DESIGN OF AN AUTOMATIC SOYMILK FILLING AND CAPPING BOTTLE MACHINE BASED ON ARDUINO UNO

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ABSTRACT

Soy milk is a plant-based milk alternative that is increasingly popular due to its health benefits and affordability. The growing demand presents an opportunity for Micro, Small, and Medium Enterprises (MSMEs) to expand. However, the manual production process commonly used still faces several challenges, such as low efficiency, contamination risk, inconsistent results, and lengthy production time. To address these issues, an automatic soy milk filling and capping machine based on the Arduino Uno platform. This machine consists of several main components, including a bottle transportation mechanism, a filling system, a sliding cup, and a capping system, all of which operate sequentially.The test results show that the bottle transportation mechanism driven by a NEMA 17 stepper motor and transmission system can reach a speed of 30.5 RPM without load and 29.2 RPM when transporting two 500 ml bottles. For the capping system, the most optimal results were obtained by setting the motor time for 4.83 seconds with a tray base using silicone rubber, resulting in an accurate and consistent bottle sealing process with a success rate of 90%.

Keywords : Soy milk, MSMEs, automatic machine, bottle transportation mechanism, capping system.