Apply Composite Material to Spinde of Bike Using Finite Element Analysis and Optimal Design

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ABSTRACT

The composite material is made use of in various different situations extensively in recent years, for example: Electronic industry, the building business, the vapor motorcycle industry, the ships industry...etc.; The bicycle each parts of spare part is the dynasty quality is light, bears to wear and the larger quantity uses composite material. This research mainly in order to consider to replace the feasibility of the aluminum magnesium metal alloy by composite material, the study folds the lamination usage by composite material to arrange the best structure a combination in the bicycle heart stalk fiber; Namely with finite element business use the software ANSYS, imitate study when the bicycle heart stalk tramples to move, the path produced is to the pressure, with turn round to meet an emergency the angle produced variety, then when the study produces path toward pressure and turns round contingency in the meantime, produce of variety, and makes algorithm of optimal the design by the Genetic Algorithm algorithm, GA in order to have to when the heart bearings is subjected to the pressure and torque, its moves, the angle variety measures minimum of many multi-target design problems for the target function, search to wait for thickness under the sistuation that limit under of the best manufacturing parameters, make it produce move quantity minimum, revolve the corn least of the composite material folds the layer alignment to combine a way to reach single target and many the optimization combination of target. End again by designing the sample and the test equipment of the manufacture by oneself to test with the real object the composite material plank that identification beg folds the accuracy that the layer arranges the best solution to even has its function by expecting this research.

Keywords : Compound material, multi-targets, manufacturing parameters, Genetic Algorithm algorithm, optimal design , finite element analysis

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