

Hozhoni Button Maker and Process Redesign Operation Manual

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DISCLAIMER

This instruction manual was prepared by students as part of a university course requirement. While considerable effort has been put into the project, it is not the work of licensed engineers and has not undergone the extensive verification that is common in the profession. The information, data, conclusions, procedures and content of this report should not be relied on or utilized without thorough, independent testing and verification. University faculty members may have been associated with this

project as advisors, sponsors, or course instructors, but as such they are not responsible for the accuracy of results or conclusions.

1 INTRODUCTION

The scope of this document is to instruct on proper use and safety precautions for using the updated Button Maker Press and the Cutting Press. The project includes both a redesign and retrofit of some features on the button maker press as well as the original design and fabrication of a cutting press for cutting button images from the sheets as supplied by the printer.

1.1 Button Maker

The Button Maker is an early 1970's model Button Maker from the Parisian Novelty company.

Original Features Include:

- Leg-operated lever for operating the press
- Rotating and swiveling lower dies for button components
- Stationary upper dies
- Currently fitted with 2.50" dies

Added Features:

- Addition of dual hand cranks and gearbox to enable hand-use of the button maker press
- Off-the-Shelf foot pedal extension

1.2 Cutting Press

A cutting press has been designed and fabricated to enable safer and more efficient cutting of button images.

Features Include:

- Lever-actuated Arbor Press
- Six steel dies in upper plate
- Machined lower tray

1.3 Precautions:

- Use only in a well-lit area with enough space to operate the button maker
- The cutting press must be placed on a level, secure table top
- Both devices should be used only by individuals who are properly trained and have good vision and manual dexterity
- Both devices should be inspected prior to use to ensure that they are clean, clear of debris, and in good working order
- Keep fingers clear of the cutting tray, button maker dies, and gearbox components.

2 DEVICE COMPONENTS AND SPECIFICATIONS

The following sections provide specific information about the location of device components and the primary sizing information for using both the button maker press and cutting press.

2.1 Button Maker Press

The Button Maker Press is currently fitted with dies to make 2.50" buttons. Other dies are available to make other sizes, but may not work with the revisions made to the machine.

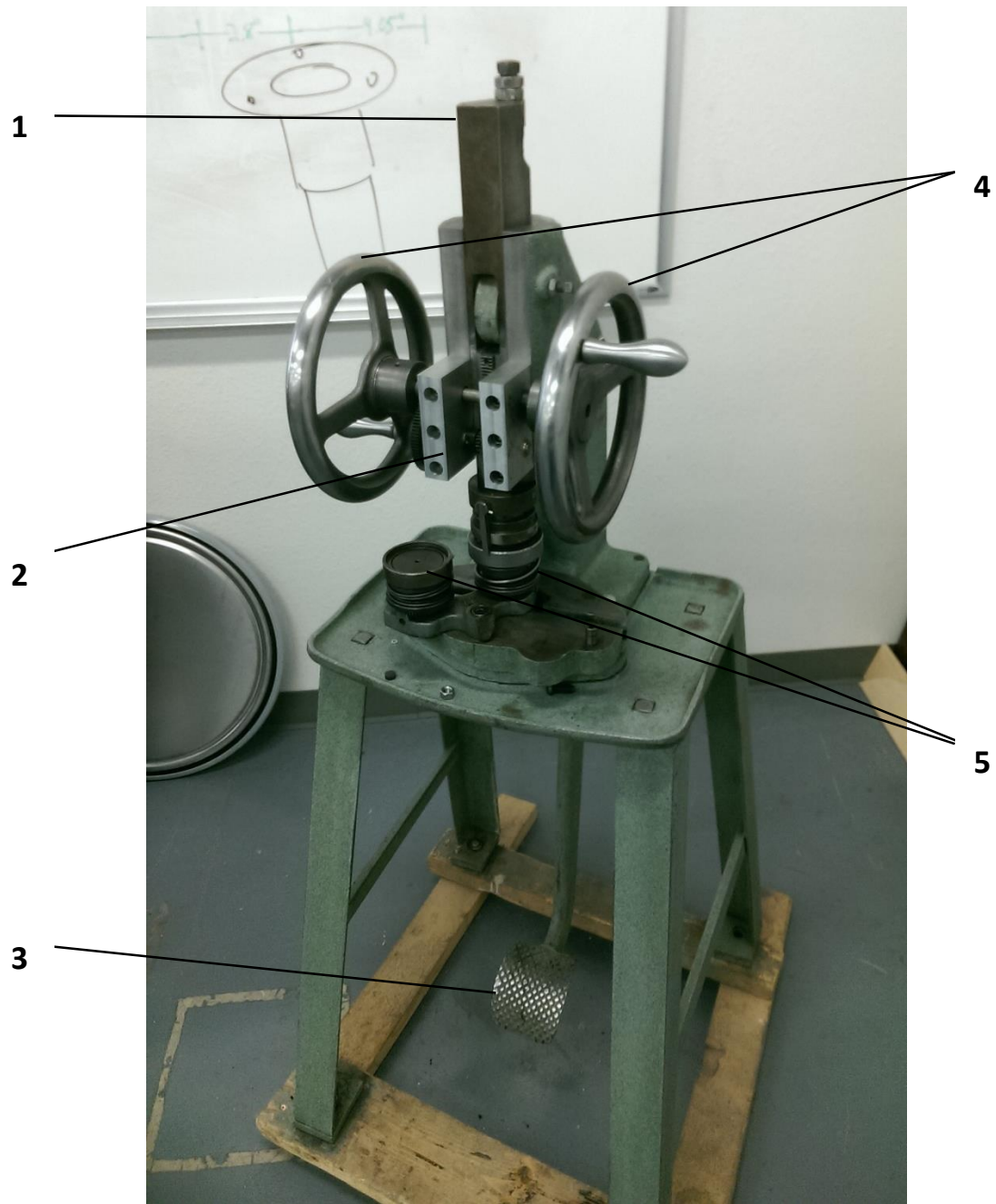


Figure 1: Labeled Button Maker

REVISED BUTTON MAKER COMPONENTS

- 1: Central Column (with attached rack gear)
- 2: Gear Box
- 3: Foot Lever (without extension)
- 4: Dual Hand Cranks
- 5: Dies



Figure 2: Detail of Hand Cranks

2.2 Cutting Press

The cutting press will cut six 1.25" circles from one sheet of paper. 5 sheets can be cut at one time.



Figure 3: Cutting Press Tray

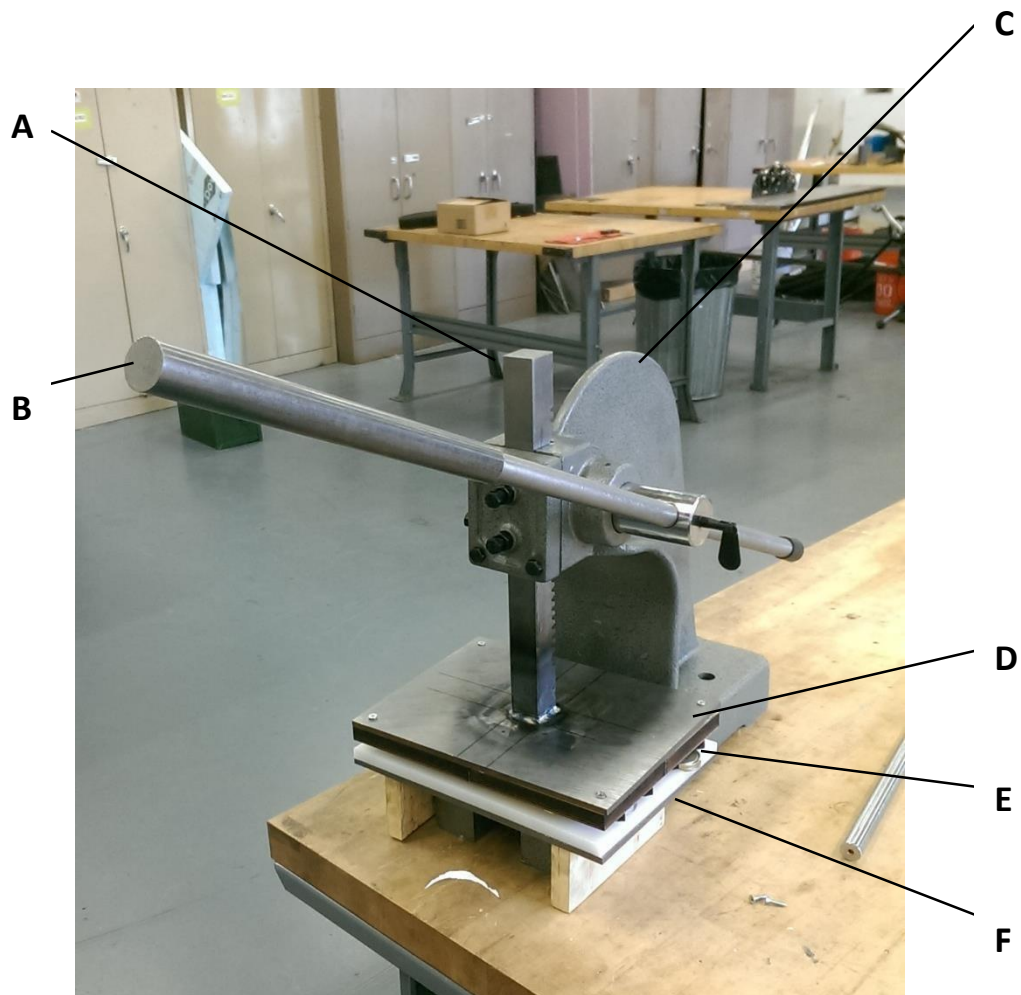


Figure 4: Labeled Cutting Press

Cutting Press Components:

- A: Rack Gear
- B: Lever Arm
- C: Arbor Press
- D: Top Plate
- E: Cutting Dies
- F: Bottom Tray

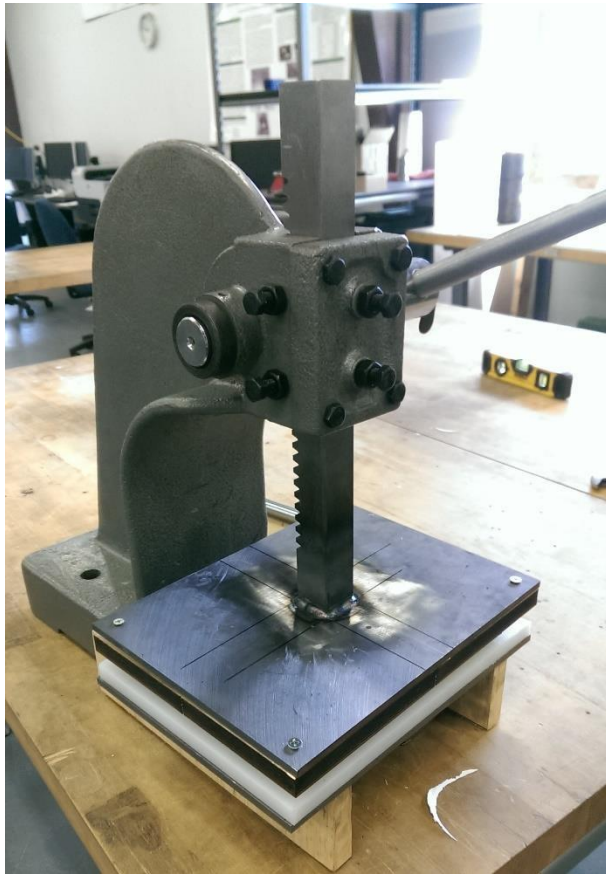


Figure 5: Cutting Press



Figure 6: Cutting Press Blades (with foam guards)

3 CUTTING PROCEDURE

This section details the process for cutting six circular images from an 8.5"x11" sheet of paper. Using more than five sheets of paper in the cutting press may result in improperly cut images.

1. Place up to 5 pages face up in the bottom tray. Ensure the edges are aligned.
2. Ensure that the lever arm is tightened in the press.
3. Keeping fingers and objects clear of the tray, pull down on the lever arm slowly and continuously.
4. Return lever arm to the upright position.
5. Remove the cut images and sheets from the tray.
6. Repeat Steps 1-5 until all images have been cut.
7. Store the cutting press away from busy areas where it may be bumped or prone to fall.

4 BUTTON ASSEMBLY PROCEDURE

This section instructs on the operation of the redesigned button maker press.

1. Inspect the machine to ensure it is free of debris and in good condition.
2. Insert the top metal button piece, the cut image, and the plastic cover in the left-hand die, FACE UP.
3. Swivel the left hand die to align under the top die.
4. Verify that the left hand die is rotated so that the image is horizontally aligned. Rotate the left hand die if necessary to achieve alignment.
5. Fully depress the leg lever or turn the hand cranks AWAY from the user until the top and bottom die have been pressed fully together to achieve capture of the button components in the top die.
6. Release leg lever or turn hand cranks TOWARD the user until the top die returns to original position.
7. Place button back (with pin) in the right-hand die.
8. Verify that the pin is horizontally aligned to ensure that the pin will lie horizontal while the image is aligned upright on the wearer's clothing.
9. Swivel the right-hand die until it sits under the top die.
10. Fully depress the leg lever or turn the hand crank AWAY from the user to assemble all components.
11. Release leg lever or turn hand crank TOWARD the user until the top die is in the original position.
12. Remove assembled button from the right-hand die. Inspect for defects.

5 CAD DRAWINGS

Solidworks 3-D renderings of selected assemblies and components follows.

5.1 Cutting Press

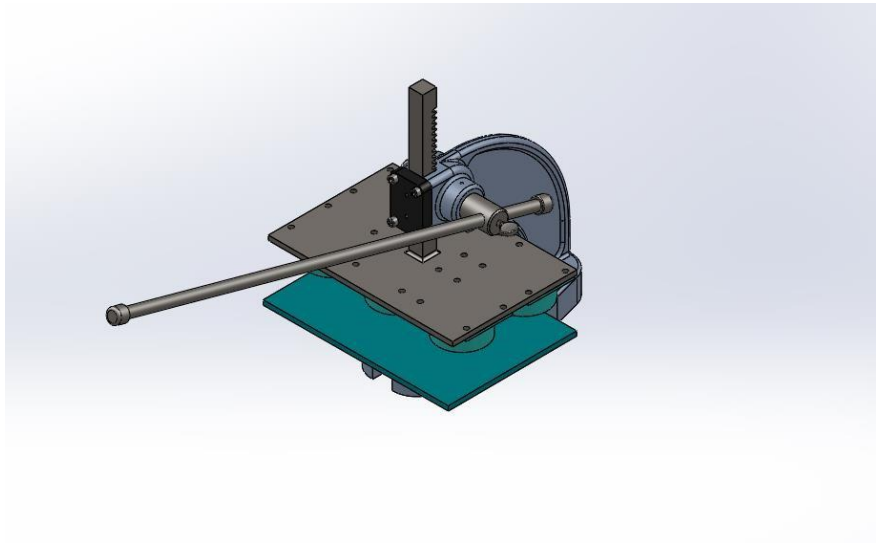


Figure 7: 3-D Model of Cutting Press

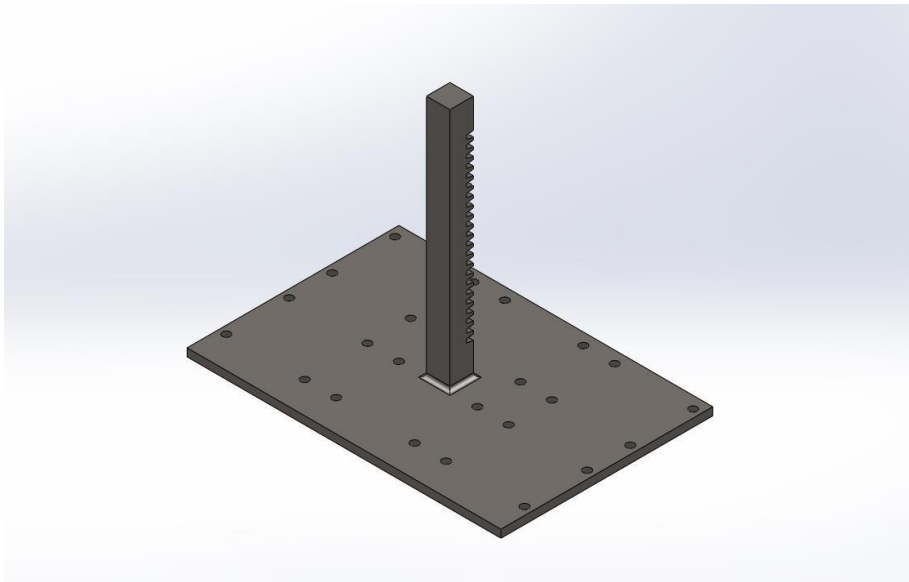


Figure 8: 3-D Model of Cutting Press Rack Gear and Top Plate

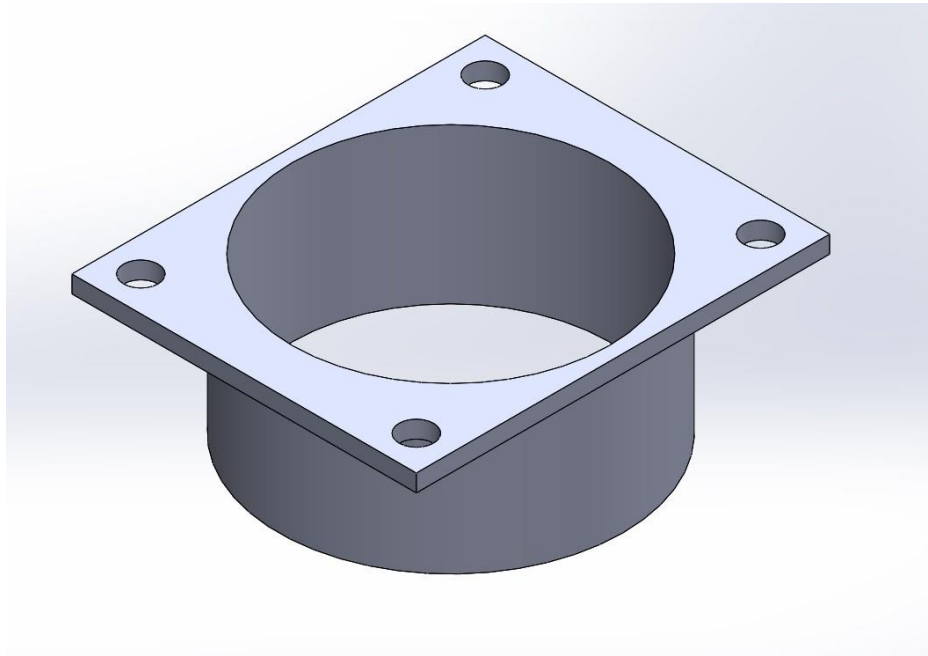


Figure 9: 3-D Model of Cutting Press Blades

5.2 Button Maker Press

The 3-D models for the Button Maker Press and selected components are included below. Note that Figure 10 displays a modular wood foot extension, which has been replaced by an off-the-shelf foot pedal extension (Figure 13).

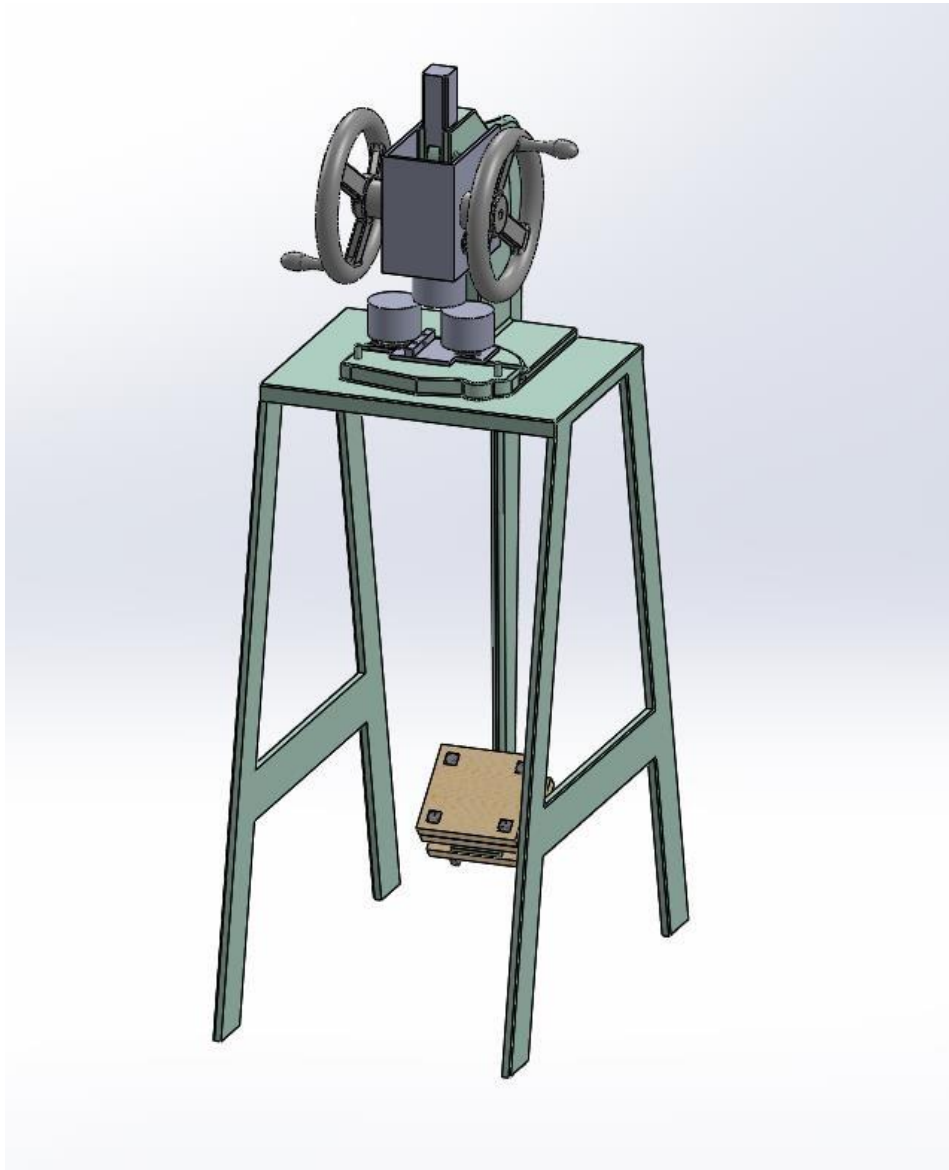


Figure 10: 3-D Model of Redesigned Button Maker

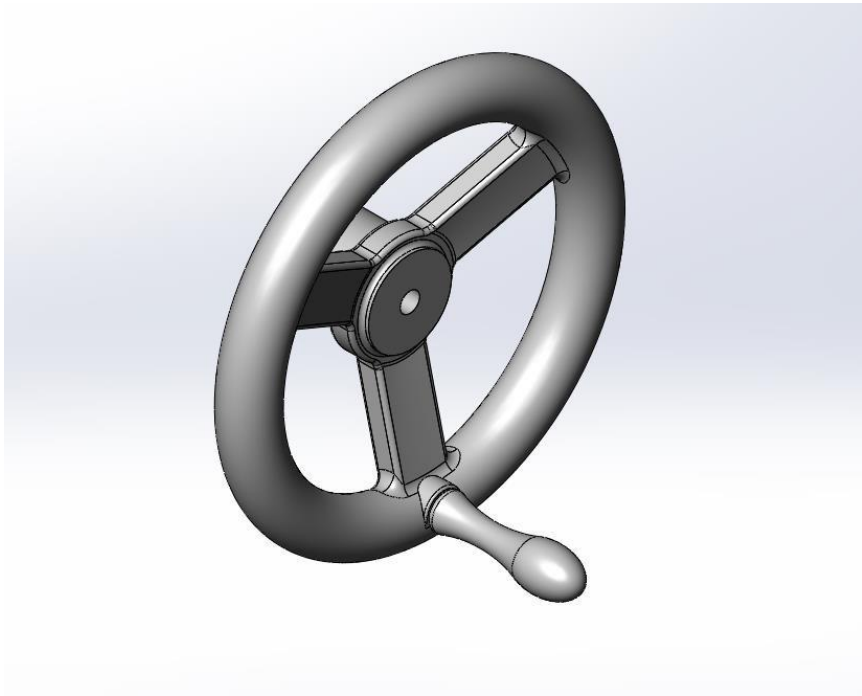


Figure 11: 3-D Model of Hand Crank

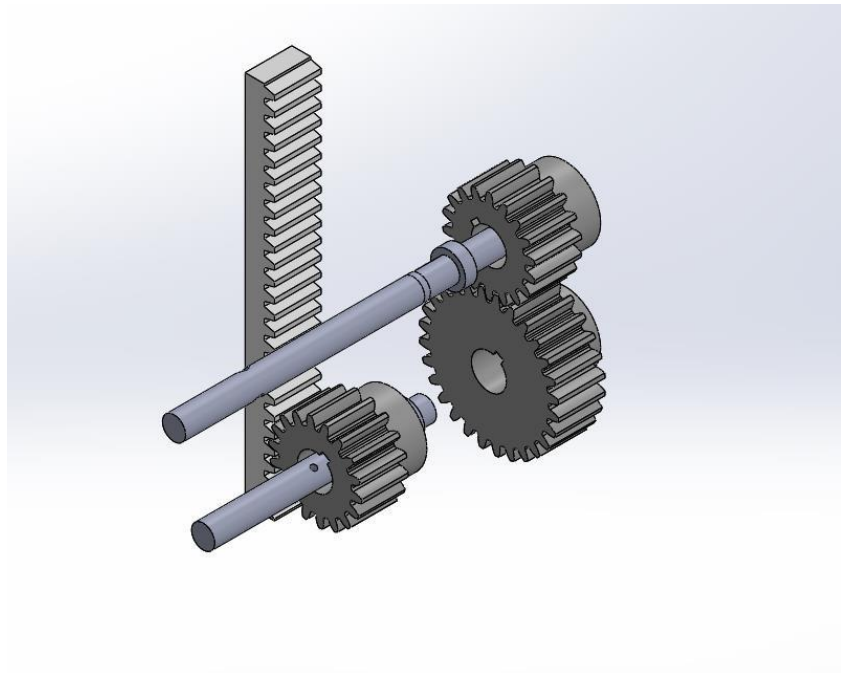


Figure 12: 3-D Model of Gearbox, Gears, and Shafts (housing removed for visibility)



Figure 13: 3-D Model of Off-the-Shelf Foot Pedal [1]

1: <http://www.fuella.com/forums/f10/ideas-needed-for-car-mods-for-right-leg-above-knee-amputee-to-drive-a-manual-trans-11973-4.html>.

