

MAGNETIC LAB STIRRER USING A COMPUTER CASE FAN MOTOR

Lab magnetic stirrers are a luxury many high schools cannot afford. Ram S. Lamba and Ramón A. De La Cuétara at the Inter American University of Puerto Rico have described a method for constructing a magnetic stirrer using a computer full-size hard drive <http://www.lce.org/equipment/stirrer/stirrer.html>. Intrigued with this ingenious use of readily available parts I tried to construct the stirrer but found that the full-size hard drive motors were not as readily available as I had anticipated.

John Grosheim at TAPIN (Technology Assisting People in Need) in Cincinnati suggested I obtain a used or surplus 12V computer case fan motor. Following up on this suggestion, I rummaged through cast off computer cases to obtain the fan and then bought the other requisite items such as the power supply, plastic case, magnets, and wood dowels. I found these items at either Radio Shack, Home Depot, or a crafts store. Instead of the metal case described by Lamba and De La Cuetara, I used a plastic case.

PARTS

1. Plastic case. Sterlite #1775 (\$2.29). You can use just about any plastic container large enough to hold the fan. This Sterlite case is attractive because it is cheap and it has a hinged lid.
2. Magnets. RadioShack #64-1877 (\$0.99) or #64-1879 (five for \$2.49). If you use #64-1879, put three together for best results.
3. Wood dowel. Home Depot #6407U 7/16" X 48" (\$0.99).
4. Pan-head screws. Home Depot #34441 (#6 X 1/2") (\$0.97).
5. Magnetic stir bar. Flinn Scientific #AP1088 (\$1.35)
6. Universal AC Adapter. Input 110V AC. Output 1.5V-12V DC at 300 mA. RadioShack #2731662. (\$15.00)

PROCEDURE

1. Drill 1/4" holes in sides (not lid) of the plastic container for ventilation.
2. Cut dowels so that there is about 1/8"-1/4" gap between top of fan and bottom of lid.
3. Drill tap holes into both ends of dowels.
4. Attach dowels to fan. There are guide holes in the fan to allow access to a small screw driver.
5. Drill holes into bottom of plastic container below dowels.
6. Attach dowels to bottom of plastic container. Washers can be used to adjust height of fan.
7. Snip off the adapter at the end of the AC adapter wire. Thread wire through one of the ventilation holes. Strip and connect wires from the AC adapter to the wires from the fan. Secure the connections with wire nuts. For the picture below I put the power supply inside the case but this adapter plugs into the wall AC 110V outlet. The 3.5V setting on the variable powers supply is best. If you can find a 100 ohm or 200 ohm potentiometer, you can buy a 6V adapter instead of the 12V variable adapter. The 6V adapter is cheaper.
8. Position the magnet to the top of the fan. I found that it is best if you use a gold or silver marker to aid in finding the exact balance point. Try to position the magnet so that there is no wobble. Secure with glue.
- 9* I found it useful, but not necessary, to add a switch and 100 ohm or 200 ohm potentiometer for fine control of the speed. Unfortunately these potentiometers are no longer available from RadioShack.

