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PRODUCTIVITY IMPROVEMENT OF OIL SEAL TRIMMING MACHINE

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Abstract

Every industry profit depends upon the production rate. We visited the BHARGAVE RUBBER PRIVATE LTD., An effective plant layout plays a pivotal role in optimizing operational efficiency and resource utilization. This abstract explores the rationale, challenges, and benefits associated with changing the plant layout. It delves into the strategic considerations, such as workflow optimization, equipment placement, and spatial arrangement, aiming to enhance productivity, reduce costs, and foster a safer work environment. The abstract also highlights the need for meticulous planning, stakeholder collaboration, and technological integration in implementing successful plant layout changes, emphasizing the potential impact on overall organizational performance.

KEYWORDS:

Plant layout, resource utilization, Enhance productivity, meticulous planning.

INTRODUCTION

1.1 CURRENT SCENARIO

Rubber product industry is the most emerging industry now a day in Indian as well as global market. In India it is the 4th largest market, which shows that how much it contributes towards our economy. Rubber product industry includes the personal care products also like rubber product. So, our project mainly focuses on the market and study of rubber product in India, it consists various domestic companies. Major players are Fenner, Tega India, Rubfila international Ltd, Gujarat reclaim & Rubber product Ltd, Merchem Ltd etc.

Rubber product market is gradually developing very fast and day by day many new varieties, liquids product, are added in it by various companies to exits in the market.

Rubber industry is very sensitive as the price of rubber is constantly changing and economic decline or rise affects the rubber industry. The rubber produces wide range products like auto tyres, auto tubes, automobile parts, footwear, belts, cables &

wires, battery boxes etc. Block rubber, Preserved Latex, crepes and sheets are some forms in which rubber is produced and used.

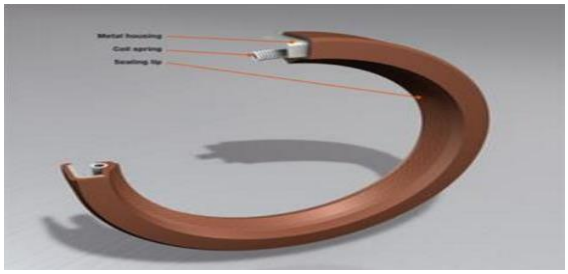

Fig 1.OIL SEAL

1.2 SCOPE OF RUBBER INDUSTRY

Rubber industry is a branch of technology which includes necessary training and guidance for the processing, packaging, transportation, storage and distribution of all the product related to Rubber industry in one way or the order. This field of technology is dependent on the principles of other branches.

The concept of Rubber security has two dimension - availability of Rubber and access to Rubber.30% of the rubber product in the country is wasted. There is a need to increase the range of rubbers available to improve overall nutrition. Packaging of rubber products has become important to ensure safety and hygiene.

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PRODUCTS OF RUBBER INDUSTRY

- Custom rubber moulding
- Transfer moulding
- Compression moulding
- Injection moulding
- Turn-key production with machining capabilities
- Part from prototype to high volume
- Material and design Assistance
- Mould design and creation
- Rubber to metal bonding
- Fabric reinforced to rubber moulding
- Cured-on wheels Forklift seats and forks
- Rubber spacer
- Fabricated/Machined Products
- Polyurethane wheels
- Solid Press-On Tyres
- Solid Industrial Tyres

OUTLOOK OF THE RUBBER INDUSTRY

There are two economic (IMF and Downside) and two planting (Base and High) scenarios for the June 2013 World Rubber Industry outlook (WRIO). Only the world totals are presented here.

The Downside scenario delays the expected recovery of the world rubber demand, which is forecast to begin in 2013 under the IMF scenario, until 2014, except for SR demand, which is forecast to decrease by 0.1 percent in 2013. This delay in the recovery translates into 800,000 tones difference between the two economic scenario for world total rubber demand in 2013.

SR Demand suffers proportionally more under the Downside scenarios as compared to total rubber or NR demand in 2013, due to changes in relative NR/SR price level and greater sensitivity to level of economic activities of rubber consumption of Non Tyre and Non-Tyre 4 product. The negative impact of the relative price level will be felt in 2014 also, resulting in only a 5, 00,000tones increase in SR demand in 2012-2014.

The impact of the High planting scenario on NR demand in 2013-2014 is to stimulate higher demand as compared to the forecast under the Base planting scenario. This is because of a lower relative rubber price as a result of increased normal production under the High Planting scenario. As a result, the NR Demand.

LITERATURE REVIEW

Researchers (1995) classify the global problem placing the manufacturing resources (machines, departments or cells) within the available floor area (block layout), (2) the input/output station location and (3) the determination of the network system to support material flow interaction between facilities.

The layout problem is concerned with funding the most efficient arrangement of the facilities within the available floor area. Having the impact of the material flow system on the design described some authors (Tompkins, White at 2003) suggest the simultaneous

consideration of the first two design tasks; others adopted a sequential approach taking the complexity of the designs into account (chhajed, Montreuil at 1992).

Barne at 1980**;** Meyers and Stewart at 2002 There is a body of knowledge which has evolved over the years that is designed to increase the productivity of an organization and of the individuals who make up the organization.

The elimination of unnecessary work and the design of methods and procedures (Which are most effective, and require the least effort, and are suited to the person who uses them) are the most important objectives of motion and time study.

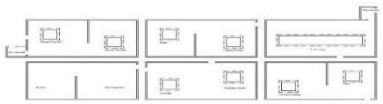
Heragu, Yang and Kuo argue that the problems has elements of both design and optimization problems. The layout design problems is ill structured in the sense that quantitative as well as qualitative criteria must be considered.

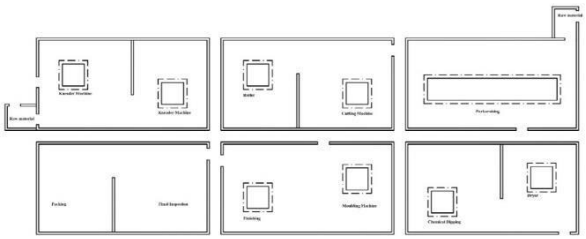
METHODOLOGY

India is progressing at higher rate and hence industrial development is on its high that's why efficient working equipment required.

Oil seal trimming machine is required so the industry context of view of the project work. Hence the future of this project work seems promising.

The work can be modified further more on changing the plant layout.





CALCULATION

MACHINING TIME FOR RUBBER

1. Kneader machine (mixing of raw materials) = 170 sec
2. Hydraulic Roller Machine (rolled the raw material in a complete sheet shape) = 170 sec
3. Cutting Machine
   - I. Assemble sheet =60 sec
   - II. Punching die = 60sec
   - III. Collecting pieces = 120sec
4. Inspection of Rubber = 300 sec

MACHINING TIME FOR SHELL

1. Parkaraising
   - I. Decreasing 1 = 420 sec
   - II. Decreasing 2 = 420 sec
   - III. Water rinsing 1 = 60 sec
   - IV. Water rinsing 2 = 60 sec
   - V. Surface conditions = 300 sec
   - VI. Phospating 1 =360 sec
   - VII. Phospating 2 = 360 sec
   - VIII. Water rinsing 3 = 60 sec
   - IX. Water rinsing 4 = 60 sec
2. Dryer = 240 sec
3. Chemical dipping = 60 sec
4. Moulding = 60 sec
5. Final Inspection = 90 sec
6. Packing =30 sec

EXISTING LAYOUT (T_i) RUBBER

1. Kneader to roller =180 sec
2. Roller to cutting = 300 sec
3. Cutting to moulding = 240 sec

SHELL

1. Parkaraising to dryer = 420 sec
2. Dryer to chemical dipping = 360 sec
3. Chemical dipping to moulding = 300 sec

Total ideal time for existing layout (T_i) = 1800 sec

FMS LAYOUT (T_f) RUBBER

1. Kneader to roller =120 sec
2. Roller to cutting = 120 sec
3. Cutting to moulding = 120 sec

SHELL

1. Parkaraising to dryer = 3600 sec
2. Dryer to chemical dipping = 120 sec
3. Cutting to moulding = 60 sec

Total ideal time for fms layout (T_f) = 1020 sec

REDUCTION IN IDEAL TIME (T)

$T = T_i - T_f$

Where,

T_i = Existing Layout = 1800 sec = 30 mins

T_f = FMS Layout = 1020 sec = 17 mins

$T = T_i - T_f$

T = 30 – 17 = 13 Mins

T = 13 Mins

Percentage Reduction = $[T / T_I]*100$

= [13/ 30]*100

Percentage Reduction = 43 %

CONCLUSION

Using modified oil seal trimming machine, the productivity can be increased much be beyond the stated results. Several techniques being explored to find the best method for cavity production.

After completing the major project on productivity improvement of oil seal trimming machine

The overall production of O-Rings will be improved through the reduction of cycle time with help of modifying oil seal trimming machine. By increasing the length of the cartridge the get many benefits that is usually one operator handles two oil seal trimming machine. Now the modification allows the operator to handle three machines.

The modification increases the machine timing and decreases the refill cycles .it gives more time for the operator to handle one more oil seal trimming machine.it also requires less man power, it results 25,000 pieces into 30,000 pieces per shift.

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