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Improving efficiency of Machine for effective management of city waste.

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Abstract : Being such a huge and diversified country, we are also in a fuss of huge and diversified waste creation which needs a good waste management treatment. Waste management is a process which includes the actions required to treat waste from its origin to its final elimination. Careless use of waste management, inappropriate use of resources, old techniques are some of the reasons for not achieving effective results. In this paper we see a review of a well-established plant or an idea of managing waste at a very high volume which we are adding up to increase the efficiency of machine and using new technologies.

I. INTRODUCTION

Over 377 million urban people live in 7935 towns and cities and generates 62 million tons of municipal solid waste per year. Only 43 million tons (MT) of waste is collected, Researchers believe that the Nation is following an awry system of waste disposal and management.11.9 MT is treated and 31 MT is dumped at landfills sites. Some municipal authorities deposit solid waste at dump yard carelessly. The ideal methods of efficient waste management are to ensure proper segregation of waste at source and to ensure that the waste passes through different process of recycling and resource recovery. Then reduced final residue should be deposited scientifically sanitary landfills. Sanitary landfills are absolute means of disposal for the unused Municipal solid waste. The challenging part in waste management is that the recyclers need to determine whether the substance present in products they manufacture have any hazardous/Toxic properties. Our goal is to make machine cost effective and make full use of existing procedures. Unfortunately, due to careless management of waste, inappropriate use of resources, old techniques we are unable to achieve effective waste management. However, waste management can be made effective by changing materials of machine, new methods, public awareness, vivid schemes [5].

II. MACHINES USED

1. Conveyor Belts

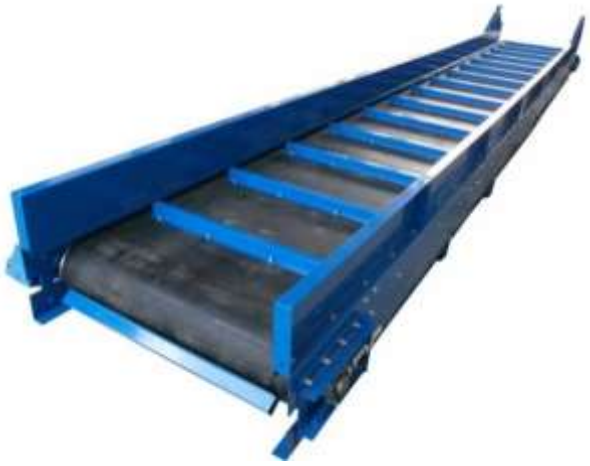

Fig 1. Conveyor Belt

A conveyor belt is something that functions in continuous moving machine of fabric, rubber, or metal used for displacing objects from one place to another. It is made up of a mixture of metals and fabrics which increase its long-lasting ability [1].

Objectives:-

- To make full use of appropriate materials at the most minimal cost.
- Making it available in under development sectors of state/nation.
- Saving cost of components by replacing them with similar properties component in order to increase revenue and profits.
- Possible material change, Polyvinyl chloride with Polyurethane

2. Trommel Screen

Fig 2. Trommel Screen

A trommel screen is also known as rotary screen is mainly used in the mineral and solid waste processing industries. It beholds a perforated cylindrical drum which is generally elevated at an angle at the end of the feed. Physical size separation is achieved as the feed material spirals down the rotating drum, where the undersized materials smaller than the screen aperture passes through the screen, while oversize material exists at the other end of the drum [4].

Objectives:-

- To replace material used in trommel screen.
- Evaluate the trommel screen performance from the economic point of view.
- Using Polyurethane screen mesh as an alternative of metal screen mesh.
- A normal metal screen mesh is of different materials depending upon their composition and features.
- But using a Polyurethane mesh instead of normal screen mesh gives a longer life, minimal maintenance cost, greater wear resistance and much more [4].

3. Sorting Machine

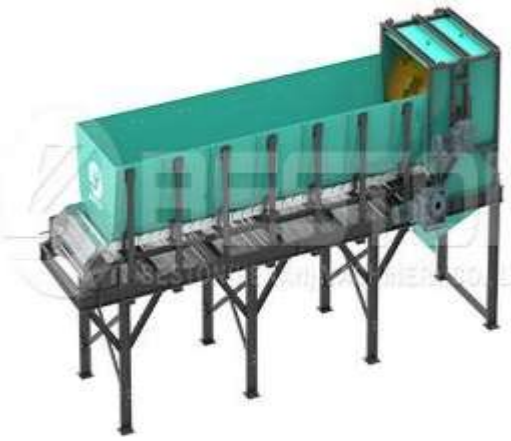

Fig 3. Sorting Machine

Waste sorting generally refers to separating different garbage according to certain regulations or standards. The purpose of categorization is to increase the resource value and profit value of garbage and strive to make the best use of materials. Municipal solid waste sorting machine (MSW) sorting can get recycling materials separated from municipal solid waste, include glass, ferrous metal, aluminum, plastics, paper. The machine makes use of various sorting means- (magnetic separator, air density segregation and other) to segregate waste and can separate the organic matter, plastics, metals and other substances out from the municipal solid waste to the maximum, to improve the reusing and recycling of municipal solid waste. Material is separated to specifications then shredded, compacted, baled for sale in market [2].

Objectives:-

- To evaluate performance of the machine for effective cost reduction.
- Using carbon steel at the place of stainless steel.

4. Shredding Machine

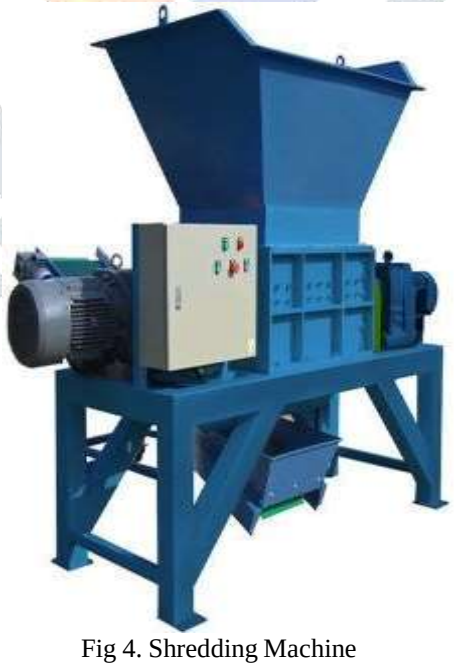

Fig 4. Shredding Machine

The shredders are useful machines for the volume reduction of bulky waste such as reams of paper, paper materials, bumpers, tires, refrigerators and the shredding of different materials such as scrap iron, aluminum, copper, plastic counting in as of municipal solid waste as well as industrial waste. The machine has three main parts Hopper, Blade box and Motor. The application of shredders is important for eco-centers, landfills, wrecking and all the organizations which work in the field of waste management as well as recycling [3].

Objectives:-

- To evaluate the performance of the machine for effective cost reduction.
- To select the possible alternative materials for the machine.

- To perform the simulation on the machine after the material change.
- Possible material change from HSS (6CrW2Si) to Stainless steel.

III. Problem Definition & Objective:

The problem presented in this paper is to design and develop efficient machine & low cost value. The primary requirement and focus are to substitute the material used in the machine which could result in less expense and quality production. The ideal methods of efficient waste management are to ensure proper segregation of waste at source and to ensure that the waste goes through different ways of recycling and recovery. Waste management can also be improved by new methods, public awareness and various schemes.

IV. Literature Review:

According to the industrial survey and literature, It is added to the annual turnover of rs.1100 Cr Includes plant components: waste conveyor, drum sieve, sorter. The total cost of machines can reach 80 lakhs. Monthly turnover 90cr. The expense is marked as 40cr. Waste generated 70 tonnes per day Waste treated 2,530 tonnes. Waste is used to generate pesticides, biogas, chemical ingredients. [6]

V. Conclusion:

The cost planning and building efficiency of solid waste management was carried out using company surveys and research. It is found that our basic step to cut off some cost to build a solid waste management plant has found to be profitable and we can build such plant at a minimized cost than usual.

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