



Increasing productivity through automation in the wicks manufacturing process

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Abstract

The economic situation of the cotton wick industry and increasing demand of wicks has forced the wick industry to use all possibilities of increasing productivity. To satisfy the increasing demand with lower cost, wick industries need some mechanized system to increase the production rate. At present wicks are produced manually. This is a time consuming process which directly affects the cost of wicks. Lack of productivity costs money, which affects the bottom line. This problem takes into consideration for project work. In this project we are developing a mechanized system to replace manual methods of producing wicks. This project seeks to discover a new tool to shorten the sequence for producing the wicks and reduce the fatigue. This will lead to significant savings of time, energy and cost, and thus improve the quality of the wicks as well as provide more profit to the rural people. With the help of this mechanism we will be able to produce cotton wicks more efficiently & economically.

Keyword: Cotton wicks; Wick Industry; Productivity

I. INTRODUCTION

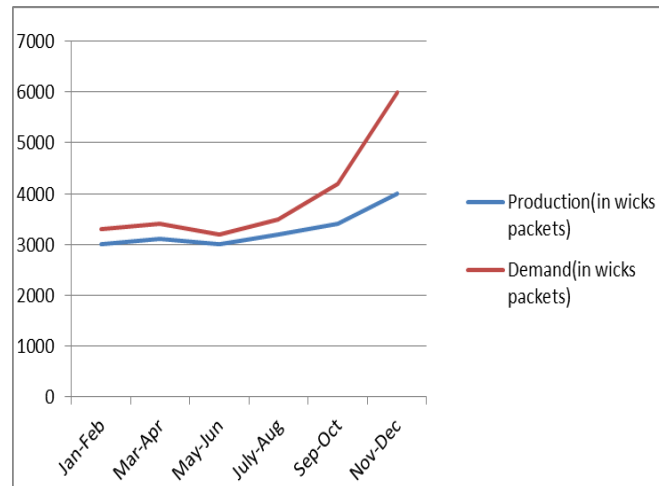
In the present scenario, cotton wicks are manufactured by women in rural and urban areas during their spare time to generate additional income to support their family. This is done with the conventional manual process. This is a time consuming process and the productivity is not up to the mark. As per our market survey, the demand of cotton wicks is very high. At the time of festivals, there is a hike in demand. The present manufacturing system is not able to meet the demands. This project focuses on making an automated machine for production of cotton wicks. This will in turn reduce the labor effort, and increase the productivity.

PRODUCTION AND DEMAND RATE IN TABLES AND GRAPH

Month	Production(in wicks packets)	Demand(in wicks packets)
Jan-Feb	3000	3300
Mar-Apr	3100	3400
May-Jun	3000	3200
July-Aug	3200	3500
Sep-Oct	3400	4200
Nov-Dec	4000	6000

MARKET DEMAND OF WICKS

Papers presented in ICRRTET Conference can be accessed from
<http://edupediapublications.org/journals/index.php/IJR/issue/archive>



II. LITERATURE REVIEW

Akash R Neet, Pravin S. Lakade and Suhas H Sahare presented the paper on "Automation of Man-made Sliver Producing". In this project they enhance the fundamental understanding of man-made cotton wick manufacturing system. With the help of this mechanism we will be able to produce cotton wicks more efficiently & economically. Which will helpful to cotton wicks industry to increase production rate as well as reduce the cost. Prof. Gajendra R. Potey, Mr. Mahesh S.Gorde and Prof. Vishal Milmile presented the paper on "Productivity improvement of sliver manufacturing in Khadi industries through the development of mechanized system". With the help of the mechanized system, Sliver (Pelu) can be produced more efficiently & economically. In case of manual method one man can able to produce 12 sliver per minutes. This Mechanized system enables the worker to produce 30 sliver per minutes with uniform quality. V Subramaniam, A. Peer Mohamed published a paper on "Spinning Technology-A Review of yarn properties" which gives the explanation of properties of yarn like effects of wrapping on the bending and torsional rigidity and fatigue resistance.

III. SURVEY

The wick manufacturing process requires cotton as raw material which comes from carding. This cotton is rolled and twisted into wick manually. So we try to develop a mechanism to produce wicks, the cost of which is comparatively so less.

Market Survey

Wicks are sold in packets, each packet, generally consists of 50 or 100 wicks costing ₹10 and ₹20 respectively. We visited various shops which sell cotton wicks and we found that the demand of cotton wick increases abruptly during the fall of the year, i.e. at the time of festivals like Ganesh Utsav, Durga Puja and Diwali etc.. So we concluded that the productivity of the conventional processes needs to be increased, which can be done by automation.

Industrial Survey

We visited GramSewaMandal, Gopuri, Wardha. Which was developed by the father of the nation Mahatma Gandhi. For study & analysis of wick manufacturing.



IV. CURRENT WICKS PRODUCING METHOD

The current wicks producing method is manual. The raw material cotton is rolled by keeping cotton in between the palms of both hands. After rolling the cotton is folded and in half and is again rolled, but this time rolling causes twisting of the halves. This current manual process is very time consuming and involves skilled worker to reduced time.

V. DATA COLLECTION

COTTON WICK SPECIFICATION

Dimensions of the cotton wick that will be manufactured by our machine will be

- **Length: 90 mm**
- **Diameter: 4 mm**

It is manufactured by giving 15-20 twists.

VI. CONSTRUCTION

The machine consists two 'U' cross section parts, over which Palau passes. The mechanism also consists of stepper motor to which hook is coupled. The motor is placed on the square shape platform which will follow the 'D' shaped path with the help of 'D' shaped slot. The platform will undergo the up and down motion with the help of gears.

VII. WORKING

As the motor moves up, the triangular part will move one of the U section parts up. Hence the hook will be in a position to hold the pelu which is over these parts. The hook will grab the sliver and then when it comes down with the motor, it will start rotating, thus giving twists to the sliver. After the hook has reached

the point, the triangular part will come down and the sharp edge of the U cross section part will cut the twisted sliver thus making a cotton wick.

VIII. CONCLUSION

By the introduction of this mechanism we will be able to manufacture wicks more efficiently & economic. This will help wick manufacturer to increase production rate as well as reduce the cost. The purpose of this project is to replace the manual process by the mechanized method. This project also leads to reduce the sequence of wicks production.

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