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Designing A Household Waste Shredder Machine Using The Quality Function Deployment Method

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ABSTRACT

Household waste, especially organic waste, is becoming an increasingly pressing challenge in waste management in the community, which can have a negative impact on the environment if not handled properly. This research aims to design a portable, efficient, and efficient household waste shredding machine by developing various attributes such as: automatic, ergonomic, easy to operate, durable, safe to use, low cost, easy to disassemble, not easily damaged, and easy to move. The method used is: Quality Function Deployment (QFD), which enables the identification and fulfillment of user expectations through in-depth analysis of the needs of the customer. The results showed that of the attributes developed, the most dominant attributes were safety in use and ease of operation, followed by portability and durability. Meanwhile, less considered attributes such as ease of disassembly and low cost were raised. The resulting machine design is able to fulfill all three user needs by users. It provides an alternative solution to improve the efficiency of household waste management at the household level to provide convenience, safety, and portability in use. From the weighting of attribute values, the most dominant attribute value is the attribute of easy to move with a value of 14,542, easy to disassemble 9404, safe when used 8,821, ergonomic 8,154, easy to operate 6,630, durable 6,348, low cost 5,439, the machine is not easily damaged 5,283, automatic 5,110.

Keywords: Portable Shredder, Organic Waste, Quality Function Deployment, Ergonomic Design, Waste Management.

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ABSTRACT

Sampah rumah tangga, khususnya sampah organik, menjadi masalah yang semakin mendesak dalam pengelolaan limbah di masyarakat, yang dapat berdampak negatif terhadap lingkungan jika tidak dikelola dengan baik. Penelitian ini bertujuan untuk merancang mesin penghancur sampah rumah tangga yang portabel, efisien, dan efisien dengan mengembangkan berbagai atribut seperti: otomatis, ergonomis, mudah dioperasikan, tahan lama, aman digunakan, biaya rendah, mudah dirakit, tidak mudah rusak, dan mudah dipindah. Metode yang digunakan adalah Quality Function Deployment (QFD), yang memungkinkan identifikasi dan pemenuhan harapan pengguna melalui analisis mendalam terhadap kebutuhan pelanggan. Hasil penelitian menunjukkan bahwa atribut yang paling dominan adalah keamanan penggunaan dan kemudahan operasi, diikuti portabilitas dan daya tahan. Sementara itu, atribut yang kurang diperhatikan seperti kemudahan dirakit dan biaya rendah diangkat. Desain mesin yang dihasilkan mampu memenuhi ketiga kebutuhan pengguna. Nilai bobot atribut menunjukkan bahwa atribut yang paling dominan adalah atribut mudah dipindah dengan nilai 14.542, mudah dirakit 9.404, aman digunakan 8.821, ergonomis 8.154, mudah dioperasikan 6.630, tahan lama 6.348, biaya rendah 5.439, mesin tidak mudah rusak 5.283, dan otomatis 5.110.

Kata Kunci: Portable Shredder, Organic Waste, Quality Function Deployment, Ergonomic Design, Waste Management.