

Modification of Briquetting Machine

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Abstract- A briquette is a compressed block of coal dust or other biomass material. Briquettes have been used for fossil fuel.

Our project has design and modification of existing machine in to compact size and easy for operation and no skill is required to operate the machine.

Forest wood and agriculture waste as a source of fuel wood for domestic and small-scale industrial activities in urban, semi urban and rural areas.

There are different machines available in market but those machines are bulky and are costly, hence here I developed a portable and low cost briquetting machine which makes use of simple mechanism to convert the biological waste into useful briquette.

I. INTRODUCTION

- Biomass briquettes are a bio fuel substitute to coal and charcoal. Biomass briquettes are made from agricultural and forestry waste.
- The low density biomass (agricultural and forestry waste) is converted in to high density biomass briquettes with the help of a briquetting machine that uses binder or binder less technique, without using any type of chemical so it is 100% natural.
- Apart from the problems of transportation, storage, and handling, the direct burning of loose biomass in conventional grates associated with very low thermal efficiency and widespread air pollution.

II. PROBLEM STATEMENT

- In the present state of art no such machine is available in the market that makes the briquettes from the dry leaves.
- The machines which are available in the market makes briquettes either from agriculture waste or from wood dust and these machines are too costly and bulky which are not affordable by small scale manufacturers and farmers.
- Even Nagpur Municipal Corporation collects these dry leaves at one place and burns it with traditional style.



III. AVAILABLE MACHINES IN THE MARKET

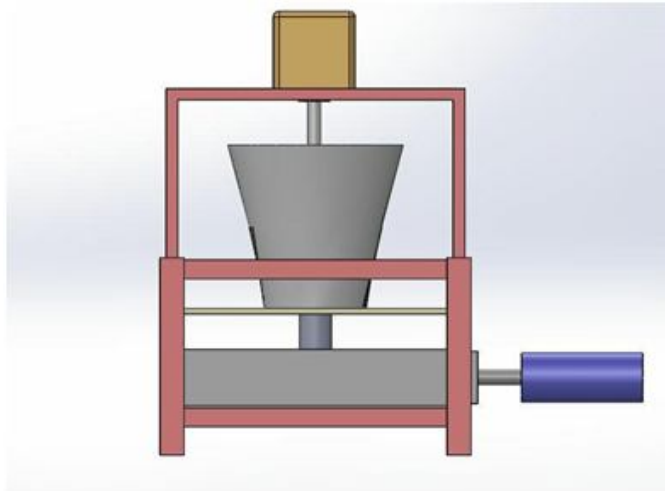
- Various machines are available in the market for briquettes. The machines are of various types: screw pressed type and piston pressed type. For making biomass like hydraulic type,
- The price of this machine is high because it uses high power motor and engines. These machines are difficult to operate by unskilled labor in small areas.
- So there is a need to develop a machine which is easy in operation and also of lesser price than the machine available in market.

IV. COMPONENTS

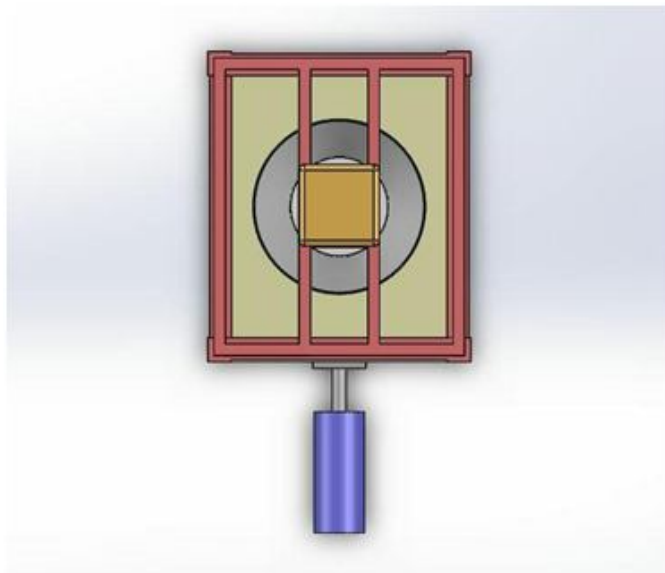
- GUIDEWAYS
- HYDRAULIC PRESS
- MOTOR
- BLADE
- HOPPER
- PVC PIPE
- OPEN/CLOSE VALVE

V. DESIGN

FRONT VIEW



TOP VIEW



VI. WORKING PROCEDURE

- Initially prepare draw material (saw dust + cow dung + paper) is fed through Hopper.
- Switch on the motor if power supply is not available then it is operated by Manually with help of hand lever both operation produce the solid Briquettes.
- Then screw starts to rotate & takes the load from the hopper.
- The volume of the material is transferred from the hopper to the PVC pipe to open/close valve.
- The open/close valve have connected by the rectangular box the move on

- Raw material have in form solid shape move on the box they have hydraulic the raw materia. jack to compress at high pressure.
- The have sleeve in the edge of the box open they taken the solid briquette.
- The produced briquettes are dried under sunlight for 1 to 2 days.

VII. SLIDER CALCULATION

Pressure Calculation:

Pressure Required=Force/Area

FORCE CALCULATION

Mass of Slider $M_s = 1.5\text{Kg}$

Force $F_s = M_s * \text{Acceleration Due To Gravity}$

$$F_s = 1.5 * 9.81$$

$$F_s = 14.715\text{N}$$

$$\text{Force } F_s = 14.715\text{N}$$

AREA CALCULATION

Square formula for $= a^2$ is $30=900$.

Pressure Required=Force/Area = $14.715/900$

$$= 0.01635\text{N/m}^2.$$

VIII. CONCLUSION

- The raw material availability for the device is quite good and the handling is quite simple. Hence it can be concluded that the waste material like dry leaves, wheat straw, saw dust, etc. are feed stocks for the biomass briquette.
- Hence for an agricultural country like India that produces huge amount of agricultural waste every year, use of these waste as a briquette can be economically viable, sustainable and environment friendly solution.
- Machine is simple mechanism with widely available machine element the machine cost could be lowered and makes fabrication economical and portable.

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