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# REVIEW PAPER ON PAPER RECYCLING AND MACHINE FABRICATION

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***Abstract:*** ***The Indian paper industry is one of the traditional industries of India consisting of over 500 units with an installed capacity (excluding newsprint) of over 7.5 mm tone per annum. The capacity utilization in the industry has remained low at approximately 60% but has lately picked up. This was owing partly to some 200 mills being small and many of which were sick. Effectively, only 321 mills are operational. Out of these, 172 mills make up for 54% of the market, with the top ten claiming a share of over 28%. The large segment consists of 21 large mills. The incidence of sickness is high in mills with less than 15,000 tpa capacity. The consumption of paper products is growing at a fast pace of around 6.5% and is expected to further go up in future. The industry now uses three sources of raw materials - recycled paper, wood and agro based, and waste. The recycled paper, comparatively cheaper, comprises almost 40% of the total raw material requirements at present. Paper is one of the most usable consumer items which has largely used throughout the world. It is generally prepared from cellulosic material by treating it with different type of chemicals and then process through roller and driers to make a suitable quality paper. The quality of paper depends upon the end use of the paper. As the demand for paper has increased, more timber has been needed to meet the demand for wood pulp. By using waste paper to produce new paper the demand can be met to some extent. Waste paper is an important raw material for paper and paper board manufacturing. Consumption of waste paper in India is very low compared to advanced countries. This is mainly due to lack of organized collection. However it is estimated that 25% of all paper consumed in India is now recycled.***

***Keywords:*** *wood, cellulose, chemicals, paper, pulp, recycling.*

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## I INTRODUCTION

Around 35 per cent of all trees cut down are used to make paper – that's 160,000km² of forest chopped down every year. But trees are a renewable resource and only nine per cent of the trees used for paper come from ancient forests .Still the number of trees used for paper making is huge and hence cause an serious effect on environment. An alternative for this situation is reuse of waste papers. The recycling of paper is the process by which waste paper is turned into new paper products. It has a number of important benefits: It saves waste paper from occupying homes of people and producing methane as it breaks down. Hence to reduce the consumption of the trees finding and alternative solution is the prime concern.

## II LITERATURE REVIEW

**Dibakar Bhattacharjee et al.:**

Automatic recycling machine will increase the turnover ratio significantly and the use of plate heater will be an advantage to heat in wet condition.[1]

**Kostyantyn Pivnenko et al.:**

In this literature we have seen that paper product manufacturing involves a variety of chemicals used either directly in paper and pulp production or in the conversion processes (i.e. printing, gluing) that follow. Due to economic and environmental initiatives, paper recycling rates continue to rise. In Europe, recycling has increased by nearly20% within

the last decade or so, reaching a level of almost 72% in 2012. With increasing recycling rates, lower quality paper fractions may be included. This may potentially lead to accumulation or un-intended spreading of chemical substances contained in paper, e.g. by introducing chemicals contained in wastepaper into the recycling loop. This study provides an overview of chemicals potentially present in paper and applies a sequential hazard screening procedure based on the intrinsic hazard, physical–chemical and biodegradability characteristics of the substances. Based on the results, 51 substances were identified as potentially critical (selected mineral oils, phthalates, phenols, parables, as well as other groups of chemicals) in relation to paper recycling. It is recommended that these substances receive more attention in waste paper.[5]

**Ilpo Ervasti et al.:**

This journal paper shows there is no reliable method in use that unequivocally describes paper industry material flows and makes it possible to compare geographical regions with each other. A functioning paper industry Material Flow Account (MFA) that uses uniform terminology and standard definitions for terms and structures is necessary. Many of the presently used general level MFAs, which are called frameworks in this article, stress the importance of input and output flows but do not provide a uniform picture of material recycling. Paper industry is an example of a field in which recycling plays a key role. Additionally, terms related to paper industry recycling, such as collection rate, recycling rate, and utilization rate, are not defined uniformly across regions and time. Thus, reliably comparing material recycling activity between geographical regions or calculating any regional summaries is difficult or even impossible. The objective of this study is to give a partial solution to the problem of not having a reliable method in use that unequivocally describes paper industry material flows. This is done by introducing a new material flow framework for paper industry in which the flow and stage structure supports the use of uniform definitions for terms relatedto paper recycling. This new framework is termed the Detailed Wheel of fibre.[6]

**M. A. Olutoye**

The development of a manually operated used paper-recycling machine is much cheaper than the automated recycling industries worldwide. The fabricated machine can serve dual purposes, it can be manned permanently at a stationary position or it could be shifted from one place to another as the case may be.[4]

## III SCOPE

The paper is the third most used thing all over the world. Even though the world is shifting towards paperless globalization still the use of paper has not reduced. The demand for recycled paper is increasing 7-8% annually. Governments in countries such as India and China are also supporting paper recyclers to protect natural resources from depletion and increase recycling rates in the region. Now the papers are produced more by recycling method than the use of trees. Sooner the demand of recycled pulp will increase than the virgin pulp and hence it will help in saving an environment.[4]

## IV STEPS BY STEP PROCEDURE OF PAPER RECYCLING

Paper recycling is a prime concern for today's environment. it is an echo friendly method of producing the papers from waste papers.

**Waste paper collection:**

Initially the waste papers are collected from various individuals and then stored into recycling cylinder.

**Classification of papers:**

Paper are classified according to their grades. The various grades of papers are defined by Environmental Protection Agency. From these papers we have used the mixed papers for recycling process which are easily available and most widely used.

**Shredding & pulping of paper:**

After sorting, the paper is then shredded to break down the material into small bits. After the material in finely shredded, a large amount of water is added along with other chemicals such as hydrogen peroxide for the bleaching of the pulp, sodium silicate for pH balancing of the pulp & caustic soda for to break down and smoothen the fibers of the paper.

The resultant slurry solution, known as pulp, has an oatmeal consistency and is the raw material used to make paper. This process of transforming the recovered paper materials to pulp is known as pulping.

**Deinking and straining of pulp:**

Deinking is one of the most important process of paper recycling. While doing the pulping the various chemicals are added for deinking purpose. Sodium hydroxide is used for saponification of the pulp and deinking To create a new paper removing the from waste paper is necessary for this purpose the deinking chemicals are used which remove the ink present on paper completely. Once the complete pulp is done the water from the pulp is drained out through strainer. The weight is applied on the slurry with the help of lead screw to remove the water content. The excess water gets collected into cylinder and the pulp is in the strainer.

**Paper Making:**

This drained out pulp is then carried through the conveyor towards the roller. 3 sets of rollers are used to pass the paper. The gap between two rollers is adjusted according to the thickness of the paper. The pulp from conveyor then passes through the rollers and then the recycled final product can be obtained. While passing the pulp through the rollers heaters or blowers will be attached to the system to dry the paper and

drain out remaining water. Which helps in getting desired size shape and thickness.[2]

## V CONCLUSION

The aims is to replace the conventional paper shredders with designed recycling machine. In this project we are going to design a paper recycling machine with low cost. The main objective of the project is to design a small scale paper recycling machine for colleges and educational institutes so that they can easily recycle there own waste.

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