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The Mechanism of Using Toroid: Electromagnetic Induced Torque to Derive A Mechanism with Multiple Shaft Configuration to Have A Working and Efficient Structure to Work In an Efficient Way to Produce Considerable Torque Output For A Crank Mechanism in N Series

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Abstract: **The mechanism of using toroid electromagnetic induced torque to derive an mechanism with multiple shaft configuration to have an working and efficient structure to work in an efficient way to produce considerable torque output for an crank mechanism.**

Keywords: **Toroid magnetic flux generation, microcontroller system feedback structure to configure flux and electromagnetic structure, crank structure mechanisms, alloy magnetic properties, structure dynamics design coherence, magnetic tolerance on system factors, Efficiency cycles.**

I. INTRODUCTION

This cyclic, procedural framework is defined as an mechanical design structure to correlate the electrically generated properties to have an dynamic motion driven system to have enhanced by torque generation with an designed mechanical source of motion. This mechanism has been made to work with an alternating current source as an initial input to go through an procedural design to generate magnetic flux to relate it to an toroid system to ensure the mechanical system to generate an output torque. The torque generation curves have been plotted to generate output input efficiency cycle. The cycle ensure an considerable amount of output work in accordance of input energy. The systems efficiency has been monitored and enhanced by acomputer system of microcontrollers programmed to maintain output flux. This mechanism alters any form of heat generation in the mechanical mechanism electrically based and the flux interference has been slightly eliminated by monitoring the flux output through a microcontroller computing. This entire mechanism is based on developing an electric flux in a supplied region to use the generated torque as an output work. The theoretical framework used for prototyping is based on conversion on electromagnetism so as to be used to drive mechanical system. The electromagnetic flux is being generated by using an solenoid structure with multiple factors affecting the development of field region of flux generation, like fields existing in space region due to geomagnetism, and for an multiple shaft configuration we have observed field effects and considerable interference which has been reduced field effect.The reduction in field effect has helped the prototypic system to sustain flux loss so as to enhance maximum torque output. The design structure is dynamically and mechanically been made stable by using multiple magnetic piston designs and reducing fluctuations as well as to stabalise the design. This has been done by using pistons in 2n composition. The 2n composition helps in maintaining polarity and reducing flux loss as well. The 2n composition also increases mechanical sustainability of the system. This design as based on a magnetic driven torque system, it has near negligible heat loss, so no such heavy cooling systems are required as in internal combustion engines and other CI engines. The axial graph has been plotted in accordance of flux generation in a three axis vectors.

II. THE TOROID COMPOSITION AND FLUX OUTPUT GENERATION IN AN ELECTROMAGNETIC PISTON TORQUE GENERATION

The toroid mechanism used to generate torque in ideal small scale piston crank mechanism has been illustrated and described below. The toroid is an coiled magneticQuasi-static conditions are assumed, so the phase of each field is everywhere the same. The transformer, its windings and all things are distributed symmetrically about the axis of symmetry. The windings are such that there is no circumferential current. Toroid are an bound electrical component with maximum flux which is dependent on the windings of core, and the ac input and can be varied by usage of shift of input voltage which can be transformed or can be mechanically used to generate torque for driving an piston crank design in an efficient way with certain parameters changes. The equation given below is used to plot curves for motion induced by toroid with varying B, magneticfield.

$$\mathrm{EMF} = \oint_{path} \mathbf{E}\cdot d\mathbf{l} = -\oint_{path} \frac{\partial \mathbf{A}}{\partial t}\cdot d\mathbf{l} = -\frac{\partial}{\partial t}\oint_{path} \mathbf{A}\cdot d\mathbf{l} = -\frac{\partial}{\partial t}\int_{surface} \mathbf{B}\cdot d\mathbf{s}$$

The above equation is used for determining induction on shaft and its constraints, like stability. The stability of the system can be attained by either suspensions with low strains and high after elastic behavior. The piston used has a low magnetic attainability so as to reduce flux losses due to piston. The first series of piston is derived with toroid flux while the subsequent piston is derived with polarity inversion. The graphs illustrate the flux behavior on the piston due to inductance and magnetic susceptibility of the flux output. In a flow work manner, the initial ac input is used for torque generation through an electromechanical system of conversion. Fig 1 illustrates and axial flux diagram of an toroid with resultant of magnetic field. The input alternating current generates flux in accordance of polarity and an shaft in between with observe an torque when used in shaft configuration as used in this research papers in a 2N series of piston. To enhance the output and efficiency cycle of the system an microcontroller setup has been installed to measure the output and input parameters in atmel ATMEGA 128 which monitors the scales and synchronises the pistons flux and torque in functional order of operation.

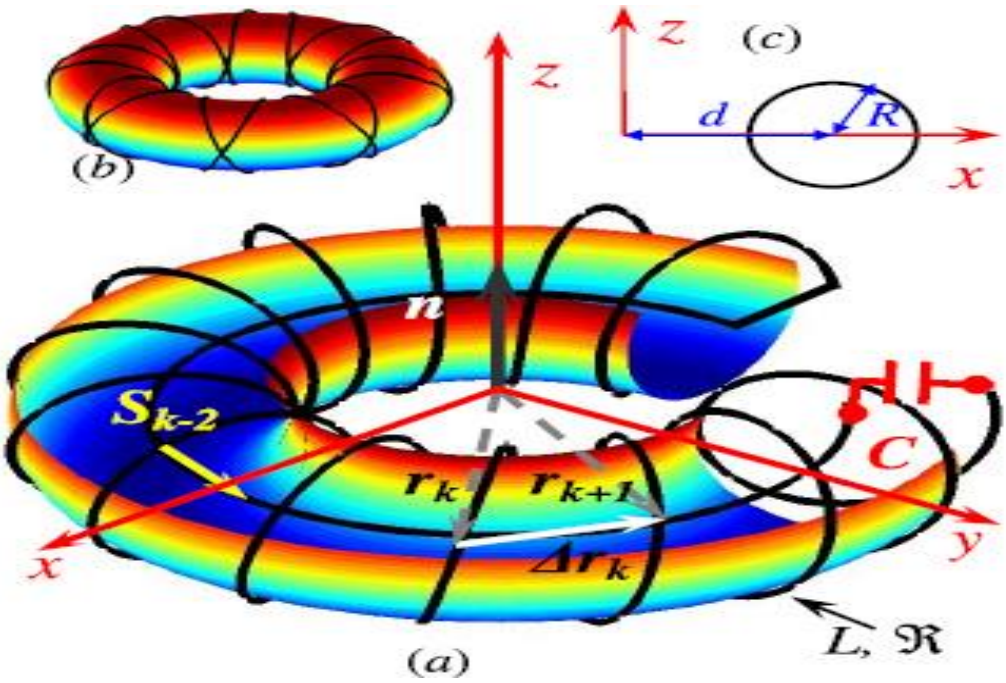

Figure 1.1:Toroid winding with axial parameters

The graph FIG 1.2 illustrate in below the variation of inductance with increasing number of turns of toroid. The toroid is n turns can be used to increase the torque output of the piston. The increase number of turns will enhance the generated magnetic field and hence torque in the shaft (crank driver) of the mechanism.

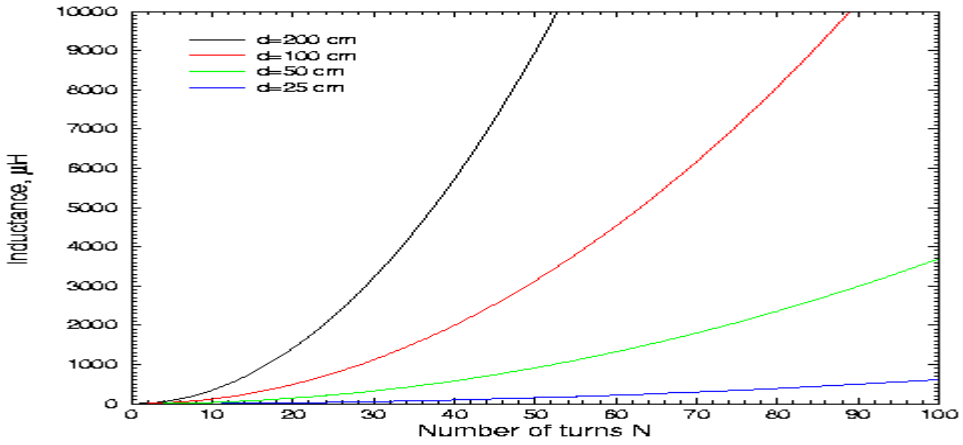

Figure 1.2: INDUCTANCE VS NUMBER OF TURNS IN THE SOLENOID

The graph FIG 1.3 below illustrates the current thrust experienced by the system in operational system with the ac input in the toroid.

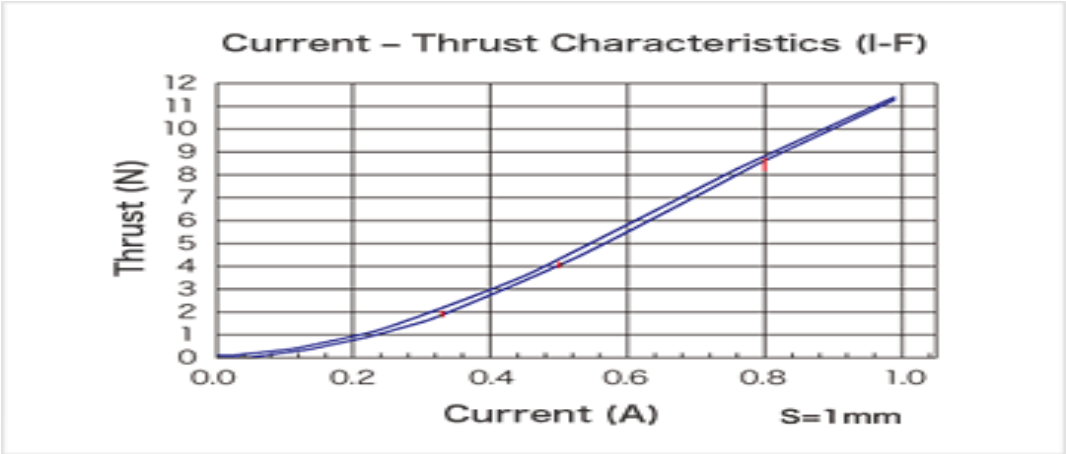

Figure 1.3: THRUST IN SHAFT VS CURRENT

III. CONCLUSION

Thisresearch paperillustrates that an magnetic toroidal system can be efficiently used to drive an piston system with certain torque to make an framework structure to get output drive shaft motion.The conclusion is based on the analysis that an mechanical crank system can be executed to motion by an torque of toroid with an direct alternating current supply in piston configuration of 2n.

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