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. 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.

Summary of Accomplishments:
** Team will all be present for the presentations and members will not be going to CUBIC like first thought.
1. Website updates with all progress reports and a timeline!
2. Made AutoCAD drawings of the grinding head and grinding chamber
3. Ordered grinding head from ECB shop
4. Found L-brackets and supports for the grinding chamber (hardware store visit)
5. Measured dimensions of current prototype for future engineering drawings
6. Purchased a Coupler/Plug Set from Menards - perfect, it we can connect it, since it adapts to 1/4" tubing and avoids having to change tubing size, use spiked fitting, where air leaks out.
7. Searched for an elbow fitting to adapt to push-in fitting so the tubing is out of the way - need to order from Price Engineering (no luck at Menards)
8. Heat flow analysis completed.
9. Cart checked out, Carla currently has keys
10. Burke O'Neill helped us find a logic relay which will simplify our circuit.

**Team and Individual Goals for Next Week:**

**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

**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

**Difficulties:**
1. Not sure if Coupler/Plug set will work. Need to find out if the spiked fitting on the lab air is removable. Both parts have similar hex nuts though.
2. There are no visible garbages in the large open design area of ECB.
3. Access to the lab is still difficult and frustrating.

**Weekly Hours:**
- Group: 1 hour
- Christine: 4 hours
- Carla: 4 hours
- Ryan: 3 hours
- Sara: 2 hours

**Total Hours:**
Christine: 18.5 hours
Carla: 18 hours
Ryan: 16 hours
Sara: 14.5 hours