

# My mini servo grippers and completed robotic arm

February 26, 2010

Whoah!, what happened here?!



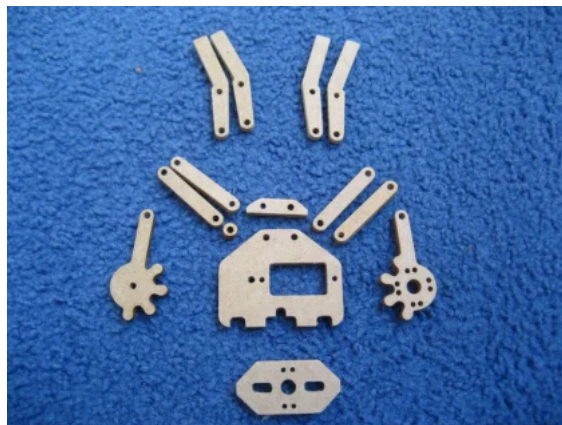
This is the work for a vacuum cleaner, to bad it did eat the part right above as well...:p



A little time ago I made a robotic arm, without the gripper. So last week I draw a gripper that is compatible with a

mini servo, I made two versions because I had to chose between two kinds of gears, straight and rounded. Because I first finished the straight gears version I milled this one first, but since there was a little play between the two gears I also made the second one, the one with the rounded gears. I was surprised because it only took me about 2 hours to make one! The gripper with the rounded gears has much less play so thats a good sign. The gripper came out quite nice, here below are some pictures:

All the part milled out, the rounded gears look really nice, without much play!



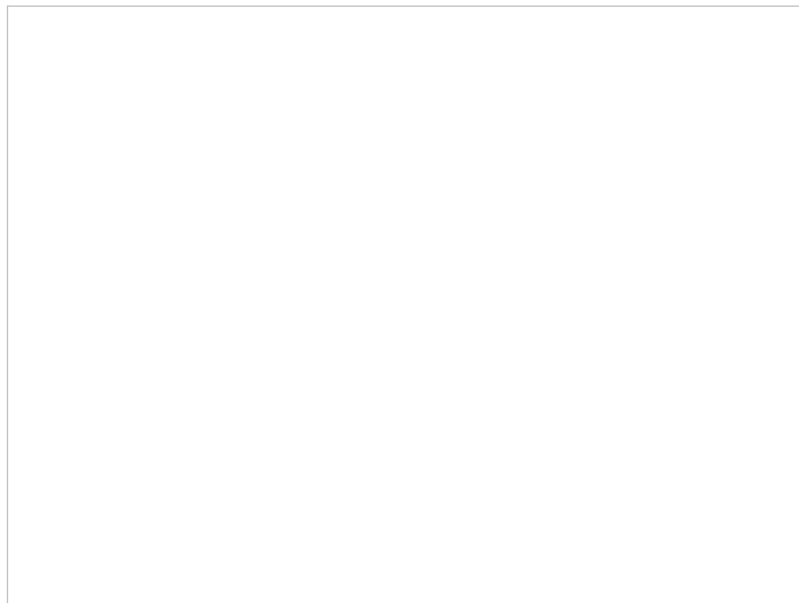
The assembly of the hand, and the 2 hands I made.

Here's a close-up of the little screws I used, there 2.0 x 10mm:

A close-up of the hand with some nice foam on it for extra grip.



Here's how the mini-servo is connected with the gripper:



Here's a video of the second gripper, it runs really nice!

Now my gripper and the arm itself is finished the mechanical part is actually finished, so I only have to make the electronics for it! Finally some progress!

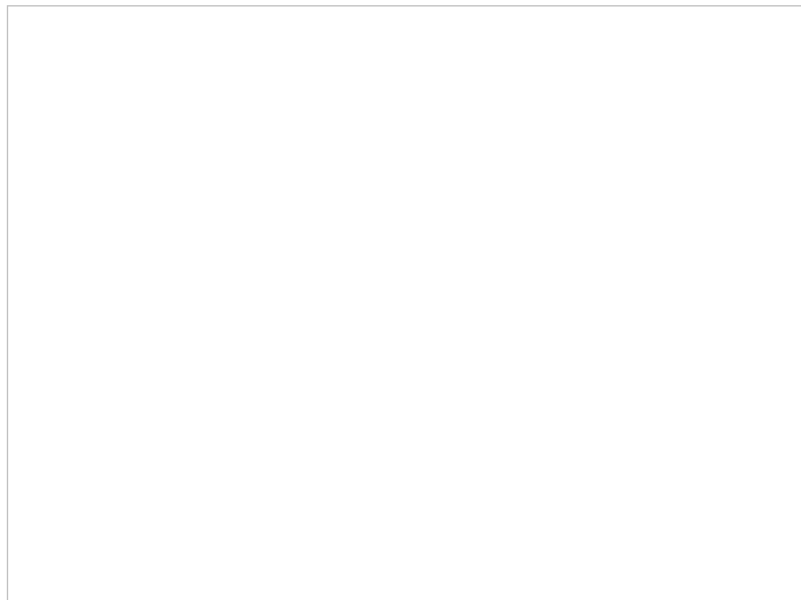
A picture of the total arm:



Here's how the arm moves, with a remote:

I already made some progress for the electronics, since I'm planning on using an Arduino to control the robot I made a shield just for connecting the servo's with feedback to the Arduino.

On the right is the shield I made:



Testing the shield with some servo's:



The schematic actually is really simple, it just gives the signals to the Arduino and backwards. There is also a female header for an infrared receiver and some female headers for power supply and 4 connections to the remaining (unused) Arduino I/O pins. So it is possible to connect another switch or sensor.

Here is how the PCB came out, the library I used had a bug in it because the distance between the headers was exactly one headerpin to close! To overcome this problem I bent the header pins to fit into the Arduino female headers. Maybe I make a new one with some more switches, but for now it is only to test the whole arm. For testing the robotic arm with the Arduino I have to wait for cables which I ordered to extension the existing ones. Also the cable has a 4<sup>th</sup> female header pin which gives the Arduino the analog voltage from the servo (which is later used for position feedback).

Here below are some more pictures of the whole arm, and a little video of the whole arm in action. Last week I had

vacation so I milled another arm, just because it is possible 😊 I'm planning on making another few arms from some nice plastic like PVC or something and mill them on a real EMCO CNC milling machine at school, but the arm I have works perfectly so far and I already have two of them.

I started to post my things on thingiverse.com, so you can download the .stl files from there:

The standard servo gripper: (not for this robotic arm)

<http://www.thingiverse.com/thing:2414>

The mini servo gripper:

<http://www.thingiverse.com/thing:2415>

The arm:

<http://www.thingiverse.com/thing:2433>

I hope you like it, let me know if you made one 😊

Update: Here's the follow up post:

<https://jjshortcut.wordpress.com/2010/08/17/multiply-the-robotic-arm-and-electronics/>