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**DEPARTMENT OF MECHANICAL ENGINEERING
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A SYNOPSIS ON

“FIBRE EXTRACTION FROM BANANA STEM”

Submitted in partial fulfillment of the requirement for the award for the degree of
BACHELOR OF ENGINEERING IN MECHANICAL

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Introduction

Banana fiber extracting industry is a large and growing industry. Banana fiber is eco-friendly like jute fiber. The technology of plantain fiber extraction has been developed in south-India where in a good number of plantain fiber extraction units have been running successfully. Some firms are exporting plantain fiber products because of the greater demand. Banana growing states of North East region as adopted the technique from south and started production of plantain fiber. The natural fiber is renewable, non-abrasive, bio-degradable entity.

Banana fiber is environmentally friendly like jute fiber. It has large export demand from many countries like Japan, Australia, Germany and many. Fiber can be obtained from whole banana plant. After the fruit is obtained, the plant is thrown away giving rise to increase in waste. The proper disposal of this plant is another problem. By using a good fiber extractor machine, a large amount of fiber can be obtained which will give rise to additional income. Banana fiber is a best fiber with relatively good mechanical properties due to its high alpha cellulose and low lignin percentage. The Banana Fiber Extractor Machine is first of its kind invented for the extraction of fiber from waste portions of Banana such as stems, leaf stalks and peduncle. The manual (or) semi mechanical extraction of Banana Fiber was tedious, time consuming, and caused damage to the fiber. It is a low cost portable device developed for the benefit of the farming Community and Self-help women group Cost of the Machine varies basing on the iron and steel rates .

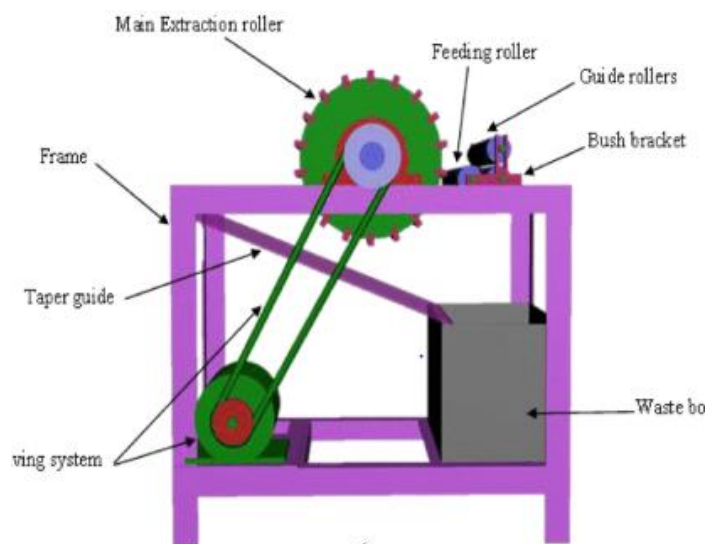
OBJECTIVES

1. o obtain banana fibers from the plant's pseudostem.
2. To develop fabrics from banana fibre in order to add a new dimension to the potential banana fibre.
3. To help the formers by providing them an opportunity to generate additional income through extracting the banana pseudo stem.
4. To give new prospects to cottage industry by extracting fiber from banana stem.
5. To create employment opportunities in rural areas.
6. After the fruit is harvested, banana plants generate a lot of agricultural waste utilize that waste by extracting fiber from pseudostems

WORKING METHODOLOGY

The extraction of the banana fiber from the plant required certain care to avoid damage. In the present experiments, initially the banana plant sections were cut from the main stem of the plant and then rolled tightly to remove the excess moisture. Impurities are removed by main extraction roller such as pigments, broken fibers, coating of cellulose etc. after this process the remaining impurities are removed by manually means of comb, and then the fibers were cleaned and dried. This mechanical and manual extraction of banana fibers is tedious, time consuming, and caused damage to the fiber. Consequently, this type of technique can be recommended for industrial application.

It consists of frame, feeding roller, stationary roller, flat inclined plate, waste box, chain sprocket, supportive bearings, motor, extraction roller and chain. The banana stem are cut into slices and feed into the guide roller it compress the slices of stem and removes the water content through the feed roller it goes to main extraction roller which is operated by the motor and chain drive it removes the surface coating, impurities by rotating with high speed and produces the fibers from the stem slice, it also separates the impurities produced during the extraction, then impurities produced during the process are dumped to the waste box through the inclined flat plate.



CONCLUSION

In many agricultural farms, the pseudostem of banana plant after harvest are disposed as landfill waste or burnt after drying their exists a high potential for converting this waste into wealth. Compare to other natural fibres, production of banana fibre less expensive since the raw material is cheap and abundantly available in banana growing region in that region produce more banana fibre. The banana fibre extraction is low cost other natural fibres at the village level it can help in recycling this banana biomass into fibres but also provide employment opportunities to the rural poor and additional income to the formers. The new banana fiber extraction machine can be designed with higher efficiency. This machine will reduce manual work and is suitable for mass production. The problem of impurities and knots can be solved with this kind of design. The factors affecting quality of fiber are roller speed feed angle and clearance also affect the production quantity of fiber

Innovations in the project

1. Automated peeling
2. High speed extraction
3. Waste reduction
4. Fiber quality control
5. Energy efficiency

Scope of future work

1. Automation and scalability
2. Waste management
3. Product diversification
4. Market expansion
5. Sustainability and social impact

