Desktop Fan Design and Fabrication
Winter 2014

Goal

Design, fabricate, assemble and test a small oscillating fan for a desktop.

Resources

Students are provided with a Sparkfun Inventor's Kit, which contains an Arduino microcontroller, an assortment of electrical components, a small DC motor, a small servo motor and an instructional manual. The manual does not include instructions on how to make an oscillating fan. See http://www.sparkfun.com/commerce/product_info.php?products_id=9837.

Students will be able to fabricate structural components from a small sheet of 1/8 inch thick acrylic. The acrylic can be cut with a laser cutter from two-dimensional drawings. Students will have access to soldering stations to create extensions to the leads on the DC motor (as needed).

Required features

1. The system must be safe. For example, there can be no potential for injury by touching spinning fan blade(s).
2. The fan should use the DC motor in the Sparkfun Inventor's Kit.
3. The orientation of the fan must oscillate back and forth up to 140 degrees (+/– 70°) or more.
4. The fan must operate without requiring the user to directly interact with any computer code, for example by typing on the computer keyboard to specify the rotation angle or fan speed.

Extra points

- The user can adjust the fan speed (speed of the DC motor).
- The fan can have an on-off switch and a second switch to start/stop the oscillation.
- The user can change the extent of oscillation (e.g. +/– 30°, +/– 45°, etc.).
- The final prototype has cool or entertaining features.
- The quality of workmanship (fit and finish) is high.
- The fan would be considered "cool" by people with no technical training.

Presentation

Bring the completed fan to class and be prepared to demonstrate it. Prepare a three minutes presentation that describes your design and that addresses the following points.
- The primary design objective for choosing the shape of your structure.
- The biggest challenge faced by your team.
- The one thing you would change (if you had more time, money or both) to make your fan design better.
- Advice you would give to a student who is about to start this project.

Give your fan a product name and include this name on the cover sheet (see below).

Documentation

One document per team is required. Your document should contain:

1. A title page including your fan product name, the names of the team members, and the standard identification of the course number and due date.

2. All the points addressed during the presentation (given above) with more details.

3. A print out of the code used.

4. It should show a picture of your solidworks drawing, as well as a picture of your actual fan.