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Mathematical Model of Edward Leedskalnin's Perpetual Motion Holder

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Introduction

There is no known mathematical model of the Perpetual Motion Holder. In developing the mathematical model, the first step is to state how the mechanism is built. This has already been done by Matthew S. Emery [1].

Construction of the Perpetual Motion Holder

• Take a 2 ½' iron, soft steel, or plain steel bar that has a diameter of 1 ½", as Matthew Emery stated.

• Bend the bar into a U-shape, each prong is 1" long, the tops of which are 3" apart.

• Using brass of aluminum, make two 6" spools, each spool fits on each prong.

• Take two 500' rolls of 14 gauges, and wind each wire roll on a spool for 1,500 turns. These are then coils on the spools.

• Put the spools with the wire coils on them as near to the bend in the bar as possible.

• Put a 6" bar composed of the same type of material as the U-shape on top of the prongs.

Magnetization of the Perpetual Motion Holder

Having the magnetic particles moving in a current perpetually is the central concept Edward Leedskalnin realized in designing and building his Perpetual Motion Holder. The concept can also be considered as magnetization. In continuing with building the mechanism:

• Connect the positive terminal of a battery to both the start point and end point of the wire of a coil so that this prong is the positive terminal of the U-shape.

• Connect the negative terminal of a battery to both the start point and endpoint of the wire of the other coil so that this coil's prong is the negative terminal of the U-shape.

• Only have the battery connected for a few minutes.

• Disconnect the battery then put a 6V light bulb in place of the battery.

• Pull off the bar from on top of the prongs quickly. The bulb will light.

• Replace the bulb with the battery.

• Put the 6" bar back on top of the prongs.

• Keep the bar and battery in these positions for 15 minutes.

• Disconnect the battery.

• Now there is perpetual motion of the magnetic current within the U-shape [2].

The U-shape is now magnetized.

Operation of the Perpetual Motion Holder

The coils now store energy in their magnetic fields. This allows for 6A to flow continually, which keeps a 6V light bulb lit, as Matthew Emery stated. The steel prong is not magnetized until the battery is connected, because only after the battery is connected does current flow through the coils. After the battery is connected, the steel prong is magnetized to have a magnetic field equal in strength to the magnetic field of the coils. After the coils are disconnected from the battery, the current across the coils remains at 6A.

Analysis

V=volts, A=amperes, W=watts, V=$\frac{W}{A}$, VA=W, so (6A)(6V)=36W of measured power stored in the coils, across the coils, to light the light bulb.

Each coil is composed of 1,500 turns of wire. For each coil, the magnetic field magnitude in units of teslas T is B=μo in, n=number of turns of the wire to make a coil, i=current, μ_o=permeability constant= $4\pi\ (10^{-7})$.

Next, $N\Phi_B$ is needed, where N=number of turns of the wire to make a coil, Φ_B=magnetic flux=BA, where A=cross-section area. $N\Phi_B$=(1,500 turns) (0.1524m) (0.011309734T)[$(0.01905m)^2$ π]= $0.002947599Tm^3$=amount of magnetic flux linkages for a single coil.

Now L is needed. L=(1.1) $\frac{N\Phi_B}{i}=\frac{0.002947599Tm^3}{6A}$ =0.000491267H =amount of henries H of inductance for a single coil.

Now the stored energy that a single coil contains can be calculated. UB=$\frac{1}{2}$ $Li^2=\frac{1}{2}$ (0.000491267H) $(6A)^2$=0.008842806J=amount of joules J of stored energy in a single coil.

Energy in joules J can be equated to current in amperes A. W= $\frac{J}{s}$, s=seconds. W=VA from an above paragraph. Both coils contribute energy, so the amount J=0.008842806 joules is doubled for the amount of power W=36 watts from above. 36W=2(0.008842806J) $\frac{1}{s}$, so then s=0.000491267 seconds. This is the amount of time needed for the magnetic current in the prong to begin circulating after the coils are connected to the battery [3].

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Conclusion

The stored energy allows the light bulb to remain lit after the battery is disconnected from the coils. The power does not dissipate after the battery is disconnected from the coils because the prong now has its magnetic current circulating, so now has been magnetized and is now a permanent magnet. The prong now can enable each coil to retain its magnetic field.

The coils are effectively solenoids. A solenoid has a magnetic field inside of itself near the center. The magnetized prong passes through the center. The magnetic fields of the solenoids and the prong combine; causing the prong-solenoid combination to permanently store energy after the battery is disconnected. When the battery is connected, the current increases to 10A or 25A, depending on the direction of current flow, as stated by Matthew Emery. When the battery is disconnected, the current remains at 6A regardless of direction. The battery is an extra source for power, so when connected, the battery causes the current to increase, and when disconnected, the current decreases to the direction-independent current of 6A.

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