Progress Report 4

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

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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. EXPO planning and expectations for display
2. Long term goal planning

Christine:
1. Complete AutoCAD drawing of the grinding head and have ME shop begin machining
2. Further brainstorm grinding chamber attachments

Carla:
1. Purchase 555 timer, potentiometers. Find/claim breadboard in design lab.
2. Meet Wednesday with Ryan to build circuit with 555 timer
3. Find relay to switch the AC signal to the solenoid (recommended by Paul)

Ryan:
1. Successfully complete timer circuit component acquisition and construct circuit from such components.
2. Examine the cycling period of the pneumatic cylinder and adjust as needed.

Sara:
2. Further design drawings for the sample chamber and attachment mechanisms.

Summary of Accomplishments:
1. Meeting at WARF with intellectual property manager in the patent application process
2. Website up: [www.cae.wisc.edu/~bme400/tissue](http://www.cae.wisc.edu/~bme400/tissue)
3. Submitted application for funding from EXPO (will take 3-4 weeks to process)
4. Circuit Design:
   a. Picked up 555 timer from EE parts shop
   b. Assembled timer circuit w/ potentiometers and LED (flashes to electrical pulses) w/ Ryan
   c. Found information on relay hook-ups, familiarization with the concept and how to incorporate that into the circuit.
5. Chamber Design:
   a. Christine and Sara met, developed a final design for the chamber and connection with the base.
Rough sketches in our notebook.
  b. Making progress on thermo calculations.

Team and Individual Goals for Next Week:

Team:
1. Plan a new mid-semester presentation time since most of the group will be attending CUBIC.

Carla:
1. Find exactly how to hook-up relay (check design lab manuals/books)
2. Wednesday meeting with Ryan to hook-up the relay (available in lab) to our circuit
3. Operate tissue grinder with the electrical parts we have assembled (Friday)
4. Obtain a cart for safe storage of prototype from ME Shop.
5. Update website w/ more progress reports and a timeline
6. Purchase 2 elbow fittings at Menards, if not there order push-and-lock fittings from Price Engineering (these fittings place the tubing or our device at a better angle and out of the way of the pivot mount)
7. Find a lab source "snap-fitting" for safer connection (take measurements of air spigot)

Christine:
1. Once the prototype is moved to a cart, begin measuring dimensions for AutoCAD drawing
2. Determine exact distance between grinding chamber and grinding head
3. Submit drawings to ME shop for machining of all necessary components together (grinding chamber attachment and grinding head)

Ryan:
1. Continue investigating relay and incorporation into circuit.
2. Work with Carla to implement circuit components.

Sara:
1. Finish thermo calculations.
2. Once dimensions are taken by Christine, help with the autocad drawings for the chamber design.

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

Difficulties:
1. Oscilloscope in BME lab differs from ones that Ryan and I have used in BME 310 and EE courses, so we had difficulties taking readings on our circuit with it. There also seemed to be a lot of 60 Hz noise on the visual display of our signal. We'll try again with the oscilloscope on Wednesday.
2. Design lab. Still hard to obtain access on weekdays. Looking forward to a better system.
3. Unsure about proper relay connections into circuit - working on that.

(Sara will be out of town this Friday)

Weekly Hours:
Group: 1
Christine: 2.5 hours
Carla: 4 hours
Ryan: 3 hours
Sara: 3.5 hours

Total Hours:
Christine: 13.5 hours
Carla: 13 hours
Ryan: 12 hours
Sara: 12.5 hours