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DESIGN AND FABRICATION OF FULLY AUTOMATED USED COTTON SEPARATING AND CLEANING MACHINE.

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Abstract

Recycled Cotton has so many applications like recycled plastic bottles to make clothing and textiles, creating very sustainable, earth-conscious products. Recycled cotton can also be used in industrial settings as polishing and wipe cloths and can even be made into new, high-quality paper. When reduced to its fibrous state. This paper discusses a framework for implementation of a machine vision-based has a simple structure having a teethed cylinder surrounded by cover with inlet and outlet, when the used compact cotton is pass through this teethed cylinder it strength get reduces and compact cotton gets open at outlet and collected in a separate room. In this, Design of Machine such that the operator need not require to present in the room there will be one inlet for used cotton outside the operating room of machine and the used cotton automatically get feeded in to the teethed cylinder which can further accumulated in the room or may be take out from the room by external arrangement.

INTRODUCTION

Such open cotton is commonly used in making pillows and mat, since the cost of fresh ginned cotton is very high around 50 to 60 Rs per kg and on other hand cost of used cotton is around 20 to 30 Rs per kg and also available used cotton in home can also be used to make the new pillows or mat at no cost of cotton. The present machine available in market is very common in India where one operator is needed to control the machining operation under very unhygienic condition, where the small length of cotton get travel all around the room which may also be get in to the operator body and causes harmful dieses . So here the main aim is to design a machine such that the operator need not require to present in the room there will be one inlet for used cotton outside the operating room of machine and the used cotton automatically get feeded in to the teethed cylinder which can further accumulated in the room or may be take out from the room by external arrangement.

Problem Identification

Machine harvesting of cotton removes extraneous materials along with the cotton lint and seed which, if not thoroughly removed, may compromise the quality of the products coming out of the textile mill. Cotton cleaning is a multi-stage operation that involves stages of production, harvesting, ginning, and textile processing. Further, cleaning practices can vary significantly within each of these stages. At the production stage, varieties, soil type, and weather-related factors may have a significant impact on the cleanliness and quality of harvested cotton. Variation in cleaning activities may include time of harvesting and the use of a field cleaner on a stripper in the harvesting stage and a combination of one to three stages of lint cleaning at the gin plant. At the textile mill, variation in opening, carding and drawing practices can also affect the degree to which cotton is cleaned. The debate surrounding cotton cleaning, however, has been limited to operational efficiency at the typical gin plant processing stage and market prices (bale value).For example, the USDA (United States Department of Agriculture) recommended combination of cotton ginning machinery, Regardless of the cleaning practices used in the production stage and desired yarn quality, includes

two lint cleanings. This processing procedure achieves satisfactory bale value and reduces damage to the inherent quality of the fiber, but it may not maximize the net cash value for each individual bale (Anthony, 1985).

From the overall industry perspective, it is important to know the most efficient (least cost) mix of cotton cleaning activities across the entire system of cotton handling. Market prices do not seem to guarantee implementation of the most efficient cleaning configuration in a system framework. Haskel (1973) suggests that price should not be considered because the segmentation and division of responsibility within the cotton industry contributes to excessive farm-to-mill costs. Excessive farm-to-mill costs are demonstrated by the fact that additional lint cleanings usually result in higher prices (Ethridge et al., 1994). This may be profitable for producers, but may not be efficient across the entire system if the objective is to minimize farm-to-mill cleaning costs. The availability of alternative cleaning configurations raises the question of identifying the optimal approach. The optimal cotton cleaning configuration for the overall industry, given a specific production practice, would include a sequence of cleaning processes at the field, at the gin, and at the textile mill which can be accomplished at a minimum cost. If it is assumed that textile mills are usually targeting a desired quality of yarn, the issue is one of selecting least cost cleaning configurations across the harvesting, ginning, and textile mill stages to achieve the desired yarn quality. No empirical research has focused on addressing the issue of cotton cleaning by integrating across the segments of the industry. Cost estimates and quality effects are not available for alternative cleaning configurations, making it difficult to suggest any preferred combination of cleaning that will minimize costs across the system. The general objective of this study is to determine optimal cotton cleaning configurations across the harvesting, ginning, and textile mill stages that can most efficiently deliver cotton with the desired level of cleanliness and quality characteristics.

Cost Effective and Chipper.

The Present Machine is the Standard Machines having various specifications at lower cost. In this machine the basic objective is to provide hygienic condition Industrial Scenario in India and Abroad.

Cotton is an important natural fiber of the 20th century. Major growth of cotton production was observed since the end of the Second World War (WWII). Cotton was grown in 90 countries during the year 2007. The used cotton worldwide is commonly used to make pillows and mat and also some other application like sustainable products, Industrial setting and Polishing and now used cotton is commonly used to produce high quality paper.

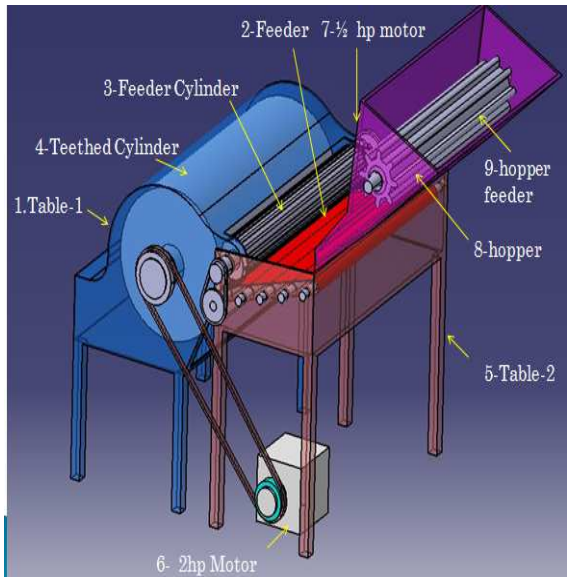
Cotton and Consumer.

At the present time consumers are increasingly inclined to use organic textile products manufactured with maximum care taken to protect the environment .The object of the present study is to compare the life cycle and impact of production processes of recycled cotton with those of conventional cotton, in order to demonstrate the enormous advantages for the environment of using recycled cotton in the manufacture of all kinds of textile garments, since this raw material is one of the most sought after textiles for fabric manufacture. The use of recycled cotton yarn has the advantages of consuming less water and chemical products, does not contaminate the subsoil, water of air, consumes less energy, recycles textile garments or fabrics which would otherwise become waste, provides economic benefits to developing countries which have been seriously damaged in recent years due to excessive mass production of cotton, and above all, production costs are lower than when using conventional or fully certified organic cotton.

in Working areas, by keeping this as a major objective cost will also be consider as minimum as possible Simultaneous

Existing Machines

New Design of Machine.



Working Principle.

This machine has a simple structure having a teethed cylinder [4] surrounded by cover [5] with inlet and outlet, when the used compact cotton is pass through this teethed cylinder it strength get reduces and compact cotton gets open at outlet and collected in a room which occupy large space. The Used cotton feeder Parts [2] are fixed on the table [1] which is so adjusted and fixed to the Table [5] So that the used cotton should uniformly pass from the Feeder cylinder at certain fixed gap, to create cleaning of used cotton at the downward region of Teethed Cylinder [4]. Feeder [2] will be surround by spikes on it surface to hold the cotton while travelling towards the Feeder Cylinder [3]. Two Separates Motor of which one is used to rotate the teethed cylinder having 2 hp Power with 1200 rpm and other 1hp motor is used for feeder cylinder and feeder with 500rpm. Whose speed should further reduce by belt drive arrangement as per requirement?

Description of Individual Parts:

Table-1: To Hold the Feeder Mechanism. (Simple available angles will use to make the table as per flexibility of feeding the cotton). Feeder: Rubber Material with spikes on it surface is used to feed the cotton. (Available rubber mats with spikes will select). Feeder

Cylinder: The Material for the feeder cylinder is the copper with Square Grooves on its Surface (Standard Feeder Cylinder will Select) Teethed Cylinder: It will be the wooden cylinders with metal teeths are fixed on its surface (Standard Teethed cylinder will select) Table-2: To fix the Teethed Cylinder. (Simple available angles with sheet metal will use to make the table-2).

Motor-1: 1hp Motor having 500 rpm will select for feeding Mechanism.

Motor-2: 2 hp Motor having 1200 rpm will select for Rotating Saw Cylinder.

Reference:

1. Bennett and Sukant K. Misra "Analysis of cost minimization of cotton cleaning in systems framework"

2. Murali Siddaiah, Michael A. Lieberman Nadipuram R. Prasad4 and S. E. Hughs "Automation in Cotton Ginning

3. L.N. Dimitrova- bozhinova "Use of chemicals for improving earliness in cotton by".

4. P. Whitelock, C.B. Armijo, G.R. Gamble, and S.E. Hughs "Engineering and ginning Survey of Seed-cotton and Lint Cleaning Equipment in U.S. Roller Gins"