Structure optimization of a 6 slot 8 pole permanent magnet linear motor

ABSTRACT

Palm oil has become the most consumed vegetable oil. In order to ensure its sustainability, the productivity of oil palms is targeted to increase by about 3.5% each year. Mechanization is one method to improve the oil palm productivity. Most activities in the oil palm process have been mechanized, and the mechanization of the harvesting process still need to be established. Tools to this end have been introduced by the Malaysian Palm Oil Board (MPOB) in Malaysia with the introduction of the CantasÊ , however, due to their operational limitations, the E-cutter was later introduced. In this paper, the design of the E-cutterôs actuator is discussed. The design targets of the actuator are also briefly explained. In the end, an E-cutterôs actuator with 218 N of average thrust, Fave and a total weight, W, of 1.8 kg has been designed. The performance of the E-cutterôs actuator is also compared to a commercialized linear motor to prove its high performance.

Keyword: Commercialize PMLM; E-cutter; Performance comparison; PM and coil size; PMLM