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Design and Development of Portable Baler Machine

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Abstract: Industries are facing a lot of problems in storing and handling the scrap. The large space required to store the chips as loose chips have a large surface area. In order to overcome these problems, the scraps can be compressed and stored in a brick form.

A Baling press machine is a machine in which a loose scrap is converted into in the form of 8-12 kg bundle. In this machine, we adopt a square bundle rather than circular shape and square bales acquire less space as compared to the round bales. The portable metal chip baler uses current technology such as pneumatic cylinder to compress the metal chips so that the system capable to operate efficiently.

The output from this system is the metal chips are compacted into a block shape and a working prototype was developed to prove the concept of the system.

Keyword: Bottle Jack, Baler machine, Motor, springs, Fastener.

I. INTRODUCTION

Municipal Solid Waste (MSW)—more commonly known as trash or garbage—consists of everyday items we use and then throw away, such as product packaging, grass clippings, furniture, clothing, bottles, food scraps, newspapers, appliances, paint, and batteries. This comes from our homes, schools, hospitals, and businesses.

India is the fifth largest manufacturing output country in the world. Today India is the second biggest ferrous (steel) scrap importer. So, manufacturing industry is facing the many problems in storing and handling waste, because it requires large amount space for storing or transporting the waste. So, today's all the manufacturing industries are trying to develop the scrap management technique and it's transportation by reducing size by using modern technologies. Baler machine are widely used in many industries to compress the any type of scrap material.

A. AIM

Design and Development of Portable Baler machine.

II. COMPONENT OF THE PORTABLE BALER MACHINE:

- A. Hydraulic bottle jack
- B. Casing
- C. Springs
- D. Motor
- E. Fastener

III. DESIGN OF THE PORTABLE BALER MACHINE:

- A. This machine is less in weight as compared to other baler and compactor machine because of its simple design.
- B. The bale (square shape scrape) size 450*450 mm compressed by our machine.
- C. In this design there is one inlet where we can input the scrape materials like plastic, paper, aluminum cans, garbage etc...
- D. There is one outlet to remove the compressed bales.
- E. There is one hydraulic jack for compress the material(scrap).
- F. There are two spring to bring back the jack to its original position.
- G. There is one 300 volt motor used for the generate automatic motion.

IV. FIGURES OF PORTABLE BALER MACHINE

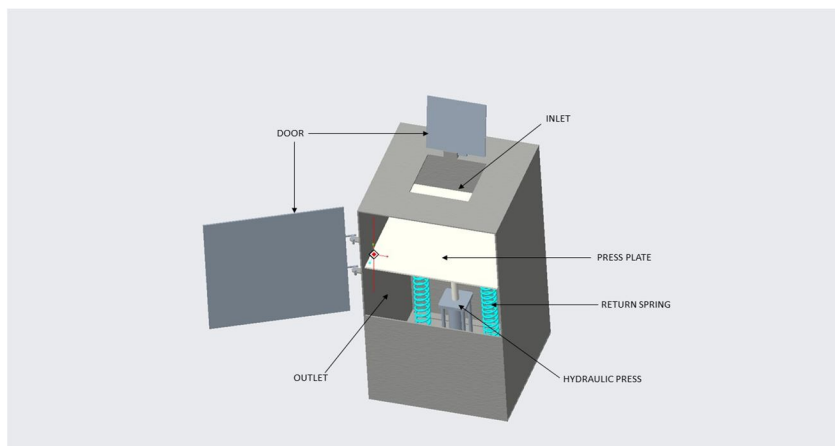


Fig. 1 Design of Portable Baler Machine

V. WORKING OF PORTABLE BALER MACHINE:

- A. As per our working model it has 2 door for inlet and outlet for scarp.
- B. Inlet is on top of model from the inlet we can add scarp for convert into the bale form.
- C. When Compressor plate is in initial position we can add scarp from inlet.
- D. As storage space is full fill by the scarp we can close the door and lock the inlet.
- E. At the bottom of model we set one electric motor.
- F. Motor shaft is connect with the handle of bottle jack for the automatic motion of handle.
- G. When electric motor start working at that time shaft connected with handle of bottle jack is move in up and down motion.
- H. As per up and down motion jack working with the oil and head of bottle jack is move on up side.
- I. On the head of bottle jack there is on plate which compress the scarp by help of close body (structure).
- J. When jack is fully open in its final position scarp material is compress by help of jack and plate.
- K. After the fully opening of jack we can release oil in bottle jack inside it one release valve is available for back down motion.
- L. When plate is come to its final position we can open the outletdoor and collect the all compress scarp material which is in now bale form as per our shape of project.
- M. This PORTABLE BALER MACHINE is compress the scarp from 450*300*450 mm to 450*300*200mm.
- N. This machine is reduce the volume form $6.075 \times 10^7 \text{ mm}^3$ to $2.7 \times 10^7 \text{ mm}^3$.

VI. ADVANTAGES OF PORTABLE BALER MACHINE.

- A. Balers can reduce labor costs.
- B. Baled material reduces any possible fire hazard and trip hazards.
- C. Balers significantly cheaper than Waste Compactors.
- D. Shipping baled material uses less fuel, shipping loose materials requires the use of a garbage truck that will have to make several trips to a recycling center while a baler eliminates the trips and material is shipped in greater volume
- E. Baling Material allows you to track your recycling progress; you can only estimate loose quantities that are recycled.
- F. Balers take up less space than a full-sized waste compactor.
- G. Balers improve recycling output, especially when balers are placed indoors.

VII. CONCLUSION

As per our working model our machine has 6.075×10^7 Cubic Millimeter volume to fill the waste material. After the working of the machine reduce waste material and finally get 2.7×10^7 Cubic Millimeter volume compress material inside the box. This study has been conducted to develop the portable baler machine in order to manage the industrial waste. We were able to prepared with low cost as compared to existing available machines. Moreover, it can be used in small industries, recycling centre, warehouse, etc. The bale compressed from this machine can further be used in many sectors like, recycling, mounding, casting and we can reuse it. Hence, the overall productivity of the industry will increase.



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