FACULTY OF ENGINEERING

DEPARTMENT OF MINING & WATER RESOURCES ENGINEERING

A FINAL YEAR PROJECT PROPOSAL

DESIGN AND CONSTRUCTION OF AN AUTOMATED SELF BATHROOM

BY

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EXECUTIVE SUMMARY

In today's life, most people fail to flush the toilet or turn off tap and shower system after using it. It creates bad odour and unpleasant environment especially in public restrooms, which affects the health of the people using it And leads to the wastage of water, causing various problems to the environment. Water is an important resource, which we owe the responsibility to pass to the future generations. The wastage of excess water as well as the unpleasant conditions in the surrounding is the threat to the environment.To overcome these problems, it is proposed to design an automatic self-powered bathroom system by using a micro controller and automatic valves integrated with both water and energy saving techniques which flushes the toilet system, opens and closes bathroom faucets automatically during and after usage. Only limited amount of water is used to flush after every usage for toilets and water flows from faucets only when the user needs to use it so that wastage of water would be stopped. It provides a good and clean hygienic environment for the public does not require electrical power from the electrical grid for operation but provides a source of free renewable energy that could be used to power other household items and can minimize capital cost and maintenance.

Keywords—automatic, self-powered bathroom, save water, produce electricity

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DECLARATION

I NGOTOAH NANDAAH JOELMARK hereby declare to the best of my knowledge, that this project proposal report is an outcome of my original work and that it has not been presented to any institution of learning for an academic award.

Signature **Date**

…….. ……

APPROVAL

This is to certify that the project proposal has been carried out under my supervision and this report is ready for submission to the Board of examiners and senate of Busitema University with my approval.

MAIN SUPERVISOR: Mr MASERUKA BENEDICTO

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Table of Contents

List of tables

List of figures

LIST OF ACRONYMS/ABBREVIATIONS

Etc. Et cetera

ASPD- automatic self-powered bathroom

(HETs)- High efficiency toilets

WC – Water Closet

WELL – Water Efficiency Label

BTa - The British Toilet association

A/C-Alternating current

D/C-Direct current

WSAP- Water Efficient Appliances and Plumbing

MaP- Maximum Performance Test

CAD- Computer Aided Design

CFD- Computer Fluid Dynamics

SI-Standard International Units

1.0 CHAPTER ONE: INTRODUCTION

1.1 BACKGROUND OF THE STUDY

The development of human society has been driven by the growth of technology mainly aimed at conserving water which is a precious and scarce resource world over. Some new technologies produced visibly dramatic changes in human life and one area of technology that has seen substantial progress in the past few decades is technology in public bathrooms. Public bathrooms are available everywhere at schools, in restaurants, in hospitals, in supermarkets and in other public buildings and therefore it's safe to say everyone is using public bathroom during their daily life. Therefore, although less noticeable than the others, technology in public bathrooms has made tremendous impact on people's daily lives. Like many other technologies, technology in public bathrooms arose as a result of preceding stimulating changes in society.

The history of the public bathroom has long been a controversy among social historians. There is no reliable documentation to confirm the exact first inventor of the public bathroom. However, it is widely believed that the concept of public bathrooms began when there was a need for social gathering and social events. One of the earliest vestiges of primitive public bathrooms was found to be in the period of the Roman Empire (about 27 B.C.). These bathrooms were constructed with stone seats next to each other without partitions of any kind because privacy was not a big concern as of today. Hygiene was maintained by a network of sewers dug under those "stone toilets" to collect rainwater and sewage. After using the toilet, people were provided with a sea sponge attached to a stick to wipe their behinds, instead of toilet paper in modern time (Lambert, et al., 2012). Since the Roman Empire, public bathrooms have developed over time. Bathroom technology really took off during the 20th century, when people started to care more about hygiene, energy efficiency and environment-friendliness (Suddath, et al.,.2009).

The first flush toilet was invented in England by Sir John Harrington in the year 1596 and this flush toilet technology was later modified by the Englishman with the unfortunate surname, Thomas Crapper .His product was simply another refinement of a design problem that the Victorians in particular had been puzzling such as how to build a flushing water closet that would efficiently and sanitarily remove waste without allowing dangerous sewer gases to enter. Early household baths in the early 19^{th} were originally, unwieldy metal-lined

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