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Flashlight Project

June 18th, 2019

Step-By-Step

Flashlight handle:

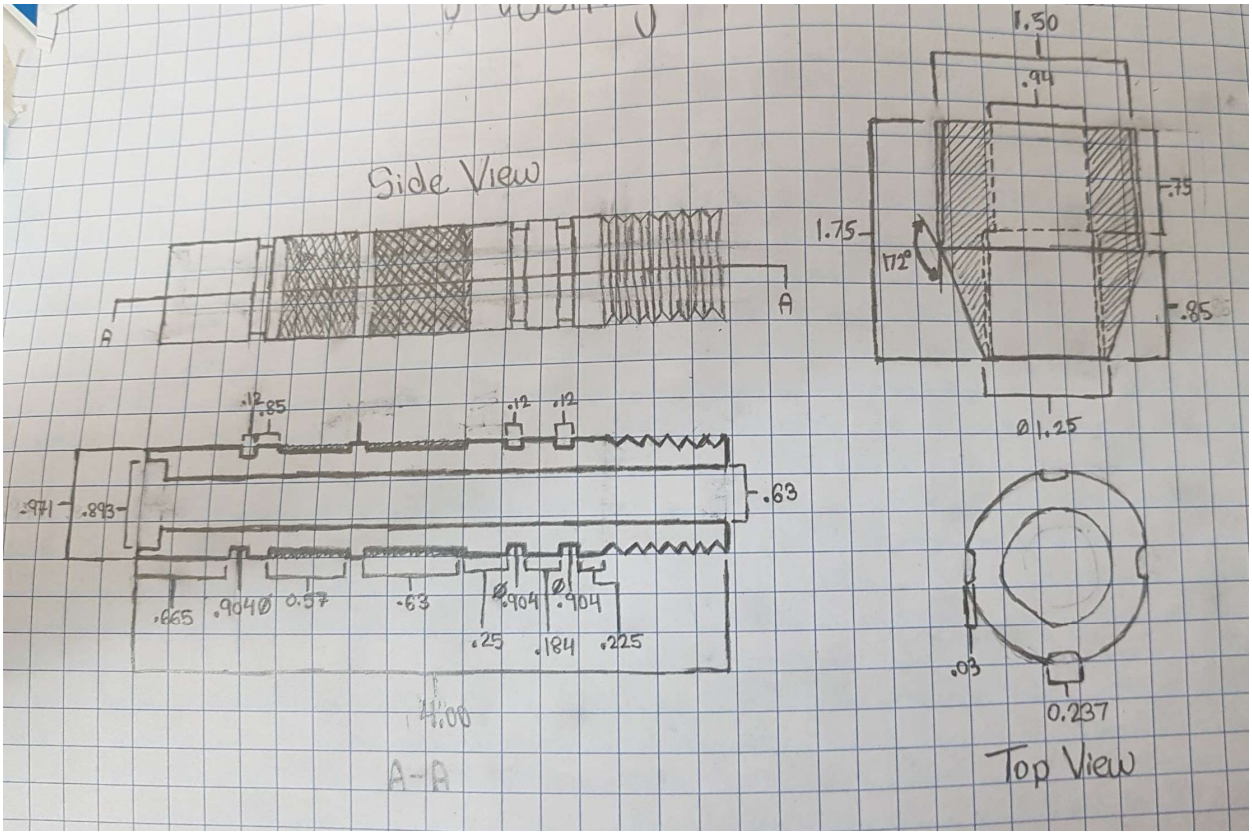
1. A cylindrical block with a diameter of 1 in was cut using the horizontal bandsaw to 4.1 in.
2. Using the lathe, both ends of the workpiece were faced so the piece is 4 in.
3. The workpiece, still on the lathe, was center drilled and drilled so that there is a hole with a diameter of 0.61 in going through the length.
4. The length of the workpiece is turned so it could later be threaded.
5. A boring tool was used to make the diameter of the hole larger for where the button would be placed in later.
6. An outer thread was used on one end for 0.75 in.
7. A knurling tool was used to create knurls on the handle
8. The regular cutter was used to smooth out some of the knurls and make the surface more mirror-like.
9. A parting tool was then used to create grooves on the handle
10. The piece was then sanded along the whole surface.

End of a Flashlight:

1. Another cylindrical block with a diameter of 1.5 in was cut using the horizontal bandsaw to 2 in.
2. The ends of the piece were faced using the lathe
3. A center drill and drill were then used to create a hole through the piece with a diameter of 0.94 in
4. A cutter was then placed at an angle of 8 degrees to create an angle cut on the workpiece.
5. The hole going through the piece was tapped for 1 in
6. The piece was then placed on a v-block on the milling machine and an end mill was used to create a vertical groove on the non-angled part of the piece.
7. The piece was rotated 4 times to make 4 grooves equal distance apart around the piece.
8. The whole piece was sanded down to create a nice finish

Reflection

At the beginning of the flashlight project, I had a certain image for how my workpiece would look but that was not the case. Currently, the top piece of my flashlight contains grooves going along the length on the workpiece rather than along the diameter. I enjoyed creating this part of the design because I used the milling machine for a cylindrical piece for the first time and the design was unique to only my flashlight. One of the things that I did not like about my flashlight is the knurl. The design of the knul can be beautiful, but I when I used the tool, it was a little dirty and the feed rate was a little too fast for the knurl to come out right. I went over the design multiple times to make the design appear better but it still was not as smooth. If given more time, I would want to experiment more on a scrap piece to find the preferred settings for the knurl. The biggest reason why my design didn't turn out the way I wanted was because of a mistake that was made during the first steps of creating the handle. The flashlight was meant to be trimmed off a little from the surface of the handle. During this step, the stage was at an angle and I had not realized until a little less than half the length of the handle had been turned. Usually, to fix this problem, the piece would be reduced to an even smaller diameter, but in the case of the flashlight, it was not possible. Reducing the diameter more would mean that the handle would be too small to screw into the top piece of the flashlight. Trimming it down further would also mean that the button obtained from a previous flashlight would not fit into the bottom of the handle of the flashlight; the handle would have been smaller than the button. I left the piece angled on that one end so not further damage could be done and turned the rest of the piece the correct way. While the design of my flashlight is not exactly the way I wanted it to be, it did turn out to be appealing and still had correct measurements, allowing the LED light and buttons from the other flashlight to fit into my design.


Side View
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Top View