Chapter 1

Introduction

A machine vice shown in Figure 4.5 is a mechanical device used to secure an object firmly in place while performing various operations such as drilling, milling, or machining. It consists of a stationary jaw and a movable jaw, which are aligned using a screw mechanism that allows the user to adjust the grip on the object. Machine vices are essential tools in manufacturing and mechanical workshops due to their ability to provide stability and precision during machining processes.

Figure 1.1: Machine Vice.

Chapter 2

2D Drawings

2.1 Parts

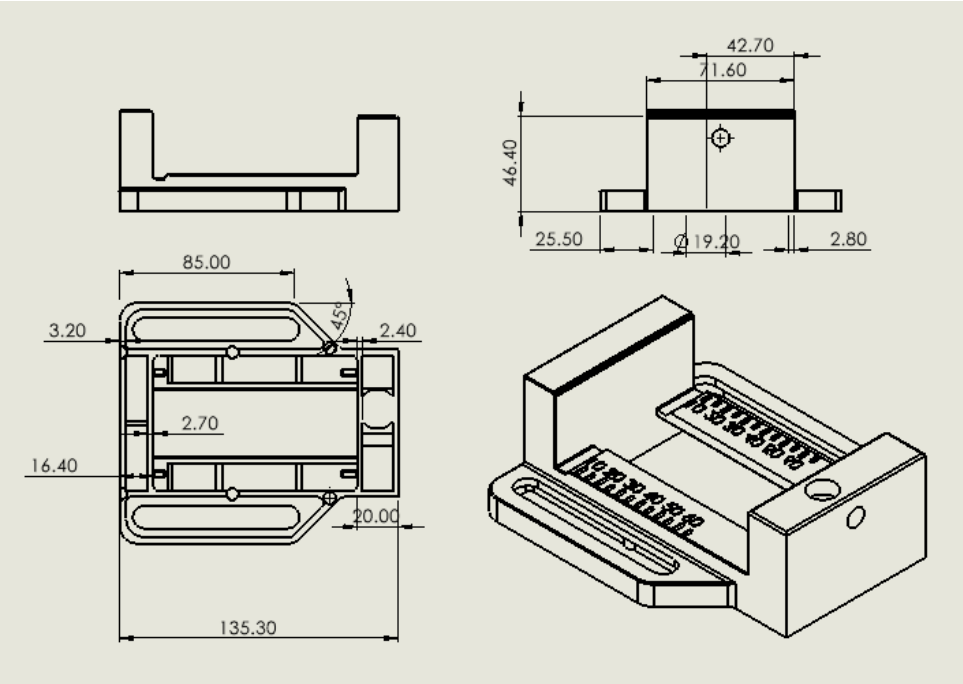

Figure 2.1: Base Drawing.

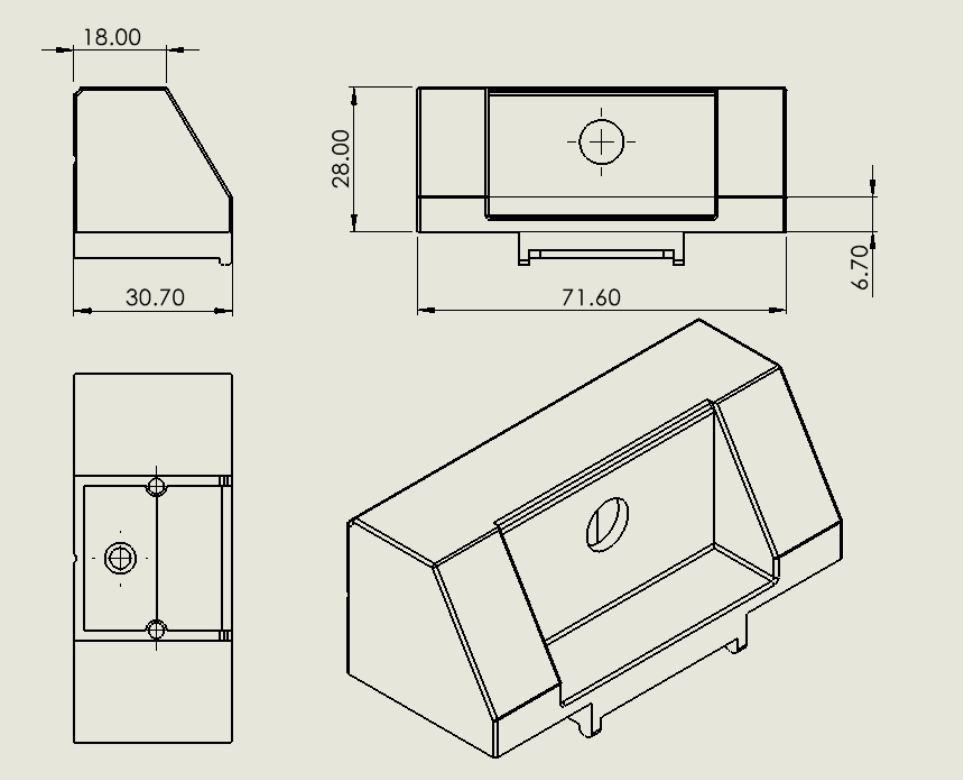

Figure 2.2: Jaw Drawing.

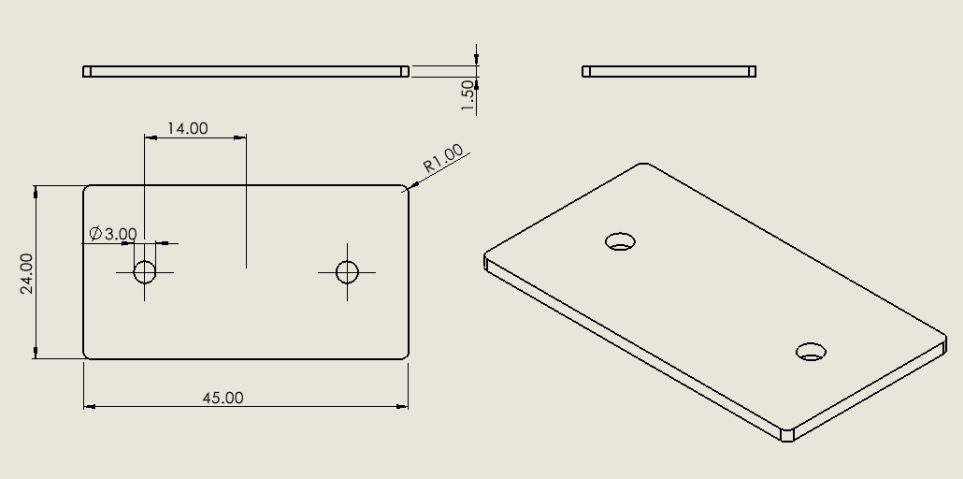

Figure 2.3: Plate Drawing.

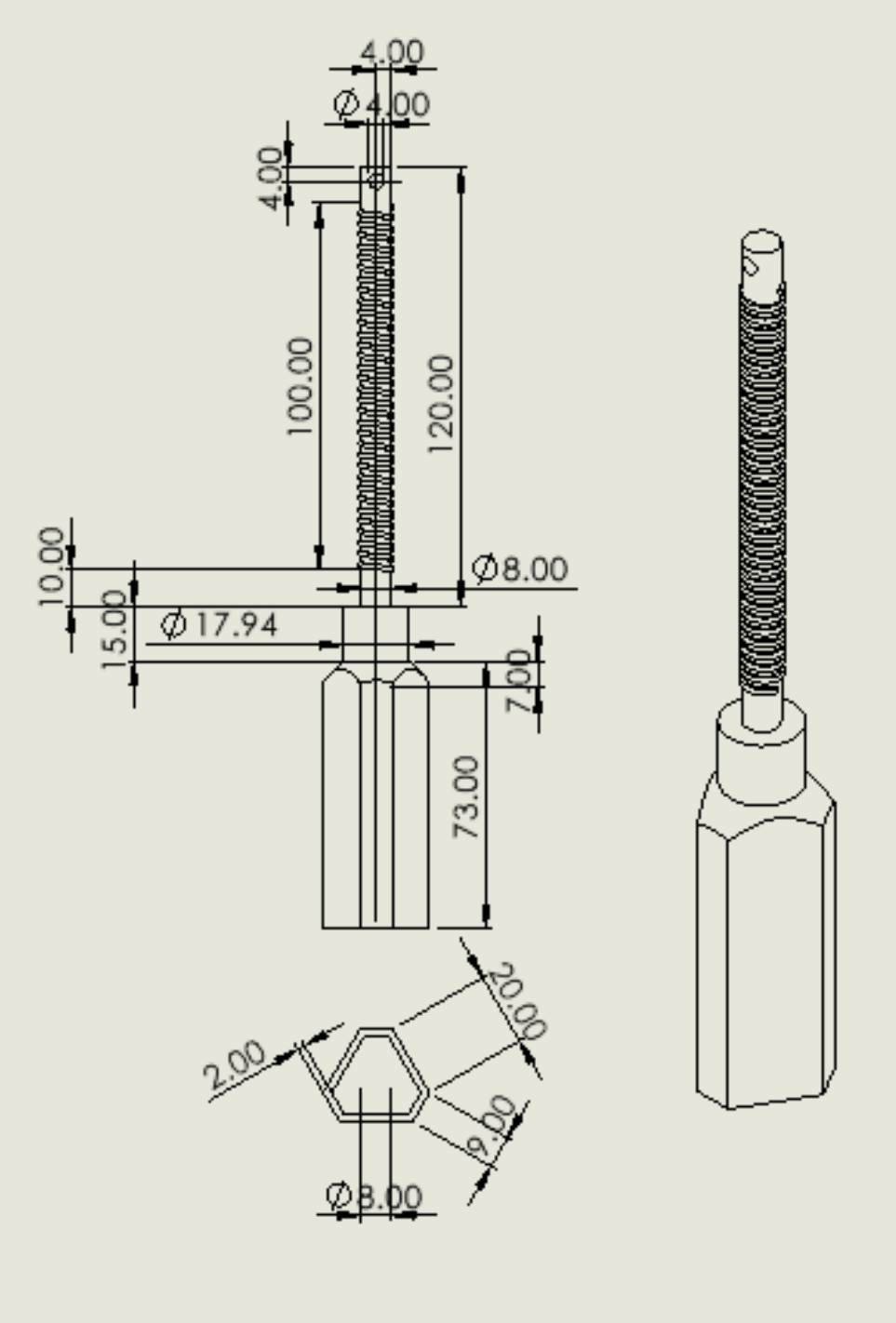

Figure 2.4: Screw Drawing.

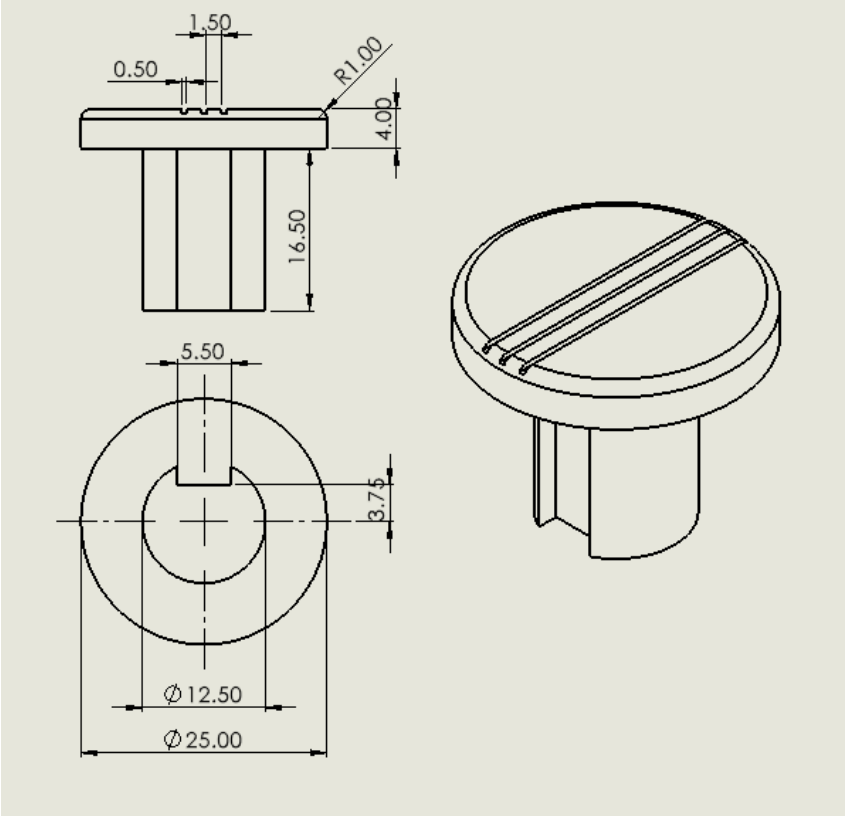

Figure 2.5: Button Drawing.

2.2 Assembly

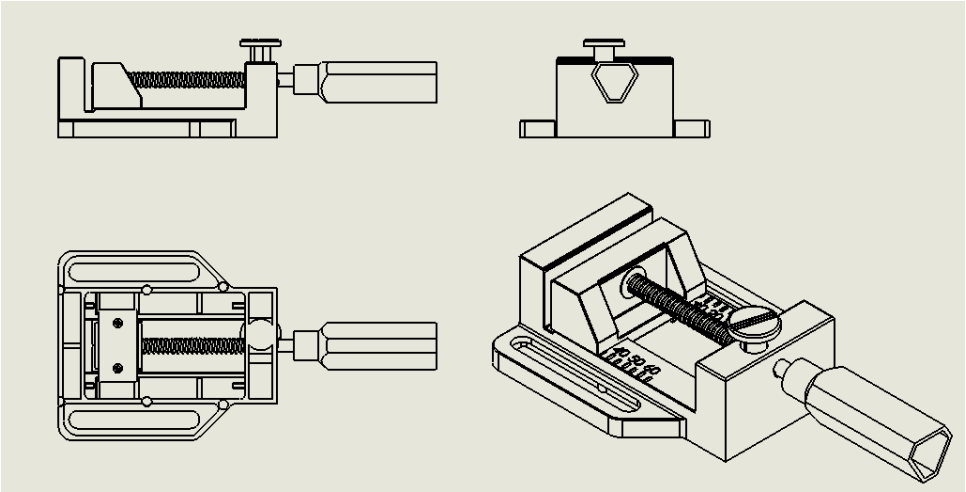

Figure 2.6: Assembly Drawing.

Chapter 3

3D Model

3.1 Parts

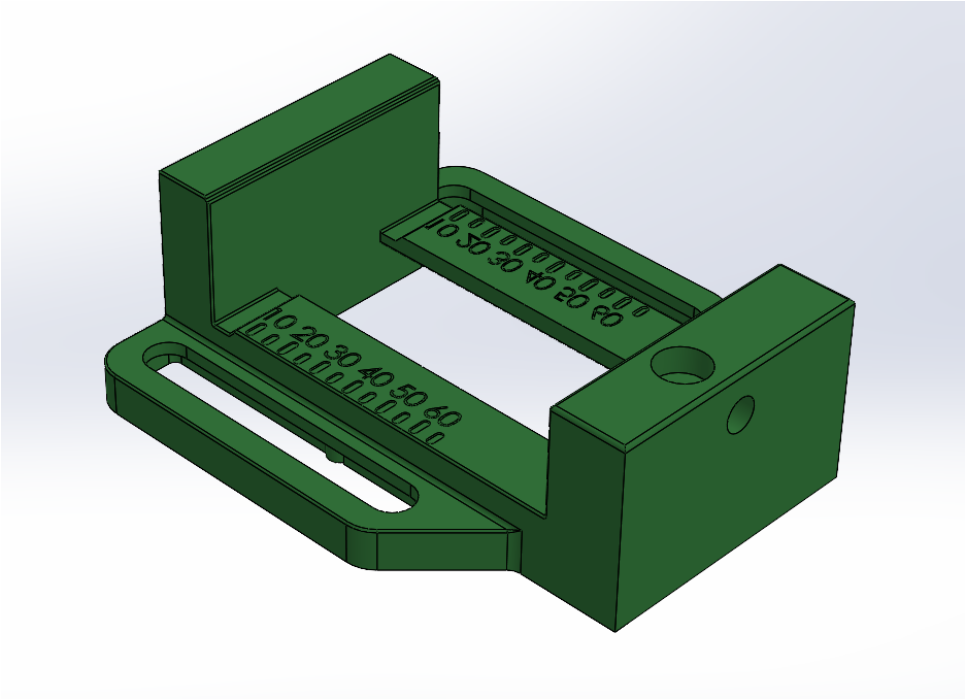

Figure 3.1: Base 3D Model.

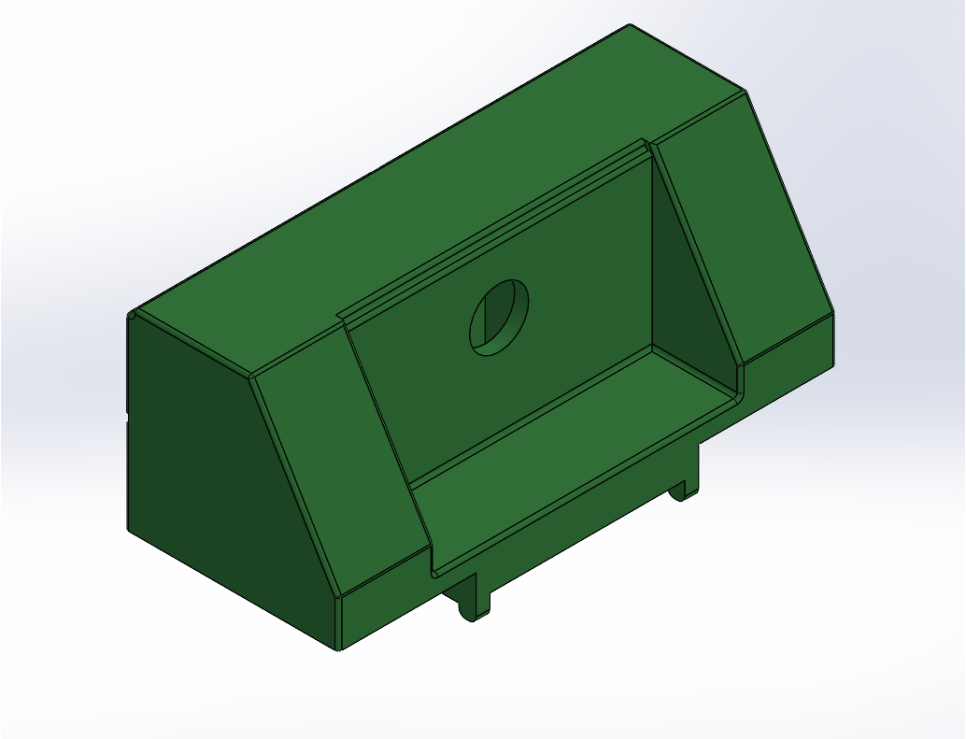

Figure 3.2: Jaw 3D Model.

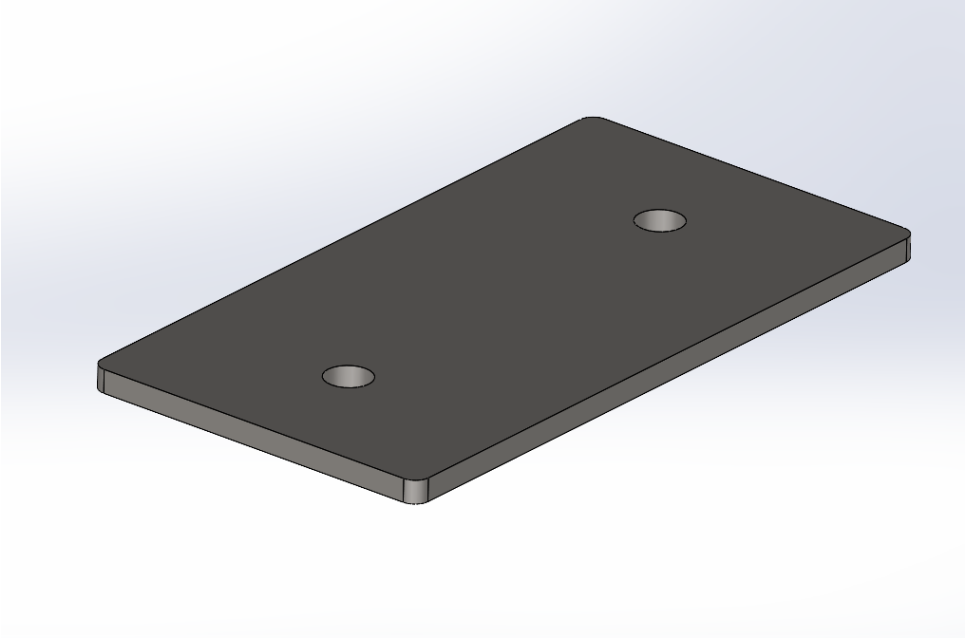

Figure 3.3: Plate 3D Model.

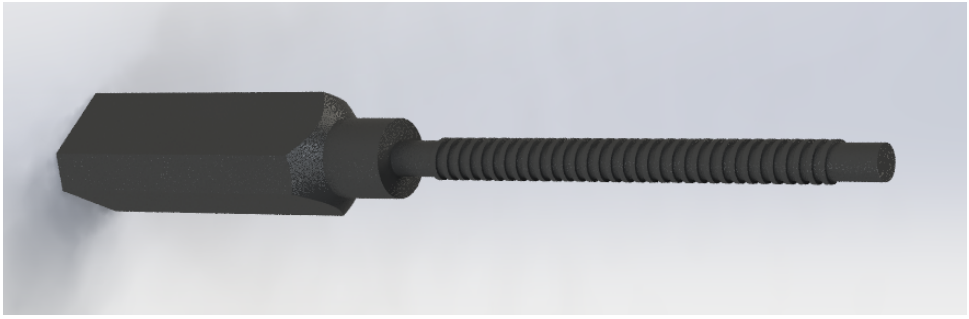

Figure 3.4: Screw 3D Model.

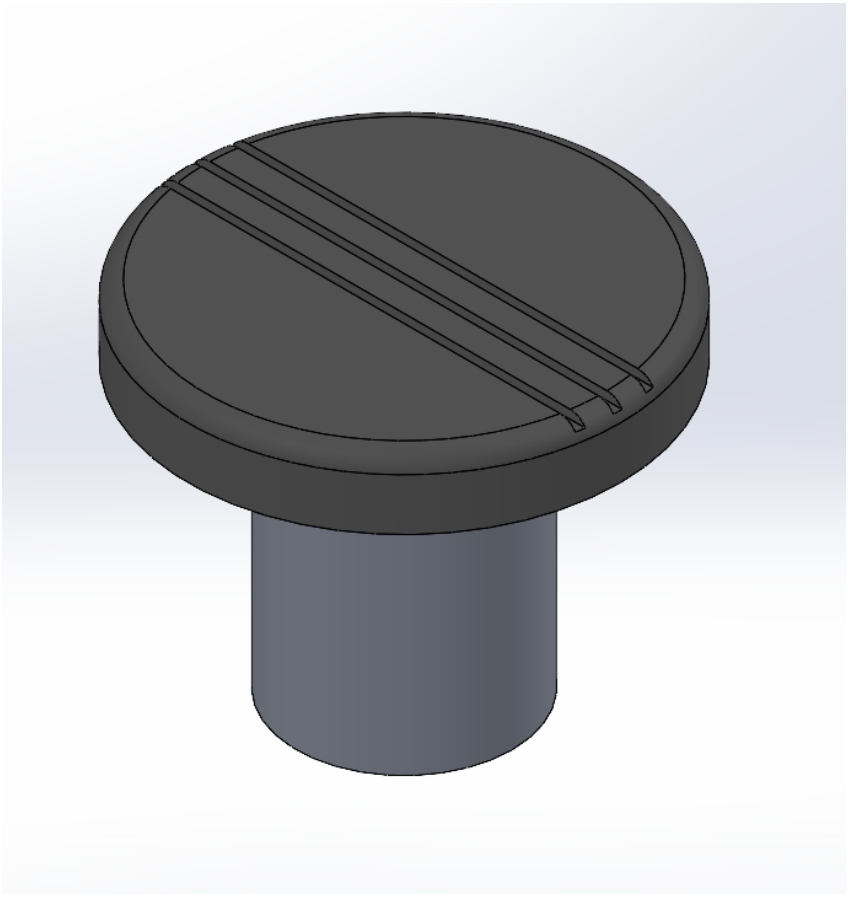

Figure 3.5: Button 3D Model.

3.2 Assembly

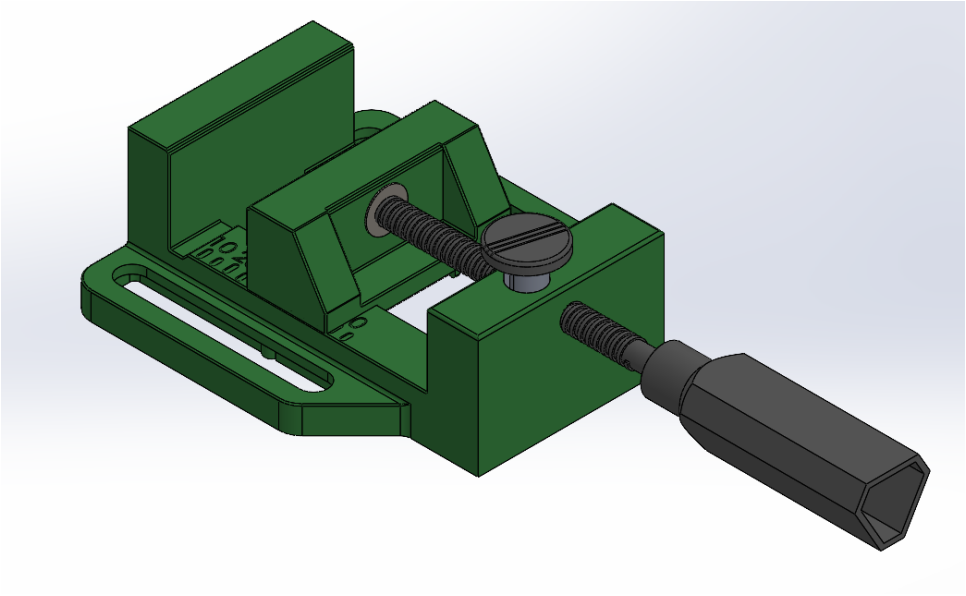

Figure 3.6: Assembly 3D Model.

3.3 Exploded View

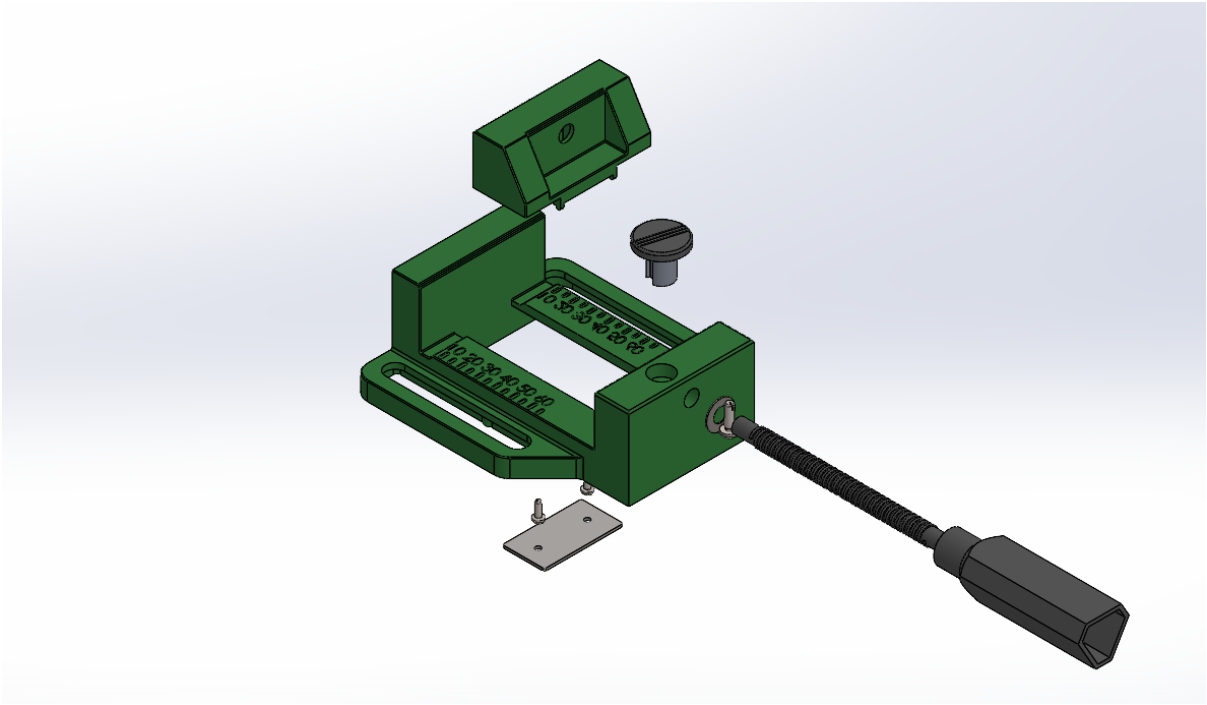

Figure 3.7: Exploded View.

Chapter 4

Modification

During the examination of the machine vice, it was observed that the movable jaw can wobble slightly to the left and right, which can reduce clamping precision and stability. To address this issue, I propose adding a groove along the length of the base of the vice. This groove will act as a guide track for the movable jaw. A corresponding protrusion on the underside of the movable jaw will fit snugly into this groove, ensuring the jaw slides smoothly and remains properly aligned, thereby eliminating lateral wobble and enhancing the overall stability and precision of the vice during machining operations.

4.1 2D Drawing

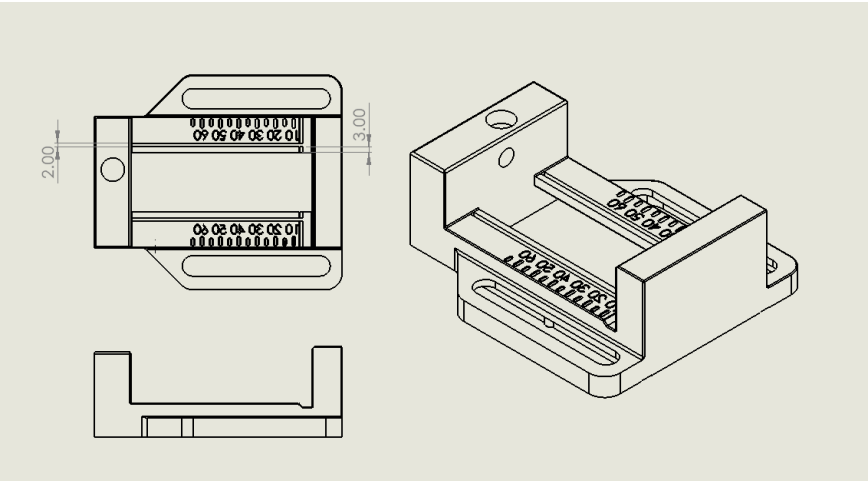

Figure 4.1: Modified Base Drawing.

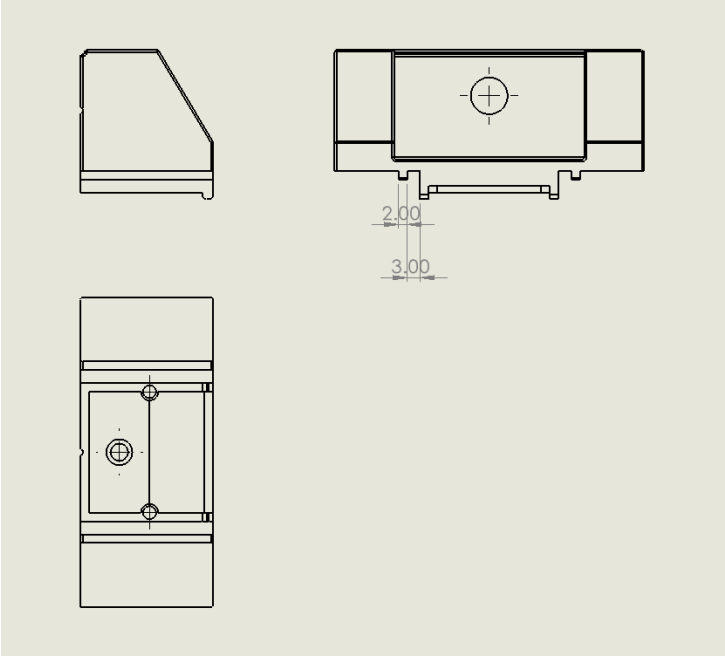

Figure 4.2: Modified Jaw Drawing

4.2 3D Model

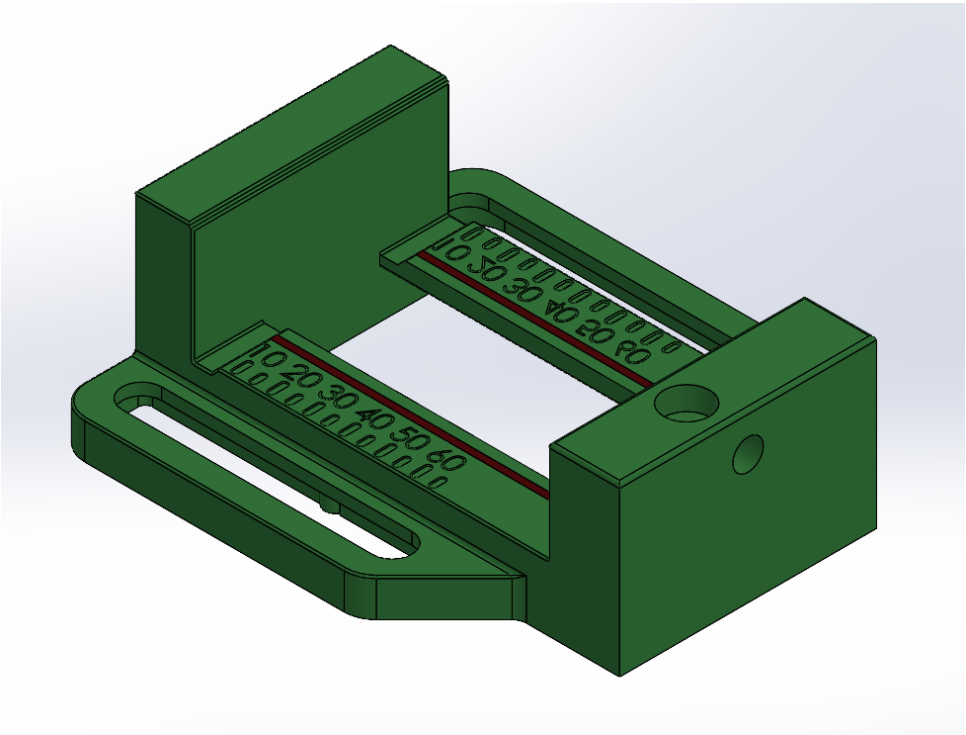

Figure 4.3: Modified Base.

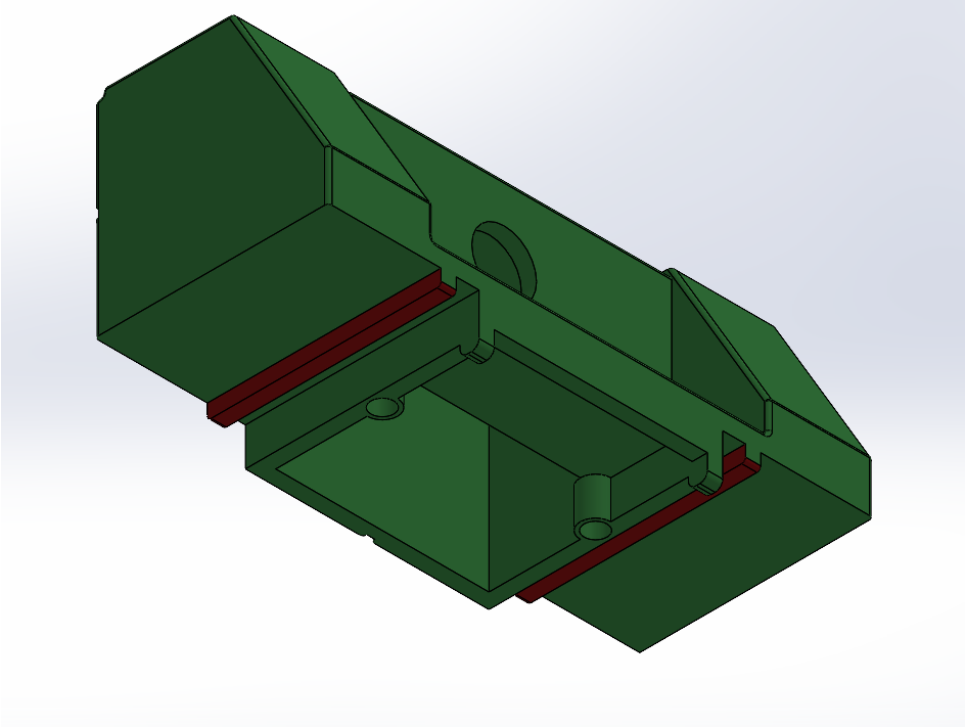

Figure 4.4: Modified Jaw.

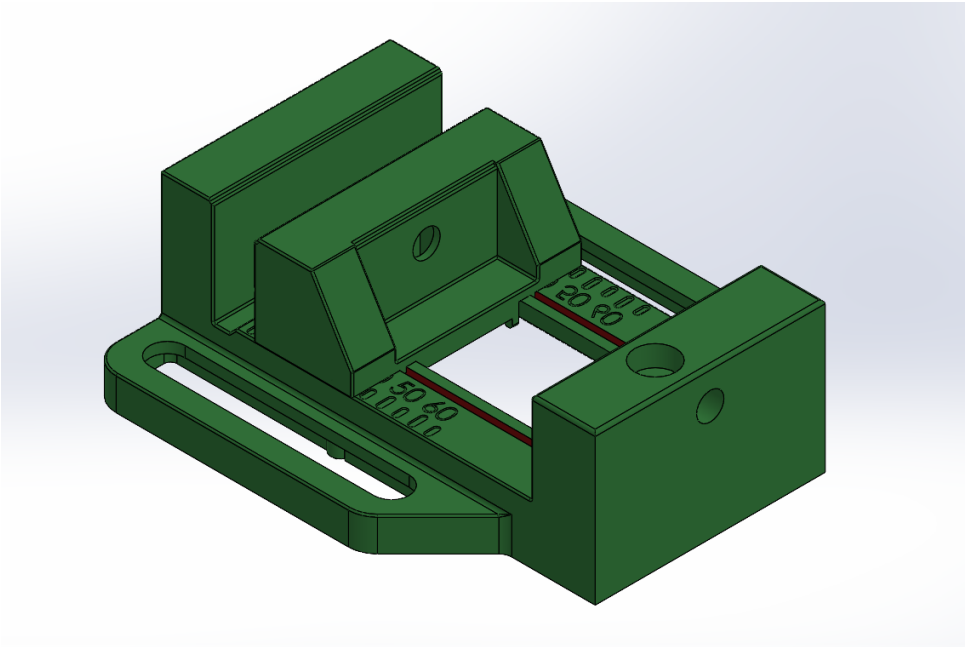

Figure 4.5: Modified Assembly.

Chapter 5

Bill of Materials

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	Base		1
2	Jaw		1
3	Washer		1
4	Button		1
5	Screw		1
6	Plate		1
7	PHT 3x8x7.5-slot-D-N		2
8	PHT 4x13x11.6-slot-D-N		1

Figure 5.1: Bill of Materials.