

Michael Torres  
Culmination Updates  
Progress Report 3  
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At this point in the project my original models aren't quite what I was expecting so I decided to start over using what I learned from the first attempt. I had the idea to print the whole case for the machine but because of its size, it soon became impractical. Instead, I decided to mount the whole system on a wooden board. This meant I needed to model all the parts to be modeled with features that would allow me to mount them onto the wooden board. This didn't take much time when it came to 3d modeling. I was able to pull all the important dimensions from the old file and rewrite them in the new one. Additionally, I had to model something to hold the motor in place. The motor has some mounting holes in the front that would help it not rotate as it moves but I decided to instead clamp the motor down rather than mount it onto something. I believe that the amount of force it will be pushing won't cause it to rotate in the mount if it's clamped hard enough. After printing the motor mount and testing how snugly it fits the process of drilling a screw down into the guide hole caused the top part to snap apart where the head of the screw met the plastic. I believe this is also due to the type of screw I was using in the test. The screws were tapered and not flat on the underside so Rudy suggested using a flat bottom screw instead of the tapered ones. This was because I didn't model any relief in the hole to account for the cone-shaped shape of the bottom side of the screws. Additionally, I was able to take what I learned from this failure and change it in all the parts and made sure to update designs by making the holes bigger to account for the size of the screws. After getting all the parts printed it was time to assemble everything and incorporate the electronics into the system of moving parts. Using some scrap steel in the shop I fashioned a L bracket to hold the heating block up from the wood. This was working well until I noticed the temperature wasn't rising at a steady pace and halted at 130 °C. I soon realized that the steel mounting bracket was leaching off a lot of the heat the block was generating. I was going to use some scrap PCB material since I knew it was well heat-resistant for my needs, but then Professor John McCullough suggested I use oak as the insulator because its burning point was also significantly higher than the temperature I was working at and I thought it would be a cool solution to my problem. After coming back the next day I remade the L bracket because it wasn't high enough. Since it wasn't seated high enough the filament as it was being pulled formed kinks in random segments. Raising the heating block solved this problem I also removed the guide as it put too much pressure on the filament and caused it to break apart. The first thing I worked on was a cutter for the ribbons made out of plastic bottles because having an inconsistent ribbon was leading to inconsistent filament. After printing a new cutter and making further modifications I was able to get one consistent tube of filament for a singular bottle. There are a couple of things I was to revise like the single power source and maybe even a complete redesign with the gear system.