

Manual Operated Paper Recycling Machine

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Abstract - In any big institution, especially 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 (craft papers, registers etc). So, instead of disposing off the waste papers into trash, recycling them makes sense. A manually operated paper-recycling machine was designed and fabricated. This was done to enable waste paper conversion into useful product in houses. Accordingly design of the machine unit has been prepared with all necessary component specifications. Also the overall cost is low and no electricity needed.

Key Words: Mixer; Press; Tank; Sieve; Bevel Gear.

1. INTRODUCTION

The main objective of this project is to reduce the paper wastage and recycle them with the help of recycling machine. Because in modern days paper usage is reduced, but we always using it for our some purposes. So, instead of throwing the waste paper into trash, why don't we recycle them in our houses. If we recycle these wastage 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.

Even now a days in many places in the World uses paper instead of other products, and we are also uses them as a notes, books, files and documents. So why don't we recycle the paper which we already used for our need. By using this we can reduce the paper wastage. Because if we burn the paper it will be emitted the Chlorin, which has causing the Ozone layer by chain reaction. So, instead of burn and through in trash, we created this machine to recycle the waste paper.

2. WORKING PRINCIPLE

It mainly contains three types of machines, which are perform the different operations simultaneously. These three machines are named as manual operated mixer, press, and mixing tank. It is in simple form.

This is a mechanical operated mixer used for mix the wastage paper to make it as a pulp. To rotate those mixer blades bevel gears are used with shaft connected with lever operated mechanism. It is an mixer which is operated without the help of electricity. Because instead of electricity, we used an hand wheel to operate the mixer. For this process and connecting both hand wheel and the mixer, we used bevel gear mechanism (large one & small one) to increase the rotating speed. So, once the hand wheel get rotated, the bevel gear (large one) also get rotated. The large one rotates the small one, which is connecting with the mixer with the help of shaft. So, the mixer get rotates and mix the paper and make it as a pulp.

The second & third devices are Sieve with press, where the paper pulp is poured and spread all over the sieve, which is placed below the sieve support. After this the spreading pulp is drained with the help of sieve and placed below the press, where the next operation will be taken. This device contains a small tank with a sieve.

Once the paper get mixed and become a pulp, it is poured inside the tank, and some chemicals are added ex: HYDROGEN PEROXIDE, and it is spread all over the sieve by hands. The large particles of pulp are get arrested by sieve, which will be going to be pressed.

The chemicals used for these operations are,

1. Hydrogen Peroxide.
2. Sodium Hydrosulpite.

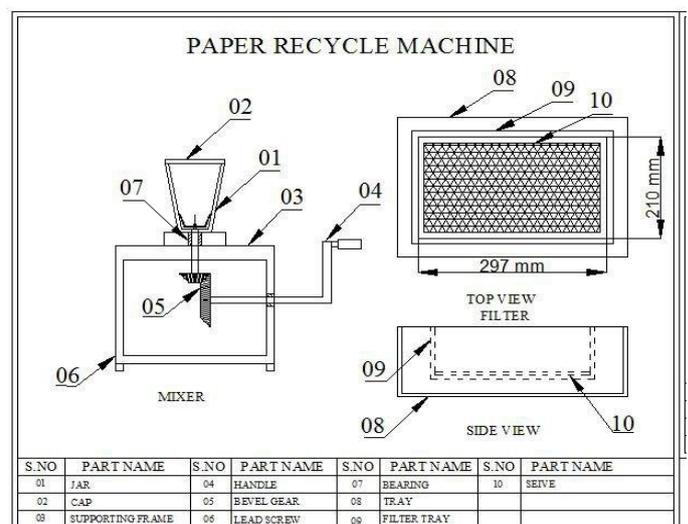


Fig (a) Manual mixer and sieve

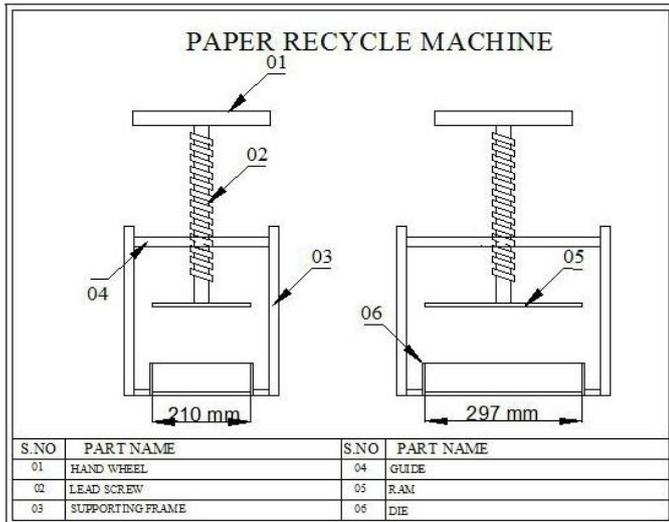


Fig (b) Manual operated press

In the manual press the drained pulp paper is placed in sieve and get compressed by the help of the ram which is placed above the sieve and operated by handle, the excess water will be taken out from the paper pulp. The water draining will be take few hours, after that the pressed paper is taken out and get dried in the atmosphere. Then the paper is taken out from the cloth which has attached with that and again dried and after few hours it can be used.

These papers are flexible and tear easily and we can use them for multipurpose. Based on the pulp density the paper can become good thickness and quality. When all the process are done, then the dried pulp become a paper now, so it can be used as some other purpose papers like ex: Tissue paper, cart boards, etc.,

3. ADVANTAGES

Operation is very simple compare to other existing machines. Overall cost is low compare with electrical operated recycle machine. There is no need of electricity. Manufacturing cost is low and also production cost is low. We can change the paper thickness and quality. The pulp creation is very easy. Chemicals are available in local markets.

4. DISADVANTAGES

The outcome paper will be very less thickness and easily tear able.

5. CONCLUSION

This study indicates that Waste paper especially the examination papers in an institution is a very big problem and it also negatively impact on the environment if proper management systems are not put in place. Recycling presents an opportunity for extracting economic and environmental benefits from waste.

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. One great advantage to be derived from the use of this machine is that the cost of running it is minimal compared to what it takes to run a full plant. The simplicity of operation of this machine ensures that no too much technical skill is needed to operate it. When the machine is well maintained, its durability is guaranteed.

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