



Review on: Grass Cutter

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ABSTRACT

Animal feed is prepared using traditional feed cutting machines, which operate in an unfriendly manner. In the animal production system, cutting animal feed is regarded as a labor-intensive processing step. A chaff cutter is a hay or straw cutting device that chops feed for livestock or raw materials for agricultural enterprises in a regular manner. In most rural regions, the crushing of farm food for easy storage and consumption is still a challenge. To prepare feed for animals, the conventional feed cutting machines are intensively used which do not have friendly operation. Chopping of animal feed is considered as a labour intensive processing operation in animal production system.

In order to feed horses and cattle straw or hay that has been cut into small pieces and combined with other forage, a chaff cutter is used. This facilitates prohibits animals from rejecting any food during an animal's digestion one of their meals. Chaff cutters have changed from simple devices to machines used in commerce that are standardised and can be speeds and can create different chaff cuts of lengths with based on the sort of animal preferred. The most recent chaff cutters are mobile, tractor-driven models. Where chaff cutters can be used in the field and loaded trolleys (if required) (if required).

One of the key concerns of governments, scientists, and businesspeople around the world is the search for energy alternatives incorporating locally accessible and renewable resources. The design and construction of the creation of a grass-grinding device to make it easier to use biomass for sustainable energy Nigeria. Because it is readily available, the work also focuses on grinding elephant grass for the creation of electricity. alternatives to fuel wood for the generation of energy Elephant grass was cooked in an oven to 250 degrees. C, to guarantee dryness Local suppliers provided the materials for the machine's fabrication. One horsepower motor, medium carbon steel shaft, and a 255mm by 255mm mild steel hopper at the top, a mild steel bearing, and an SPA rubber melt.

1. INTRODUCTION

A mechanical tool called a "chaff cutter" is used to mechanically break up straw or hay into small pieces so that it can be mixed with other forage grass and fed to horses and cattle. This enhances the prohibits animals from rejecting any food during an animal's digestion one of their meals. Chaff cutters have evolved throughout time. Simple machines to industry-standard machines that may be driven at different speeds to accomplish different sizes of chaff according on the sort of animal preferred. New Portable tractor- driven chaff cutters are one type of chaff cutter. cutters used for chaff cutting in the field, and loaded into carts. The chaff cutter equipment we have today is less compact, lacking in safety, and moving slowly in some cases tiny machines.

The performance of straw chopping machines has been the subject of numerous studies on both design and evaluation. These investigations encompass a wide range of subjects, such as the design of the chopping machine, the manner of cutting, the amount of power needed for cutting, and the rotational speed of cutting. bar, the feed rate, the size of the cutting, and the depth and the cut. A straw-chopping device was created. to slice mushrooms, see Lal et al. (2018). most significant The construction of the machine was the study's main focus, and the study included intricate schematics of the chopping machine. Ghaly and others (2013) conducted a second study to assess a straw-chopping machine's performance taking into account rotating speed, feed rate, depth of cut, length farmers rely on crop residues for their feed supply. Stovers are dry stalks from mature maize or guinea corn, without grains. Cereal stovers are popular for feeding livestock. In the semi-arid areas guinea corn and maize stovers are vital part of ruminant animal feeds during the dry season which help to sustain feed supply and survival (Sibanda, 1986). However, cereal stovers are bulky, fibrous and relatively poor in nutritive value . Tropical livestock farmers frequently struggle to provide a balanced food for their animals during the dry season when agricultural wastes are scarce and of poor quality. It is a severe problem to meet the nutritional requirements of animals during the dry season since insufficient feeding of livestock lowers their productivity in terms of growth and milk production, which eventually reduces the farmer's profit. Animals who are underfed are also less nimble, more susceptible to illness, and less fertile. Natural grassland is uncommon in metropolitan areas, thus farmers must feed their animals by-products of the agricultural industry, planted pastures, and crop leftovers. Due to the seasonal availability of crop leftovers and fodders in metropolitan areas, Silva et al. (2008) reported that Stowers' usage in the diets of useful animals is constrained by the low quality of its crude protein and the absence of other essential elements. Dzwowela (1987) claimed that crop leftovers might be backed up by bran and millings, cakes made from seeds, legumes, and feed from trees with several uses.

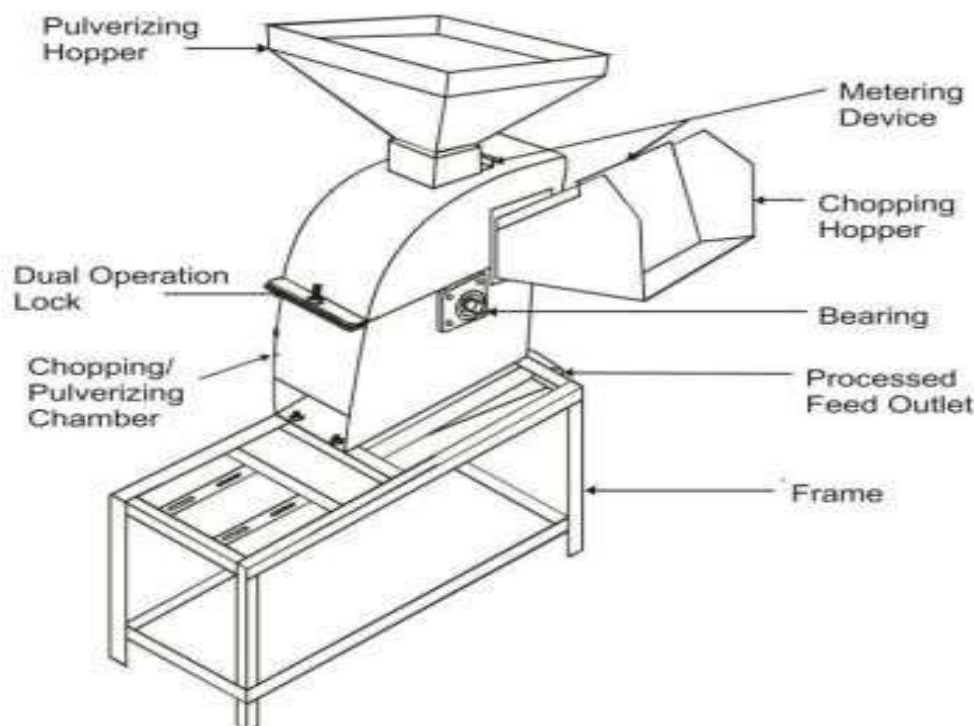
According to Osafo et al. (1993), chopped sheep were involved. Sorghum stover and mineral lick were blended. enough to support rams' weight between the 15 years and 20 months old According to a claim, sliced Sorghum stover that is rich in minerals and No other dietary supplement was a long-term plan. for keeping weight up in sheep that are getting near to maturity. It is possible to manage crop residue by using processing methods to create balanced feed made of straw for The livestock's capacity to absorb the nutrients in the feeds is further improved by the size reduction of the feed ingredients. The size and lack of nutrients in the Crop wastes must be reduced in size in order to combined with other feed components to produce balanced livestock feedstock Consequently, the goal of design, manufacture, and investigation of the the effectiveness of a combined feed cutting and Pulverizer device for crop residue processing easy production of pellets from them. The appropriate consideration of fabrication materials to sustain the various loads from machine operation. The feed materials' angle of repose were also taken into account when constructing the hoppers. Similarly, the positioning of the chopping knives, crushing hammers, and screen openings to sizes of the desired materials were taken into account. in chronological order In order to create the hammers for the crushing chamber, Khurmi and Gupta's (2005) equation (1) was used.

A mechanical tool called a straw chopper is used to consistently slice fodder into tiny bits so that it can be combined with other types of grass and fed to cattle. The goal of this project was to create a machine for dairy farmers to use to slice animal feed that was within their price range. These machine parts' drawings were constructed in a nearby workshop, and the design work was done with CAD software. after its development On a farm, performance tests for machines were conducted.

2. MATERIAL AND METHOD

The feed chopper/pulverizer for cattle was created and constructed (figure 1). It includes a hopper for cutting, measuring tool, chopping tool, and hopper for grinding the processed feed, the crushing chamber, and the screen outlet. The shapes of the two hoppers were trapezoidal. They were 30° elevated. over the horizontal axis to help the unrestricted movement of feed (stovers and grasses) in the device. The crushing/chopping chamber consisting of a sharp cutting portion steel blades with edges, rectangular, for cutting feed materials a pulverizer that has been cut into the desired lengths (sizes) steel hammers set on a shaft that swings. The hammers continually strike and damage the materials until they are sufficiently tiny in the pulverizer. pass through the screen's openings.

The conceptual design is based on its mode of operation, material choice, belt size, shaft diameter, throughput capacity, dynamic load on bearing, power of the electric motor needed to turn the shaft for efficient grinding using the disc plate, diameter of the screw shaft, and other factors. the electric motor's output and the dynamic load the screw shaft places on the bearing necessary to extrude the resulting briquette from the die and compact the crushed feedstock, Cand the machine's size. Figure depicts the conceptual diagram for a grass grinder. The grass is supplied with the hopper and into the crushing chamber to reduce the material's size. Crusher is constructed of discs. electric motor with a direct linked drive powers a plate.



3. MODIFICATION ON GRASS CUTTER

A. FABRICATION OF GRASS CUTTER.

A DC motor that is controlled is utilised to change the direction of the grasscutter as needed, and the battery may be charged using both a solar panel and an external power source. To extend the life of the battery, overcharging and discharge are prevented using the most up-to-date regulator. Solar energy is the ideal substitute for electricity because as industrialization progresses, more electricity is needed for various industrial applications and electrical devices. These parts are used to construct a lawn cutter: solar panel, battery, DC motor, solar charger. There is less maintenance because they employed fewer moving parts. The user of this lawn cutter will benefit from considerably more physical activity, and it will readily.

B. MODIFICATION OF GRASS CUTTING MACHINE.

Due to spiral blades boosting cutting efficiency, they prepared a manually operated grass cutter with spiral rollerblades for this paper. Reel cutter is a component attached to a lawn cutter for regulating the height. This lawn cutter can cut a variety of grass varieties while also cutting the grass uniformly. The battery features both AC charging and the ability to charge while in use. The grass cutter is covered with a cutting box to collect the chopped grass, which is then spread outside the yard. It is both lightweight and small in size.

C. GRASS CUTTER MACHINE.

The author created a solar grass-cutting machine to eliminate human labour and use non-renewable energy sources on the surface of the world allow energy to be harvested from the sun, stored in batteries, and then used as needed. All of these activities are being carried out in accordance with the schedule thanks to careful oversight. Batteries are protected from excessive charge using a specialised process, extending their lifespan. On a smaller scale, it can also be utilised for gardening.

D. ENVIRONMENTAL GRASS CUTTER.

This device includes a battery that charges concurrently with use. There is an alternate source of power through the battery if the weather conditions are not favourable for the solar panel to generate electricity and if the user wishes to utilise the machine at that time. In comparison to a traditional grass cutter, this machine uses less power. Both automatic mode and manual mode completely regulate how the machine moves.

4. CONCLUSION

Because there is a high need for electricity, we decide to use solar energy, which is free to use and renewable. This idea is more appropriate because it offers many additional benefits, such as zero fuel costs, zero emissions, and zero fuel residue. Two blades are arranged, covering a larger area than other machines, and the blade height can be adjusted to meet individual needs. The DC motor is highly efficient while using little electricity. This machine is extremely cost-effective when compared to other high-tech grass cutters, especially for farmers.

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