Painting Solutions for Limited Mobility
Weekly Report #5
Wednesday Feb 15th – Wednesday Feb 22nd

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Team #1
BME 291
22 February 2006

Work Completed:

During the week of February 15th – 22nd the GXC adjustable mounting clamp was received. The focus of this week was interfacing the cut 8020 stock to create an articulating arm. The articulating arm consists of 3 pieces of 8”x1”x1” aluminum stock. A hole with a diameter of _” was drilled _” from the edge of each of the pieces. Then the pieces were connected using 2.5” bolts. A nylon washer was placed in between each of the pieces of stock in order to provide a low friction interface between the connected pieces of stock. The bolts were secured using nylock washers which will prevent loosening from occurring during use and vibration.

The GXC adjustable mounting clamp was tested and confirmed to mount easily and steadily to a _” circular bar of a wheel chair. Adaptable mounting screws were also shipped with the package.

The 65” piece of aluminum stock will be used as the post, but will likely be cut down to two 16” pieces which will interface with each other to allow for height adjustment of the post.

A polymer clay was ordered this week in order to create a mold for fiberglass composite. The clay is made out of a polymer material which does not require firing, but baking at low temperatures. The clay is made by SuperSculpty and is a ceramic like polymer after baking, and is shatter and chip resistant, it can also be machined and sanded.

Future Work:

There is still 65” of aluminum stock left which will be used to interface a post that can be clamped to the chair. The small nylon washers in use now will likely be replaced with larger 1” OD washers.

The incoming clay materials will be used to create a mold for fiberglass composite. The clay is made out of a polymer material which does not require firing, but baking at low temperatures. The clay is made by SuperSculpty and is a ceramic like polymer after baking, and is shatter and chip resistant, it can also be machined and sanded.
After the clay is constructed, it will be coated with Partall #2 wax paste. This is a waxed based compound which is applied to the mold surface to aid in removal. The PVA mold release will also be used in conjunction with the wax paste. The Fiberglass is 1.5oz per square foot of chopped strand mat. The fiberglass will be cured using a general purpose polyester resin.

The linear slide also will be machined so that it can be used with a braking system. A hole will need to be drilled to mount the braking device, and the unused side of the linear slide will also be removed by machining in order to reduce weight and size.

The PVC cross section needs to be mounted to the wrist brace and a device to secure a brush or marker of a variety of sizes needs to be incorporated.

Work for the Next Few Weeks:

- Create arm support mold using clay
- Implement the fiberglass to create composite
- Cushion support using foam
- Cut stock and interface with clamp
- Interfacing of hinges for support system with a wheel chair

Project Review:

This week consisted of purchasing and planning the necessary requirements for the actual fiberglass forearm mold. All materials were purchased and plans are in action for the construction of the device. The aluminum stock is going to be machined further and more parts are in plan to be ordered from 8020 in the following week. Most of these parts are accessories such as end caps and fasteners.

By Friday 2/24/06 the clamp should be interfaced with the proper lengths of aluminum stock to create a working post. Also the springs and PVC cross section will be used to incorporate a brush which can secure and adjust the position of a paintbrush.

Updates to Timeline:

- Obtain a template wheel chair
- Dismiss use of ball joint
- Incorporate fiberglass mold into design
- Supplementary ordering of fiberglass, and fasteners
- Decision for use of gas spring
- Interface clamp with post
- Creation of swivel joints
Updated Timeline:

<table>
<thead>
<tr>
<th>Task Description</th>
<th>Date</th>
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<tbody>
<tr>
<td>Create arm support mold using clay</td>
<td>Wed 2/22/06</td>
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<tr>
<td>Implement the fiberglass to create composite</td>
<td>Wed 2/22/06</td>
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<tr>
<td>Cushion support using foam</td>
<td>Wed 2/22/06</td>
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<tr>
<td>Cut stock and interface with clamp</td>
<td>Wed 2/22/06</td>
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<tr>
<td>Interfacing of hinges for support system with a whe</td>
<td>Wed 2/22/06</td>
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<tr>
<td>Cut 32&quot; and 8&quot; sections of stock</td>
<td>Wed 2/22/06</td>
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<tr>
<td>Incorporate braking system with Slide</td>
<td>Wed 2/22/06</td>
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Hours Worked:

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
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<tbody>
<tr>
<td>Thursday 2/9</td>
<td>2:00 Pm – 4:00 Pm</td>
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<tr>
<td>Friday 2/17</td>
<td>1:00 Pm – 5:00 Pm</td>
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<td>Monday 2/13</td>
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<tr>
<td>Tuesday 2/14</td>
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<tr>
<td>Wednesday 2/22</td>
<td>10:00 Am – 1:45 Pm</td>
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Hours total = 10.75 Hours