Project Identity
Shampoo-Conditioner Identification Device/ Medicine Reminder
Week 1: 3/18 – 3/25
Kenta Umetsu

Work Completed

Medication Reminder:

This week, several researches were done on the medication cabinet. First, magnets that were planned on being used for the cabinet were looked up. Several different types of magnets were available as well as shapes and sizes. Several cheap and affective options were observed on the website that we could use. The one that seemed appealing was the ultra-high energy ultra-flexible magnetic strips. They had good magnetic strength as well as the flexibility to cut and stretch it to the size we needed for the application.

The major work for this week on the medication reminder was the updated cabinet design done on Microsoft visio. The design of the front of the medicine cabinet is shown in the figure below.
As we proposed before, our plan is to have two cabinet compartments with both adjustable shelves for the medication. This way when her medication is updated she can still customize the cabinet to her use. The bottles will go right into the cabinet instead of having compartments on the shelves because her medication is not all pills and include liquid medication also. The door design has changed to be two separate doors now instead of one large door. The doors will be held closed by a magnet that we have mentioned earlier as well as providing labels for our client so that she can organize her medication. The labels will be located on the inside of the door so that when she opens the compartment she can see what medication is where if the medication bottle labels are hard to see. Another figure which shows the side view of the medication cabinet is shown below as well.

This view is to show how the cabinet will look from the side as well as some of the features that are hard to show from the front. The cabinet shelves as you can see will have a unique cut to them. This is to have the shelves slip into the shelf pins so that forces on the horizontal plane will not knock out the cabinets. The shelf pins will be located in the white holes that will be drilled in the wood. Each shelf will be held by 2 shelf pins in
the front and back totaling four per shelf. Extra shelf pins are being planned to be given to the client so that when some are lost they can be replaced.

**Shampoo-Conditioner Identification Device:**

For the Shampoo-Conditioner Identification Device, we did as much future planning for the device casing as possible this week with the applications that were done. Measurements were taken on the waterproof speakers as well as the color sensor. We also estimated the PC board size to see if our previous design can hold all the parts. We may have to change the design slightly depending on the actual size of the PC board when fabricated. This will be determined soon as the PC board design is currently being worked on by Sheldon. Our device casing plan originally was to cut the entire thing out of one large plastic. Suggestions have been made to maybe make them out of two pieces of plastic. We have been looking into both plans to see what the prices would come out to as well as which ones are easier to work with. The designs on the front and back pieces of plastic will be slightly different if we go with the 2 pieces of plastic so further planning must be made to see which one will be easier to do. As of now, the 1 ½ inch thickness PVC is $146.34 per piece. This means that it will come out cheaper than having one large piece. 3 inch thickness PVC as mentioned in the previous week was about $348.06. Another thing we discussed about the design was where some of the parts will go. We decided that on the front we are going to try to keep it simple. The only thing that we have planned showing on the front is the clear polycarbonate window for the color sensor and the speaker depending on the clarity we get for our final result. The switch of the device will be located on the side and the battery compartment will be located on the back.

Sheldon and I have also been working closely with several tuning of the speaker. We hadn’t actually hooked up the waterproof speaker to the circuit before to hear the sound quality so we pushed to test that out in lab. We first tested it by simply running both speakers since we did not want to remove the SP03 speaker until we were sure. The sound quality and volume on the waterproof speaker were superior than the SP03 speaker in every way which was promising for us. Unfortunately, we still think that the volume is still not loud enough for a shower environment so we have decided to go with
amplifying the signal. Now that we saw the sound quality on the water proof speaker we took apart the SP03 speaker. In the future we will solder on the water proof speaker so that we do not have to wire it up every time we test it. While testing the sound quality, Sheldon and I have discussed more on the speech of the actual program. The “shampoo” and “conditioner” were coming out a bit awkward so we sat down and came up with several different spellings of the word so that it would come out clearer. The pitch, speed, and spelling were adjusted to maximize the programs articulation of each word and were updated.

**Future Work**

In the upcoming weeks we really need to get as much done since the prototypes are due in 4 weeks. Sheldon and I project that it will be tight but can have everything done for the Shampoo-Conditioner Identification Device besides the casing. We project that we may still be finishing up our casing but it will be mostly done and be finished by senior design day.

For the medication reminder, we may expect some program delays but everything else should be done. The casing plastic needs to be measured and outlined in the upcoming weeks so that it is ready to be cut and machined. The wood for the medicine cabinet also needs to be decided on soon to give enough time to ship. Having as much parts ready to be ordered will be my goal for the week as most of the other planning cannot take place till this is done.

A lot of machining needs to be done for both projects so my work in the next several weeks is to have ever part ordered and planned out so that all the machining can be done during the week we plan on going into the shop. This way both projects will move along as much as we can.

**Project Review**

Overall the Shampoo-Conditioner Identification Device has seen a lot of progress in the recent weeks and is really starting to see how the final product will be like. A lot of promising features are almost done and we are projecting to be finished by senior design day. The medication program is also on its way and depending on how much of the
program we can get done, it will also come out very well. Hopefully the medication cabinet will be finished as well to accomplish more than what were asked to do by the client.

**Hours Worked:** 14