

Semi-Automatic Poultry Farm Feeding Machine

Eldhose Kurian¹, Jerin Joshy², Josin Jose³, Rohith Augustine⁴

^{2,3,4}Student, Department of Mechanical Engineering, Viswajyothi College of Engineering and Technology Vazhakulam, Kerala.

¹Assistant Professor, Department of Mechanical Engineering, Viswajyothi College of Engineering and Technology Vazhakulam, Kerala.

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ABSTRACT: The main aim of this work is to build an efficient way of feed handling machine in a poultry farm with a low cost which is the screw conveyor. A screw conveyor is a mechanism that uses a rotating helical screw blade usually within a tube, to move liquid or granular materials. They are used in many bulk handling industries. Screw conveyors in modern industry are often used horizontally or at a slight incline as an efficient way to move semi-solid materials, including food waste, wood chips, aggregates, cereal grains, animal feed, boiler ash, meat and bone meal, municipal solid waste, and many others. There are many readily available screw conveyors in the market. But these are for large material handling purposes and they are not suitable for small scale industries. Also the cost of the machines is more and hence they are not affordable by the small scale industries and small workshops. Hence this project serves as an efficient way of material handling machines which is of low cost. The components that are made used in this project are easily available in the market and hence the cost of the machine is less.

KEYWORDS: Screw Conveyor, Testing, Poultry Farm, Feeding Mechanism

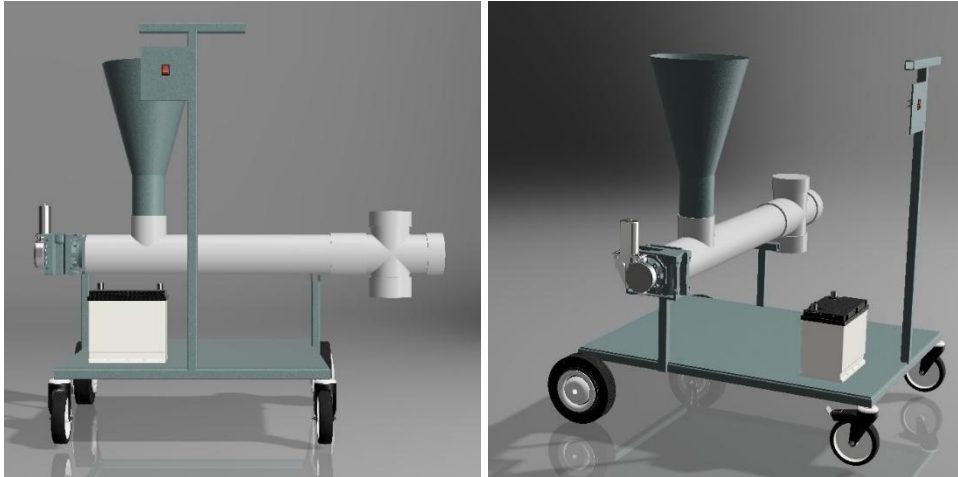
I. INTRODUCTION

Poultry farming is a farming system in which birds such as turkeys, domestic chicken, quails, geese and ducks are raised for the production of meat and eggs. Feeding in poultry farming is manually driven in tropic countries; the cost of production is high and generates low profit. The problems that the poultry farmers are facing in most cases reduce the level of productivity of their farms. Poultry rising is one of the most progressive businesses of the country today, the poultry industry in Tanzania is divided into traditional poultry production and commercial poultry production. The traditional poultry sector is the largest contributing of about 70 percent of the flock and supplying 100 percent of poultry meat and

eggs consumed in rural and 20 percent in urban areas.

Nowadays, the chicken poultry industry is an important industry for sustainable food supply in our country. Over the last 20 years, due largely to genetic selection but partially to improvements in nutrition, there has been a substantial decrease in the time it takes to grow a broiler to market weight. Much of this improvement is attributed to increased food intake. The invention of an improved mechanical feeding system led to a dramatic reduction in stress due to the elimination of manual feed sorting and relocation of birds by weight, more efficient feeding, less disturbance by staff, the elimination of meal replacement due to better weight control monitoring and increased productivity due to less handling. All of these factors contribute to the realization of the birds' genetic capabilities. There is also increased efficiency for the producer as no time is required to correct uneven bird weights and staff will have more time to devote to animal husbandry. There exists many automated equipment to feed birds in large scale poultries. But it is difficult or not possible to include large scale equipment in small scale poultries. People were used to the conventional method of feeding chickens which is by filling containers with grains and foods manually. The main problem encountered by using this method is, the need to continuously provide the food, be alert and conscious of the food remaining in cages by the breeders. The sufficient amount of the food provided. Also cannot be determined clearly There is much waste and is non - economical. Breeders also find that it is difficult to manage their business effectively because they need to be around the cages every now and then to monitor the poultry. There exists many automated equipment to feed birds in large scale poultries. But it is difficult or not possible to include large scale equipment in small scale poultries. So the need for a semi-automatic feeding machine arises here.

II. COMPONENTS & DESCRIPTION



A. FRAME



The frame is constructed using mild steel hollow square pipes welded together. All the mountings on the machines are fitted to a steel frame. Holes

required to fit other parts of the machine are drilled according to the design.

B. HOPPER



The hopper is made up of mild steel material. The such a way that the feed will fall on to the auger below by gravity. The hopper is of trapezoidal

shape of the hopper is designed in shape to serve as an outlet of the feed. The hopper is also equipped with a feed cover.

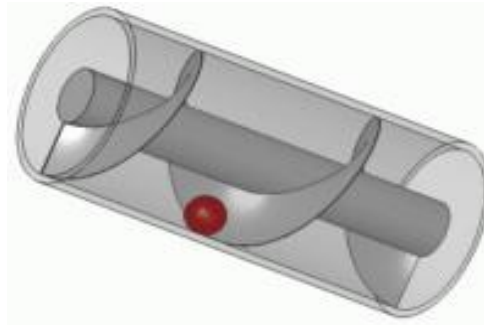
C. MOTOR



An electric motor is a machine which converts electrical energy to mechanical energy. Its action is based on a principle that when a current carrying conductor is placed in a magnetic field, it

experiences a magnetic force whose direction is given by Fleming's left hand rule. When a motor is in operation it produces torque. This torque can produce mechanical rotation.

D. SCREW CONVEYOR



Helix screw is the screw element in the screw conveyor. A screw is a mechanism that converts rotational motion to linear motion and torque to a linear force. They are used in bulk handling industries.

The rate of volume transfer is proportional to the rotation rate of the shaft. They consist of a trough containing a spiral blade coiled around the shaft.

E.C ASTORWHEELS

A caster is an undriven, single, double, or compound wheel that is designed to be attached to the bottom of a larger object to enable that object to be moved. They are available in various sizes, and are commonly made of rubber, plastic, nylon, aluminum, or stainless steel. Casters are used in numerous applications, including shopping carts, office chairs, hospital beds, and material handling

equipment. High capacity, heavy duty casters are used in many industrial applications, such as platform trucks, carts, assemblies, and two lines in plants. Generally, casters operate well on smooth and flat surfaces. Casters may be fixed to roll along a straight-line path, or mounted on a pivot or pintle such that the wheel will automatically align itself to the direction of travel. The one that's employed for ease of movement and portability is swivel castor and a swivel caster incorporates a wheel mounted to a fork, but an additional swivel joint above the fork allows the fork to freely rotate about 360°, thus enabling the wheel to roll in any direction. Additionally, a swivel caster typically must include a small amount of offset distance between the center axis of the vertical shaft and the center axis of the caster wheel.

When the caster is moved and the wheel is not facing the correct direction, the offset will cause the wheel assembly to rotate around the axis of the vertical shaft to follow behind the direction

of movement. If there is no offset, the wheel will not rotate if not facing the correct direction, either preventing motion or dragging across the ground.



III. EXPERIMENTATION

The machine mainly consists of a frame on which other components are mounted. The frame is made up of $\frac{3}{4}$ inch mild steel material. Other components used for fabrication includes a hopper, screw conveyor, dc motor, castor wheels, battery and switch. The hopper is made up of aluminium sheet, which is made in the circular truncated cone shape. Screw conveyor is the major component of the machine which is made up of PVC pipes. A DC motor is used for rotating the screw conveyor. A 12V DC Motor having 36rpm is used. The shaft of the motor and conveyor is coupled by using an iron piece. So that when the motor rotates, the conveyor also gets rotated.

The food to be transmitted is fed through the hopper. This feeding can be done manually or may be automated whereas the automated feeding requires some special attachments. However, in our project, we prefer manual feeding. The food is transported by the rotation of the screw conveyor which moves the material in the forward direction in the tube from the feed point (hopper) to the discharge point (outlet).

Screw conveyor is driven by a gear motor.

The motor is switched on such that the power from the motor is transmitted to the screw conveyor. Screw conveyor consists of a number of helix blades which are used for transmitting the material in forward direction. As the blades or the helix screw rotates, the food is advanced by one pitch length such that the material comes out of the outlet.

IV. CONCLUSION

This project work has provided us an excellent opportunity and experience, to use our

limited knowledge. We gained a lot of practical knowledge regarding, planning, purchasing, assembling and machining while doing this project work. We feel that the project work is a good solution to bridge the gates between the institution and the industries. The “fabrication of screw conveyor” system is working with satisfactory conditions. We are able to understand the difficulties in maintaining the tolerances and also the quality. We have done to our ability and skill making maximum use of available facilities. Thus we have developed a “screw conveyor” which helps to achieve a low cost material handling system. semi solid granules can be transmitted with the help of this screw conveyor. By using more techniques, they can be modified and developed according to the applications.

SOME OF THE ADVANTAGES FROM THE ABOVE RESULTS

- Human labor is reduced
- No need of skilled operators to operate this system
- Easy construction

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