

Power Generation Platform from Recyclable Sewage Systems

Introduction

In the beginning of my research the purpose of the project was to build a prototype of a pipe that would use wastewater from households to give these houses energy. This idea turned into me designing a prototype that includes 3 turbines that spin when in a stream of water. When the turbine spins it is attached to a DC motor which also rotate and power a circuit proving that the prototype is providing voltage.

Materials & Methods

1. Obtain a 4 inch diameter tube
2. 3D Print 3 turbines that have space for a 1 inch dowel to go through it.
3. Drill holes into the pipe which would allow for the dowel to go through the pipe
4. Mount an anchor on the both sides of the pipe
5. Place a flat metal rod onto the anchor so that a DC motor can be placed on top of it. Make sure that the metal rod is fitted securely onto the anchor
6. Mount the DC motors on top of the metal rod
7. Place two gears for each DC motors, one on the actual DC motor and the other onto the dowel
8. Solder wires onto the DC motor connecting the positive wires with each other and the negative wires to each other. Forming two long wires, one positive one negative
9. Connect the wires to a pre made circuit that can measure how many volts are being generated.

Results

As you can see from the video, when placed in water the turbine is able to spin. We did not perform this test with the electronics attached to the system in order to protect the electronics. We tried to demonstrate the spinning of the turbine with a fan, but the fan was not strong enough to push the turbines. If there was no concern about using water to test the prototype voltage would surely be present in the system proving that the portype works toward its cause.

Conclusion

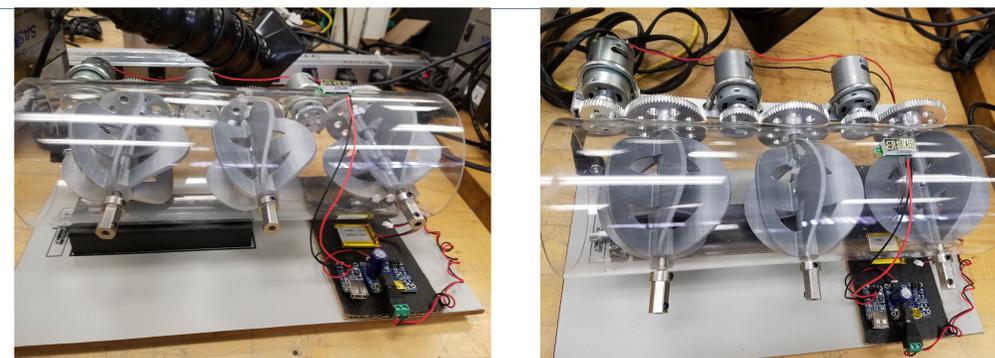
In Conclusion the prototype worked for the cause it was built for. The turbines were able to spin efficiently when put under water. When testing out the DC motor gear system when the turbine spins it triggers the gears to start spinning as well which allows for the DC motors to start generating power proving that the prototype works.

Design Prototype

First Prototype:



Second Prototype:



Future Modifications

Future modifications include make the gear system more efficient. At the moment the gear system is smooth but not as smooth as it could be. By making the gear system more efficient it will allow for the system to generate more power which is the main purpose of my prototype. Another modification that will be looked at is how to protect the electronics so that the prototype can be tested underwater. By protecting the electronics it will allow for me to gather more solid data when testing the prototype. By doing this I could show that the system is actually generating power and that it is charging the battery that it is connected to.

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References

1. <https://www3.epa.gov/mpdes/pubs/bastre.pdf>
2. <http://www.nj.gov/pvsc/what/>
3. <https://energy.gov/eere/water/types-hydropower-turbines>
4. <https://www.renewableenergy.com/hydro-power/large-hydropower-solutions/hydro-turbines>
5. <https://www.youtube.com/watch?v=5kWQ10px2vE>

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