Lab 9 – Simple Mechanics

INFOSYS 290-13/ CNM 290-1: Design and Theory of Tangible User Interfaces
Date: Thursday, October 25, 2007

Objective

Learn how to translate rotational motion into other types of motion.

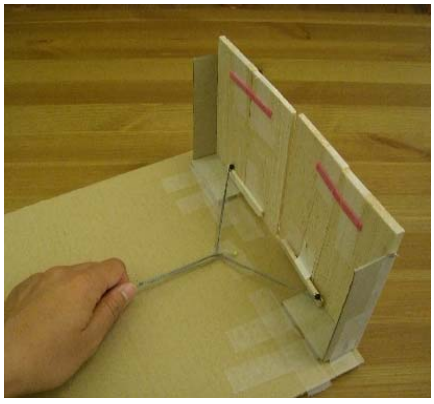
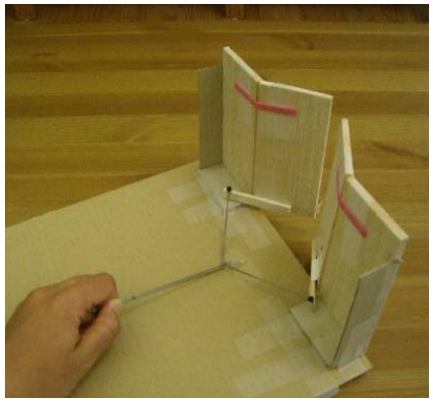
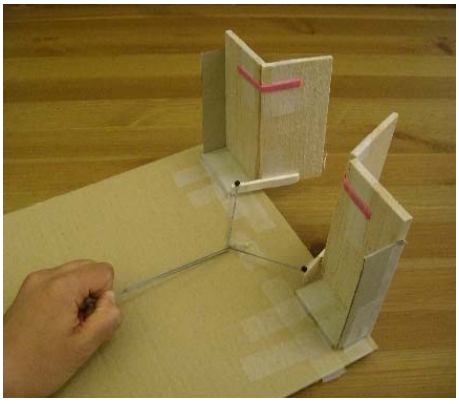
Activities

Create a "Cuckoo Clock" mechanics. Cuckoo Clock typically has an automaton of the bird that appears through a small trap door while the clock is striking. In this exercise, you will create mechanisms for 1) a door that opens and closes, and 2) a bird that leaps forward and backward. Once you have your mechanics working, you may automate the motion with your DC motors and servo motors controlled by Arduinos.

Important: Explore and get the mechanics to work first before trying to make it work with your DC motors or servo motors.

Part 1 – The Door

Create a mechanical construction of a trap door that opens and closes. Here is an example.

Useful Links

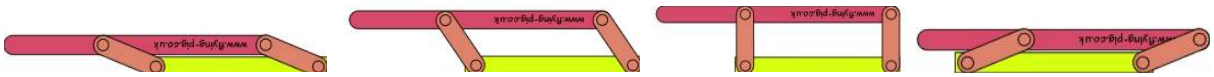
http://www.technologystudent.com/cams/camdex.htm
http://www.flying-pig.co.uk/mechanisms/pages/bellcrank.html

Part 2 – The Bird

Create a mechanical construction that moves the bird forward and backward.

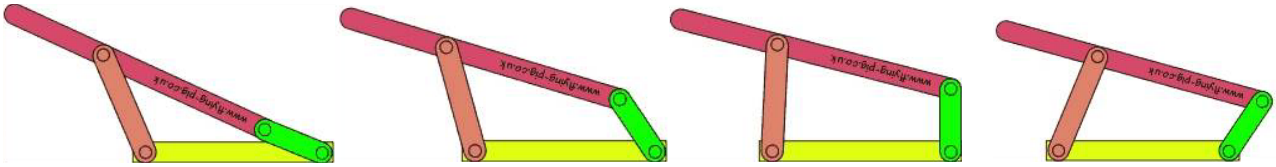
A linkage example I

1. 2. 3. 4.



A linkage example II

1. 2. 3. 4.



Part 3 (extra credit) –Putting Them Together

Put the door and bird together so that the bird sticks its head out when the door opens and goes back as the door closes. Once you get the mechanics to work, try to control it from Arduino.

Homework for next week:

Post descriptions and photos (and or video) of your "Cuckoo Clock" mechanics on the course website.

More Useful Links

The "Stretchable" 4-bar linkage simulator:
http://www.saltire.com/applets/FourBar/FourBarLinkage.html

Cool examples of stuff you can do with linkages:
http://www.cabaret.co.uk/