

Multi-Tool Badge Holder

Congratulations for being chosen to be a NASA HUNCH Finalist for Design and Prototyping. Know that there were a lot of very good teams with great ideas competing for these spaces. Being a Finalist means you are already a winner. There is not a 1st, 2nd, or 3rd place—there are only Finalists. Although HUNCH would like to have all of these projects turned into flight hardware, most won't make it that far. However, some of these ideas may inspire other hardware and equipment. This is like real engineering where any of the projects or ideas in a project that are deemed valuable to NASA could be incorporated into another project. NASA has no intention of taking or stealing ideas. HUNCH has every intention to keep your names attached to those projects so that you and your team retain credit for your ideas and efforts. In general, NASA does not seek patents on space hardware unless there is a use for it on the ground that could be valuable.

Suggestions for the Final Design Review

Houston in the middle of April is warm and humid. The building is air conditioned but there will be lots of people. Rain is possible.

- Look professional.
- Everyone on the team should plan to talk.
- Update your brochure with you latest prototype and information.
- Make sure your QR code works for everyone.
- Update your tri-fold with your latest information—less about early concepts, more about features.
- The better your model looks, the less you have to say.
- Take a video of everything working well so if it fails when you arrive, you can still show functionality.
- You will be sharing a table with another team. Make sure your display will not take up more than half of a 6 ft x 2ft table. There will be some tables with power and some without. We will try to give priority to those who need it for the presentation—video.

Suggestions for the Multi-Tool Badge Holder

- Make any updates to your design that you think will make your badge more desirable.
- Make sure your edges are rounded so there aren't pokey.
- Make sure your attachment is strong and will last a long time.
- Make sure you are within the weight limit.
- Have a logo for your product.
- You are welcome to make 10 badge holders of your design and try to sell them for nothing less than \$10 while you are at Rocket Park.
- Come up with a sales pitch.
- Talk about the value of your product first. If they ask about your design process, be ready.

Problem

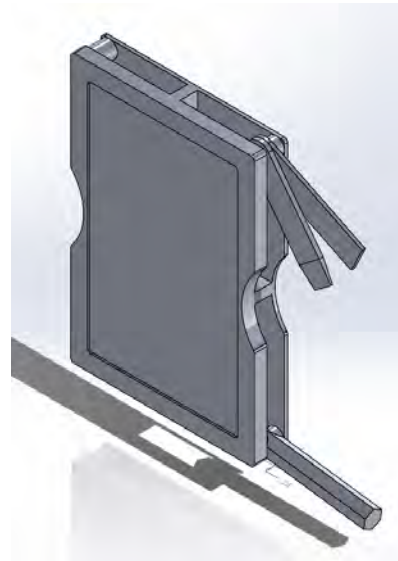
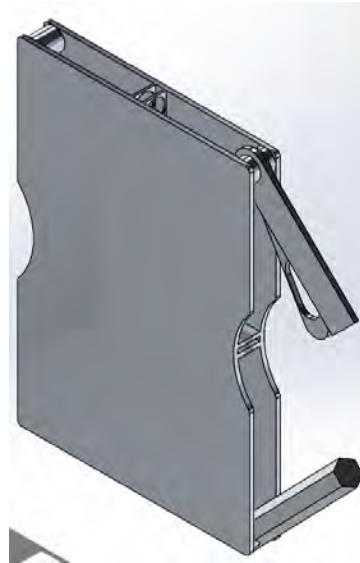
The problem we are trying to solve is creating a multi tool apparatus that can hold an ID badge securely while also allowing the user to remove and scan the ID badge.

Similar Products



Our Goal is to combine these two products into one seamless design that is at most 60 grams and is within the dimensions of 2 $\frac{3}{4}$ " by 4 $\frac{1}{2}$ "

Solidworks Assembly



The Final Design

The materials we would use for the final design are aluminum sheet metal for the exterior fixtures, with aluminum bushings, and varied metals for the tools depending on the needs.

Problems we encountered while developing our prototype

While developing our prototype we encountered several issues. Some issues we've encountered were dealing with incorrect bolt length, our designs being out of spec and finding a connector for the lanyard.

Next Steps

If we continued designing and correcting the design we would create bushings that go interior to the tools to create more structural support on the tool. Allowing more extraneous daily use.

Final Design



Progression



Data and Testing



Multi Tool Badge Holder

By: Lucas Crowl, James Eshbaugh, Caleb Kendall, & Jesse Derushie



**Space Coast Jr/Sr High
Cocoa, Florida
Mr. Reyes**

Badge

The purpose of this project is to design a multi tool badge. This badge must be lightweight and compact for easy use.

This badge is design with the disable NASA employees in mind. For that reason, the badge will have a series of add-ons and braille engraving's.



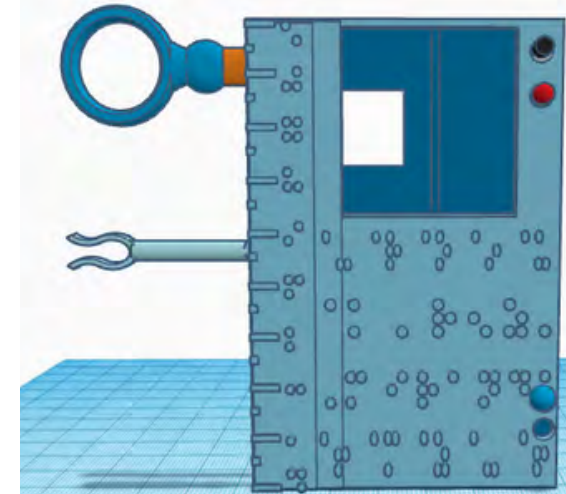
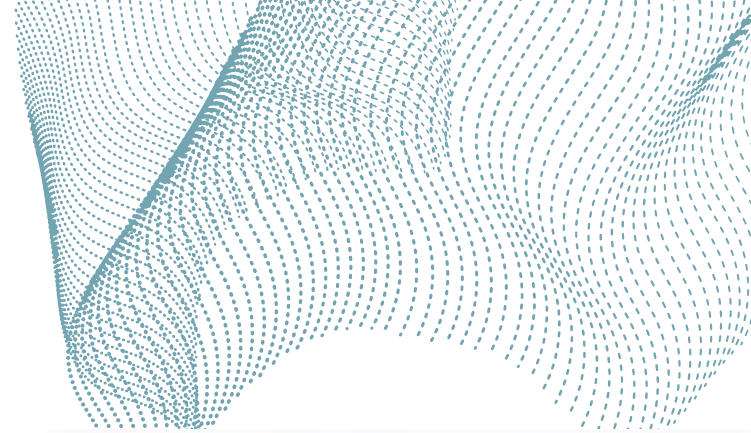
Information :



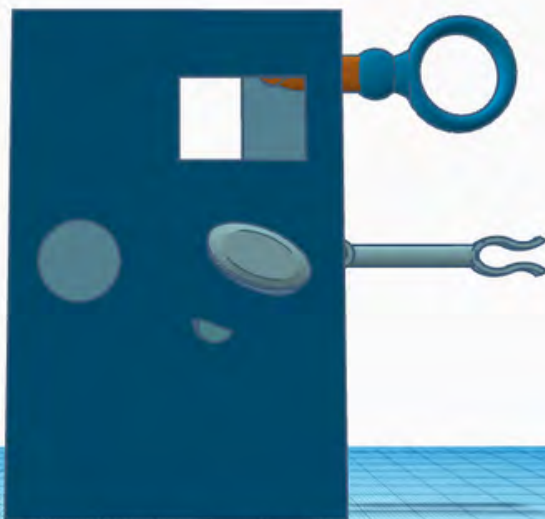
Centro Residencial de Oportunidades Educativas de Mayaguez

Karina A. Miranda Casiano

Prof. Danelix Cordero



NASA HUNCH: Badge



Desing

Add-ons

The collapsible item is a: magnifying glass
This item will not be bigger than one and a half inches.

The thermometer will be digital and will be place at the back of the badge for easy acces.



The design of the badge is of a multitool and useful for the disable. The one add-on will be collapsible and the rest will be place inside de badge. These items are lightweight.



Add-ons

The other items are: a light, a ruler, motion sensor, and braille engravings. These items are place on the front part of the badge. The ruler will be place on the left corner. The light will be place on the front of the badge. The Braille engravings will be for the information The motion sensor will detect objects from away and make a sound.



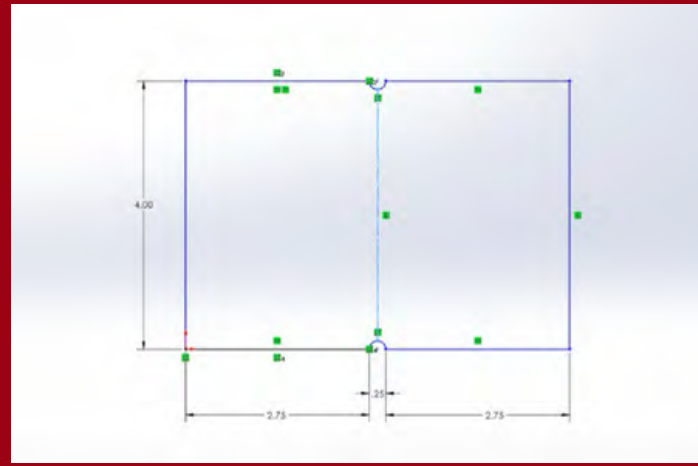
Multi-tool Badge Holder



Palm Bay Magnet
Highschool

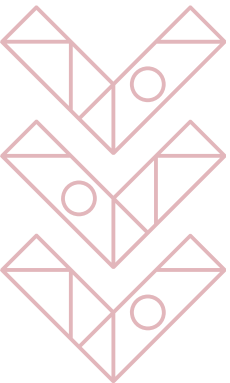
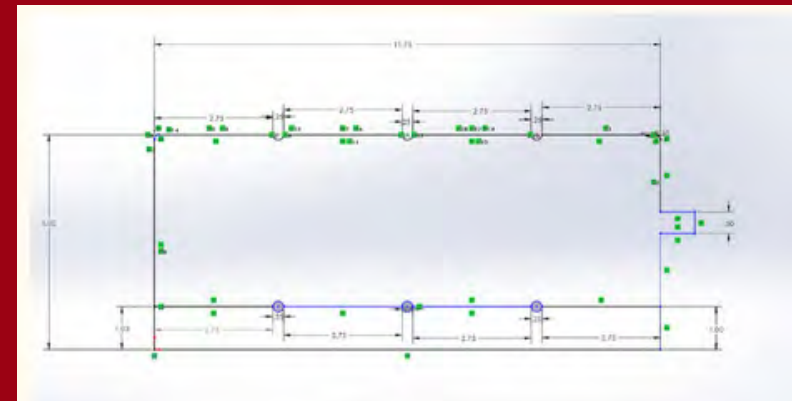
Mrs. Allen

Nicole DiPasquale & Rayne Cantrell



The main feature of the second multi-tool badge holder is that its like a box and on the side of it will have pockets on the side for the tool.

The main feature of the one multi-tool badge holder is that it folds so that it like a book and that when you open it shows all the tools.



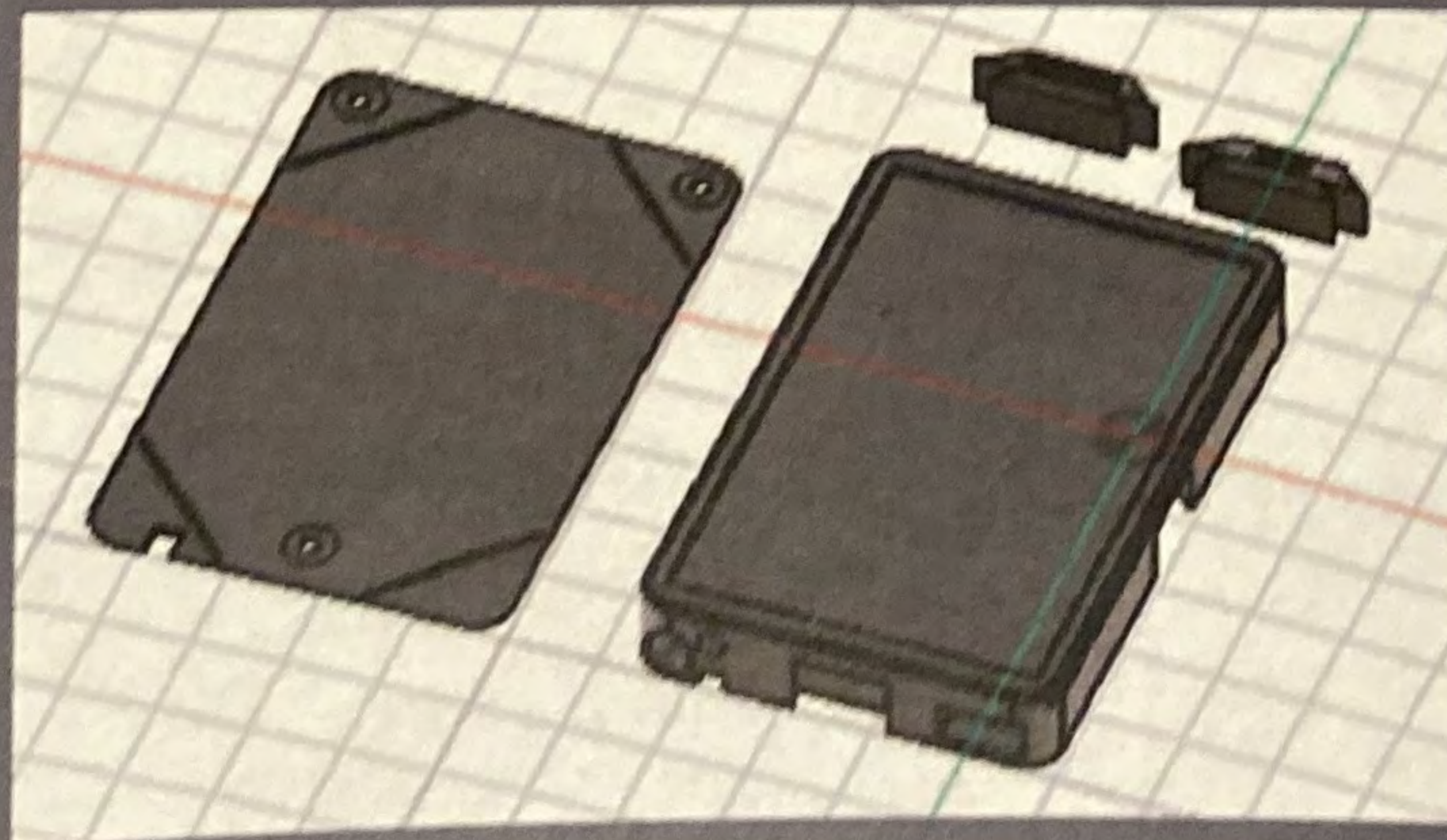


Columbia Area Career
Center
Columbia Missouri
Michael Merz



How We Did It

- 3D Printed Body
- Interchangeable Attachment Method and Location
- Off-The-Shelf Easily Obtainable Tools
- Minimal Glue Design for Reparability
- RFID Shielding



TIB

Tools and Identification Badge-Holder

Multitool Badge Holder
Project

Maxwell Strode, Armani Speek,
and Griffyn Landsperger



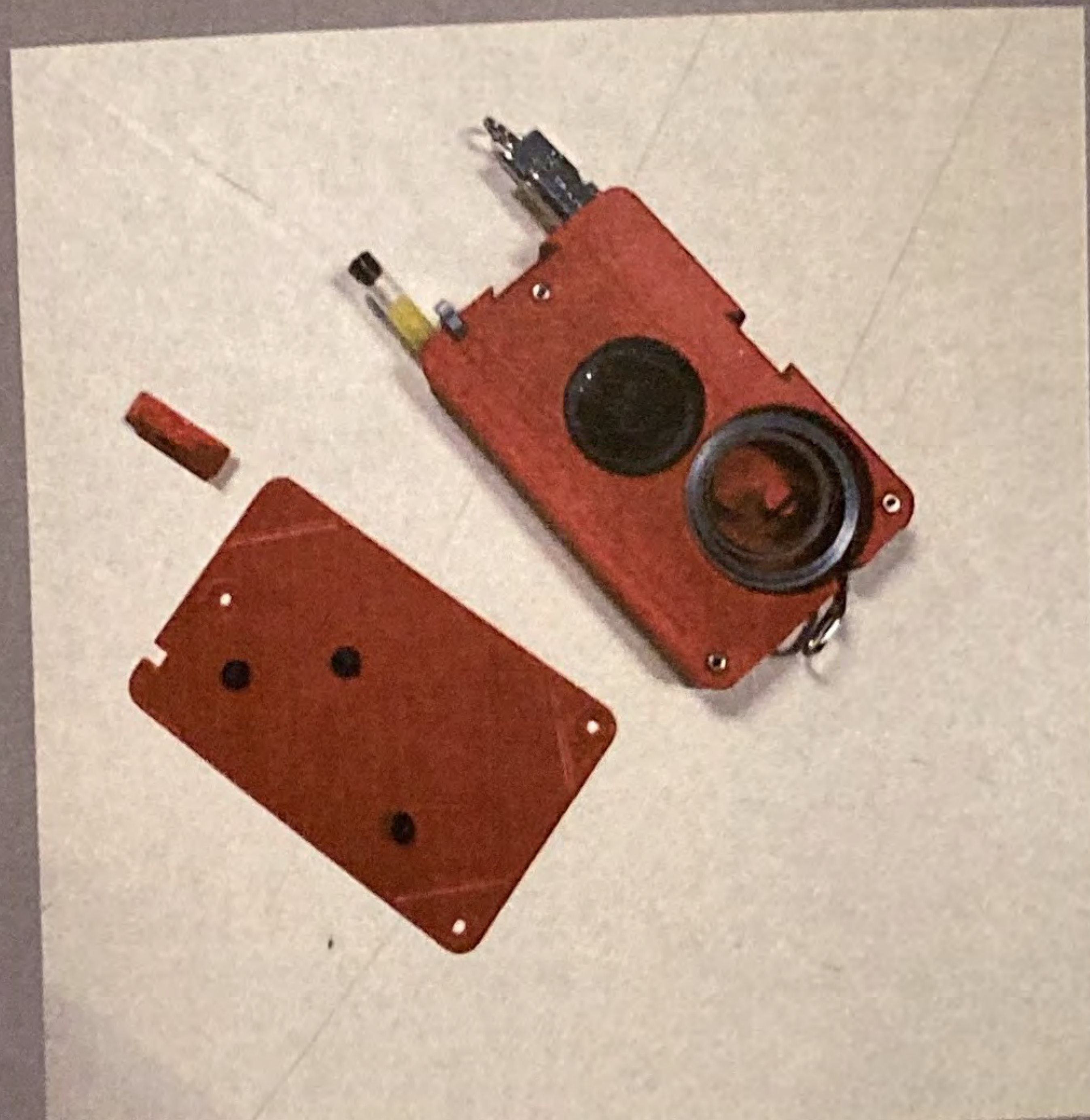
Tools

- Nail Clippers
- Pen
- Pencil Lead Holder
- Tape Measure
- Bluetooth Tracker
- Tweezers



Why TIB?

- Existing badge holders do not provide much function
- TIB adds tools to something already carried around everyday
- 2 Card Capacity



Who is it For?

- The Everyday Office Engineer
- Useful Tools Can help Many People

Function *With* Form

- Sleek design
- Ability to switch orientation
- Ability to switch attachment Method

Modular Badge Holder

Instead of having static tools fixed into place, this Badge Holder has removable components.

This Badge Holder is very lightweight

This Badge Holder is almost entirely 3D printable

Current Components

- BADGE HOLDER BODY
- PENCIL HOLDER
- BLANK CORNER MODULE
- BOX OPENER
- USB HOLDER
- RULER
- RFID BLOCKING LINING



Future Improvements

Further Reduce Weight
Improve Back Plate Connection
Add Additional Components

- Eyeglasses Holder
- Screwdriver Holder
- Stapler Remover
- Wire Stripper

Meet The Team



Cam, Will, and Marcus

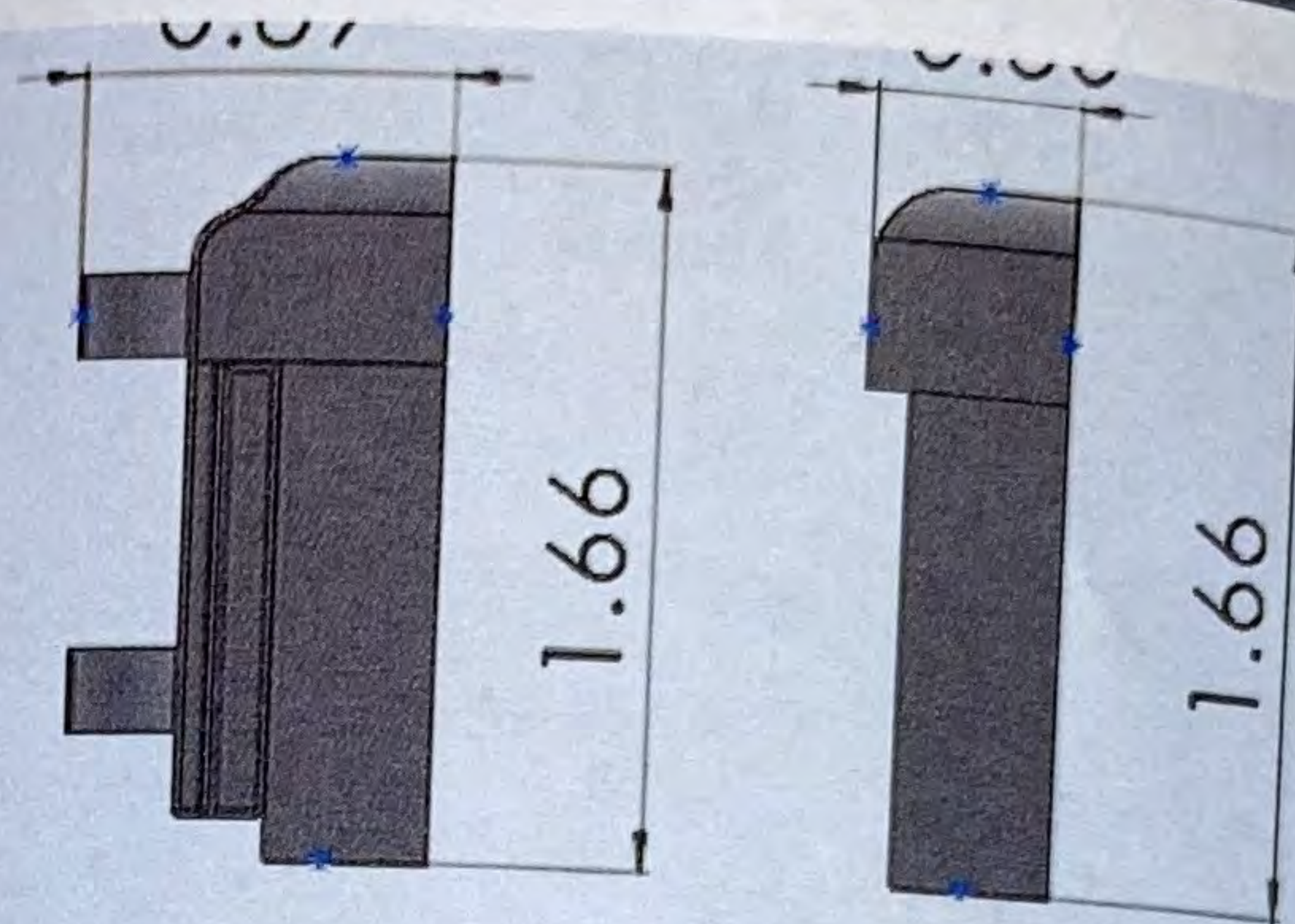
Teacher: Mrs. Magas
magas@tri-county.us

Tri County Regional Vocational
Technical High School

📍 147 Pond St, Franklin, MA 02038

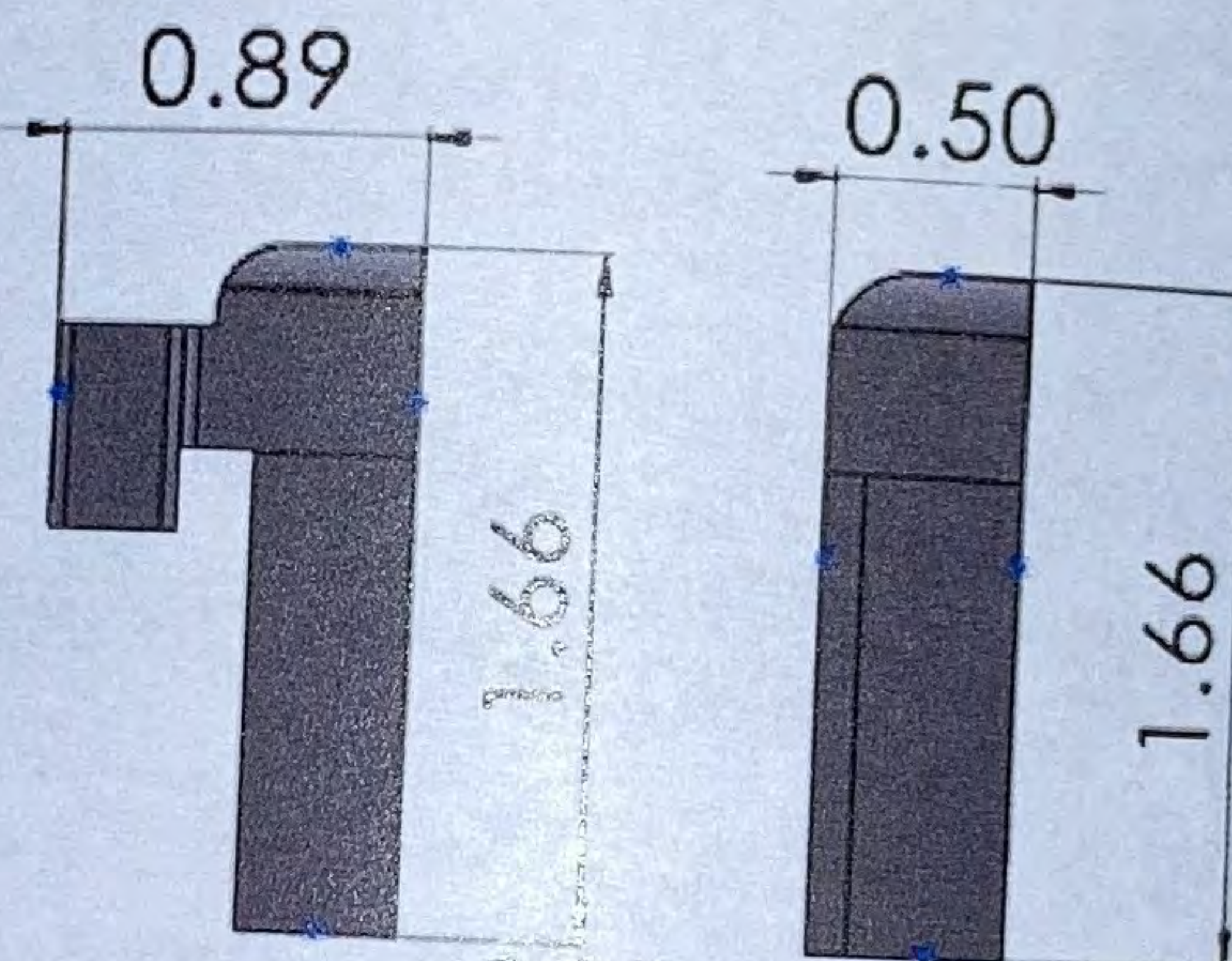
Pencil Holder Module

This module has 2 clamps that a pencil can snap into. The pencil can be removed with a bit of force. The clamps are strong enough to endure repeated use.



USB Holder Module

This module contains a pocket for the metal portion of a USB stick. The pocket is held away from the body of the Badge Holder, so most sizes of USB can fit.

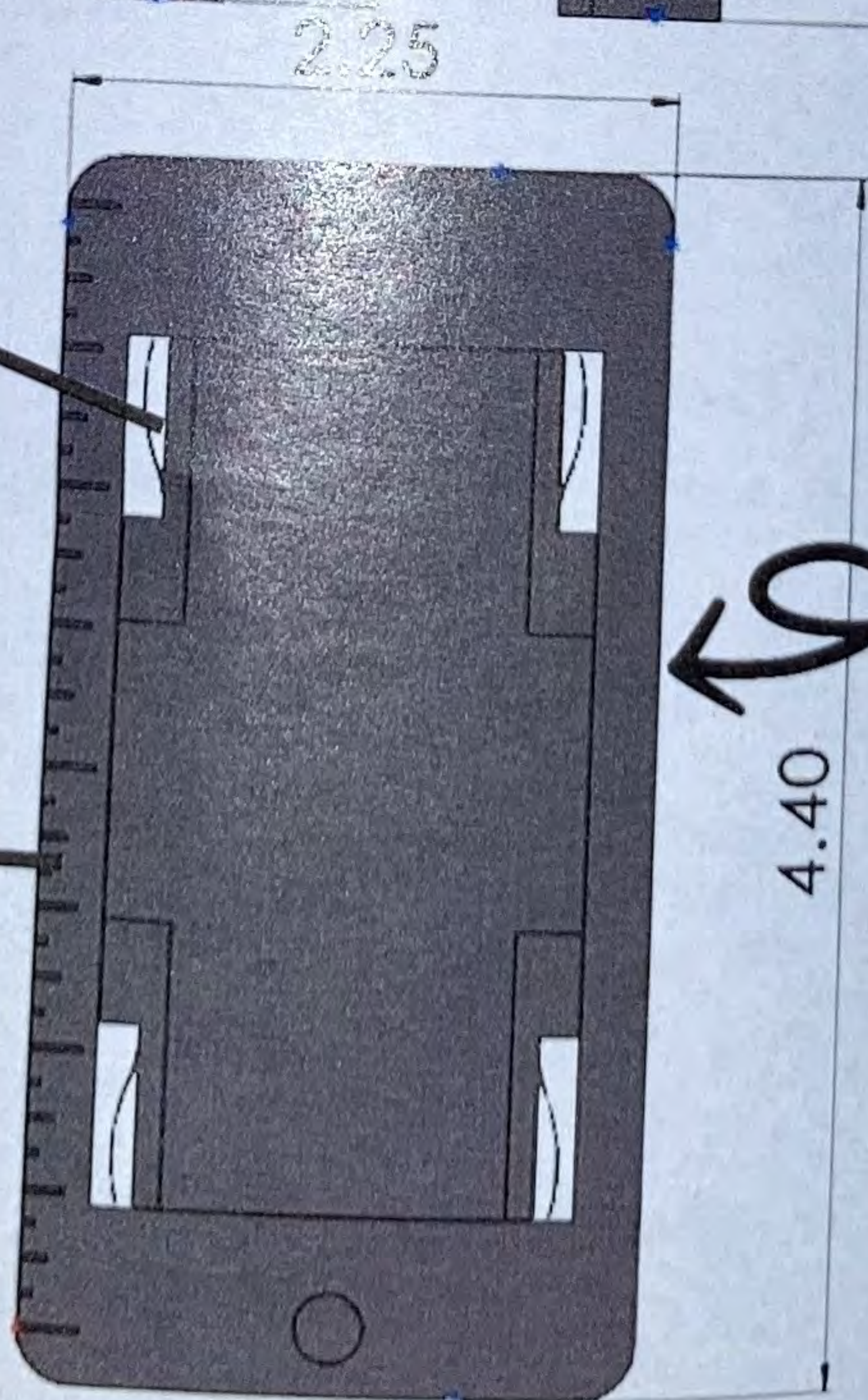


Attachment Mechanism

The attachment mechanism joins the modules and the main body of the Badge Holder. This works by using plastics inherent flexibility and springy-ness.

Ruler

This is the ruler. It is in Inches, but if needed, one in Metric can be added to the other side.



Blank Corner Module

This module does not do anything, it is just here to fill empty corners when there are no other modules in use, and to build off of when designing new modules.

Box Opener Module

This module contains a retractable cutting blade for opening packages, opening letters, or cutting paper. When going through airports, you can just remove and throw away the module before going through metal detectors. Once at your destination / home, you can reprint the module.

RFID Blocker

Flipping the badge holder, you can find the housing for the RFID blocking cloth. This cloth must be folded down (not cut!) until it fits into the pocket. Then, the covering for the pocket must be pressed into its place, and held until a 'snap' is heard. Now, once the cloth is inside the Badge holder, no RFID badges can be scanned. The Badge must be taken out of the Holder to be scanned.

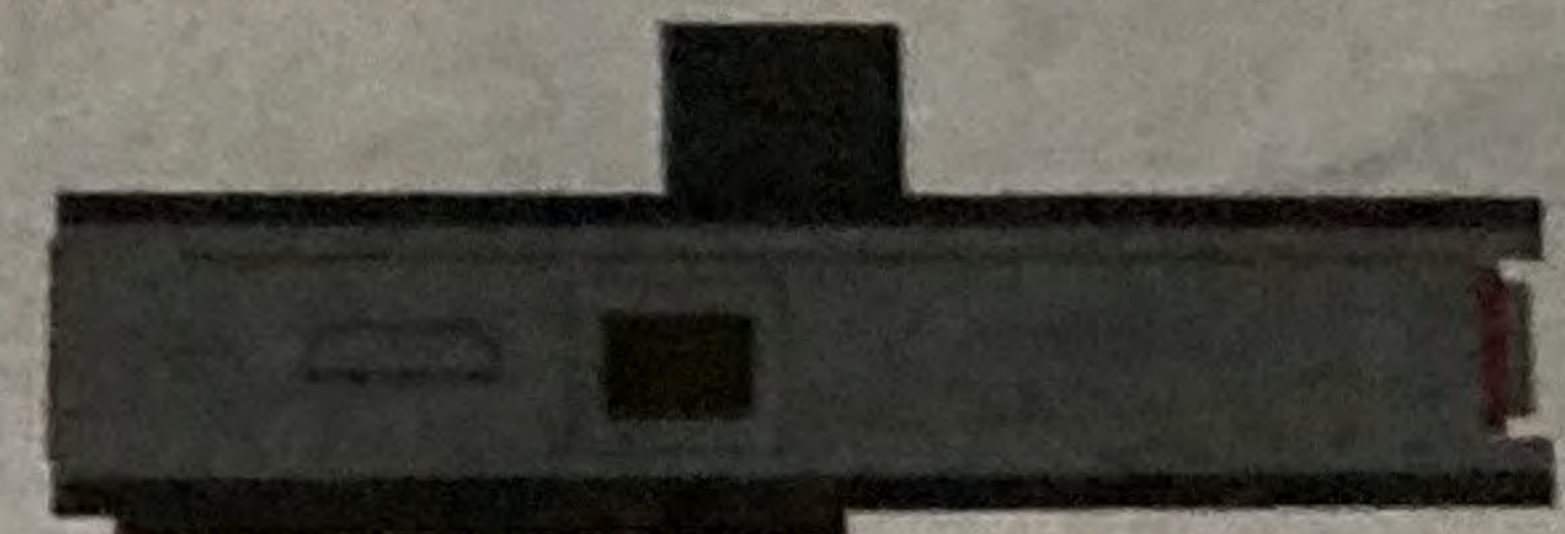
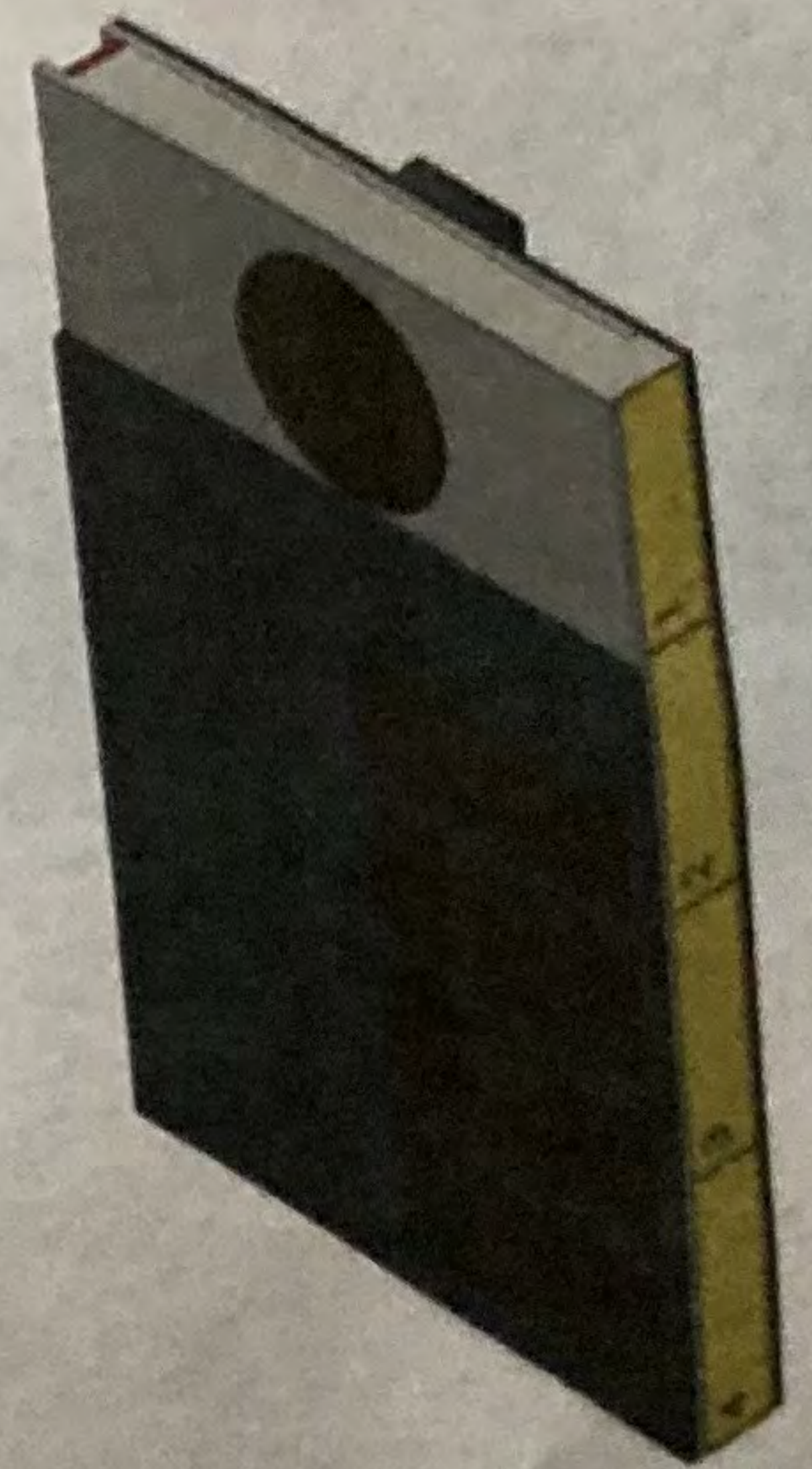
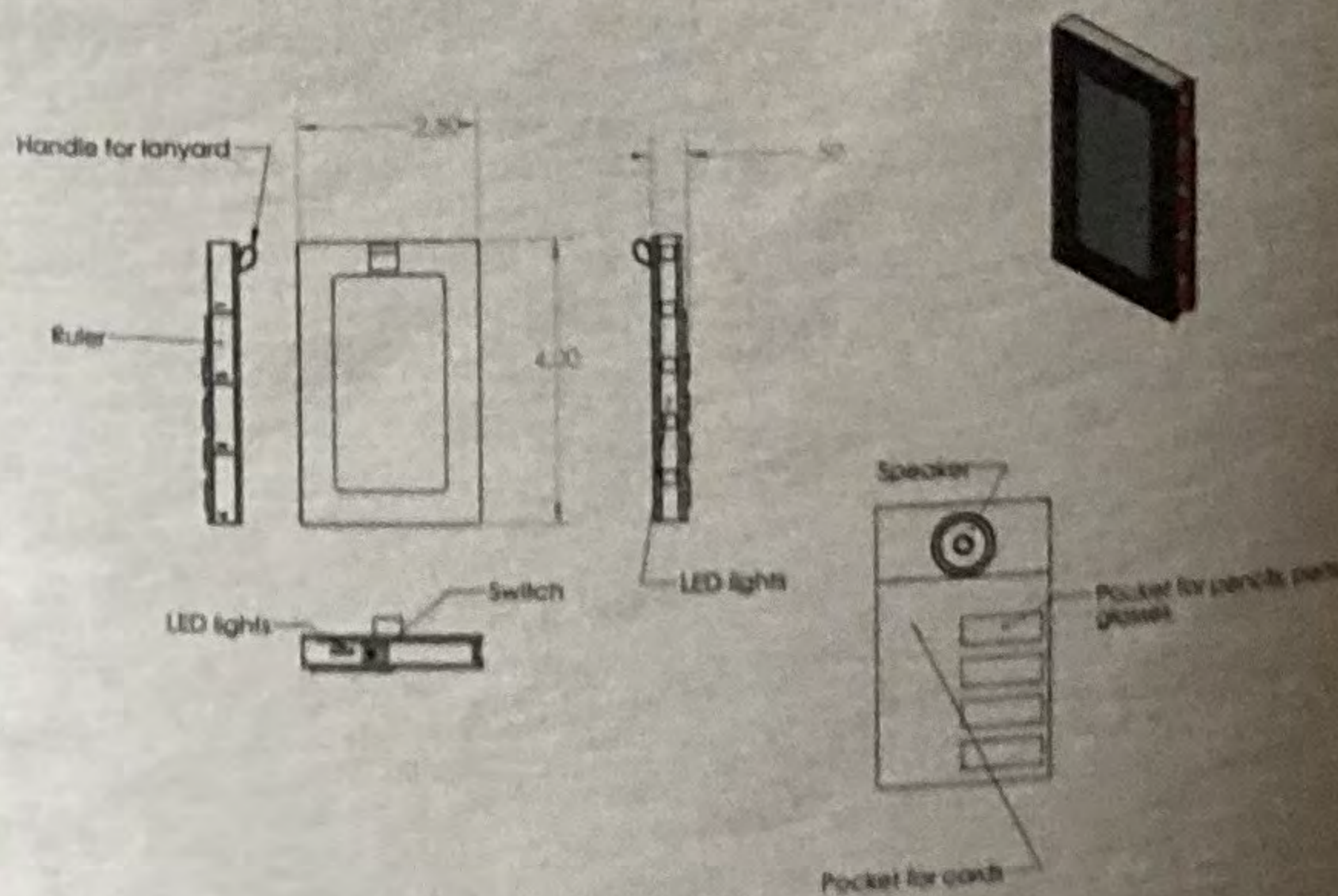
Badge Holder Multi-Tool

Conroe High School
Mr. Canestorp
Jaynie Octaviano



The main features of this badge holder will be that it has a numerous amount of tools that may be used on a daily basis. The tool is made from plastics and reused fabric, thus reducing the costs of production. So far it contains 5 different tools.

Each tool on the badge holder is important. The bluetooth speaker, located on the back, and LED lights, located on the side, will allow users to locate their ID with ease. The circuit board component and wires are covered by a 3D printed layer which will protect it from taking a lot of damage if dropped. The big grey pocket on the back allows for cards held with the badge holder, while the 4 black strips are meant for pens/pencils. The ruler increments on the side of the badge will also aid users in measuring objects.



(Badge holder will be charged via
micro-usb charger)



Scan for more info

Objectives of the Multi Tool Badge

- Accessible
- Durable
- Multipurpose
- Light weight
- Everyday use - versatile
- Extend the lifespans of ID Badge

The multi-tool badge holder is machine sewn using a lightweight material **Tyvek®**. The items and/or tools that could be put into the badge pockets are item used by workers during the day.

It has multiple panels and seven pockets for easy access.

The Lanyard is part of the Badge Holder as it has a retractable measuring tape and the connector is the jump drive.

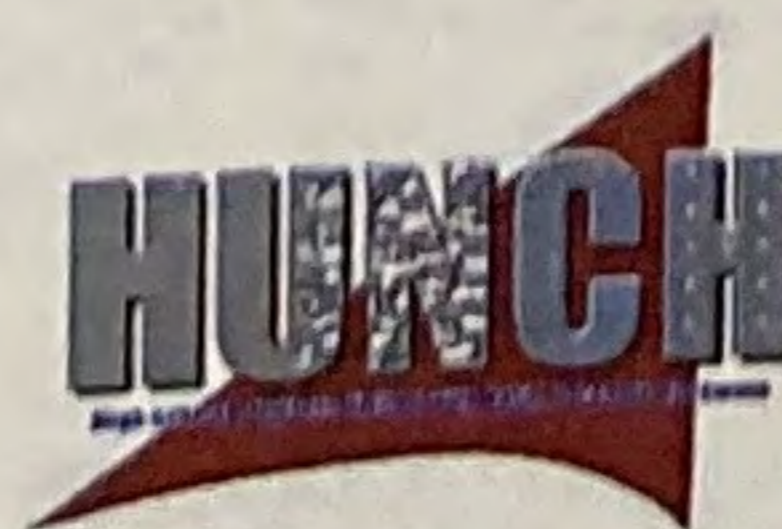
Tools that are useful to workers everyday!



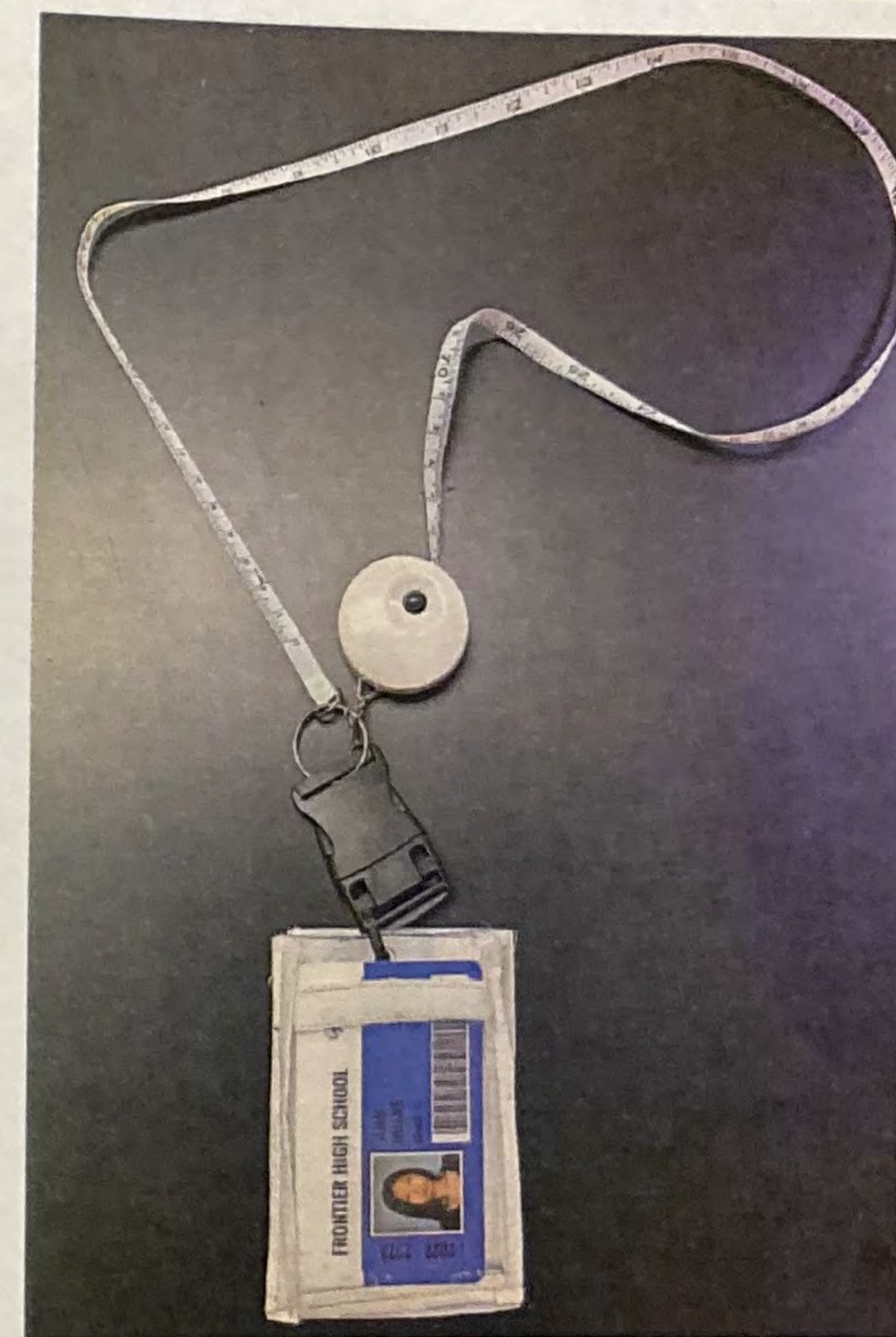
Jump Drive Connector



Arianna Grace Chapline & Juan Huang



Multi Tool Badge Holder



Project By:
Juan Huang
Arianna Grace Chapline

**NASA HUNCH Project
2023 - 2024**

Frontier High School
Hamburg, NY, 14075

Teacher Mentor
Sandra George



Finished Product



Specifications

Empty Badge Holder **11.2 g**

Lanyard

- Measuring Tape
- Jumpdrive w/Badge attachment

30.6 g

Designed Pockets for

- Post-it-notes
- Calculator
- Pen
- Credit Cards
- Business Cards
- Multi-tool

Multi-tool featured (purchased) **36.5 g**

- Mirror & Nail Filer
- Bottle Opener, Can Opener
- Box/Letter Opener & Nail Puller
- Inches & CM Ruler, Cellphone Stand
- 4 Screwdrivers (Philips, Flat Head, and EyeGlass Screwdrivers)
- 6 Hex Head Nuts & Bolts (#2, #4, #6, #8, #10, #12)

Although we didn't have the capability to make our own Multi tool at this time - Our idea was to design a smaller & lightweight multi tool without a bottle opener

Materials:

- Tyvek®.
- Mesh
- VELCRO®
- Measuring Tape
- Jump drive connector
Connects the badge Holder to the Lanyard measuring tape

The material Tyvek® was chosen because it is lightweight, waterproof, and flexible.



Process of making the Multi-tool Badge Holder



Submit your Feedback!

Frontier Team 1

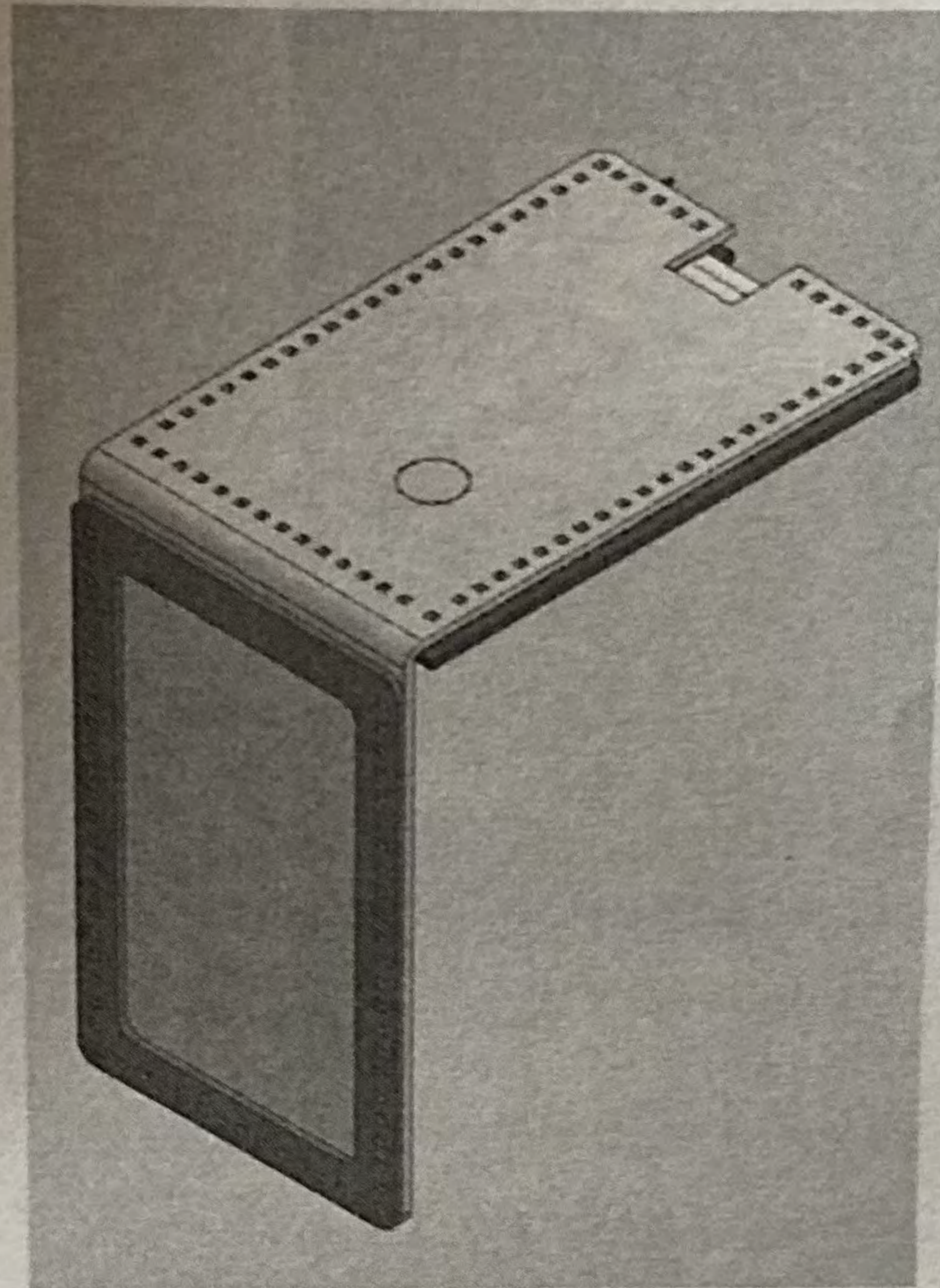


OUR PROBLEM

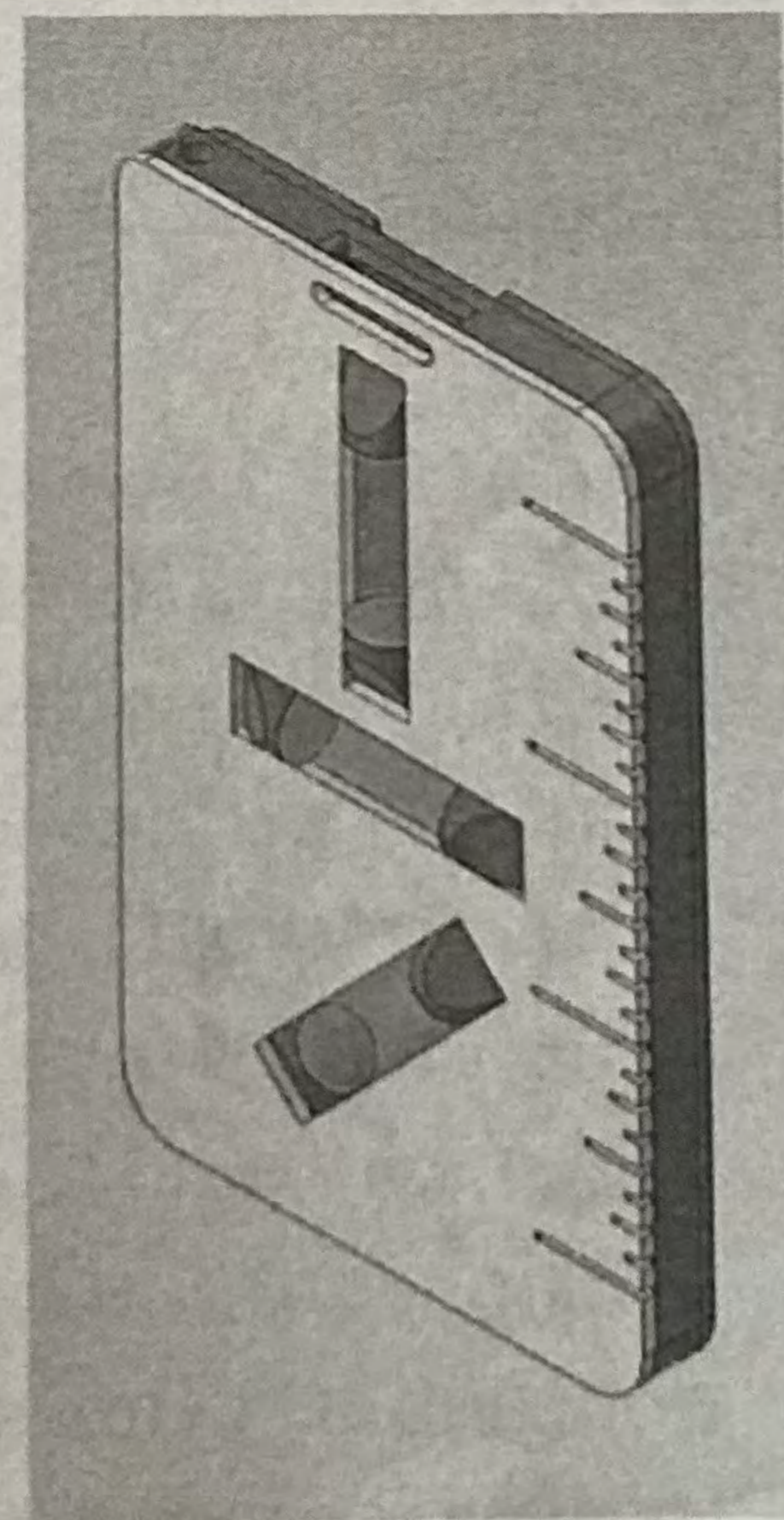
We were tasked with creating an ID badge holder that functions as a multi tool device. There needs to be at least three different tools useful in a pinch, and must not hinder the user in any way.



CAD DRAWINGS CONT.



Design #1 Isometric



Design #2 Isometric

Badge Holder Multi Tool

Teacher: David Laughlin

School: Bridgeland High School
(10707 Mason Rd, Cypress, TX 77433)

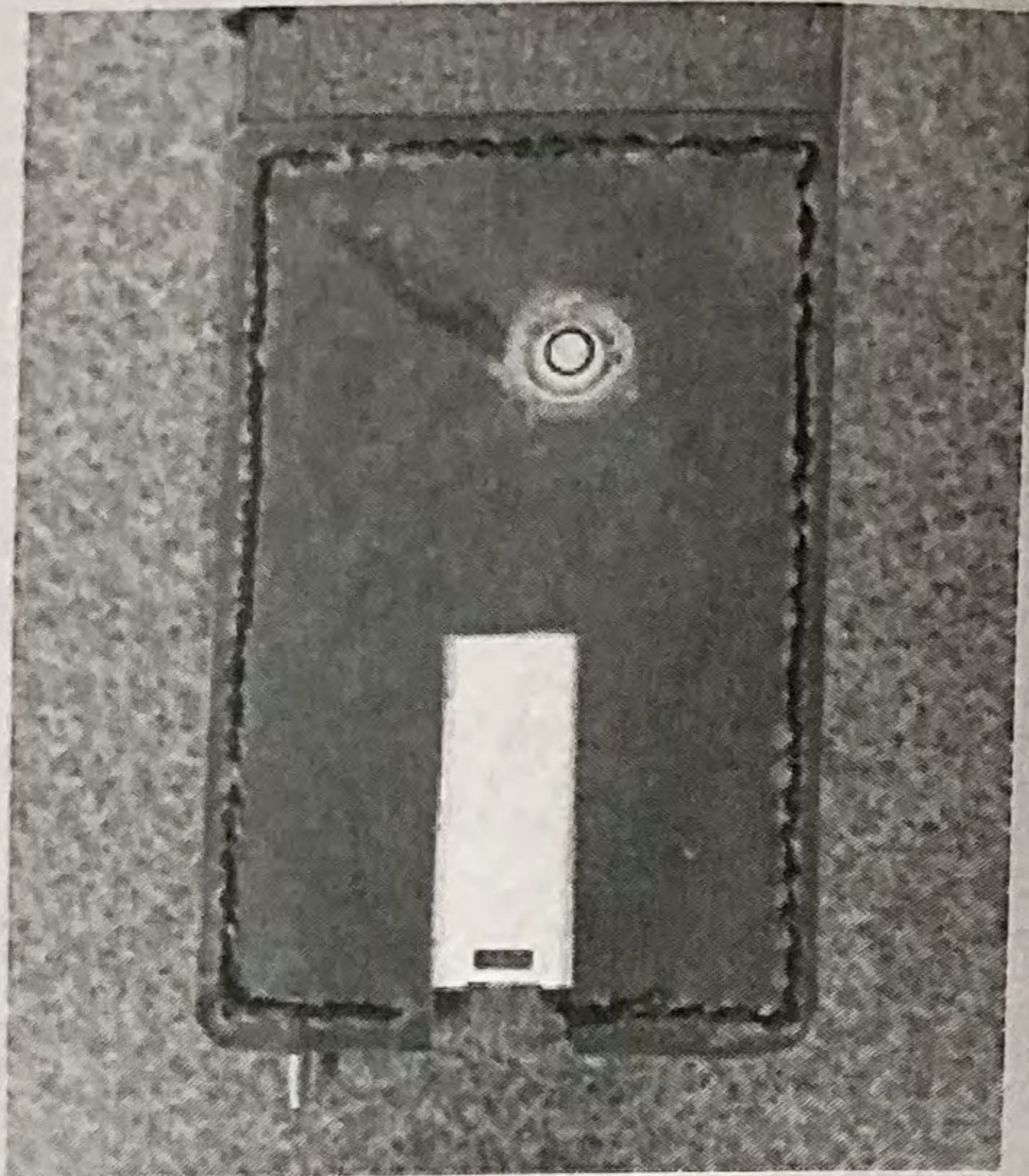


Hamd Tabrez (Left), William Montgomery (Middle), Ethan Presswood (Right)

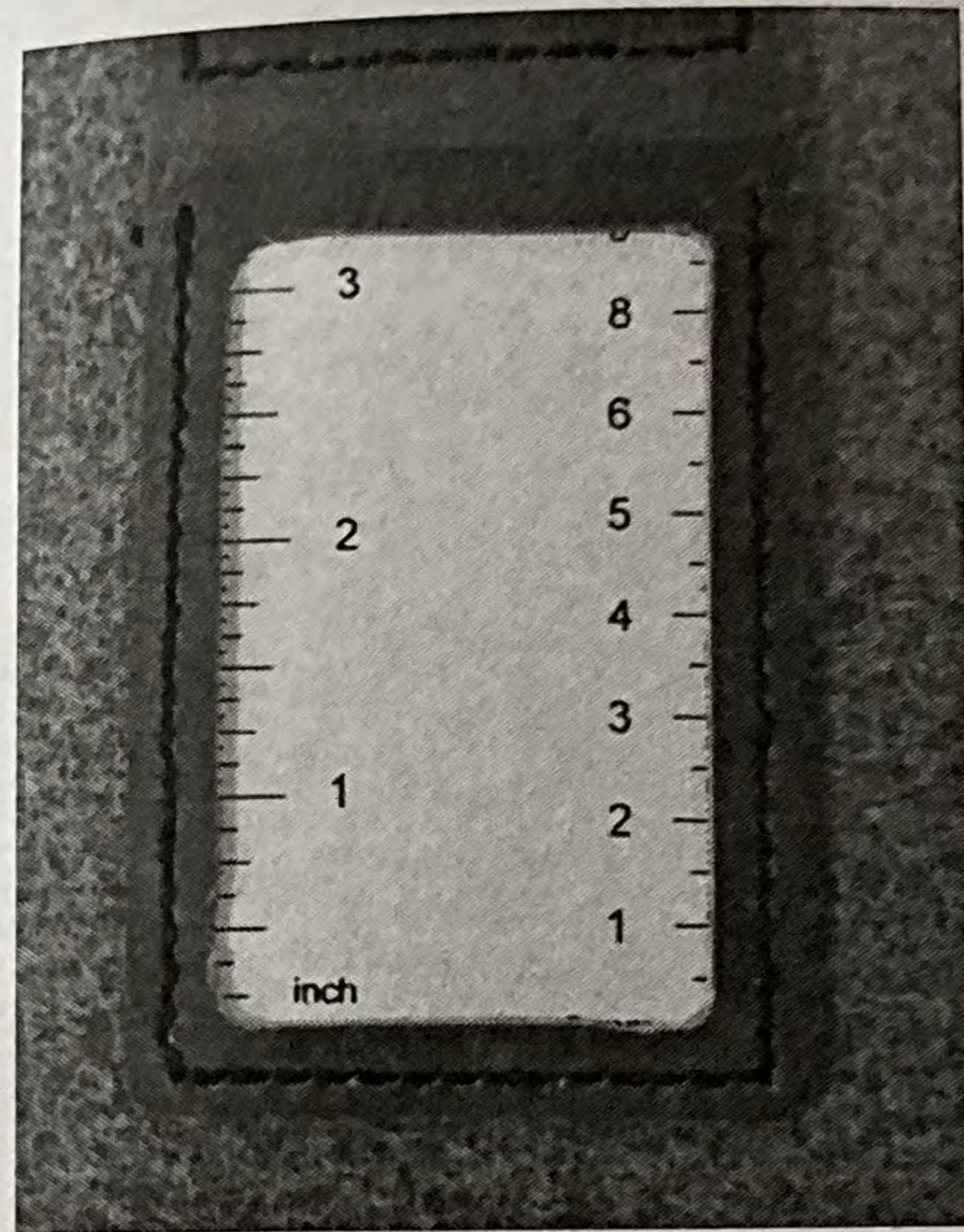


Scan to view video and powerpoint presentation

OUR SOLUTIONS

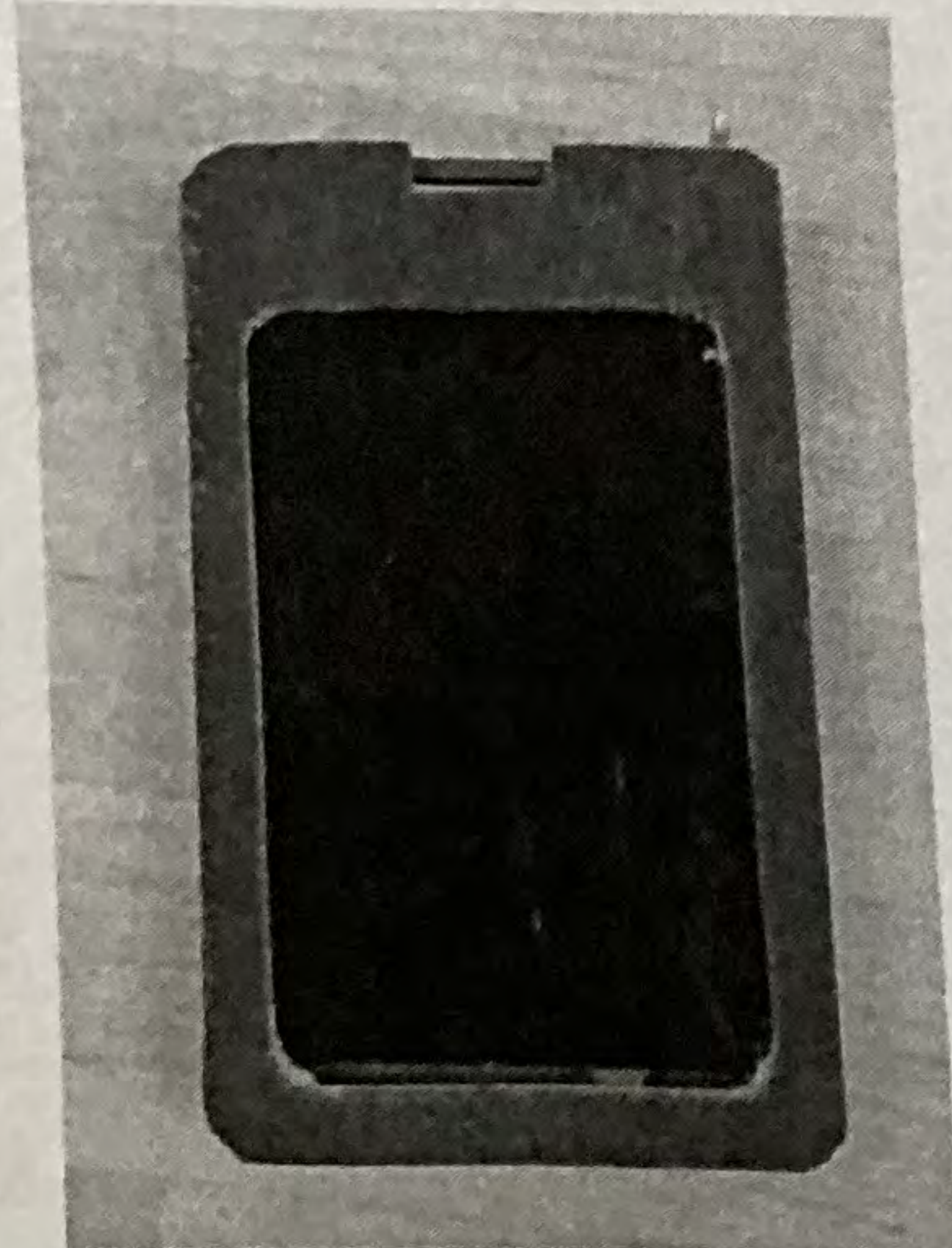


Tool section on back

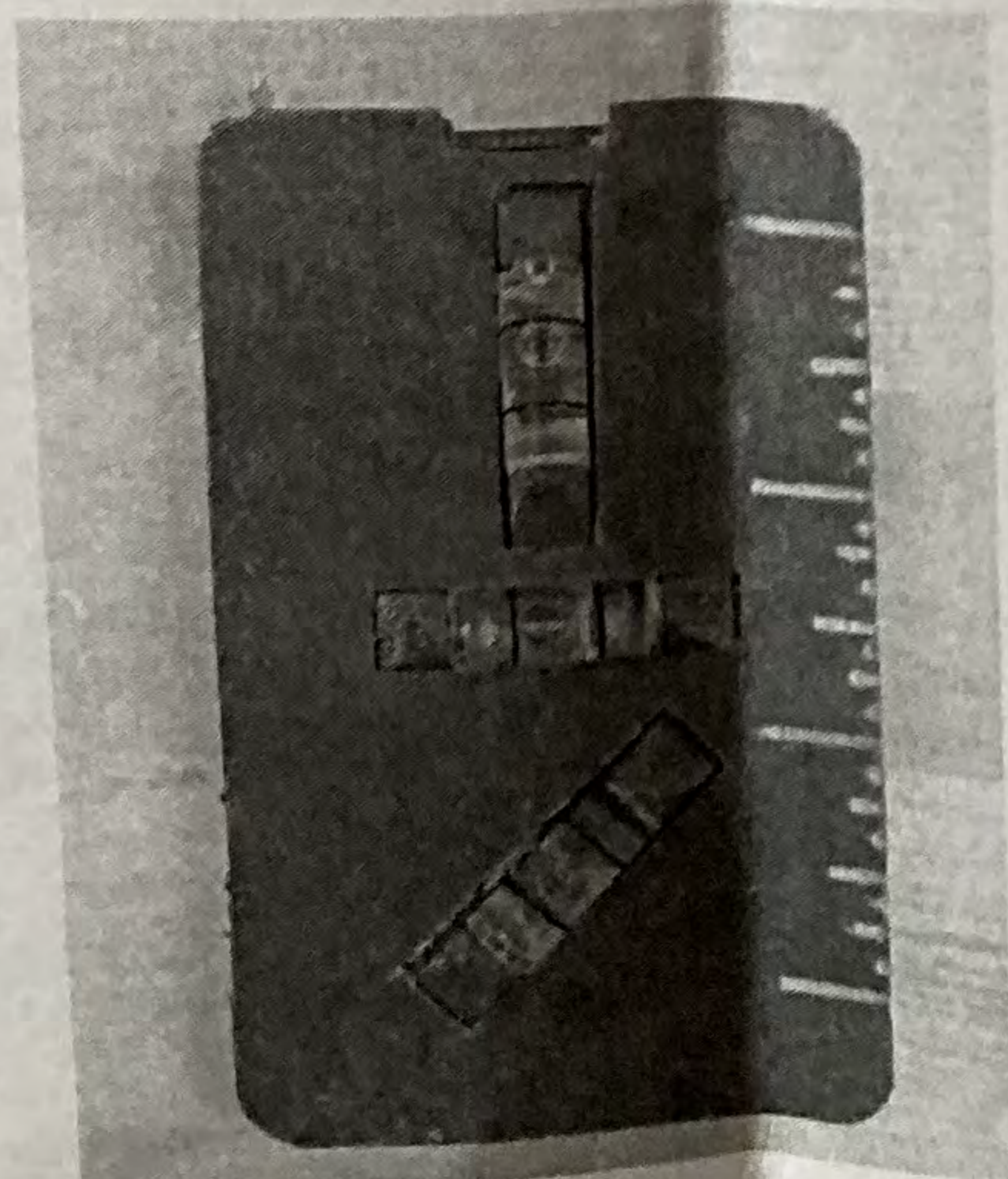


ID slot on front

In this reiteration of our design, we opted for an almost entirely leather construction rather than relying on 3D printing. This makes it more durable and lighter. It includes a bubble level, pen, integrated USB drive, and a removeable ruler that also functions as the aluminum backing. It folds like a wallet to hide tools when not in use.



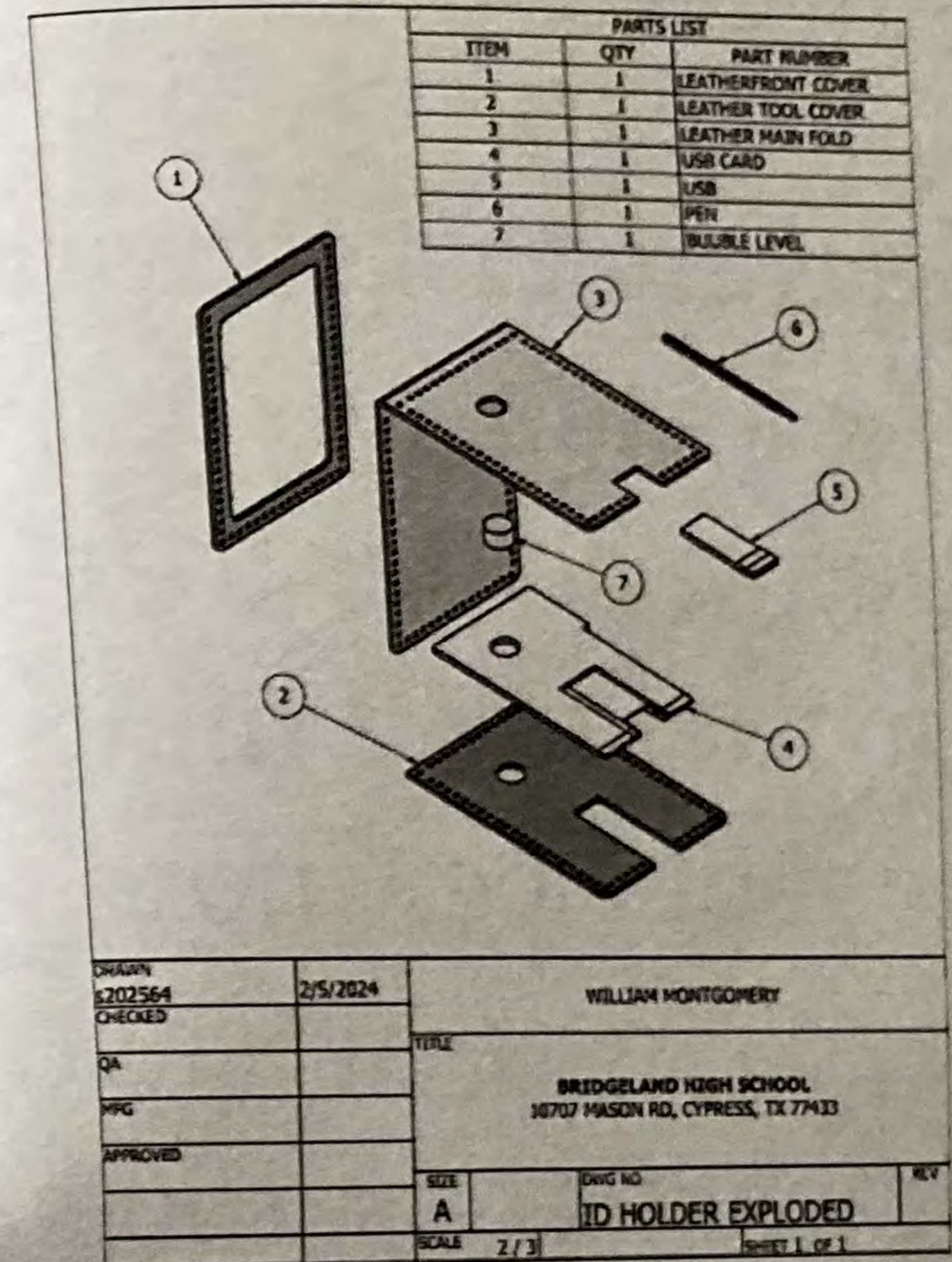
ID slot on front



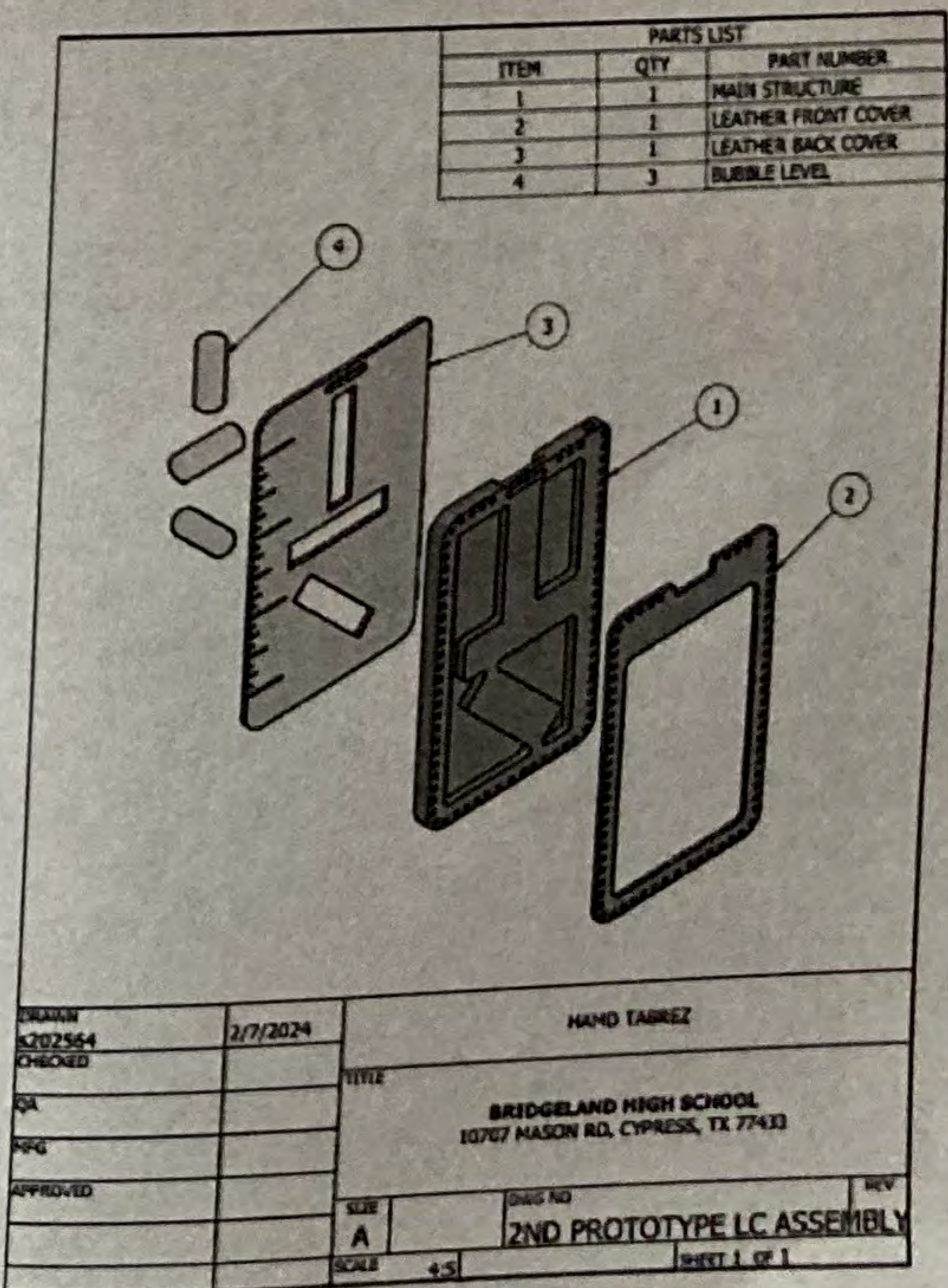
Back with tools

Our second design has multiple bubble levels, a pen, and a 3 inch ruler. The core is 3D printed, but leather covers the front and back giving it a cleaner look. There are no moving parts, and the leather on the front rather than another 3D printed part makes it more durable

CAD DRAWINGS



Design #1 Exploded



Design #2 Exploded

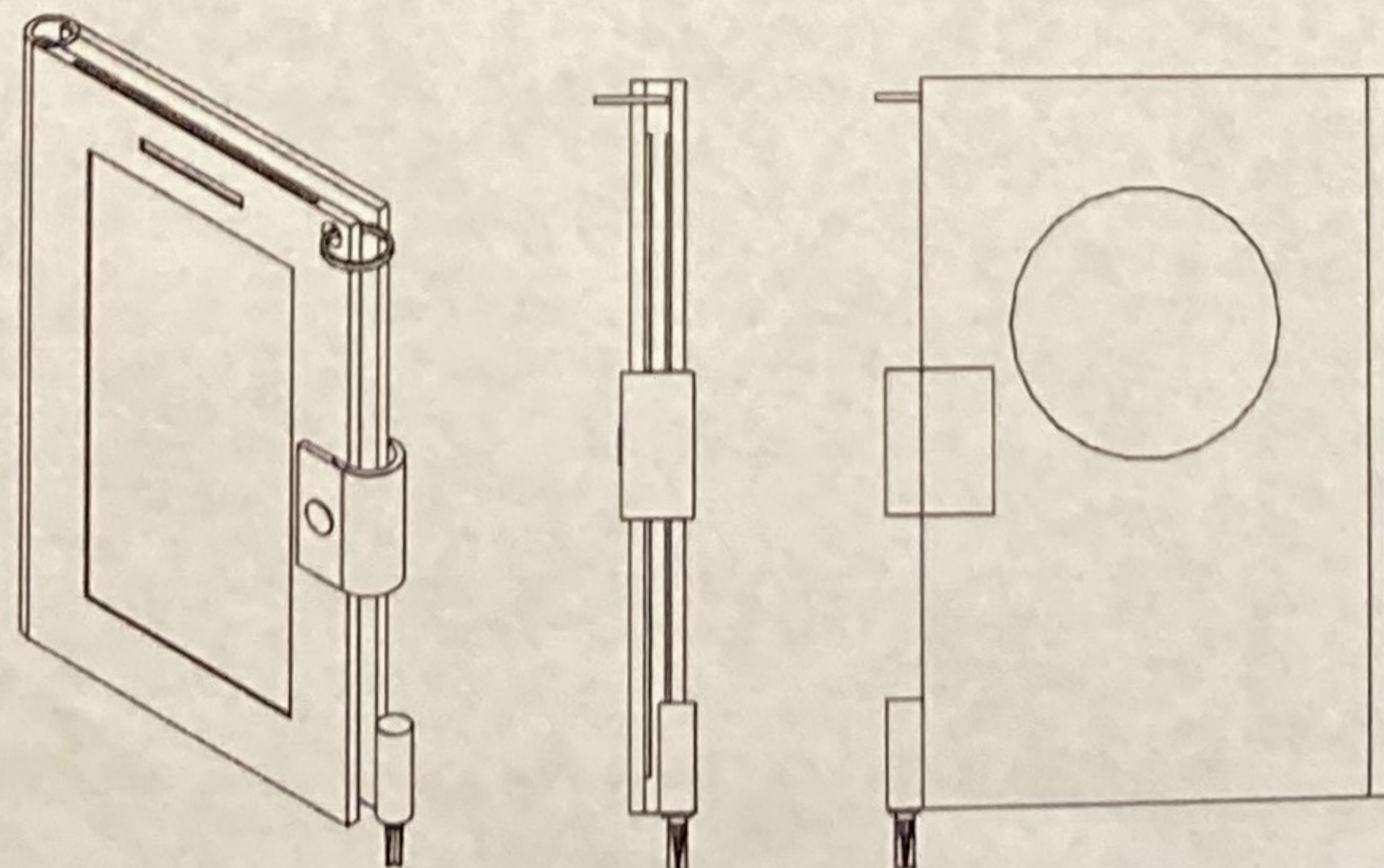
TESTING VIDEO



DESCRIPTION

- ▶ The main reason we made this badge holder was to have tools that would be useful to those who work with NASA, not the people up in space, but rather the office workers.
- ▶ Unlike most badge holders, which are typically made of plastic materials, the primary material for this badge holder is faux leather.
- ▶ It features slits that increase the card storage capacity of the badge holder, allowing for carrying 4 extra cards of choice on your person.
- ▶ On the side, a built-in screwdriver with a head that can be flipped to be either a Philips or Flathead is attached.
- ▶ In the middle, a pen holder has been fashioned into the badge holder to allow for quick access to a writing utensil whenever needed.

▶ CAD Drawings

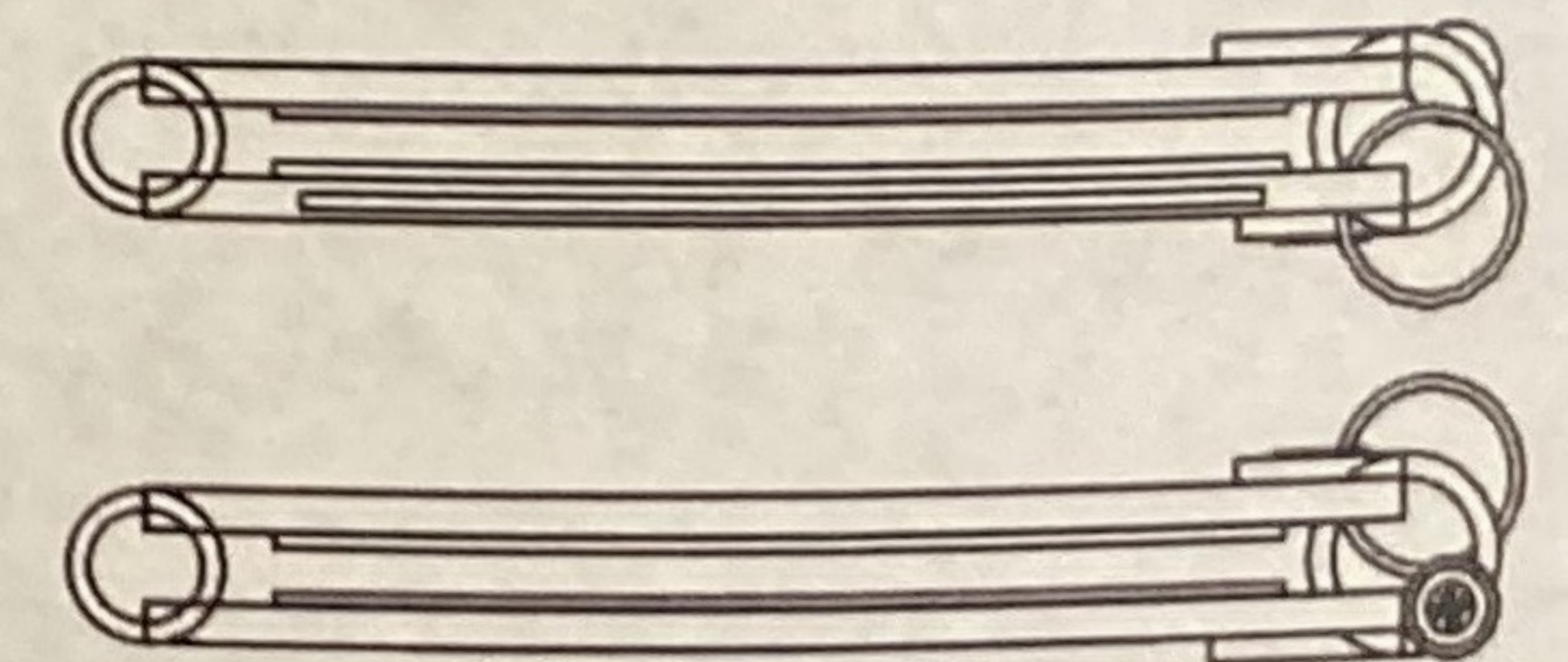


FEATURES

Increased Storage Capacity

Built-In Screwdriver

Pen Holder





NASA HUNCH



**HARLINGEN
COLLEGIATE
HIGH**

BADGE HOLDER MULTITOOL

Ms. Espinoza

1. Andy Castellano
2. Diego Esquivel
3. Nicolas Capetillo
4. Aidan Figueroa

**HARLINGEN, TEXAS
(33 MI FROM MCALLEN,
253 MI FROM SAN
ANTONIO)**