

Crusher for Disposal of Garbage

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Abstract: The goal of making the "CRUSHER FOR DISPOSAL OF GARBAGE PROJECT" is to dispose the Waste Properly by reducing the space utilized by the Dumping Ground and helps in improving the efficiency. Garbage waste can be used for something of value, such as compost, feed pellet, biomass pellet, and briquette. Before becoming such things, it takes a tool to make it smoother, called a crusher. The objective of this work is to do mechanical design and 3-D modeling on garbage waste crusher. The steps for designing the garbage waste crusher involve determining a conceptual physical geometry, conducting mechanical design, and finally, developing a 3-D working drawing. Manufacturing and testing of the crusher were conducted. 3-D modelling design was used for visualizing space requirements, improves drawing efficiency and accuracy. Mechanical design was applied for hopper, frame and blades, storage tank, etc. 3-D modeling process was used to draft the working drawing of an organic waste crusher. 3-D designing is very useful for providing accuracy. Mechanical design of designed crusher was determined. The working drawings of designed crusher are also presented. The garbage crushed with the designed crusher was ready for composting.

I. INTRODUCTION

A crusher is a machine designed to reduce the large size material into a small particle. Crusher may be used to reduce the size, or change the form, of waste material so that they can be more easily disposed of or recycled, or to reduce the size of solid mix of raw materials, so that pieces of different composition can be differentiated. Crushing is the process of transferring a force amplified by mechanical advantage through a material made of molecules that bound together more strongly, and resist deformation more, than those in the material being crushed do. Crushing devices hold material between two parallel or tangent solid surfaces, and apply sufficient force to bring the surfaces together to generate enough energy within the material being crushed so that its molecules separate from (fracturing), or change alignment in relation to each other.

Further from the type of roller crusher we had selected a Double Roller Crusher. In the Double roller crusher, there are two shafts mounted parallel to each other. The crusher blades & spacers are mounted on the shaft. A key is used to hold both the Shaft & the Crusher blades together. The crusher blades mounted on both the shaft are in opposite direction to each other. So that any material placed in the material will be crushed by this crusher blades which is mounted on shaft & rotates by the prime mover. Both the shaft are connected using a External Gears, by this meshing of this gears the both shaft will rotate in opposite direction. By this principle of the roller crusher, the reduction of the material into a smaller particle will be achieved. We had used this roller crusher for purpose to crush the garbage. The big lumps of the garbage product will be crushed into smaller particles by the roller crusher.

II. LITERATURE SURVEY

A.O. Coaker, C.G., M.K.C. Sridhar, C.J. Donnett (2015) studied the current institutional solid waste management in a Nigerian private institution of higher learning. Using key informant as interview and personal field observations, the waste generation rate, pattern and characterization was made. It was concluded that if all the organic waste streams from the kitchens, canteens and animal house are utilized for the bioenergy and organic fertilizer and non-biodegradables can be sold in the secondary market and considerable amount of wealth can be recovered.

Rajamanikam, G. Poyyamoli (2014) discussed the importance of waste stream analysis with special reference to the domestic waste to design and develop sustainable solid waste management systems in the higher education institutions (HEIs) through a study conducted at staff quarters of Anna Engineering College (PEC). Solid waste was

segregated into compostable(organic), dry and special wastes. The results showed that the average household solid waste was 1.76 kg/day. The composition of solid waste was found. It was also found that there was a considerable portion of recyclables. Based on these findings programs and policies for improving source segregation, storage of recyclables, collection and transportation and safe disposal methods to facilitate increased recovery rate towards forming an inclusive sustainable waste.

III. PROPOSED METHODOLOGY

Working of the Crusher for the disposal of the garbage is as follows:

A Garbage Disposition is the Major issue in all World to overcome this problem the garbage crusher can used. First of all, the garbage or waste will be feeded into the hopper which is located just above the Crusher. A magnetic separator is fitted in the hopper which will separates metal particles as the garbage is feeded into the hopper. The Crusher is placed below the hopper and will crushes the feeded garbage. The Crusher will crush the big and uneven particles in the garbage to the smaller or powdered form. The rotational motion of the electric motor is used to rotate the blades of the Crusher. This small particle of garbage is then stored or collected in the garbage collector tank and then further dump into the Dumping Ground.

The space required in the vehicle is also reduced and easy to dispose and also takes less time period.

IV. ADVANTAGES

- Helps in proper Disposal of the Garbage.
- Space required for Disposal is Less.
- Soil Erosion will not Occur.
- Increased Fertility of the Soil.
- Crushed particles will be disposed properly without harming the environment.
- Unskilled workers can also operate the unit.

V. APPLICATION

For those who aren't in a position to compost, in-sink garbage disposals allow for a clean, fast way to remove food waste (and the inevitable food odours). Disposals work by pulverizing food scraps into small enough particles that they can go through the water waste system-rather than into a landfill. How? Once you drop your apple peels and eggshells into the disposal, turn on the faucet, and flip the switch, that food is knocked backand forth inside the grind chamber. Whether you're looking to get a new garbage disposal, are purchasing one for the first time, or need a refresher on how they work, we have you covered. Here's everything you need to know about the kitchen necessity. (And if you need help installing one yourself, we have a step-by-step guide that'll take you through the process.)

VI. FUTURE SCOPE

- Conveyor Belts: It can be used for transferring the crushed waste particles from one place to another. This can be used to reducing the human involvement.
- Sensors: Various types of sensors such as metal sensors, will sense the metal component and gives signal to avoid from any damage.
- Dry & Wet waste Separator: It will help to separate out Dry and Wet Waste from the garbage coming out from household waste.
- Magnetic Separator: It will separate the metal particles from the garbage for preventing damaging of crusher blades.
- Compressors: It will compress the crushed particles for reducing the space and proper disposal.

VII. CONCLUSION

We can conclude that our Garbage crusher is emerging for solid waste disposal, landfilling still remains the most common solution in overall world. The establishment and closure of landfills could pose a potential hazard to ground

water, due to leachate seepage, and air quality due to gases released. Unless the proper maintenance and managements is sustained for a fairly long time, up to 30 years public health may be compromised as a result. Such a management is costly and potentially dangerous if faulty.

Thus, a safer and more sustainable approach of Garbage crusher may be minimizing the number of landfills constructed and ensuring their longevity so as not to continue taking viable land for waste disposal. It is therefore critical to divert waste from landfills through reduction and recycling. Thus, it seems that our Garbage crusher is significant for the awareness of importance of recycling in all over the world, however open or illegal dumping and burning of unacceptable waste has been listed by several solid waste professionals in the various areas of the world. These experts are in consensus that landfilling waste is the most economical disposal method and they also agree that more recycling and resource reduction should be attained to reduce the continuous need for landfills.

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