Heated Diagnostic Radiology Examination Table

Week 12 – April 10th to April 17th, 2009

Team Members:

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Problem Statement

A frequent patient complaint is that current x-ray tables are hard and cold. A pad can be used to eliminate the first complaint; however the temperature of the table cannot be altered on standard tables. A heated exam table or attachment that has a temperature control to give patients added comfort during exams, needs to be developed. The materials used need to be radiolucent and may not obscure the body part being imaged. A mechanism must be implemented that eliminates the possibility of patient injury such as burn.

Last Week's Team Goals

i. Retest tubing and padding for radiolucency with phantom and make adjustments to design as needed.
ii. Develop a procedure for testing heating characteristics.
iii. Test heat characteristics proposed heating unit, tubing, and padding.
iv. Finalize pump requirements, and order pump.
v. Order other necessary parts and begin assembling prototype.

Summary of Accomplishments

i. After testing different variations on our padding tubing design with the phantom it was found that the contrast introduced was not acceptable. The polyethylene tubing filled/unfilled with water, was tested in different configurations with the phantom, wood, and acrylic sheets. Vertical edges were the main source of the contrast observed. We will make several different prototypes or variations on our tubing design before we test them all on Monday of next week.
ii. Tyler, Joey and Joel went to Menards to search for pumps and finalize the materials and plan for construction of the piping system for our design.
iii. Paul has worked on the MatLab X-Ray attenuation program. Paul's program has been very useful in understanding the attenuation effects we have observed during testing. Additionally, Paul's program has and will play an important part in the re-design of our padding tubing system.
iv. Joey ordered padding, we may or may not use this padding depending on the solution we find to the tubing design challenges.
v. As a team and individually we have began researching and brainstorming changes to be made to minimize the contrast seen in our padding tubing design.

This Week's Goals

i. Create several potential alternatives or variations to design in an attempt to eliminate contrast introduced by tubing, then retest.
ii. Consider alternative heating strategies if tubing not feasible.
iii. Proceed in ordering and assembly of entire prototype

Project Difficulties

After our second round of testing it was discovered that the polyethylene tubing in our design introduces an unacceptable amount of contrast. We will proceed to make alterations in an attempt to reduce contrast to an acceptable level.

Activities

4.10.2009	Team: Tong lecture	1 hour
4.10.2009	Joey: Search for materials at Menards	1 hour
4.15.2009	Joey: Finalize pumping calculations.	2 hours
4.15.2009	Joey: Order padding.	.5 hours
4.16.2009	Joey: Meeting at union to discuss tubing challenges.	1 hour
4.16.2009	Joey: Brainstorm and research tubing alternatives/variations.	2 hours
4.10.2009	Joel: Search for materials at Menards.	1 hour
4.15.2009	Joel: Testing with client.	4 hours
4.16.2009	Joel: Brainstorm and research tubing alternatives/variations.	2 hours
4.12.2009	Paul: MatLab X-Ray attenuation program	3 hours
4.15.2009	Paul: Testing with client.	4 hours
4.16.2009	Paul: Meeting at union to discuss tubing challenges.	1 hour

4.16.2009	Paul: Brainstorm and research tubing alternatives/variations.	2 hours
4.16.2009	Paul: Updated website.	.5 hours
4.10.2009	Tyler: Search for materials at Menards.	1 hour
4.14.2009	Tyler: Organized and purchased prototype materials.	1.5 hours
4.15.2009	Tyler: Testing with client.	4 hours
4.15.2009	Tyler: Search for heating alternatives.	1.5 hours
4.16.2009	Tyler: Brainstorm and research tubing alternatives/variations.	2 hours
4.16.2009	Tyler: Wrote progress report.	.5 hours

Tentative Project Schedule

	January		February				March				April				May
Task	23	30	6	13	20	27	6	13	20	27	3	10	17	24	1
Project Research	X	X	X	X	X	X	X	X		X	X	X	X		
Brainstorming/Work on Design		X	X	X	X	X	X	X		X	X	X	X		
Prototype															
I. Ordering															
ii. Expected Shipping															
iii. Work on Design/Building										X	X	X	X		
iv. Testing						X					X	X	X		
v. Re-design													x		
vi. Re-test													X		
Deliverables															
i. Progress Reports	X	X	X	X	X	X	X	X		X	X	X	X		
ii. PDS		X	X	X	X	X	X	X		X	X	X	X		
iii. Mid-Semester Presentation						X	X								
iv. Mid-Semester Report							X	X							
v. Final Poster Presentation															
vi. Final Report															
Meetings															
i. Group	X	X	X	X	X	X	X	X		X	X	X	X		
ii. Advisor		X	X	X	X	X	X			X	X				
iii. Client		X				X							X		
iv. Semester Wrap-Up w/ Advisor															
Website	X	X	X	X	X	X	x	X		X	X	X	X		

Expenses

Date:	Item:	Cost:	Comments: