ABSTRACT

Internal-combustion engines have been used for over one hundred years. Though high-performance internal-combustion engines have been developed constantly, but their thermal efficiency is unable to break through the limit of innate restriction. Combining the Stirling engine and the internal-combustion engine might be able to attain the goal of reducing pollution. The Stirling engine is one kind of heat machinery with a fixed amount of output power. It is very difficult to control its output power. The design of applying the variable crank and the flywheel with variable mass moment of inertia on the Stirling engine makes its output power can be easily controlled. This study made an analysis of dynamics by using different types of variable crank and stroke. Getting result curves of position, velocity and acceleration. According to the analysis curve, we can see the advantage and the faults of this machinery, and using the result compare to a reciprocating engine as a standard. This study use the reciprocating engine as a standard and made an analysis of dynamics by using different types of variable crank and stroke. Getting the result curves of position, velocity and acceleration. According to the analysis curves, we can see the advantage and the faults of this machinery. Design flywheel with variable mass moment of inertia to increase stirling engines environmental adaption. Using the spring control the clutch, and set the clutch into high speed and low speed two steps of mass moment of inertia. Flywheel function is set by rotational speed. When the speed is low, the variable mass moment of inertia is bigger than the high speed. This study uses ADAMS for simulate analysis. By high speed computing, we can find the problems and solved them before the products has been completed.

Keywords : Stirling engine ; design ; Variable crank ; Flywheel with variable mass moment of inertia

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