ABSTRAK

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Meningkatnya jumlah limbah kaleng bekas yang dihasilkan dari konsumsi minuman dan produk kemasan logam menuntut adanya teknologi yang dapat membantu proses pengolahan limbah secara lebih efektif dan efisien. Salah satu solusi yang dapat diterapkan adalah penggunaan alat pres kaleng yang mampu mengurangi volume kaleng sehingga memudahkan proses penyimpanan, pengangkutan, dan daur ulang. Penelitian ini bertujuan untuk merancang dan membangun alat pres kaleng otomatis sistem pres ganda berbasis motor listrik serta melakukan analisis biaya produksi sebagai dasar penentuan kelayakan ekonomi produk. Sistem pres ganda dipilih untuk meningkatkan kapasitas kerja alat dibandingkan dengan sistem pres tunggal sehingga proses pengepresan dapat dilakukan lebih cepat, efektif, dan produktif. Metode penelitian yang dipakai meliputi tahap perancangan, pemilihan material, proses manufaktur, perakitan, dan pengujian alat. Selain itu, dilakukan perhitungan biaya produksi yang membahas tentang biaya material, biaya sewa alat, biaya listrik, biaya operator hingga harga jual produk. Biaya sewa mesin dihitung dari berapa waktu pengerjaan menggunakan mesin selama proses pembuatan. Biaya bahan baku meliputi penggunaan besi hollow, plat baja, motor listrik, poros, bantalan, komponen transmisi, serta bahan pendukung lainnya. Biaya tenaga kerja dihitung berdasarkan waktu pengerjaan pada proses pemotongan, pengeboran, pengelasan, perakitan, dan finishing. Hasil perhitungan biaya produksi digunakan untuk menentukan harga pokok produksi (HPP), estimasi harga jual, dan analisis keuntungan yang dapat diperoleh apabila alat diproduksi secara komersial. Analisis biaya produksi menunjukkan bahwa komponen biaya terbesar berasal dari biaya material, yang mencapai sebagian besar total biaya pembuatan alat, sehingga pemilihan material yang tepat sangat berpengaruh terhadap efisiensi biaya produksi.

Kata Kunci: Alat pres kaleng, sistem pres ganda, motor listrik, biaya produksi, harga pokok produksi, harga jual.

ABSTRACT

Design and Construction of an Automatic Dual-Press Can Crusher Powered by an Electric Motor (Production Cost Analysis)

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The increasing amount of waste aluminum cans generated from beverage consumption and metal packaging products requires technology that can support waste management processes more effectively and efficiently. One solution that can be implemented is the use of a can pressing machine capable of reducing the volume of used cans, thereby facilitating storage, transportation, and recycling processes. This study aims to design and develop an automatic dual-press can crushing machine powered by an electric motor and to conduct a production cost analysis as a basis for determining the economic feasibility of the product. The dual-press system was selected to increase the machine's working capacity compared to a single-press system, allowing the pressing process to be performed more quickly, effectively, and productively. The research method employed includes the stages of design, material selection, manufacturing, assembly, and machine testing. In addition, a production cost analysis was conducted covering material costs, machine and equipment rental costs, electrical energy consumption costs, labor (operator) costs, and product selling price determination. Machine rental costs were calculated based on the duration of machine usage during the manufacturing process. Material costs included hollow steel, steel plates, an electric motor, shafts, bearings, transmission components, and other supporting materials. Labor costs were determined based on the working time required for cutting, drilling, welding, assembly, and finishing processes. All cost components were used to calculate the Cost of Production (COP), determine the selling price, and analyze the potential profit that could be obtained if the machine were commercially produced. The results indicate that the automatic dual-press can crushing machine powered by an electric motor operates according to its intended design and provides a more efficient can crushing process compared to manual methods. The production cost analysis shows that material costs represent the largest portion of the total manufacturing cost, followed by labor, machine rental, and electricity costs.

Keywords: can compactor, dual-press system, electric motor, production cost, cost of goods manufactured, selling price.