Testing the Viability of Using the Supercoiling of String to Run a Hand-Powered Generator

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Hand-powered generators are essential during natural disasters, military missions, and in developing nations. The paperfuge is a paper centrifuge that uses the supercoiling of string to reach speeds up to 125,000 rpm. The traditional hand-cranked generator reaches approximately 2,000 rpm. Due to the much higher rpm from the paperfuge, the supercoiling of string was used to test whether a generator could be powered by the supercoiling of string. The outcome of this study could possibly be a hand-powered generator that is cheaper and more portable as it doesn't need gears and a crank to run. A hand-powered generator was 3-D printed in three parts with UV resin. UV resin is toxic when uncured, and safety precautions were taken by the researcher. The generator was attached to a breadboard with a multimeter and resistor, measuring the voltage and amperage separately. For measuring the generator powered by the supercoiling of string, seven data points were collected approximately 0.3 seconds apart and were measured for one consecutive outward and inward pulling motion. The same generator was then tested with a drill gun that reached 2,000 rpm to mimic a hand crank. The supercoiling of string produced amperage 112 times greater than the drill gun-powered generator and voltage 11 times greater than the drill gun-powered generator. The research conducted suggests that the supercoiling of string can be used to create more electricity than a hand crank; however, more testing and designs must be conducted to ensure this idea's viability for public use.

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