



Design and Fabrication of Natural Waterproofing Solution Making Machine

Jalpesh Solanki¹, Aditya Pathak², Ajay Singh³, Vijay Prasad⁴.

¹(Department of Mechanical Engineering VIVA Institute of Technology India)

²(Department of Mechanical Engineering VIVA Institute of Technology India)

³(Department of Mechanical Engineering VIVA Institute of Technology India)

⁴(Department of Mechanical Engineering VIVA Institute of Technology India)

Abstract : The project focuses on studying and developing a machine which produces a natural water proofing solution which is biodegradable, and can potentially replace plastic as a packaging material. beeswax has been used as a natural sealant since 800 B.C. the property of beeswax of repelling water is what the project is based on. The development of the machine is designed after studying an old American recipe, used by local hunters. The solution can be used on surfaces to make them parched. application of the solution on paper or fabric can. The cloth used for wrapping Egyptian mummies contained beeswax.

Keywords – Natural Waterproofing, Plastic, Beeswax, Linseed Oil, Turpentine.

I. INTRODUCTION

As expressed in an exceedingly report of the Environmental Protection Agency, the additive production of plastic has already surpassed eight billion metric tons worldwide, with any will increase expected within the coming back decades. regarding four-hundredth of the full plastic waste is within the style of discarded Packaging Materials. the target of this project is to cut back the utilization of plastic, used for the aforesaid purpose of producing packaging materials. This project can facilitate to develop resolution an answer } that may be a three-ingredient solution wherever the bottom material is beeswax, that once combined with oil and turpentine, will mimic the waterproofing property of the plastic. Beeswax has been employed by humans for a protracted time, Beeswax has been used since period of time because the initial plastic, as a lubricating substance and waterproofing agent, within the lost-wax casting of metals and glass, as a polish for wood and animal skin, for creating candles, as associate degree ingredient in cosmetics and as a creative medium in paint paintings. Beeswax is consumable, having similar negligible toxic elements to plant waxes, and is approved for consumption with food in most countries and within the international organization beneath the E range E901.

II. PROJECT BACKGROUND

The sole purpose of the development of the machine would produce a solution which is made out of natural beeswax which will work as waterproofing and can mimic the properties of plastic and can replace plastic packaging. using the same coating on paper or fabric can mimic the waterproofing properties of plastic. History states that “The old Egyptians used beeswax when embalming, for mummification of their pharaohs and for retaining the permanency of wig curls, for preserving the papyrus scrolls and to protect paintings. The wrappings of Egyptian mummies contained beeswax.” Replacing modern day plastic sheets with wax coatings can have a huge impact on the planet. Beeswax is very versatile, Beeswax is used in lip balm, lip gloss, hand creams, salves, and moisturizers; and in cosmetics such as eye shadow, blush, and eye liner. Beeswax is also an important ingredient in beard wax and hair styling products, which make hair look sleek and shiny. Linseed oil acts as a binding agent Owing to its polymer-forming properties, linseed oil can be used on its own or blended with combinations of other oils, resins or solvents as an impregnator, drying oil finish or varnish in wood finishing, as

a pigment binder in oil paints, as a plasticizer and hardener in putty, and in the manufacture of linoleum. In this report tests are performed on the materials and the results are shown. In this report the literature review about the uses of beeswax after treating with linseed oil and turpentine and its properties of mimicking plastic's and functions like a waterproofing solution are presented. Brief information about the design, development and functioning of the machine is highlighted in this report. The characteristics of materials like paper and cloth fabric are also demonstrated and studied. The Beeswax Waterproofing solution proposed can be used as a replacement of plastic spreading from shipment packaging to food packaging.

III. PROBLEM STATEMENT

Packaging of products, food & beverages always uses a lot of plastic of which 40% is thrown away in form of waste which never gets recycled or reused and is left to pile up with the other 144 Million tons of plastic waste that humans generate every year. There are possible changes that can be done to eradicate these problems.

IV. METHODOLOGY

In this paper a design for a machine used for making a natural water proofing solution, using three base ingredients namely linseed oil, beeswax, and turpentine. Making a natural waterproofing solution which when coated on other materials can mimic the waterproofing of pl

TABLE 5.1

Sr. No	Parts	Objective	Volume
1.	Metal Container	Storing Turpentine.	300 ml.
2.	Metal Container	Storing Linseed Oil.	300 ml.
3.	Heating Chamber	Heating and Mixing of Wax.	1 Litre
4.	Motorized Stirrer	Stirring the solution.	N/A
5.	Heating Coil	Heating the solution.	N/A
6.	Wax Bath	A Bath to Coat Paper / Fabric with Wax	1 Litre

V. CONCLUSION

In this report the literature review about the uses of beeswax after treating with linseed oil and turpentine and its properties of mimicking plastic's and functions like a waterproofing solution are presented. Brief information about the design, development and functioning of the machine is highlighted in this report.

Acknowledgements

We would like to express our special thanks of gratitude to our teacher, Prof. Mansi Lakhani, who gave us the golden opportunity to work on this wonderful project. Which also helped us in doing a lot of Research and We learned about many new things while researching the topic.

REFERENCES

Journal Papers:

- [1] **M. P. Colombini, G. Giachi, F. Modugno, P. Pallecchi, E. Ribechini.** *"The Characterization of paints and waterproofing materials from the shipwrecks found at the archaeological site of the etruscan and roman harbour of pisa"*. Issued on 10th November 2003
- [2] **M. Regert, S. Colinart, L. Degrand, O. Decavallas.** *"Chemical Alteration and Use of Beeswax Through Time: Accelerated Ageing Tests and Analysis of Archaeological Samples from Various Environmental Contexts."* Issued on 10th March 2003.
- [3] **H. Dahlbo, V. Poliakova, O. Sahimaa.** *"Recycling potential of post-consumer plastic packaging waste in Finland."* Volume 71, Page 52-61 January 2018.
- [4] **A. Lopez, A. Torres, B.M. Caballero.** *"Pyrolysis of plastic packaging waste: A comparison of plastic residuals from material recovery facilities with simulated plastic waste."* Volume 32, Issue 5, May 2012, Pages 826-832