Week 8 Report

Standing Gardener

Work Completed

For the standing gardener all of the holes for the legs to be bolted to the top and bottom plates have been punched. These holes are all 5/16". There are 8 legs in total and they have all been bolted to the plates. Once the top plate was finished and bolted we had to make sure the legs were completely perpendicular to the top and bottom plates to that they would telescope properly. To do this we used a level. Once the legs were lever they were clamped and center punched where the holes needed to be made. To actually put the hole in the plates we used the hydraulic punch for most of them. Then we used the drill press for the ones we could not reach on the punch. Finally there were two holes which could not be reached by either the punch or the drill press. To get these we had to use a hand drill. Once all of the holes were drilled we bolted the legs to the bottom plate and tested if the legs telescoped. They did! With a little muscle at least. To improve the sliding of the legs we might have to apply some oil or grease to the inside of the legs.

Once the legs were bolted on we flipped the frame over and marked the layout for the caster wheels which will be on the bottom of the standing device. To drill these
holes we had to use a hand drill since the device would not fit on the drill press or the hydraulic punch. Once we finished drilling the holes we noticed the wheels were going to hit the bolts which held the legs to the tables. To fix this problem we used washers as spacers then bolted the caster wheels to the bottom of the table. Unfortunately we thought we had 8 wheels so we drilled 8 holes. We only had 6 wheels so now we have 2 holes in the bottom plate of our device, we will need to order two more caster wheels.

Also this week we made a pad prototype. We used plywood for the back of the pad and put two screws through it. Then we cut a piece of foam to the size on the wood and the thickness we were looking for. Then we cut out a piece of our waterproof material. We wrapped the foam and wood in the material and then stapled it on the back of the wood.

**Future Work**

In the future we will perfect our pad design. Also we are still searching for a material to go on top of the steel which will prevent our client from getting burned if the steel gets hot. We are looking for something sturdy, weather resistant, and heat resistant. However everything we find is very expensive. Also we are making a piece which will hold the knee pads. this piece will connect to the legs of standing device.

**Multi-Terrain Wheelchair**

**Work Completed**

For the wheelchair the back wheels have been finished. This piece consisted of an axel connected to a steel bar which attaches to the wheelchair.
The axel is 10" in length and 1" in diameter, at the end of the piece it is smaller to fit in a hole on the steel bar to increase the strength of the part when welded. The wheel slides onto this piece. The bar we used is the same as the bar used in the front wheels its dimensions are 2" x 1/2" x 11". There are three holes in this part of the wheelchair. One for the axel and two spaced two inches apart near the top of the bar. The hole for the axel is 3/4" in diameter and is placed 3/4" from the end of the bar. The hole on the other end is 7/16" in diameter and is also placed 3/4" from the end of the bar. This makes the back wheels lower 9 1/2" to touch the ground. The two small rods which connect to the wheelchair are 3" long and 7/16" in diameter. On the ends of these rods there are threads for a nut to be applied.

The back wheels would hit the vertical bar if we did not add a spacer to go in between. Therefore a one inch spacer was made out of brass to act like a bushing. Once the wheel was in place we added a washer and drilled a hole for a cotter pin which will hold the wheel in place. Once this was finished the rear wheels were done.

The next step was testing the wheelchair, to do this we took it outside in the snow. There was one problem. The wheelchair had a stability issue. It would tip forward sometimes when it hit a larger amount of snow. To fix this we could either lower the back of the wheelchair or raise the front. The easier of the two was raising the front. To do this we made spacers to go between the bolts which attached the front wheels to the adapter piece. We raised the front and 1 1/8". These spacers were made out of steel. After this correction was complete there was no more snow therefore we had to create an obstacle course. We set up steel bumps for the wheelchair to go over and it seemed to handle these bumps very well.
Future Work

The wheelchair is pretty much finished. We will need to test it in sand as well as snow one more time. Also we will be adding an umbrella holder and a cup holder to the device.

Hours Worked: 24.5