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Development and Fabrication of Paper Recycling Machine

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Abstract: **It is literature review paper on Development & Fabrication of paper recycling machine. In every big institution ,mainly educational institutions like schools or colleges, generation of large quantity of waste papers is quite apparent. And effective use of recycled paper is also possible. So, instead of disposing off the waste papers into trash, recycling them makes sense. This not only helps the institute in cost saving but will also ensure its contribution towards the protection of the environment. Designing machine which integrate all the process in single unit, which can be used in schools and colleges, ensures that a cheap and non-complex method of production of paper product is guaranteed. Accordingly design of the machine unit has been prepared with all necessary component specifications.**

Keywords: Paper Recycling, Design, Modelling, Waste, Conversion, Defibre

INTRODUCTION

Paper is one of the most important products ever invented by man. The primary raw material for the paper production is the pulp fibers obtained by complicated chemical process from natural materials, mainly from wood. This fiber production is very energy demanding and at the manufacturing process there are many of the chemical matters which are very problematic from the view point of the environment protection.

Instead of throwing the waste paper into trash, why don't we recycle them in our houses. If we recycle these wastages it can be used as some other purposes. ex: Tissue paper, or some board (in small thickness). In our project the recycle of paper is more and safe work and also less cost of production. The main concept of this project is to reduce the paper wastage in our houses with the help of manual operated paper recycling machine. It is fully mechanical operated, so there is no
need of electricity is used, low cost, maximum usage of waste paper as in the form of recycled paper.
The primary source of raw material for production of paper is vegetable fibers, obtained mainly from plants. To ensure that the forest is not depleted of these woods, there is need to provide alternative source of raw materials, this therefore leads to the invention of the process of recycling.

Recycling, which is the extraction and recovery of valuable materials from scrap or other discarded materials, is employed to supplement the production of paper. The designing and fabricating of a used paper recycling plant therefore a welcome development as it will ensure that the source of raw material for paper production is multiplied and also waste paper that could have constituted into wastes are recycled for various productive purposes.

Designing portable operated small-scaled paper recycling plant, which can be used in schools and colleges, ensures that a cheap and non-complex method of production of paper product is guaranteed.

A. According to the International Research Journal Of Engineering and Technology

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Working Principle and designing units are as follows:

Here the motor and heater will be provided with electric current and starts working. The motor will start to run by getting the input power. The pulley connected with the motor drives the belt and transmits the power to the sieve. The

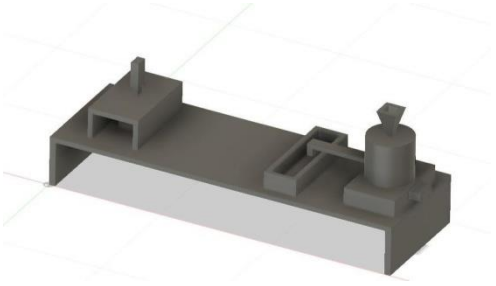

Fig 1: 3D Design

sieve inside the hollow tank starts to rotate. The sieve will crush the paper and the ingredients will be added to make it a pulp. The pulp will be taken and mixed with Hydrogen Peroxide for the quality. The pneumatic cylinder will be used to make the paper into required shape and size. The bulk of the parts of the plant were fabricated using mild steel, this is because it is the easiest to be joined among all other metals. It is a very versatile metal, necessitating its use by many industries for fabrication of process unit equipment. Apart from its versatility, it is also very cheap and readily available compared to other metals.

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Fig. 2: Design Units

B. *According to international journal Scientific &Engineering Research, volume 8, issue3,March 2017*

In this paper Methodology and designing units are as follows:

A. *Pulping*: Shredded paper along with warm water is fed into the pulper. Pulper blends the solution of paper and water along with binder and deinking and whitening agents.In pulper paper fibre are separated from each other and a thin solution of paper pulp is formed.

B. Forming: Pulp from the pulper flows down through valve on the felt conveyor. Some fraction of water is drained due to gravity through felt mesh.

C. Press Rolling: Felt conveyor moves through series of rollers and due to pressing by rollers water is squeezed out. Sheet of recycled paper will be formed. Roller pairs will be followed by idler rollers. Only one roller will be driver roller and rest will be driven due to motion of felt.

D. Drying: After sheet formation felt will be passed through a heated roller and then to air blower section, which will evaporate the water left in the sheet and finally dry sheet will be obtained.

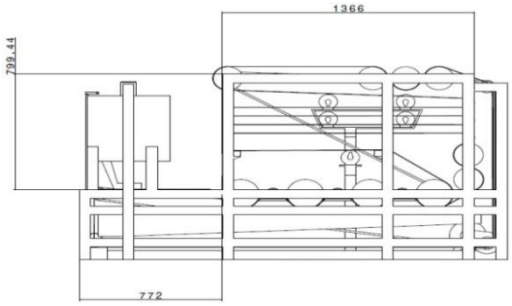

Fig 3: Paper Recycling Machine - Front View

C. According to the European International Journal of Science and Technology ISSN: 2304-9693 Volume: 4 NO 5 August 2015

In this the hydrapulper was fabricated at ISOLTEC Technical Workshop, Ibadan. The major processes undertaken during the fabrication were grinding, marking out, cutting, beating, welding, sharpening, drilling and boring, from which the cylindrical container, the rotor blade, the container cover and the hydrapulper legs were fabricated and assembled together. The schematic diagram and the bird's eye view of the hydrapulper assembly are shown in Fig. 4.

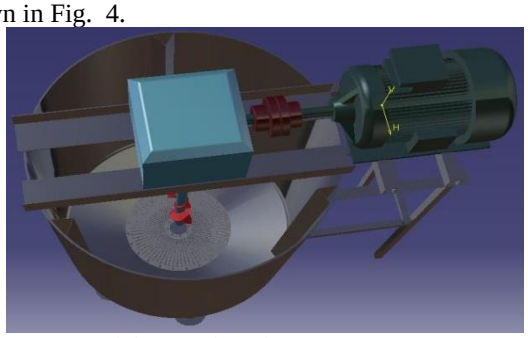

Fig.4: A Bird's Eye View of the Hydrapulper Assembly

D. According to the Fabrication of Paper Recycling Machine (IJSRD/Vol. 4/Issue 02/2016/199)

It has been conclude that paper recycling machine consume less time to produce paper as compared with manually operated machine.

This machine can be used in Gramudyog, home and colleges for the production of paper from waste paper which generated in that region.

There is only one operator is required to operate the machine.

With the use of some easily available chemicals and water, machine produces the printable paper sheets. (Caustic soda, bleaching powder and starch)

The use of this project work is the small scale producers of waste papers can contribute more than the large scale producers so that they will be able to make the nature go green and lessen the deforestation done for the production of the paper.

The development of an automatic paper-recycling machine is much cheaper as compared to machines in recycling industries.

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.

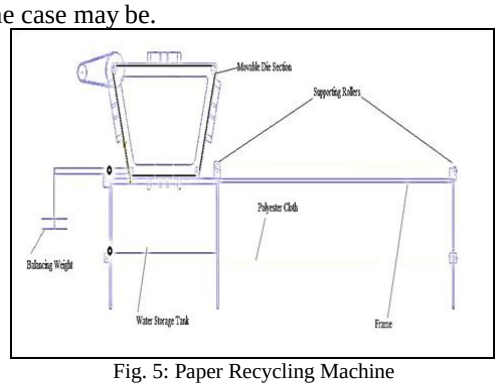

Fig. 5: Paper Recycling Machine

Along with this technology in various equipment's used in paper recycling we are going to done this pulp making in simple way in 3 steps.

In 1st step the defibration of paper is take place with the help of paper grander.

In 2nd step the layer formation of pulp in A4 size

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sheet is takes place in water tank. containing chemicals viz. starch, alum, caustic soda, silicate, acid orange, methyl violet etc.to obtain various grades of paper.

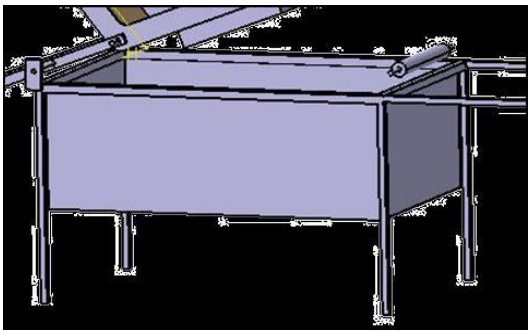

Fig. 6: Pressure punch remove the water contain

In 3rd step with the help of pressure punch remove the water contain in paper layer and hang it for drying in natural air or hot air.

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