Tissue Sample Preparation Device for Biochemical Analysis

Team Members:
Sara Alford (Team Leader)
Christine Koranda (Communications Rep.)
Carla Maas (BWIG)
Ryan Roth (BSAC)

Client:
Jeff Ross and Charles Tessier
University of Wisconsin - Medical School
Department of Oncology

Advisor: Paul Thompson

Date: February 26 - March 4, 2003

Problem Statement: To design a device that completes the preparation process done manually to prep a tissue sample for biochemical analysis. The device should freeze the tissue (with liquid nitrogen), and grind it to a powder. Sample should be easily collected.

Restatement of Team and Individual Goals:

Team:
1. Start working on mid-semester presentation

Carla:
1. Find out if Coupler/Plug Set is a viable option for connection
2. Order elbow fitting
3. Sauder wires with Christine on Tuesday at noon
4. Meeting with Ryan to hook up circuit on Wednesday

Christine:
1. Finalize design drawings of grinding chamber with Sara
2. Submit drawings to ECB shop for grinding chamber and its attachment
3. Begin AutoCAD drawing of current prototype

Ryan:
1. Meet with Carla to hook up circuit.

Sara:
1. Finalize design drawings of grinding chamber with Christine
2. Submit drawings for grinding chamber to ECB Shop

Summary of Accomplishments:
1. Divided up the presentation slides and work between group members.
2. Made a small video of the functioning prototype to show during the presentation since the room we are presenting in will not allow us to have a live demonstration.
3. Determined the dimensions for the metal insulating chamber.
4. Completed AutoCAD drawings of grinding head and metal insulating chamber and submitted them to the ME shop.
5. Circuit was Saudered.
6. Solenoid now runs on the circuit and logic relay.
7. Removed test capacitor from circuit and begin creating circuit on tinier board.
8. Entered circuit into PSpice.

Team and Individual Goals for Next Week:

Team:
1. Finish Mid-semester presentation slides and get ready to present on Friday.
2. Group meeting ECB 1036 Wed. 8pm to prepare presentation.

Carla:
1. Complete electrical circuit on smaller circuit board and sauder
2. Run device on electrical circuit (need either 9V batt, or 9V DC adaptor, or lug power supply to air supply)
3. Find the right capacitor and resistor/potentiometer match-ups to achieve a descent pounding speed range
4. Get Christine's AutoCAD drawings online

Christine:
1. Update IronCAD drawing of prototype
2. Determine height of the insulating chamber from the base
3. Find out how EXPO funding is distributed

Ryan:
1. Circuit work with Carla

Sara:
1. Determine the dimensions and shape of insulating chamber
2. Research sealants needed during construction of insulating chamber

Project Schedule:
Week 1: Group chose same project, client was contacted.
Week 2: Divided tasks, patent proposal, prototype work
Week 3: Patent, EXPO proposal, prototype working, chamber design
Week 4: Patent Meeting, Chamber Design, Circuit Timer
Week 5: Drawing for head and chamber, Circuit Timer
Week 6: Presentation, Drawings for chamber, circuit building

Difficulties:
1. ME shop has a four-week backlog with orders
2. Part from Menards does not work w/ spiked fittings, and spiked fittings appear to be sealed on. But on positive side, the clamps are working well for keeping the hose on.
3. Key/design lab still a hassle, also still no garbages in large design area
4. Did not have 9V DC power supply for camera recording, disconnecting power source in lab and moving seemed to difficult.
5. University mail is down for both Christine and Carla (apparantly till
Wednesday) so communication has been a little harder.
6. Carla had difficulty running circuit in PSpice. I have heard CAE only has a trial version so maybe you can't simulate circuits w/ 555 timers in them in the student version. Otherwise I'm just missing a component value that I can't figure out how to enter.

Weekly Hours:
Group: 1.5
Christine: 4 hours
Carla: 3.5 hours
Ryan: ? hours
Sara: 3 hours

Total Hours:
Christine: 24 hours
Carla: 23 hours
Ryan: 17.5 hours
Sara: 19 hours