

FABRICATION OF ORGANIC WASTAGE CUTTER AND SPRAYER

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Abstract - In this article we propose to identify and analyze the concepts and strategies for waste recycling. The European Union's objectives is to reduce their negative impact on the environment and human health, and the natural resources. Currently, the waste is an existential issue in Romania, which is why you must identify economic solutions. In developing countries, reducing the amount of waste is one of the major challenges that must be solved to improve living conditions. Through the application of management in waste recycling, may contribute to urban development, but we must keep into account that waste management involves considerable costs. Finally, we specify that in order to adopt management strategies in the field of waste recycling are necessary debates and discussions nationally and internationally. Implementing an environmental management project should "flow" naturally from a series of prior fundamentals. In the situation that the arguments in favor of execution an environmental project are not sustainable, there is a risk of failure and, as such, the smartest decision would be to stop using it.

1. INTRODUCTION

An organic fertilizer is a plant fertilizer that is derived from organic sources. Organic fertilizers can range from organic compost to cow manure, but they must be derived from all-organic sources. Chicken droppings from an organic farm would be considered an organic fertilizer.

As organic material is used up, the soil structure deteriorates; it becomes harder and less able to hold water and nutrients. Organic fertilizers differ from chemical fertilizers in that they feed your plants while building a healthy soil. They are considered the more environmentally friendly option.

2. PROBLEM IDENTIFICATION

1. Fertilizers as shown in contain minerals such as nitrogen, potassium and phosphorus, which help plants to grow.

2. Use of mineral or organic fertilizers in agriculture increases inputs of nutrients to soils, and the form in which the nutrients are applied and their fate in the soil-plant system

3. Too many nutrients in water can cause algae to grow, which uses up the oxygen in the water.

2. WORKING PRINCIPLE

Our project consist of hopper, rotating plate, AC motor, chain drive, sprocket and gear arrangement. The sprayer cutter is placed inside the bottom of hopper and it is fixed by using the bearings. A hopper contains the small openings in the bottom for spraying the fertilizer. The sprocket is fixed in the both ends of driving and driven shaft (cutter shaft). The driving shaft contains the gear arrangement, which is coupled with the motor and chain drive is used to transmit the power from driving to drive shaft.

When the motor is rotated the power transmits to the cutter shaft. Due to this the cutter rotates and sprays down the agriculture wastage into the ground. Here worm gear is used for uniform spraying and also attain the high torque.

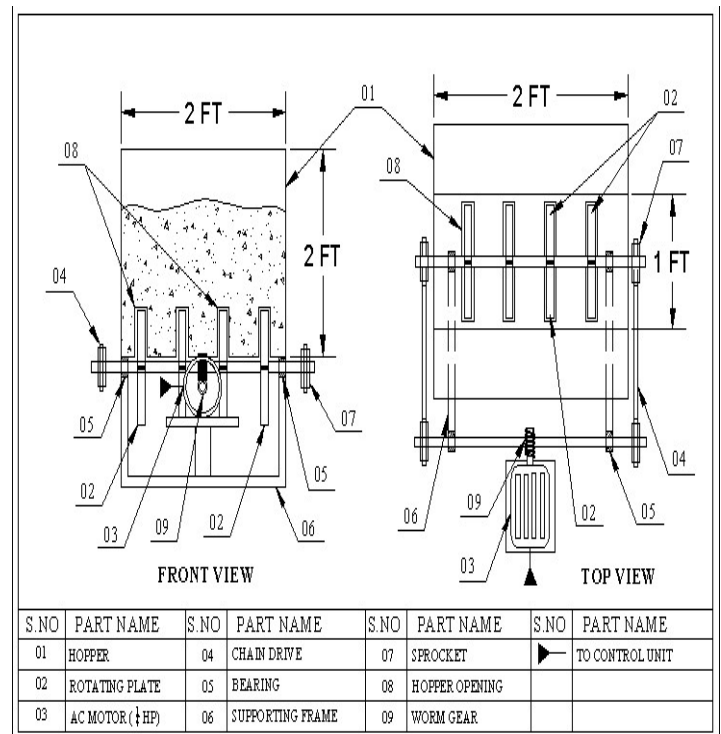


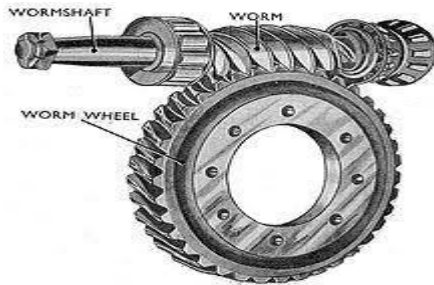
Fig : Conceptual Design

2.1. Gear

A worm drive is a gear arrangement in which a worm (which is a gear in the form of a screw) meshes with a worm gear (which is similar in appearance to a spur gear). The

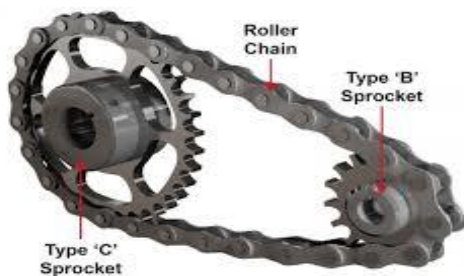
two elements are also called the worm screw and worm wheel. The terminology is often confused by imprecise use of the term worm gear to refer to the worm, the worm gear, or the worm drive as a unit.

Like other gear arrangements, a worm drive can reduce rotational speed or transmit higher torque. A worm is an example of a screw, one of the six simple machines. One of the major advantages of worm gear drive units are that they can transfer motion in 90 degrees.



2.2. Chain drive

Chain drive is a way of transmitting mechanical power from one place to another. It is often used to convey power to the wheels of a vehicle, particularly bicycles and motorcycles. It is also used in a wide variety of machines besides vehicles. Most often, the power is conveyed by a roller chain, known as the drive chain or transmission chain passing over a sprocket gear, with the teeth of the gear meshing with the holes in the links of the chain. The gear is turned, and this pulls the chain putting mechanical force into the system. Sometimes the power is output by simply rotating the chain, which can be used to lift or drag objects. In other situations, a second gear is placed and the power is recovered by attaching shafts or hubs to this gear. Though drive chains are often simple oval loops, they can also go around corners by placing more than two gears along the chain; gears that do not put power into the system or transmit it out are generally known as idler-wheels. By varying the diameter of the input and output gears with respect to each other, the gear ratio can be altered. For example, when the bicycle pedals' gear rotate once, it causes the gear that drives the wheels to rotate more than one revolution.



Advantages of chain over belt :

- As no slip takes place during chain drive, hence perfect velocity ratio is obtained.
- Since the chains are made of metal, therefore they occupy less space in width than a belt or rope drive.
- It has the ability to transmit motion to several shafts by one chain only

2.3. Sprocket

“Roller chain or bush roller chain” is the type of chain drive most commonly used for transmission of mechanical motorcycles, and bicycles. It consists of a series of short cylindrical rollers held together by side links. It is driven by a toothed wheel called a sprocket. It is a simple, reliable, and efficient means of power transmission.

The "bushing less" roller chain is similar in operation though not in construction; instead of separate bushings or sleeves holding the inner plates together, the plate has a tube stamped into it protruding from the hole which serves the same purpose. This has the advantage of removing one step in assembly of the chain.



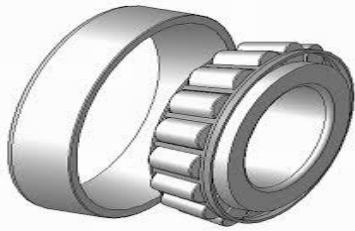
The roller chain design reduces friction compared to simpler designs, resulting in higher efficiency and less wear. The original power transmission chain varieties lacked rollers and bushings, with both the inner and outer plates held by pins which directly contacted the sprocket teeth; however this configuration exhibited extremely rapid wear of both the sprocket teeth, and the plates where they pivoted on the pins.

There is even very low friction, as long as the chain is sufficiently lubricated. Continuous, clean, lubrication of roller chains is of primary importance for efficient operation as well as correct tensioning. Chains operating at high speeds comparable to those on motorcycles should be used in conjunction with an oil bath.

2.4. Bearing

A bearing is a machine element that constrains relative motion to only the desired motion, and

reduces friction between moving parts. The design of the bearing may, for example, provide for free linear movement of the moving part or for free rotation around a fixed axis or, it may prevent a motion by controlling the vectors of normal forces that bear on the moving parts. Most bearings facilitate the desired motion by minimizing friction. Bearings are classified broadly according to the type of operation, the motions allowed, or to the directions of the loads (forces) applied to the parts.



2.5. A.C Motor

An AC motor is an electric motor driven by an alternating current (AC). The AC motor commonly consists of two basic parts, an outside stator having coils supplied with alternating current to produce a rotating magnetic field, and an inside rotor attached to the output shaft producing a second rotating magnetic field. The rotor magnetic field may be produced by permanent magnets, reluctance saliency, or DC or AC electrical windings.

Less common, AC linear motors operate on similar principles as rotating motors but have their stationary and moving parts arranged in a straight line configuration, producing linear motion instead of rotation.

2.6. Supporting frame

A frame is often a structural system that supports other components of a physical construction and/or steel frame that limits the construction's extent.



3. CONCLUSION

The production of animal feed provides one of the most logical routes for utilizing a substantial portion of the

enormous potential material represented by agricultural residues. The approach has been part of traditional agriculture for centuries. A wealth of information has accumulated in the past 20 years indicating the feasibility of the processes and identifying their pitfalls. The technologies involved may sometimes be large-scale and require organization, but are not out of reach for rural communities. The animal wastes (cow, sheep, pig, rabbit and poultry) and vegetable compost can be used to produce the earthworm. But the growth and produce depend on the biochemical quality of the substrates and the availability and facility for using a nutritive element.

4. REFERENCES

1. Bremner JM, Mulvaney RG (1982) Nitrogen total. In: Miller RH, Keeney DR, Page AL, Miller RH, Keeney DR (eds) "Method of soil analysis". American Society of Agronomy.
2. Steven JF, Thai's W, Johan S (2009) "Earthworm populations in relation to soil organic matter dynamics and management" in California tomato cropping systems.
3. Nelson DW, Sommers LE (1982) "Total organic carbon and organic matter". In: Page AL, Miller RH, Keeney DR (eds) Method of Soil Analysis.