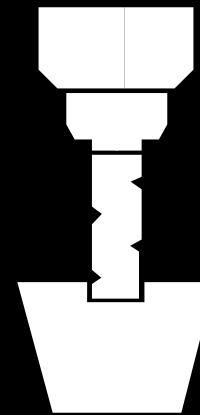
The aesthetic is achieved by combining machinery with the satisfaction and luxurious feeling of brass.



Family of form will be achieved by utilizing the **fibonacci percentages**.



The feeling of **luxury** will come from the satisfaction of brass.



Tight tolerance machining using the engine lathe and mill.

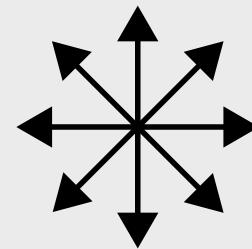
IDEATION

With a solid theme in mind, I began to explore forms that best express the aesthetic.



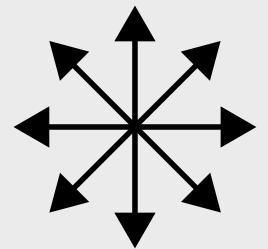
MOVEMENT PATTERNS

With the need to have a more visual distinction from piece to piece, patterns were developed by looking into the direction(s) each piece is allowed to move.



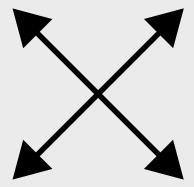
KING

One square in **any direction**.



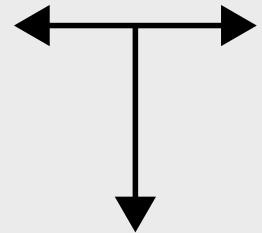
QUEEN

Any direction as far as possible.



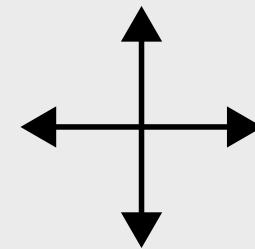
BISHOP

Diagonally as far as it wants.



KNIGHT

Two squares in one direction
and then one more move at a
90 degree angle.



ROOK

Any **perpendicular** direction.



PAWN

Forward but attack diagonally.

DEVELOPMENT

The movement patterns are incorporated into the crown of each corresponding piece. The individual patterns, in addition to the height difference, help to visualize the hierarchy of the set.



KING

One square in **any direction**.



QUEEN

Any direction as far as possible.



BISHOP

Diagonally as far as it wants.



KNIGHT

Two squares in one direction
and then one more move at a
90 degree angle.



ROOK

Any **perpendicular** direction.

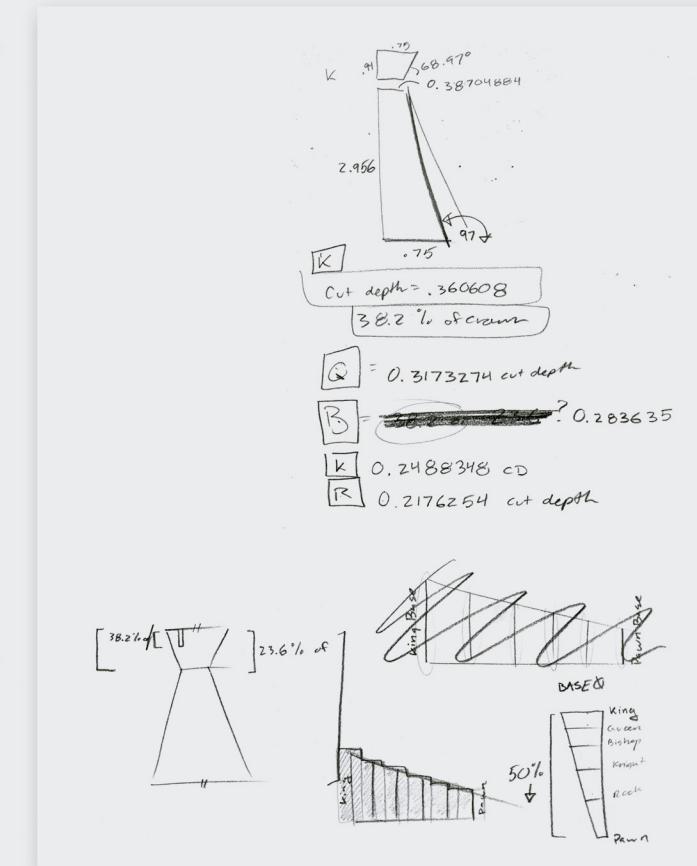
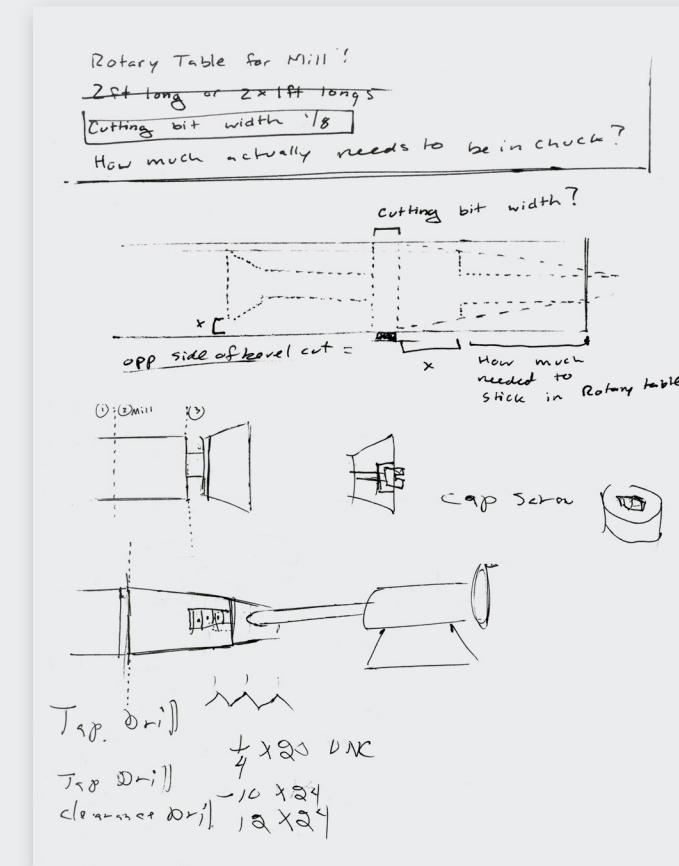
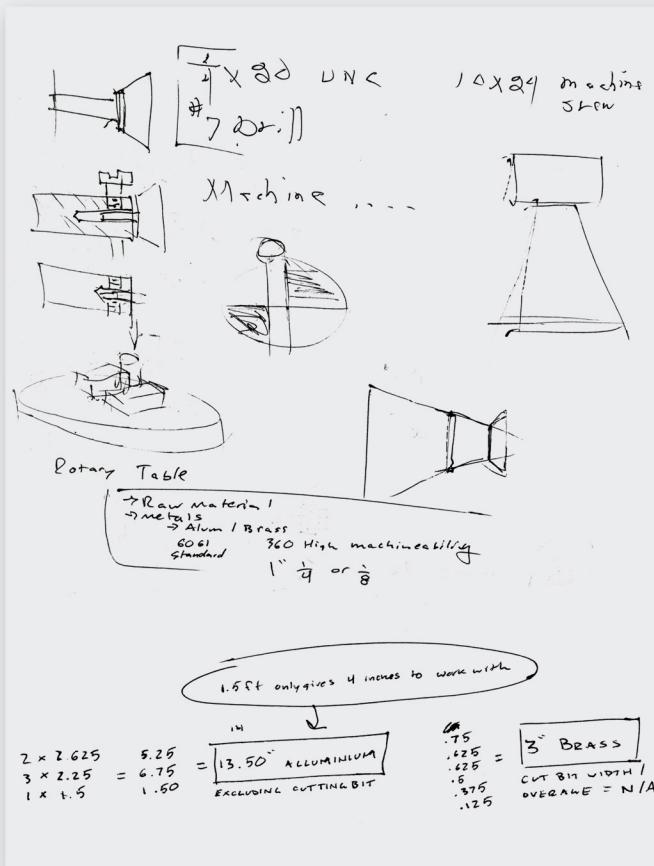


PAWN

Forward but attack diagonally.

"FIGURING IT OUT"

Being my first time using the engine lathe and mill, I wanted to make sure I had every step of the process figured out before I got started. These are visuals of the discussions I had with my professor.



PROCESS_001

I needed to make sure the shop had a rotary table before I began as it was a crucial tool to maintain the design intent. They had two. They were both broken! Luckily, my professor saved the day by showing up with his rotary table that he keeps in his office!



PROCESS_002

The aluminum taper was cut longer than needed and then slowly faced until a perfect fit was matched with the brass crowns.



PROCESS_003

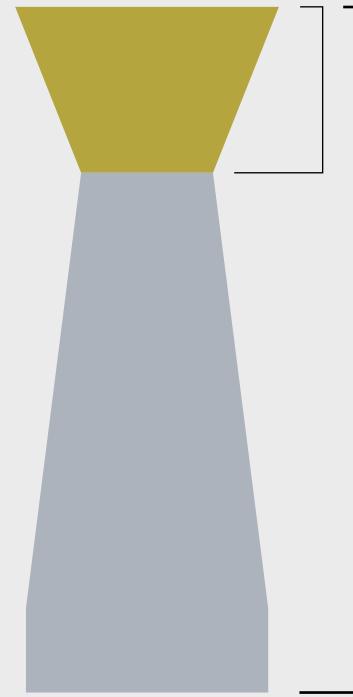
Using the rotary table, the patterns were milled into the crowns. I then sanded and polished the pieces and used epoxy to hold them together.



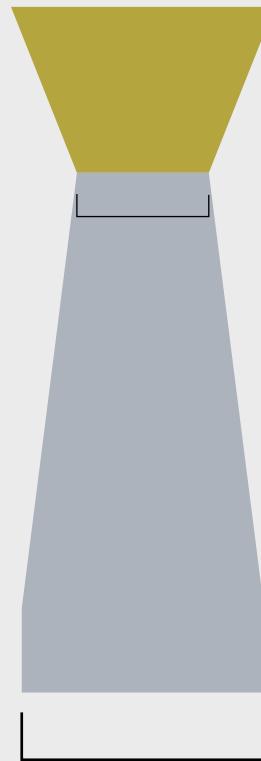


FIBONACCI PERCENTAGES

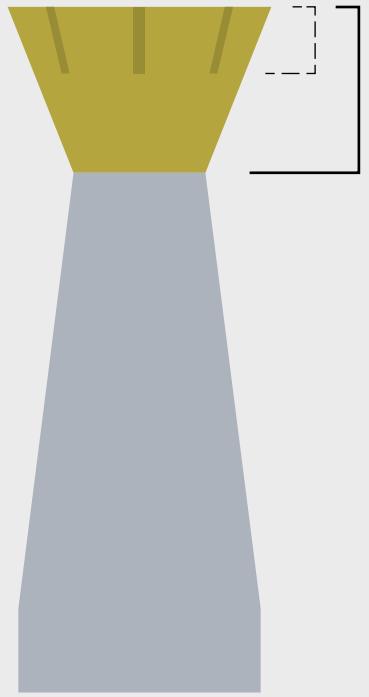
Focusing on family of form, the fibonacci percentages were utilized to maintain proper proportion within each piece regarding height, width, and cut depth.



Each crown measures **23.6%** of the piece's total height.



The narrowest width of the piece is **50%** of the total width.



The cut depth of each piece measures **38.2%** of the crown.

FIBONACCI PERCENTAGES

Fibonacci percentages were also used to provide proper proportion to the set as a whole focusing on overall height and base diameter.

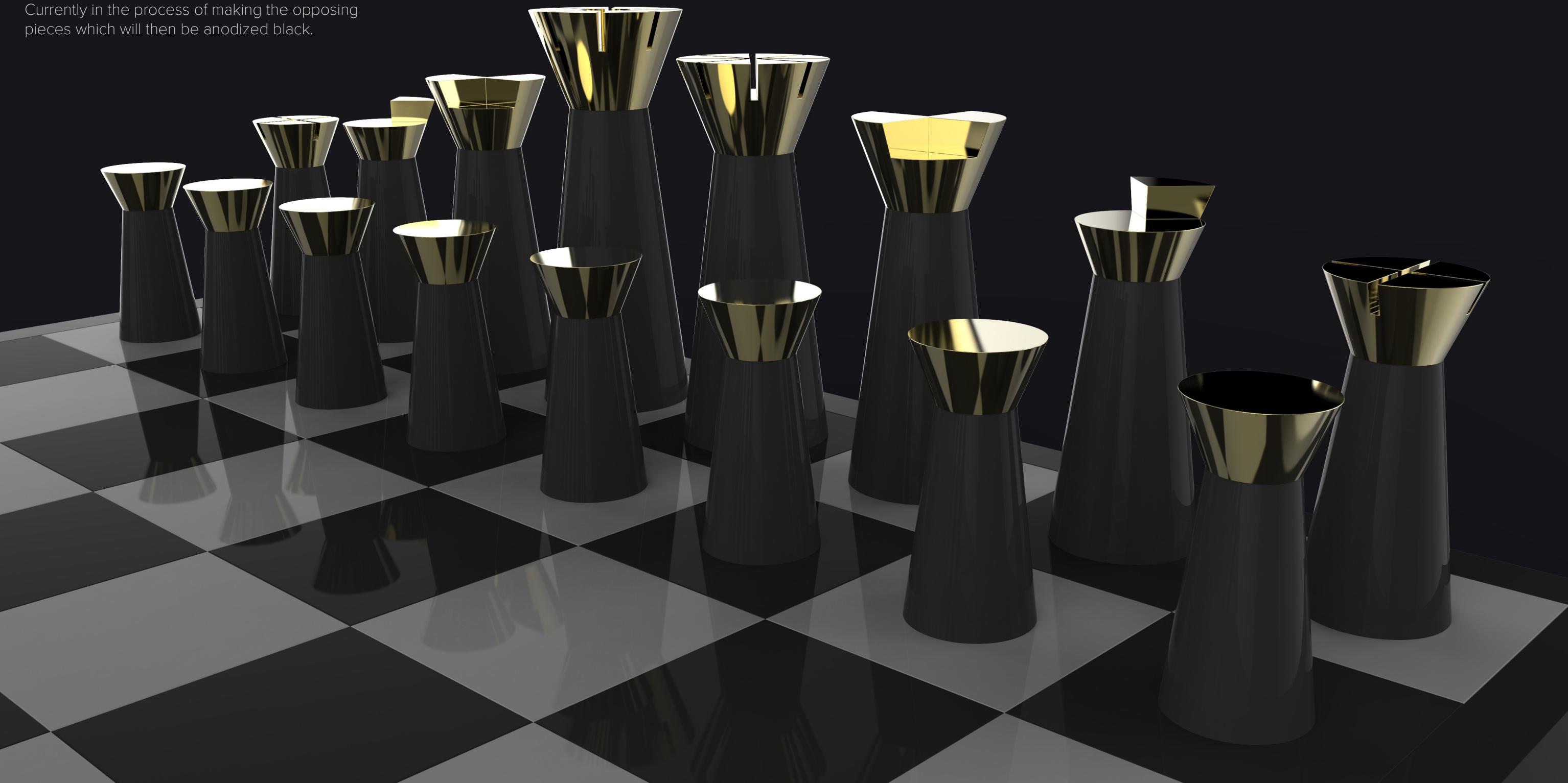


The height of the pawn is
50% of the king's height.

The pawn's base is **61.8%**
of the king's base.

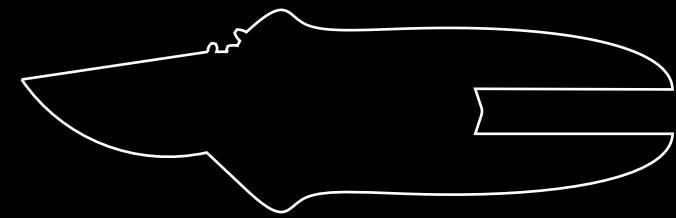
TO BE CONTINUED ...

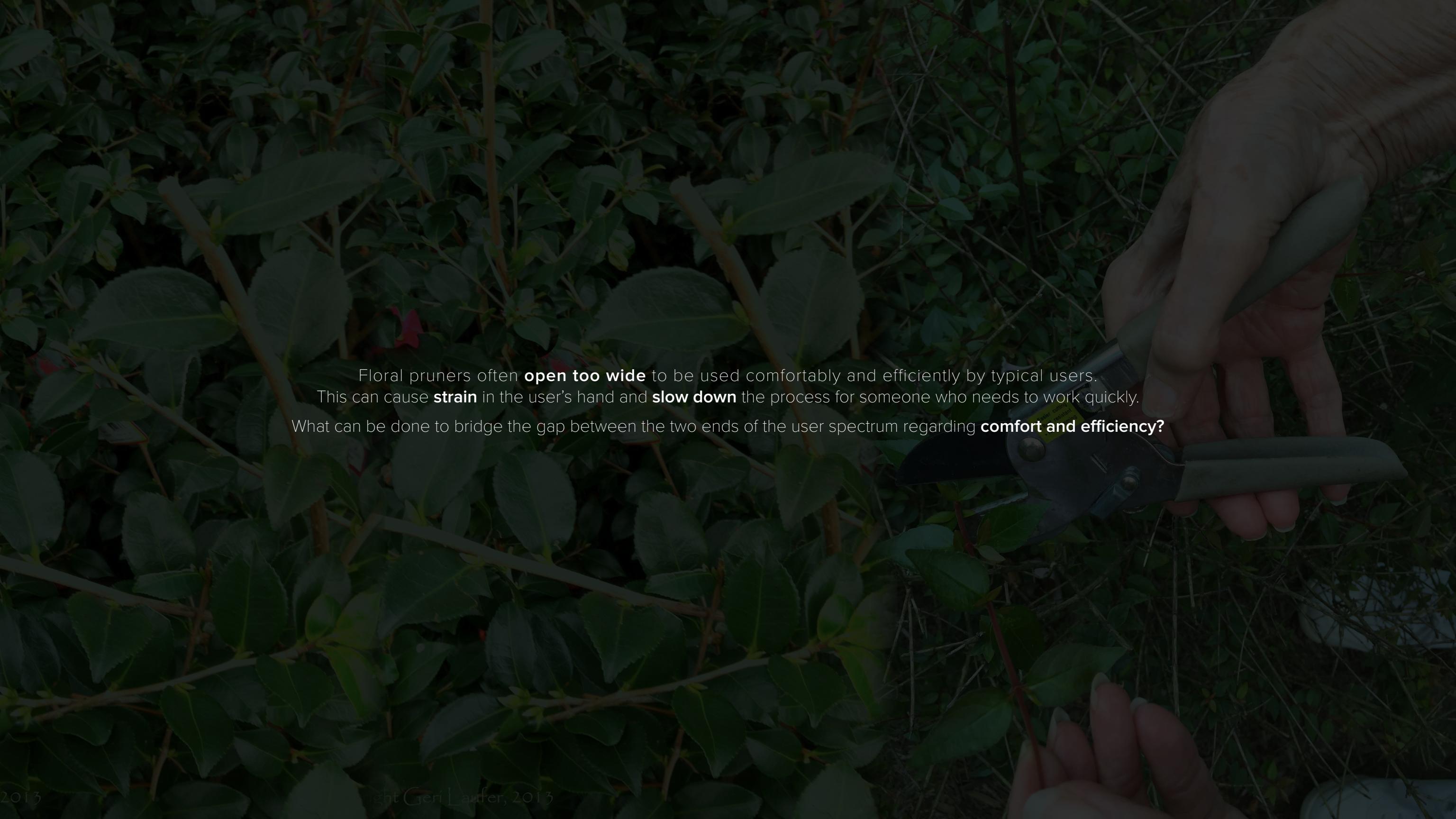
Currently in the process of making the opposing pieces which will then be anodized black.



Fiskars Floral Pruners

designed to improve comfort and efficiency



A close-up photograph of a person's hands using a pair of black floral pruners to trim a dense green bush. The hands are positioned at the handle of the pruners, which have a textured grip. The background is filled with the dark green leaves and branches of the bush being pruned.

Floral pruners often **open too wide** to be used comfortably and efficiently by typical users. This can cause **strain** in the user's hand and **slow down** the process for someone who needs to work quickly. What can be done to bridge the gap between the two ends of the user spectrum regarding **comfort and efficiency**?

“If we understand what the **extremes** are,
the middle will take care of itself.”

Dan Formosa
Smart Design

Source: *Objectified*, Documentary

USERS

Barbara and Kristen represent the extremes regarding usage, age, and time constraints.



Barbara

Retired School Teacher

*"I love gardening in my spare time but I can't seem to get my hand around the bloody things anymore; **they're too wide for me to hold on to.***

A good pair of pruners that are easy on my hands would make all the difference."



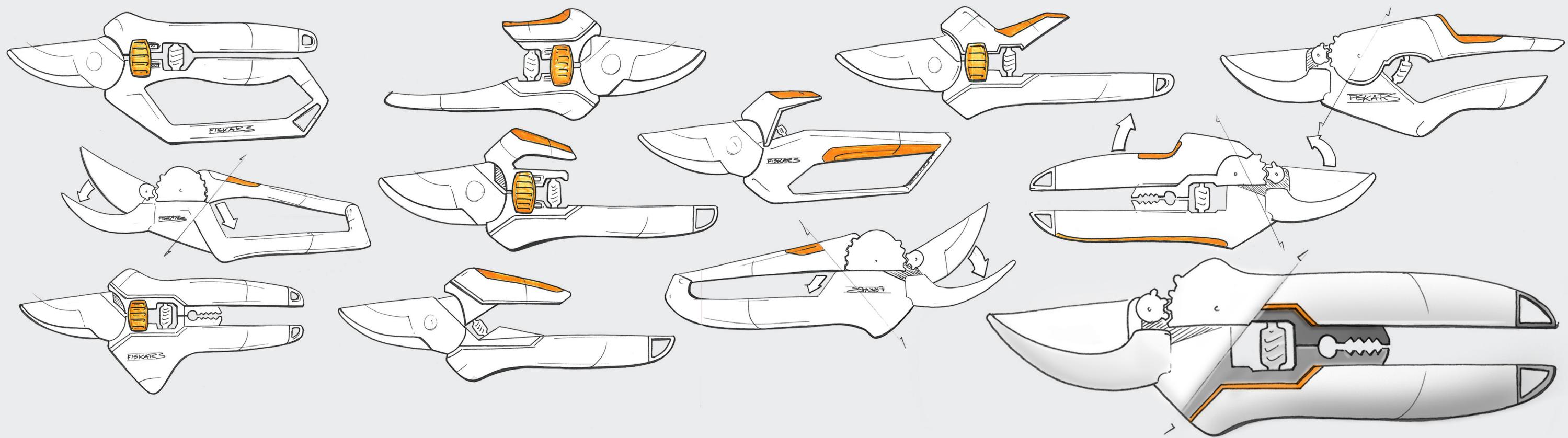
Kristen

Florist at Norman Florist

*"Being a florist, I use my pruners the most out of any other tool. Often times, the shop gets so busy! In order to be efficient **I have to work quickly**, but after a while my fingers get tired from the constant opening and closing of my hand."*

IDEATION

Three general concepts were explored with the intent to provide a more comfortable handle design. The decided direction uses a big to small gear ratio to limit the distance the handle has to travel as well as providing quickness, which is ideal for florists.



PROTOTYPES

Once a final design was reached, I quickly jumped into 3D modeling. The use of SolidWorks and laser cutting allowed for rapid iterations.

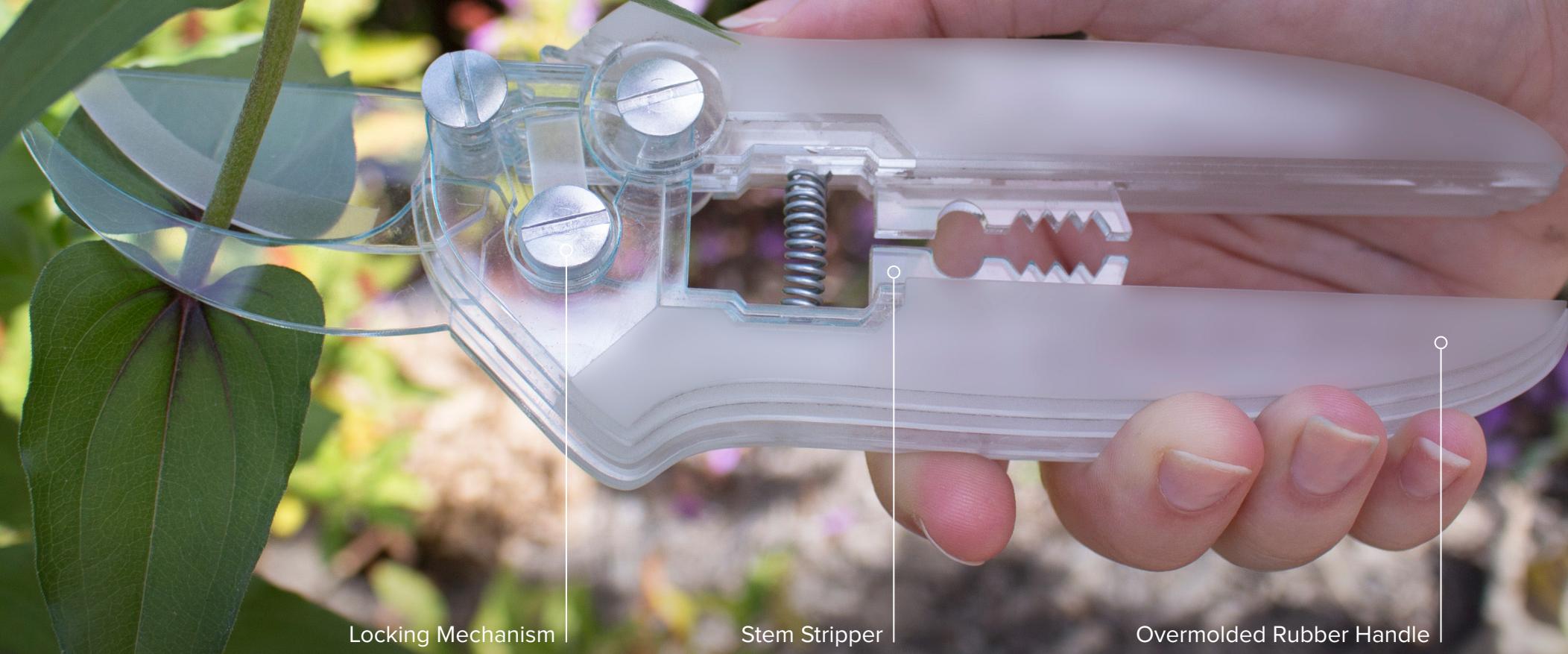


Version one is a test to make sure the **mechanism** works properly.

Version two develops the **ergonomics** and **aesthetics** by offsetting each plane.

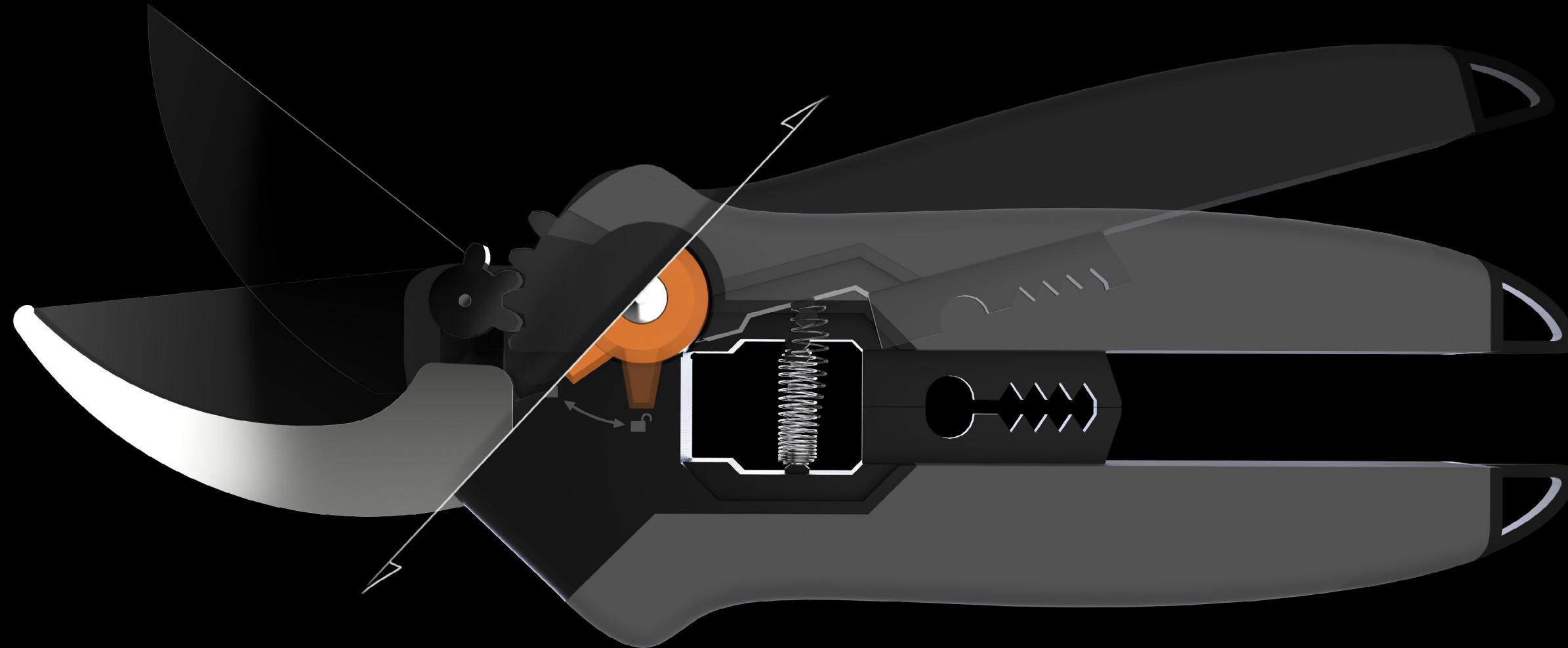
Version three explores the idea of a smaller top handle **just for the thumb**.

FINAL PROTOTYPE



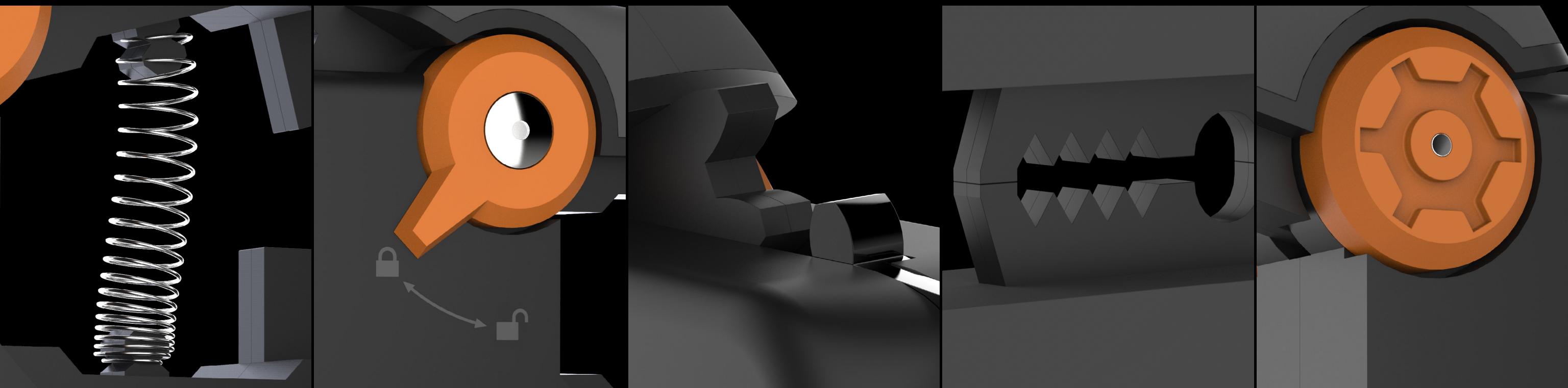
SECTION VIEW

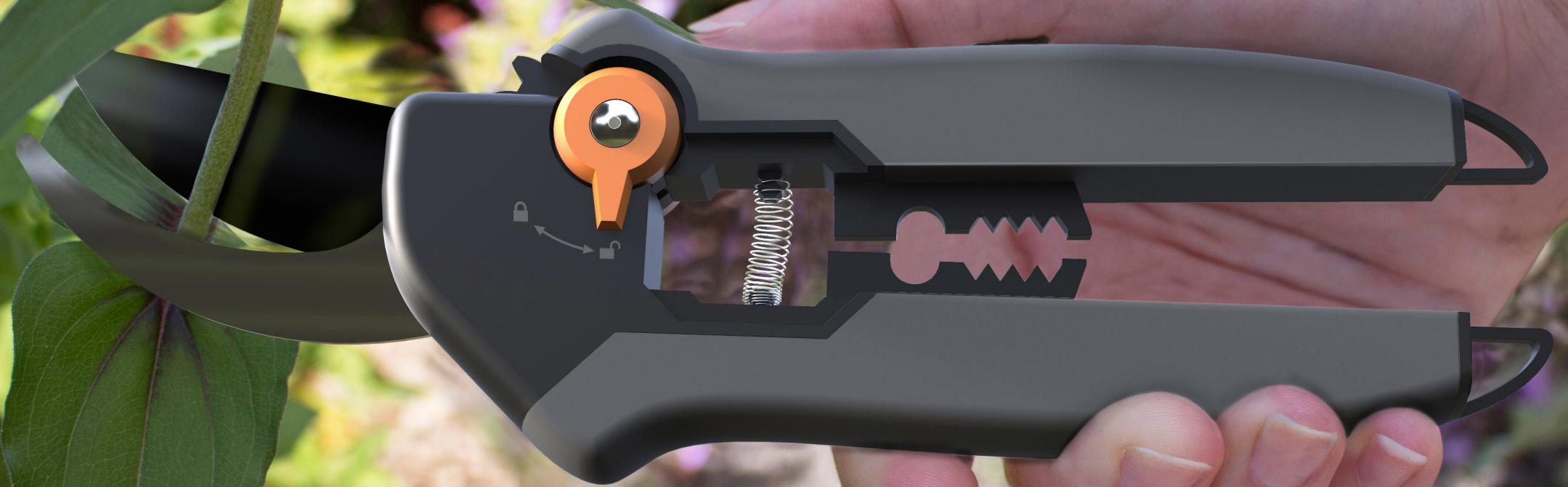
A big to small gear ratio allows the blades to open full width while the handle only needs to travel half the normal distance. This ratio makes the pruners very quick as well, which is ideal for florists.



DETAILS

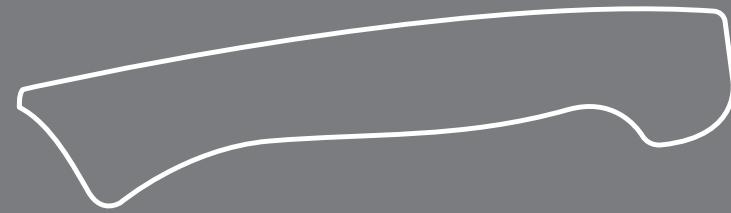
Fiskar's orange was used sparingly and thoughtfully to call attention to the locking mechanism, the main interaction point for the user. It was also used as an aesthetic detail for the backing that secures the pin which attaches the top handle to the main body.





Arrow Staple Hammer

two week redesign exercise



Arrow Fastener's staple hammer has been around for quite some time. However, it is time for a change or two...or three. I set out to solve the issues of **comfort, safety, and aesthetics**.

In this **two week exercise**, I explored what a new Arrow Fastener staple hammer could look like.

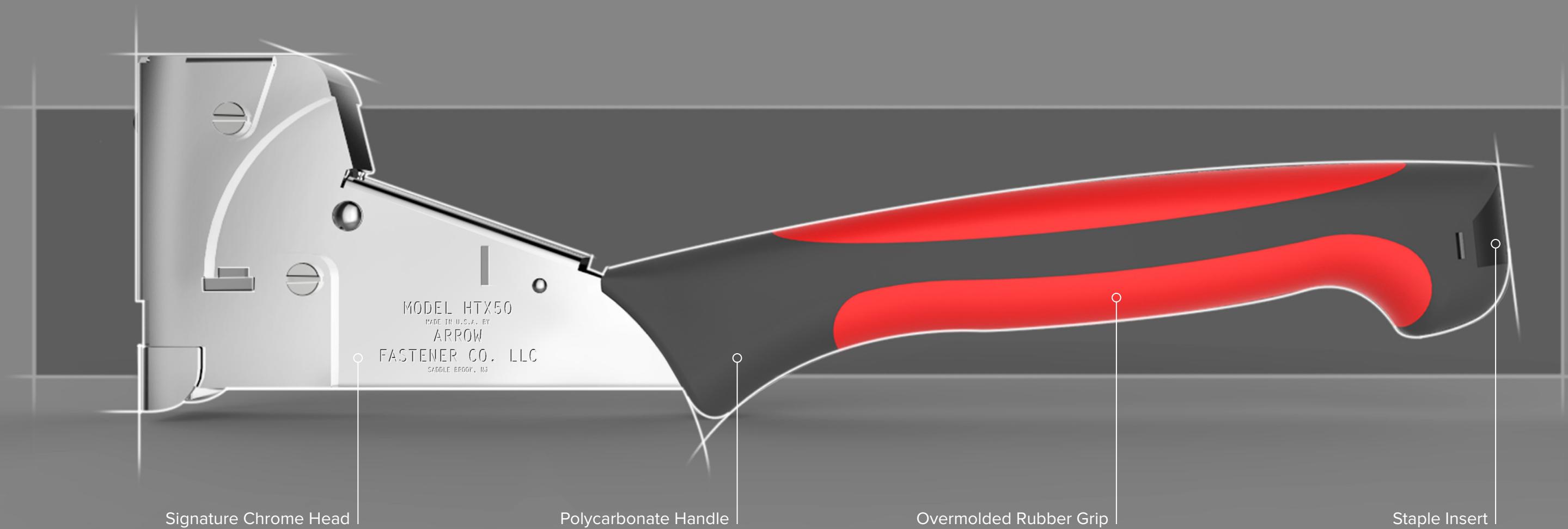
ARROW STAPLE HAMMER

The original Arrow staple hammer is pretty utilitarian looking. The user's knuckles are placed on the same plane as the point of contact, increasing the potential for injury. The hard plastic, rectilinear handle is not comfortable for user's over the course of an eight hour day. It's time for an upgrade.



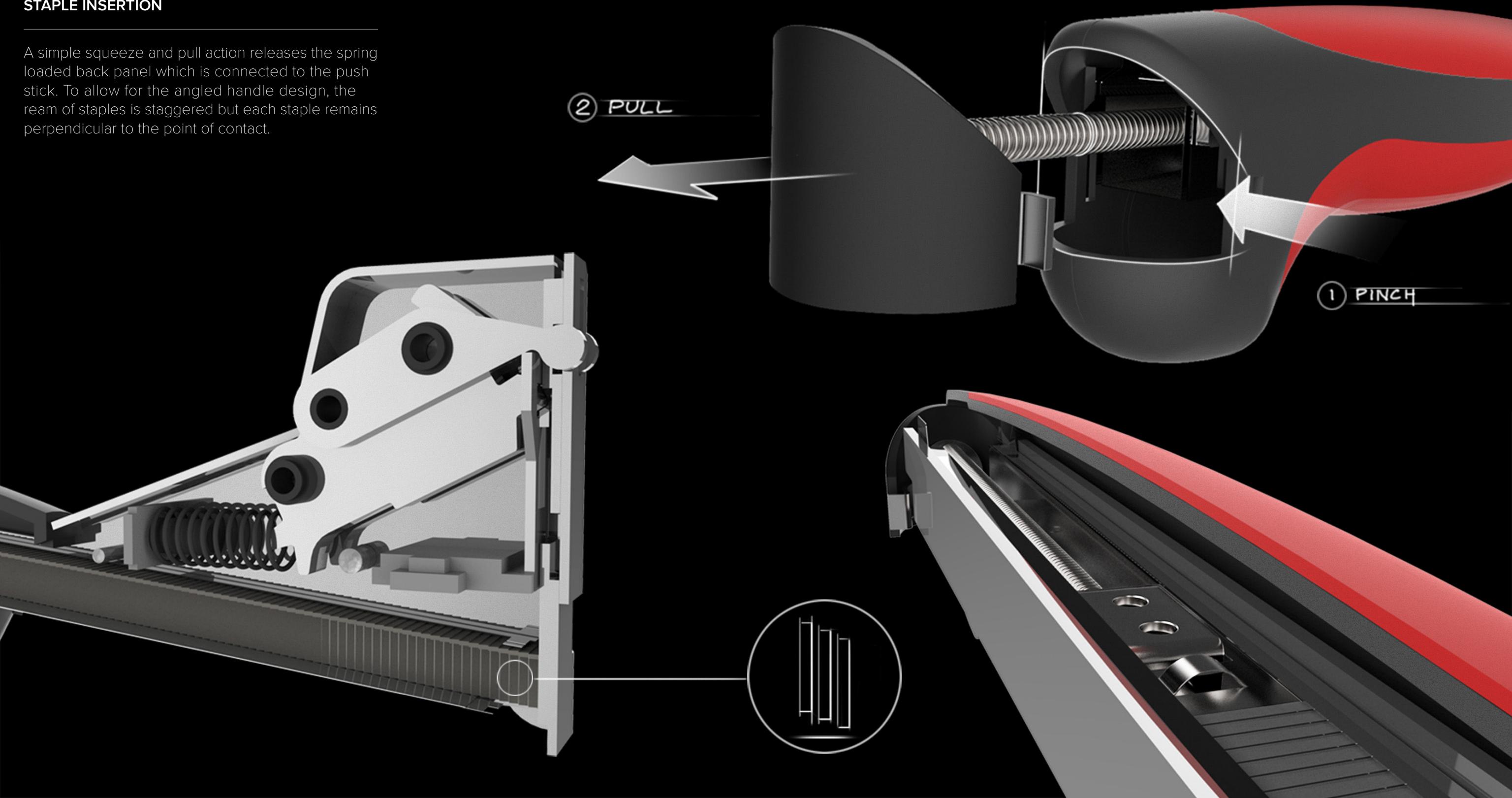
ARROW STAPLE HAMMER 2.0

After many ideation sketches and a few rough foam models, a final direction was resolved. The new design features a more ergonomic handle which is angled to provide breathing room for the users hand. Arrow's signature chrome head was implemented for the purposes of brand identification.



STAPLE INSERTION

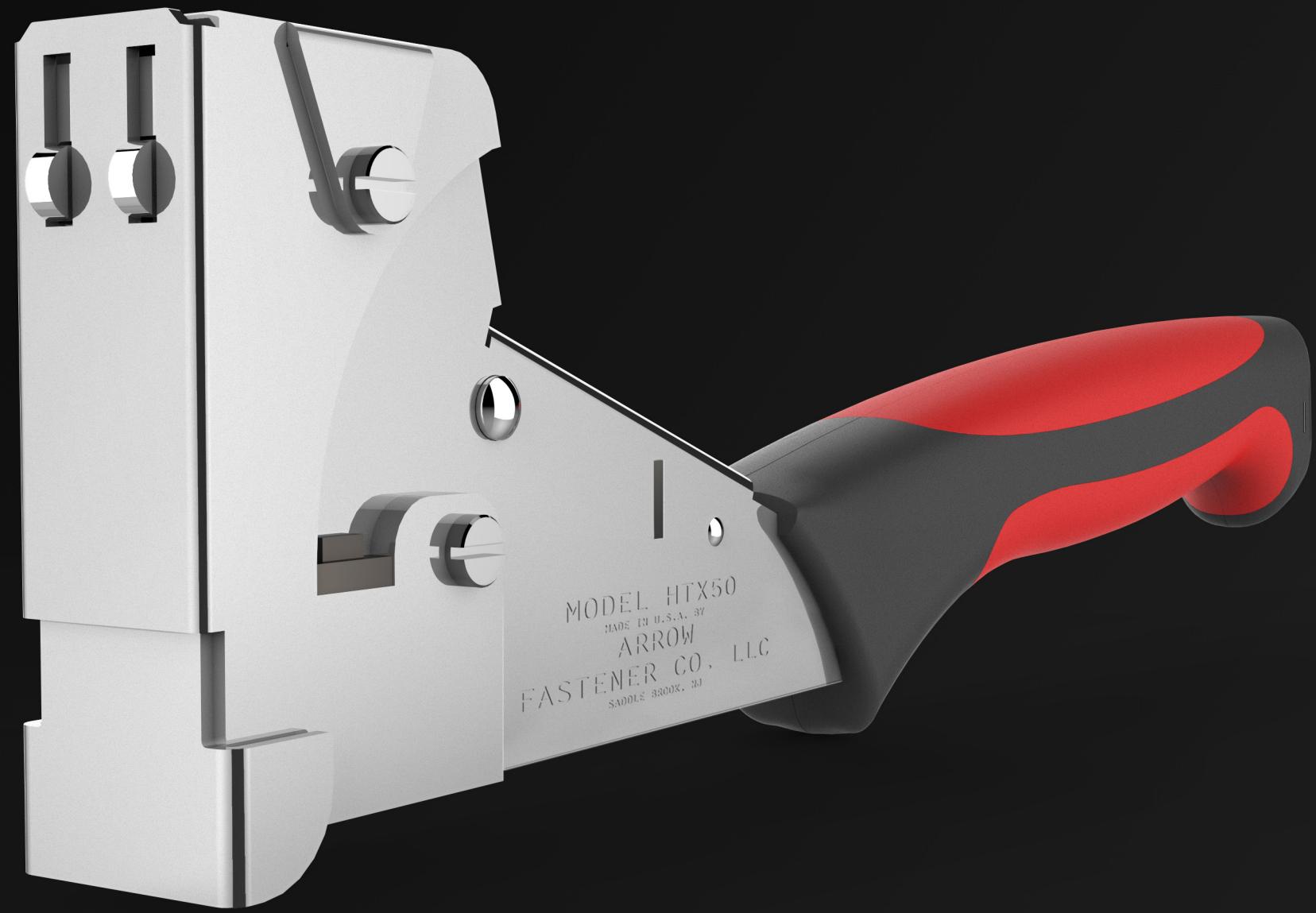
A simple squeeze and pull action releases the spring loaded back panel which is connected to the push stick. To allow for the angled handle design, the ream of staples is staggered but each staple remains perpendicular to the point of contact.



GRIP

In order to increase comfort and impact resistance, soft-touch rubber grips are overmolded onto the polycarbonate handle.



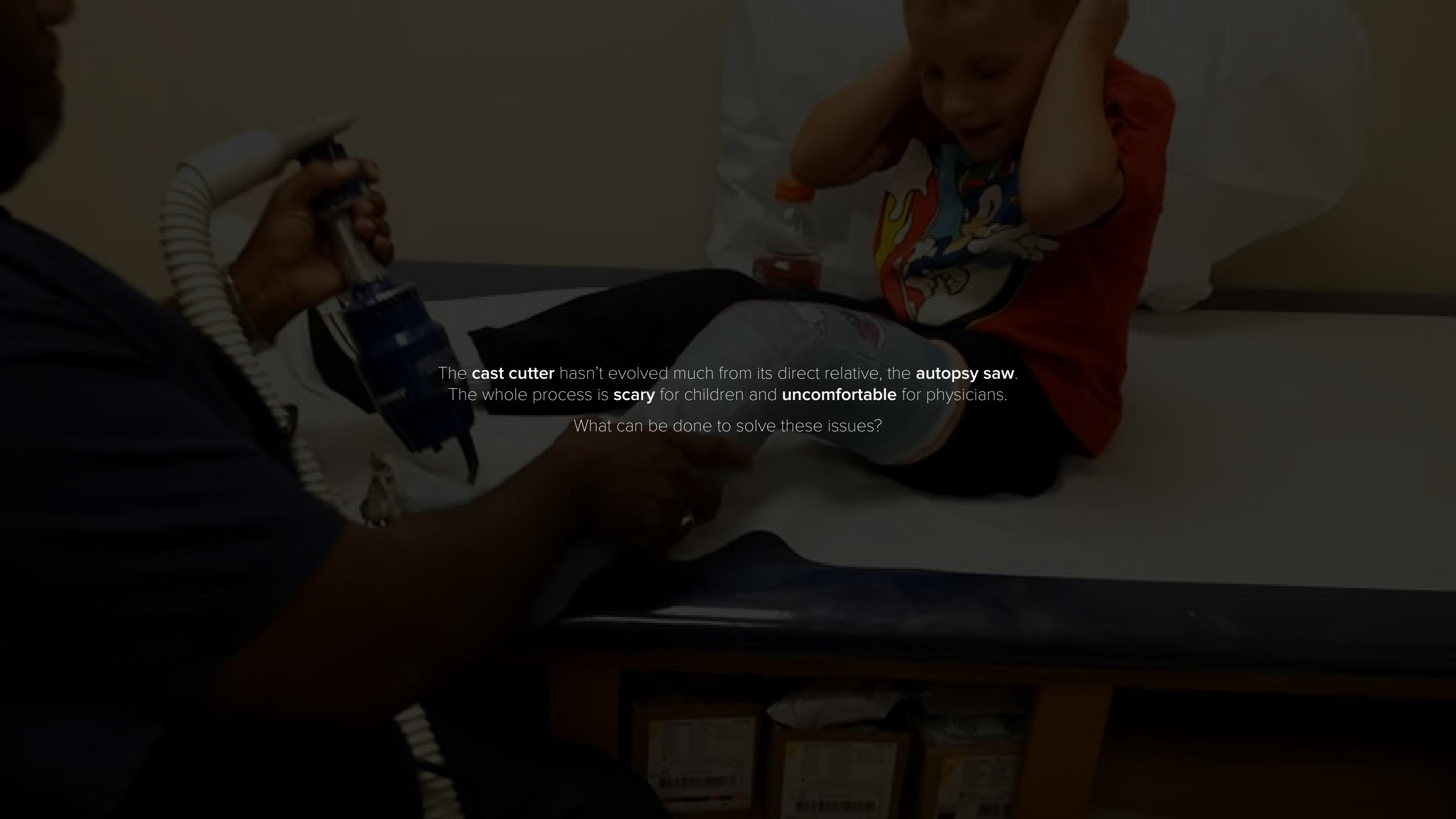


ARROW >
HOW IT ALL COMES TOGETHER

PHILIPS CAST CUTTER

(work in progress)



A dark, grainy photograph showing a medical procedure. A doctor's hands are visible, holding a power drill-like device to cut through a child's arm cast. The child, wearing a colorful pajama top, looks down at the procedure. The scene is dimly lit, with the bright light from the surgical lamp creating a strong contrast.

The **cast cutter** hasn't evolved much from its direct relative, the **autopsy saw**.

The whole process is **scary** for children and **uncomfortable** for physicians.

What can be done to solve these issues?

WHAT'S WRONG?

Between the loud noise and the huge, exposed blade, getting a cast off can become any child's worst nightmare. I set out to pinpoint problematic areas that need attention.



① Dust Collection

Extraction hood is nowhere near the point of cutting.

④ Scale

It is difficult to maneuver into the optimal cutting position.

② Blade

Huge, completely exposed, and difficult changing process.

⑤ Power Switch

Rear location requires two hands to power on.

③ Grip

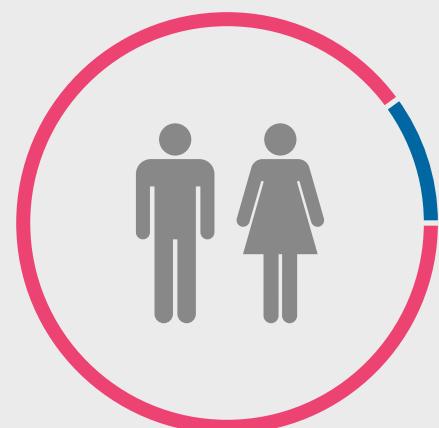
Wide, awkward grip designed for equally large hands.

⑥ Vacuum Hose

Vacuum hose attachment is unwieldy and gets in the way.

RESEARCH

It was important to get feedback from the physicians and the physician's assistants who actually use this tool so a survey was sent out to many orthopedic offices in order to see who is using this tool, how often, and what's most important to them as the user.



GENDER

Female	90%
Male	10%



CAST REMOVALS

1-10 a week	40%
1-5 a day	10%
5-10 a day	40%
10-15 a day	0%
15+	10%



VACUUM EFFECTIVENESS

1	0%
2	0%
3	70%
4	30%
5	0%



VACUUM DISPOSAL

2-3 weeks	0%
1-2 months	0%
3-4 months	40%
6-12 months	20%
Not Sure	40%



IMPORTANCE

Ergonomics	4.70
Vacuum	2.70
Depth Control	3.10
Weight	2.90
Speed Control	1.60

DESIGN GOALS

After verifying the perceived problems with the physicians through the use of a survey and a visit to a local orthopedic office, I decided to focus my design on these five goals.



COMFORTABLE

In order to increase efficiency and comfort for the physician, excellent ergonomics are a must for the cast cutter.



EASY / INTUITIVE

The blade changing process should be easy and intuitive. Mid-cut blade rotation also needs to be considered.



MANEUVERABLE

The current system is very unwieldy. The cast cutter should accommodate various optimal cutting angles and positions.



APPROACHABLE

The cast cutter should be friendly and approachable to minimize the fear pediatric patients often experience.



SAFETY

Safety (and the perception of) needs to be highly considered as cast removals are often very scary for pediatric patients.

POTENTIAL ARCHITECTURES

After an initial brainstorm with the designers at Farm Design, it was concluded that there were three potential general architectures to explore or the combination of any of the three.



RADICALLY CHANGE

The use of a **flex shaft** would significantly decrease the size of the cast cutter providing more opportunities for an **improved ergonomic design**. If the tool can't be cordless, it may be beneficial to at least make it smaller.



WORK WITH GIVEN

While keeping the **current system**, improvements can still be made to the design of the cast cutter through **ergonomic** and **safety** considerations as well as different features regarding **cord management**.



PORTABILITY

Using an **internal vacuum** may add another step to the procedure from the nurse's perspective but it could significantly **reduce the amount of noise** that the current shop-vac style dust collection is causing.

WHY PHILIPS?

It's an exciting design challenge to imagine what the first Philips Cast Cutter could be like by merging the sophisticated, precise design language of their consumer products with the softer, more approachable aesthetic of their medical devices.



PRECISE



APPROACHABLE



IDEATION

I am currently in the ideation phase. I've started to generate many ideas focusing on my design goals and Philips's form language. My next step will be to W and combine different ideas to generate concepts to implement into initial prototypes.



IN PROGRESS

Check back in 3 months to see the final product!

CO-OP Experience

During co-op, I had the privilege of working on projects for these clients.



THANK YOU!

See more work and full resolution portfolio
at **jackthrun.com**

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