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A REVIEW PAPER ON POULTRY PLOWER

Shaikh Naeem¹, SayedAzhar², Borhade Vishal³, Waghmare Mayur⁴ and Mr.Dhore S.S.⁵

^{1,2,3,4}Student mechanical department (2nd shift) Jaihind Polytechnic kuran.

⁵Lecturer mechanical department (2nd shift) Jaihind Polytechnic kuran.

ABSTRACT

Poultry technology is the process of applying the technology daily life and applying that to poultry sector, which improves the output of poultry industries and also develop mechanical machine to help the poultry field which reduces the amount and time of work spent on the folk .Hence in this work project we decided to design a better mechanical machine which is available at poultry farmers at a cheaper rate and which can steer the litter and remove the trap gases from litter at same time. The success of poultry farms indirectly depends on timely stirring of litter with minimizing the requirement of labor. Our machine deals with stirring of litter with the help of rotary rotavator, driving mechanism provided with electric motor having less noise which is prime consideration while designing of mechanism.

Keywords- Poultry Plower, Rotavator.

I. INTRODUCTION

An odour impact from Boiler farms, caked litter is a major issue facing the Indian and several other country meat Chicken industries. If litter is not kept at an acceptable moisture level, very high bacterial loads and the unsanitary growing conditions may result to produce the bad smell (including ammonia), insect problems (particularly flies), solid feathers. This can result in quality issues when the birds reared under such bad condition reach the processing plant. In a well-managed broiler house, litter moisture normally average between 25 to 35 %. Litter that is managed correctly with the moisture content is kept within the acceptable range can be reused if no disease or other production problem occurs. On the other hand, the caked litter must be removed between flocks and replaced with new litter.

At present, there are three categories which deal the treatment of the odour emissions, cake formation in broiler sheds:

1. Using dispersion to dilute the odour before reaching sensitive receptors.
2. Caked litter replaced with new litter.
3. Prevention of cakes formation of litter.

Poultry plower can be moved from caked litter so as to stir and to remove gases trapped in litter with rotational speed of 180 rpm with it's sufficient to stir the caked litter with sharp blades. The Poultry Plower machine pulverizes hard caked litter and allows moisture to evaporate also releasing ammonia, it dries and levels the bedding. When it does become time for a shed clean out the treated litter have value as a valuable fertilizer and effective soil builder. The rotavator of Poultry Plower is propelled by electric motors which get electric supply

II. COMPONENTS AND THEIR FUNCTIONING

2.1. Rotavator:

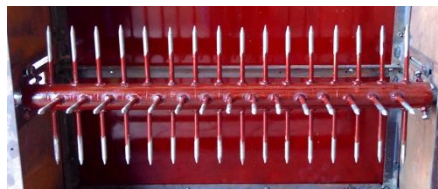


Fig.1. Rotavator

A rotavator is any of several types of several implement used for secondary tillage. One sense of the name refers to frames with shanks that pierce the soil as they are drag through it linearly. Another sense refers to the machines that use rotary motion of disks or teeth to accomplish a similar result. The rotary rotor is a principal example.

The rotavator consist of MS solid polish bar on which there is a hollow shaft of MS. The polish bar are cut in 13mm in length and welded on the hollow shaft. This polish bars are used as a teeth of a rotavator which plows the litter and helps to remove the gases. The rotavator is driven with the help of the motor connected to it through the belt pulley.

2.2. Shaft:-

A shaft is rotating machine element which is used to transmit the power from one place to another. The power is delivered to the shaft by some tangential force and the resultant torque set up within the shaft gives a power to various machines linked up to the shaft. In order to transfer power from one shaft to another, the various members such as pulley, gears etc., are mounted on it. These members along with forces exerted on them causes the shaft to bending. In other words we may say that a shaft is used to transmit the torque and bending moment. The various members are mounted on the shaft by means of keys or splines. The shaft is usually cylindrical, sometimes it is square or cross shaped in section. They are solid in cross section but sometimes, the hollow shafts are also used.

2.3. Belt Drive:-

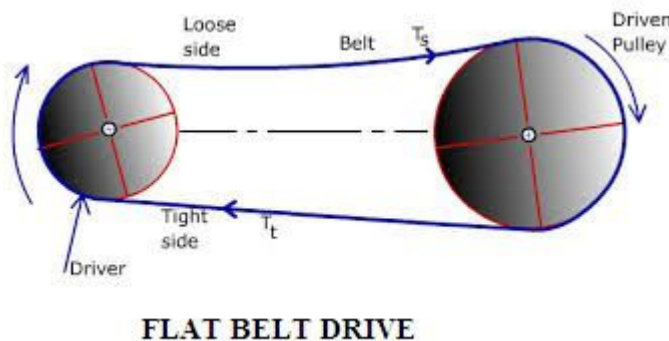


Fig.2. Open belt derive

Power transmission devices are commonly used to transmission of power from one shaft to another. Belts, chains are gears are used for this purpose. When the distance between the shafts is large, belts and ropes are used and for intermediate distance chains can be used. The distance can be maximum for belt drive but this should not be more than 10 meters for good results. Gear drive is used for short distances.

2.4. Bearings:-

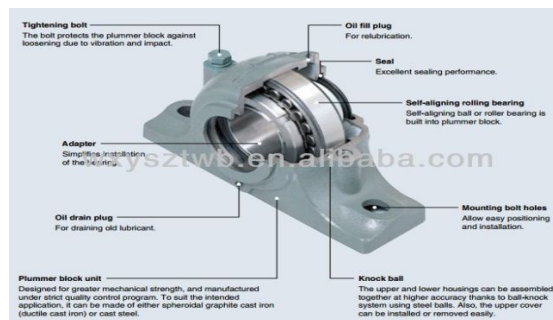


Fig.3. Pedestal bearing

Bearing is mechanical element which locates two machines parts relative to each other and permits the relative motion between them.

2.5. Wheels:-



Fig.4.Rubber wheel

A wheel is a circular component using basically for the easy transmission of heavy commercial loads. There are different shapes and sizes of the wheel as on requirement of their function. Basically the rubber wheel is use for generators, and any other heavy load transporting from one place to another. Rubber tyres have a better grip and also low cost during the manufacturing than any other wheels. Rubber wheels also able to the carry the heavy loads.

2.6. Electric Motor:-



Fig. 5 Electric spindle motor

An electric motor is an electrical device that converts electrical energy into mechanical working energy. The reverse of this function be the conversion of mechanical working energy into electrical energy and is done by an electric generator. In this the spindle motor is basically use by the belt drives by using pulley .basically this motors is selected by their speed of rotation of the spindle and their internal motor torque. These spindle motors are used for this increase or decrease the speed of output functions.

III. CONSTRUCTION AND WORKING

Construction:-

Our machine consists of four wheel two front and two rears. The wheels are connected to each other through the axles. Rotavator is mounted between the front and rear wheels. This consists of blade which rotates with the help of shaft provided with pulley. The whole equipment is moved with the help of handles provided on it.

The main power source in machine is AC power supply. This is given to the motor which is of 1 HP with 1440 rpm. The motor consists of pulley of 2 inch from which the drive is provided to the rotavator shaft with the help of belt drive. The rotavator shaft consists of pulley of 6 inch.

Working:-

The AC power supply is directly given to the motor. The motor is make adjustable as it is fixed with the help of nut and bots on the C – channel on which slotting is done. It is done to adjust the distance between the rotavator shaft and the motor. The rotavator is mounted on the two plates from both the sides on which also slotting are done to maintain the distance between the rotavator blades and the floor. Rotavator is drive with the help of belt drive. The equipment is moved forward with the help of handle.

Above overall description is how the power is provided to the motor and finally to the rotavator with the help of pulley arrangements. Also, the slotting arrangement is mentioned which is an important part to safely complete the operation without any accidents. The operation is to stir the litter properly. This operation is carried out with the help of blades of 5 inch mounted on the rotavator shaft. Due to this stir of litter the harmful gases trapped in this litter is removed. The litter which is stir can also use as a fertilizer in farms. This equipment reduces the human efforts and a much valuable time.

IV. ADVANTAGES

- i. This machine is simple in construction and can be handled by any one or unskilled labor also.
- ii. The rotavator of machine gives perfect stirring which increases the growth rate of birds and reduce the mortality rate of birds.
- iii. The area of about 10000 ft² is stirred within the time of 30 min to 60 min which saves three hour of labor daily and increases the productivity and output of poultry.
- iv. Stirring removes the gases trapped in the caked litter and also removes the moisture content trapped in litter which also increases the growth rate of folk.
- v. Noise level in poultry farm is maintained due to use of electric motor which is prime consideration in poultry farms. Due to use of electric motor there is no pollution around the poultry and this machine becomes eco-friendly.

V. CONCLUSION

This project is made to stir the litter in poultry farms. We chose this project because there is not any machine available in a market to stir the litter present in poultry farm. Manual method is used to stir the litter. It can be adopted because of the advantage of time saving and reduction of human effort. Our designed mechanical machine is advantages in the following ways:

- i. Its cost is less and can be manufacture in various sizes.
- ii. It enhances the output of poultry and it can affordable for small scale and large scale business of its cost.
- iii. Due to adjustable position of rotavator it can be set at required height from floor.

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