

CD Bot Assembly



Hardware to know

1. Switches: DPDT (Double Pole Double Throw)
2. DC Motor
3. Ribbon Wire
4. Castor Wheel
5. Transistor Battery
6. Chassis

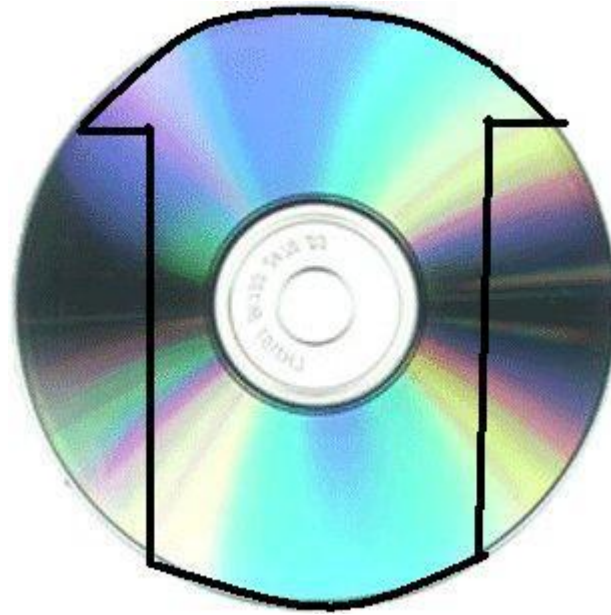
Concepts that you learn

1. Relative Motion, Friction
2. Electric Circuit
3. Design

Step 1



Take one CD. Mark the shape on it using a marker. Then, cut the marked shape with a scissor



Marked Shape



After cutting

Step 2

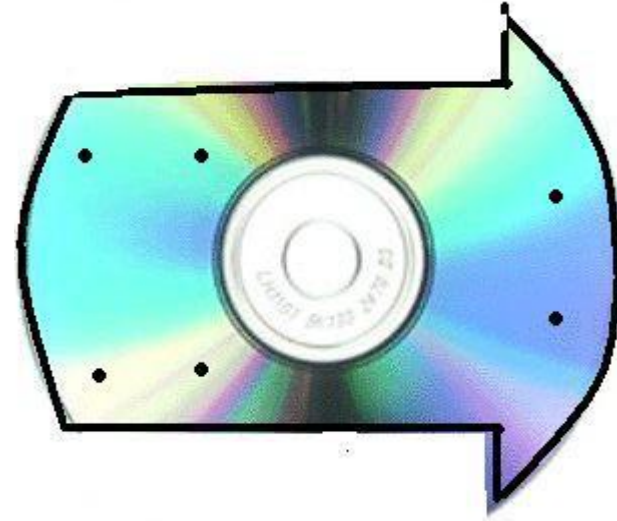
Since one CD will be stacked on another CD, cut the similar shape on CD 2. Now, Mark points for drilling holes so that long screws can be put through both of the CD's.



Black Dots represent marks

Step 3

- Drill Holes at the marks using a Mechanical Drill machine.



Step 4

- Mounting of DC motors:

We shall use a small measuring scale, M-seal and motors for this purpose. Cut the measuring scale into three pieces, slightly, larger than the length between the marked points on both sides. Make holes through the cut-piece of scale using Drill.



Cut-piece of Scale with holes

Now, mount one DC motor on the middle portion of scale between holes as shown in figure. Make 2 such pieces, say, M1 and M2. Use M-seal.



Putting M-seal



Mounting DC Motor



Mounting Motors on Chassis

- Mount M-1 and M-2 pieces on the marked CD at their appropriate positions. Run screws through holes of CD and scale.
- Remember: Long Screws must pass through the back portion while short length screws must pass through front portion. Tighten the screws with bolt.

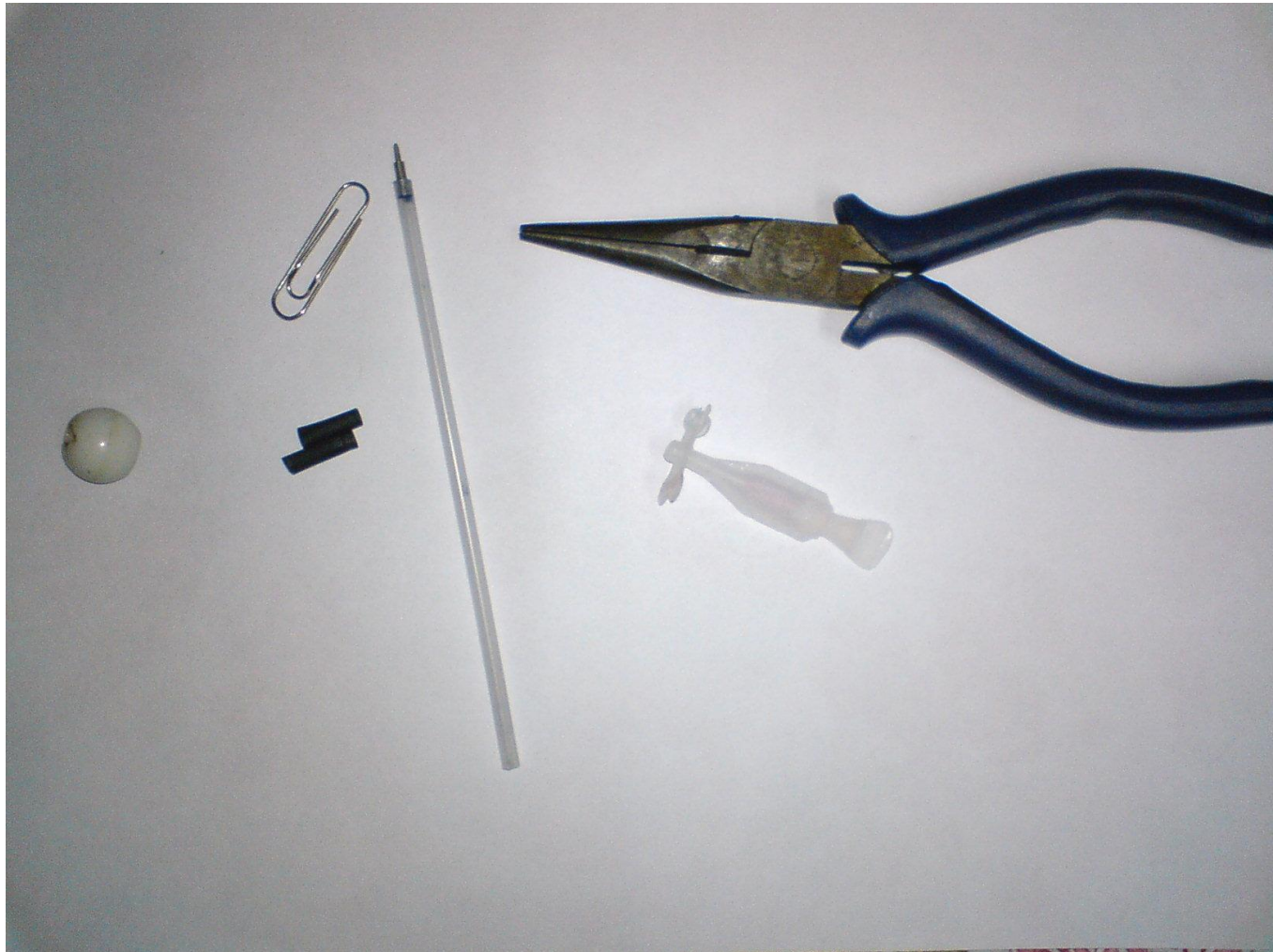
DC motors mounted



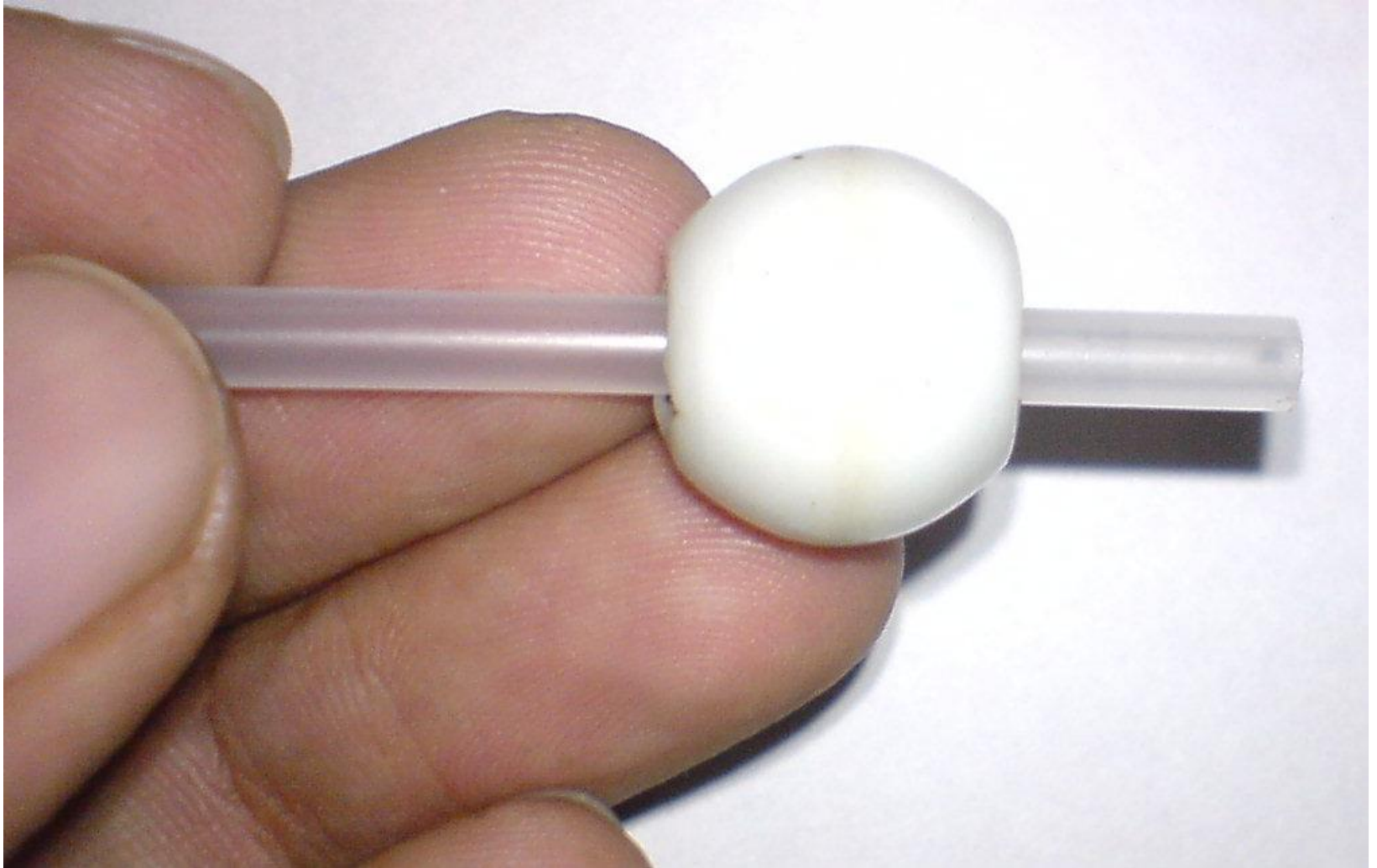
Step 5

- Making a Castor Wheel
- Components required: A bead, A pen refill, A paper clip, Feviquick

Material for Castor Making



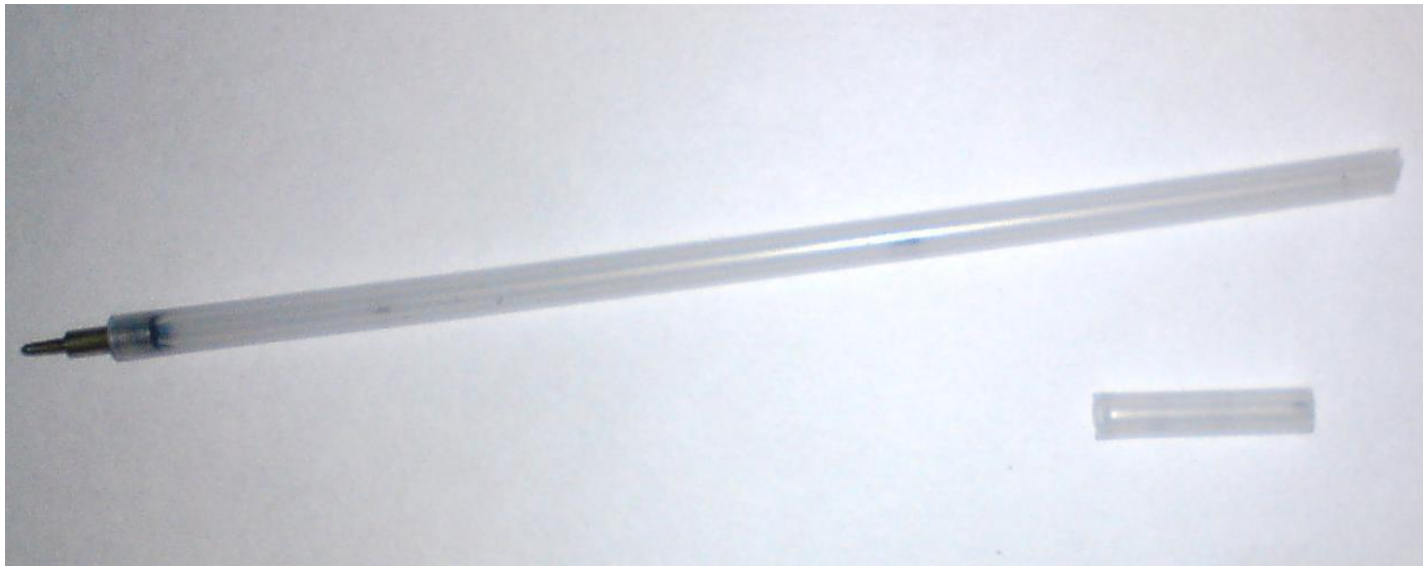
Insert the pen refill through bead



Cut a small piece of refill



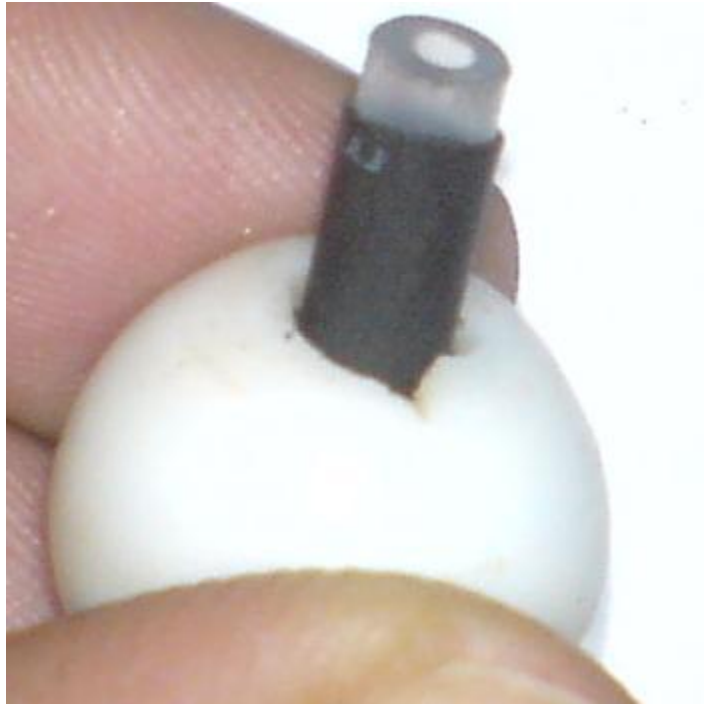
Cut-piece of Refill



Put a heat sunk tube
across the refill piece



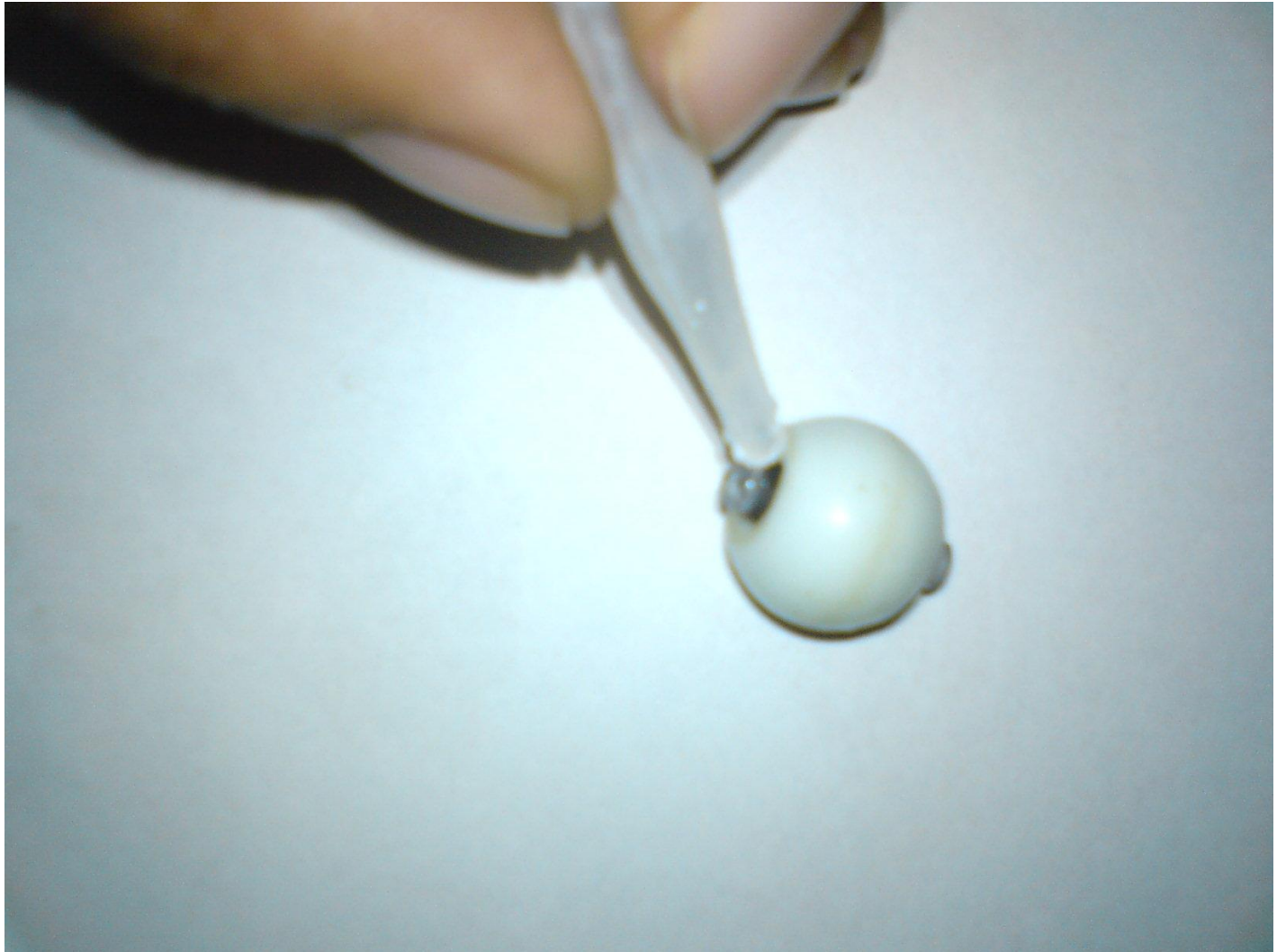
Put the refill piece through the castor



It should be tight enough



Fix the refill piece with bead



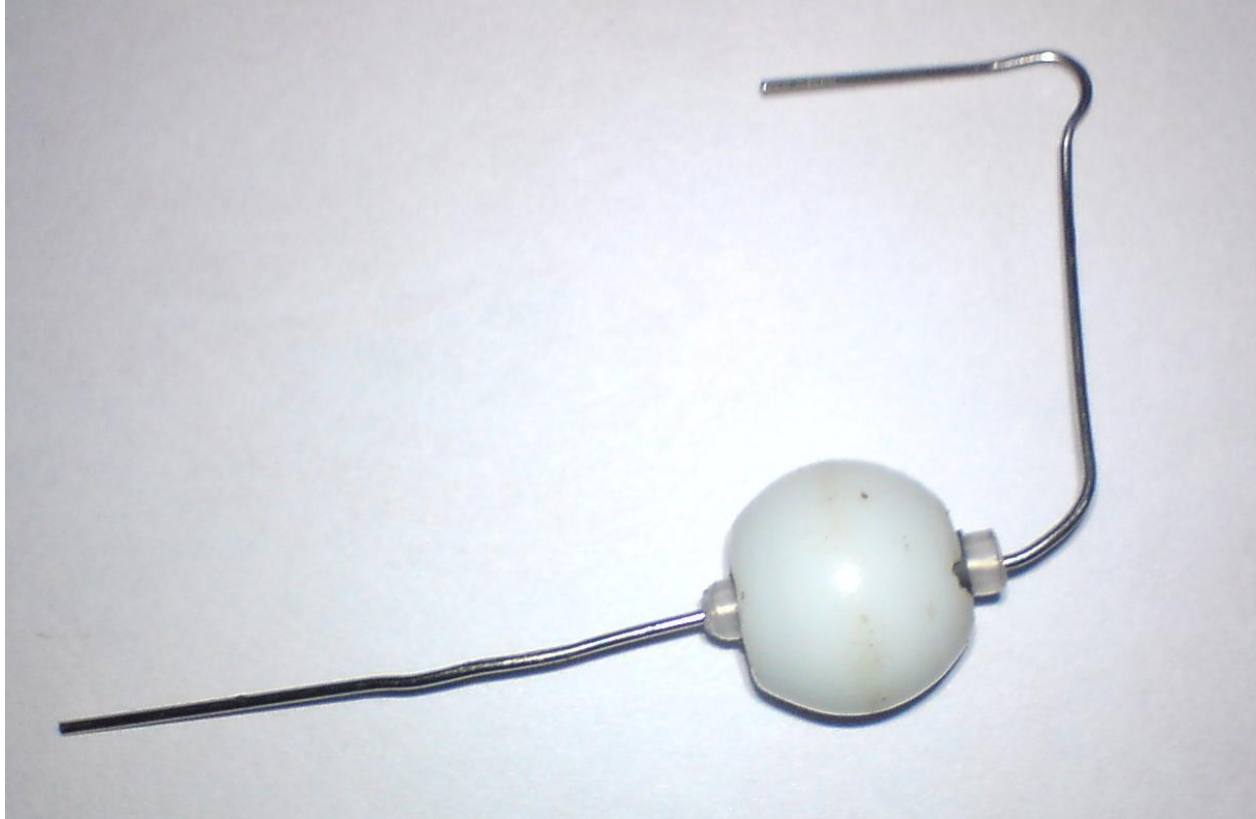
Fix the refill piece with bead



Unbend the paper clip and make a
creative axle as shown in figure



Put the axle through the refill



Final Castor Wheel



Step 6

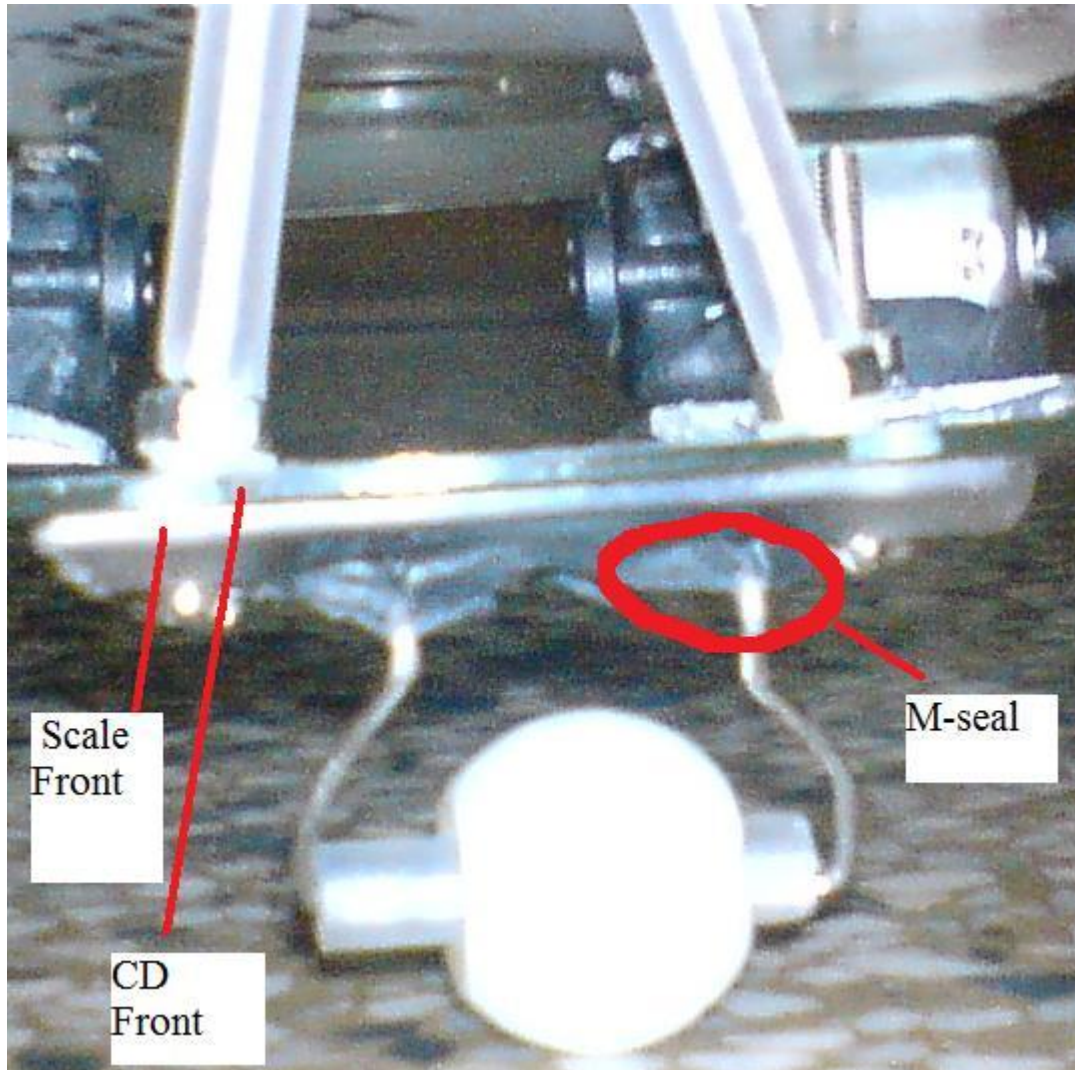
Mounting the Castor wheel

Use the same measuring scale funda. Paste the paper clip ends to the piece-scale using m-seal. Then, mount the scale at the bottom of CD using Long-screws and Feviquick.

Back side of CD



Front view of castor wheel mounting



Side view of castor wheel mounting



Step 7: Bearing Construction

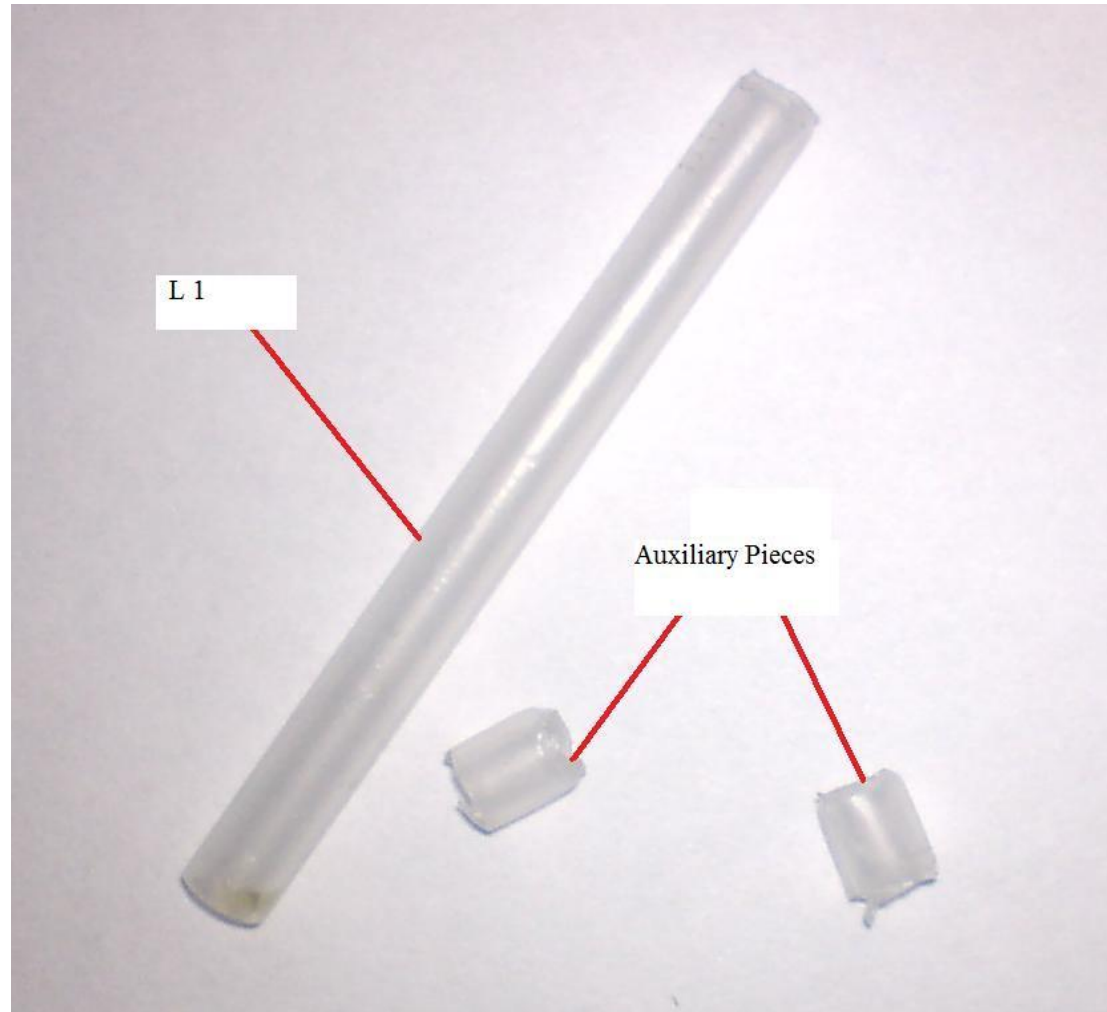
Materials Required: Two pen refills with different diameters, Feviquick and heat shrink tube



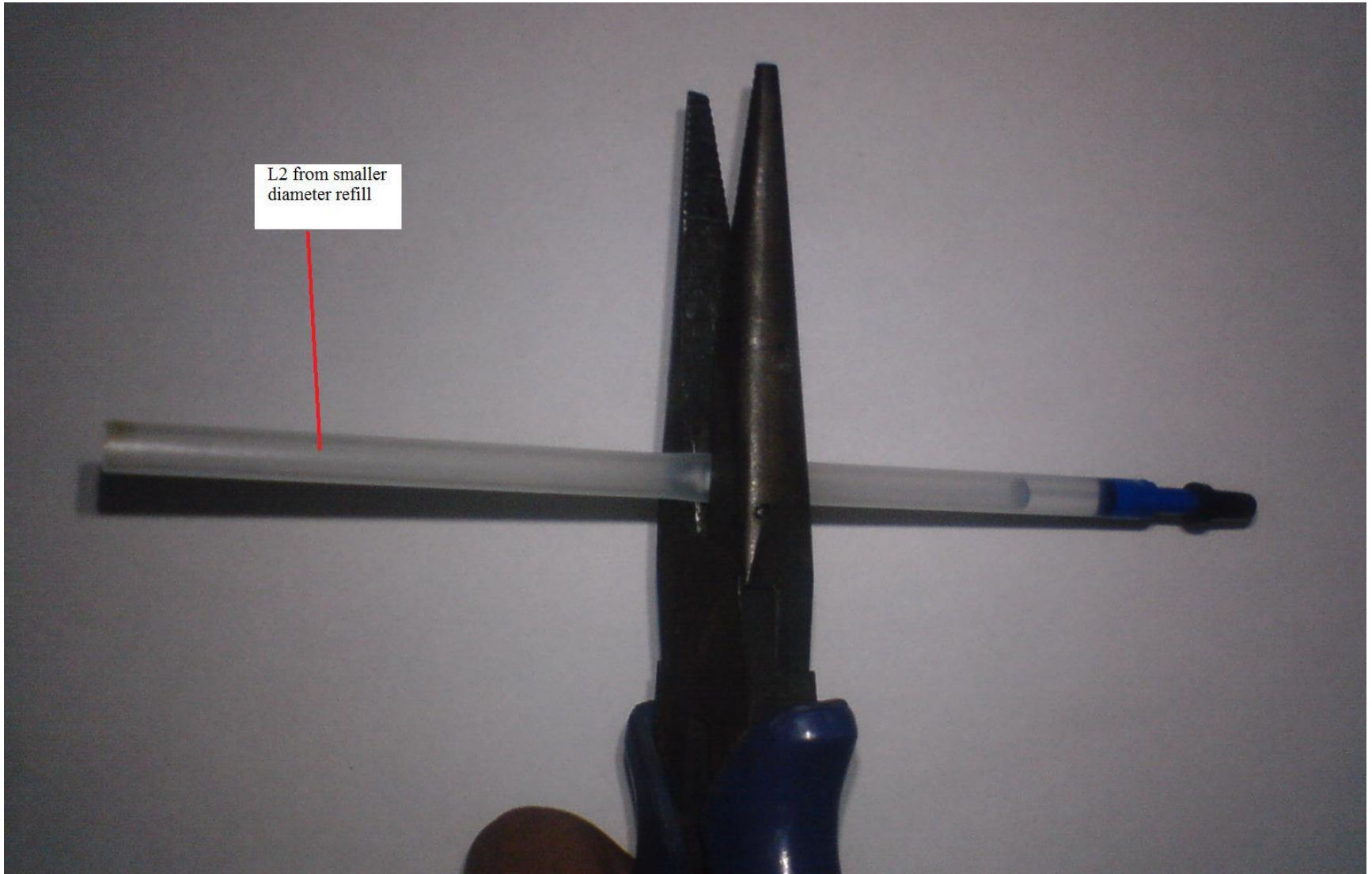
Cutting

- Cut a piece of length, say L_1 , from a refill of bigger diameter and a piece of length, say L_2 , from a refill of smaller diameter, where L_1 is smaller than L_2 .
 - Smaller diameter piece (L_2) should rotate freely inside the bigger refill piece (L_1)
 - Cut two very small auxiliary pieces that will act as a head from bigger diameter refill

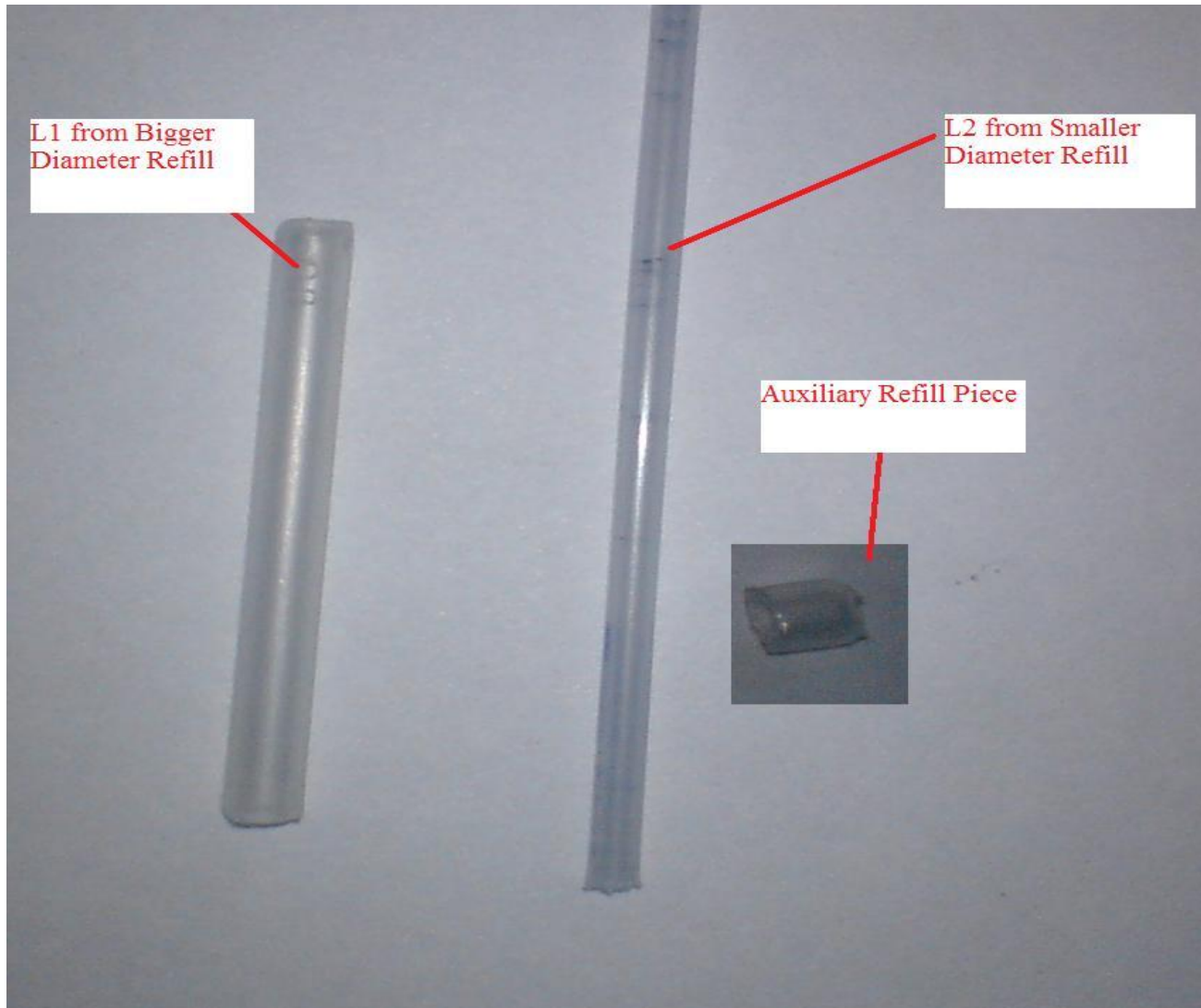
Operating on Bigger dia Refill



Operating on Smaller Dia Refill



Final



Insert L1 into L2



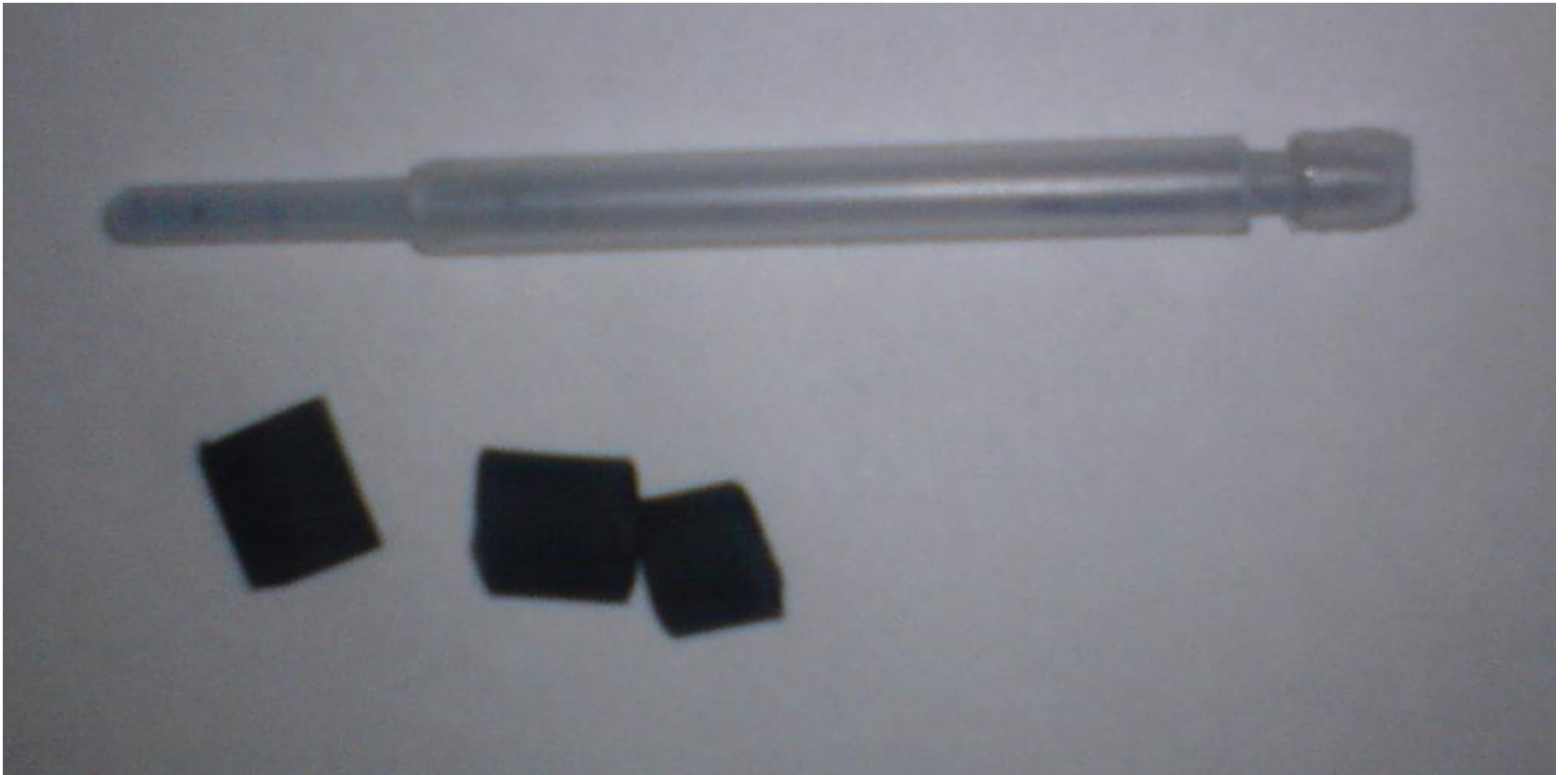
Put auxiliary piece as head on one side
of L1



Fix head using feviquick



Cut three small pieces of heat shrink tube



Heat Shrink Tubing

Tubing will done at three places

1. At ends of L1
2. At end of L2 (opposite side to head)

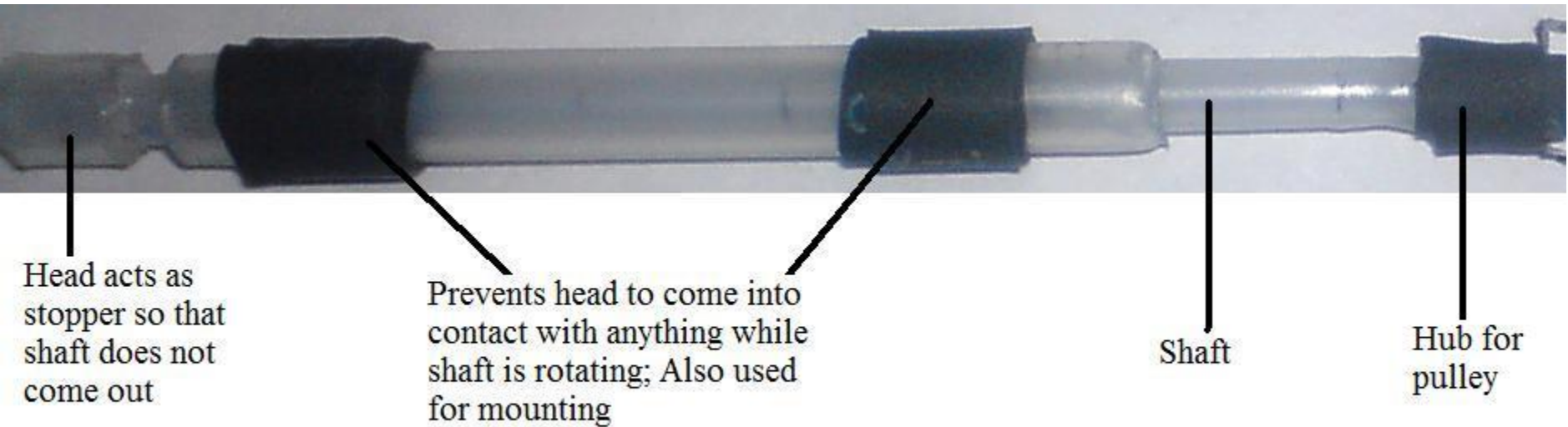
Tubing at one end of L1



Final Form



Purpose of Heat Shrink Tubing



Note: Fill the other end of head with M-Seal

Step 9

Now, bearing arrangement is ready. Make two such bearings for two rear wheels. In our model, pulley acts as a wheel. Make a small hole in the center of pulley having diameter equal to the smaller diameter refill (L2). Insert the L2 refill through hub into this pulley. Fix both these bearings parallel to the shaft line on the underside of the bottom plate/CD.

Implementing Step 9



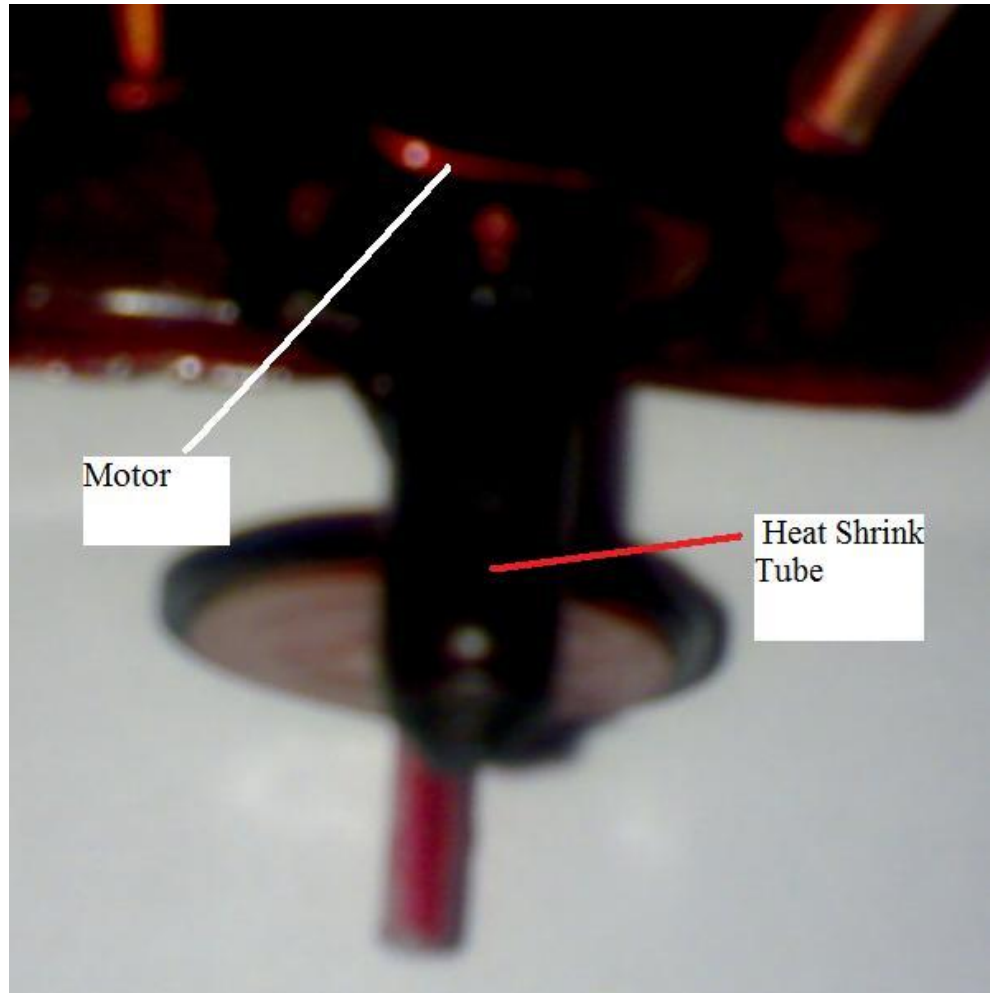
Step 10

Heat Shrink Tubing on Motor Shaft

In order to ensure proper contact between the shaft and the pulley, the diameter of the motor shaft is enlarged by inserting the shaft in tight fitting pen refill and then, putting layers through heat shrink tubing.

Heat shrink tube increases the diameter of the refill enough to touch the circumference of pulley so that enough friction causes relative motion between two surfaces.

Front and Top View of Tubing



Step 11

It is time for electrical connections. Elements required for it are as follows:

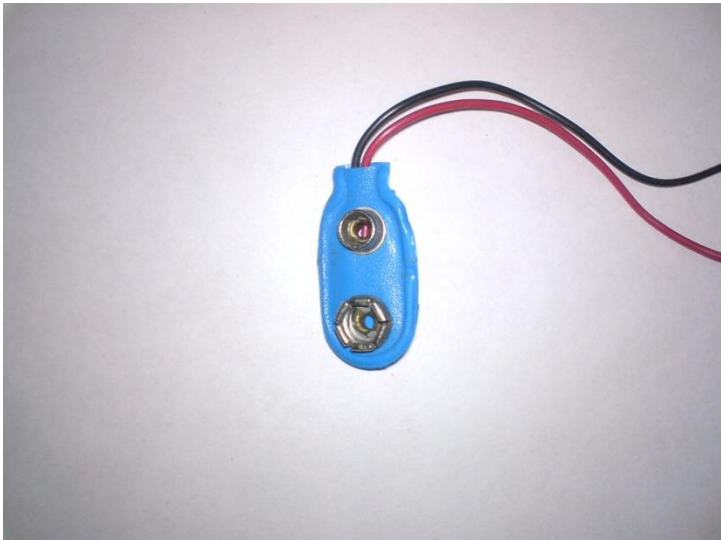
1. SPST (Single Pole Single Throw)
Switches-2 in no.
2. 9V Transistor Battery: 2 in no.
3. Ribbon Wire: 5 meter long
4. Battery Connector: 2 in no.
- 5.1 DPDT Switch (Double Pole Double Throw)



DPDT Switch



DPDT Switch



Battery Connector



Ribbon Wire

Electrical Connections