ESIGN AND CONSTRUCTION OF A MICROCONTROLLER BASED SUGAR PALM SYRUP PACKAGER AND SEALER

Design Project

CHINO JEROME C. AVIÑANTE
CHRISTIAN C. RECABAR
RUSSEL RAY S. TUPIL

College of Engineering and Information Technology
CAVITE STATE UNIVERSITY
Indang, Cavite

April 2009

DESIGN AND CONSTRUCTION OF A MICROCONTROLLER BASED SUGAR PALM SYRUP PACKAGER AND SEALER

Undergraduate Design Project
Submitted to the Faculty of the
Cavite State University
Indang, Cavite

In partial fulfillment
of the requirements for the degree of
Bachelor of Science in Computer Engineering

CHINO JEROME C. AVIÑANTE
CHRISTIAN C. RECABAR
RUSSEL RAY S. TUPIL

April 2009

ABSTRACT

AVIÑANTE, CHINO JEROME C., RECABAR, CHRISTIAN C. and TUPIL, RUSSEL RAY S. Design and Construction of a Microcontroller-Based Sugar Palm Syrup Packager and Sealer. Undergraduate Design Project. Bachelor of Science in Computer Engineering. Cavite State University, Indang, Cavite. April 2009. Adviser: Ms. Poinsettia A. Vida.

The design and construction of a microcontroller-based sugar palm syrup packager and sealer was conducted at Indang, Cavite. The general objective of the project was to design and construct a microcontroller-based sugar palm syrup packager and sealer.

The project was composed of a microcontroller unit, that controls the operation of the system, a photo sensors for dispensing sugar palm syrup and cup cover, a stepper motor for driving the conveyor belt, pneumatic mini valve for adjusting the air pressure output. It has a power supply that produced 5 V DC and 12 V DC needed for the stepper motor and for the relays, respectively.

Testing and evaluation of the machine were conducted at Cavite State University on October 13, 2008. The evaluation was done by determining the time to dispense and the volume of syrup dispensed by the machine. The average volume of syrup dispensed was 152.4 ml. The average time in dispensing, capping, and sealing are 8.35 seconds, 5.48 seconds, 9.69 seconds, respectively.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

LIST OF FIGURES

DESIGN AND CONSTRUCTION OF A MICROCONTROLLER BASED SUGAR PALM SYRUP PACKAGER AND SEALER[1/]

AVIÑANTE, CHINO JEROME C.
RECABAR, CHRISTIAN C.
TUPIL, RUSSEL RAY S.

[1/] An undergraduate design project presented to the faculty of the Department of Computer and Electronics Engineering, College of Engineering and Information Technology, Cavite State University, Indang, Cavite in partial fulfillment of the requirements for the degree of Bachelor of Science in Computer Engineering with contribution no. **BSCoE – 2008 – 09 – 004.** Prepared under the supervision of Ms. Poinsettia A. Vida.

INTRODUCTION

Sugar palm is a common name for several species of palms used to produce sugar. In Cambodia, multipurpose sugar palm trees have played an important role in an integrated farming system. They provided high-energy feeds, low in fiber but with very low protein contents. Sugar palm juice was used as the sole energy source for growing and finishing pigs. Some skillful farmers in Cambodia can managed to get juice with high value that was good for sugar syrup production because it requires less firewood for boiling the juice the whole year. Packaging and sealing process was one of the most important parts in a food industry. Packaging and sealing of sugar palm syrup can be done manually and automatically.

Sugar palm syrup is one of the processed products of sweet sap of sugar palm. It is obtained by reducing the moisture content of sap through evaporation of sweet sap. In our country, the sap of the sugar palm is commonly used for the production of arenga