Automatic Cattle Feeder- A Review

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Abstract

Many people in developing countries still use driven machine for cutting cattle feed and distributing it manually. These machines become less safe to the person while operating and it requires more skilled labor for operating. The main barriers are lack of labor and blockage of grass creates feed interference. Now-a- days efforts have been made by developing countries to promote automation in feeding systems. Various types of feeding machines are available in the market but these technologies operate at a very low efficiency and consume more power and leads to the wastage of feed (crops). A number of different types of AFS are currently used, because of their potential of reducing labour time and workload as well as more flexible working time. Furthermore, farmers focus on the benefits for their animals, where Food and feeding are the important elements for growth and production.

Keywords: Cattle feeder, automation, review.

1. Introduction

Even in this modern era, many people in developing countries still uses the hand driven techniques for cutting cattle feed and distributing it manually. These machines become less safe to the person while operating and it requires more skilled manpower for operating. The main barriers are lack of manpower and blockage of grass creates feed interference. In recent years, an effort has been made to trend towards the automation especially in cattle feeding systems. The proposed work focuses to automatically feed the sorghum at a predetermined time. In a way, it is to control the cattle feeding activity by using a cattle feeder that combined the mechanical system and electrical system to form a device instead of manually feeding. Cattle owners whom are away for a long time will have trouble knowing the situation of the feeding cattle. Thus, the automatic cattle fodder device is very convenient. The device will consist of a gear motor, wiper motor, circular saw blade, conveyor and Microcontroller 8051.The chaff cutter is used to cut the straw or hay into small pieces a to fed the cattle. This improves the animal digestion and prevents animal from rejecting any part of their food. A timer is used to control the number of cutting time at an interval of time. In addition, there is an IR sensor to sense the cattle feed. With this, the user or the owner can be away from home are benefited.

2. Literature Survey

E.H.Cabezas-Garcia et.al this study evaluated the effects of gradual replacement of a mixture of late-cut grass silage (LS) and barley with early-cut grass silage (ES) on milk production, CH4 emissions, and N utilization in Swedish Red cows.

Two grass silages were prepared from the same primary growth of timothy grass sward but harvested 2 wk apart [11.0 and 9.7 mJ of metabolizable energy/kg of dry matter (DM)].

A.N.Brown et.al in dairy farming systems, growing winter crops for forage is frequently limited to annual grasses grown in monoculture. The objectives of this study were to determine how cropping grasses alone or in mixtures with legumes affects the yield, nutritional composition, and in vitro digestibility of fresh and ensiled winter crops and the yield, nutritional composition, and in vitro digestibility of the subsequent summer crops. Experimental plots were planted with 15 different winter crops at three locations in Virginia.

Chang et.al this study verifies chaotic motion of an automotive wiper system, which consists of two blades driven by a DC motor via the two connected four-bar linkages and then elucidates a system for chaotic control. A bifurcation diagram reveals complex nonlinear behaviors over a range of parameter values. Next, the largest Lyapunov exponent is estimated to identify periodic and chaotic motions. Finally, a method for controlling a chaotic automotive wiper system will be proposed.

Pang.Degong et.al this study compared the effects of a grain-based conventional concentrate (GC) and a concentrate based on agro-industrial by-products (BC), fed with grass silage harvested at early (ES) or late (LS) maturity stage, on dairy performance, CH_4 and CO_2 emissions, and metabolic status of dairy cows. Twenty lactating Nordic Red cows averaging 81 in milk and 31.9 kg of milk/d pre-trial were assigned to a replicated 4-× 4 Latin square design. Dietary treatments were in a 2 × 2 factorial arrangement.

Daijie Hea et.al Belt conveyors play an important role in the dry bulk material handling process. Speed control is a promising method of reducing the power consumption of belt conveyors. However, inappropriate transient operations might cause risks like material spillage away from the belt conveyor.

Hongbin Chang et.al base on the development practice of carbide milling cutter used for high speed machining of aluminum alloy, through the empirical analysis of the failure mechanism of milling cutter, and combined with the cutting performance of high strength aluminum alloy and the stress strain characteristics of cutter on high speed condition, the design principle, manufacture and using technology of carbide milling cutter for high speed machining of aluminum alloy are discussed in detail.

Philips.S.Ogun et.al forced structural vibration and cutting tool inaccuracy have been identified to be the primary causes of surface defects in rotary wood planning. This paper presents the development of a control strategy used to compensate for the effects of both vibration and cutting tool inaccuracy on planed wood surface finish. The solution is based on active vibration control and real-time modification of the cutting tool trajectory using an optimal Linear Quadratic Gaussian tracking controller. A small-scale Mechatronics wood planning machine, which has an actively controlled spindle unit, has been designed for practical investigation of the proposed technique.

Baohai et.al generators and chemical engineering compressors include heavy and large centrifugal impellers. To produce these impellers in high- speed machining, a 4½-axis milling machine (or a 4-axis machine plus an indexing table) is often used in the industry, which is more rigid than a 5- axis-milling machine.

Since impeller blades are designed with complex B- spline surfaces and impeller channels spaces vary significantly, it is more efficient to use multiple cutters as large as possible to cut a channel in sections and a blade surface in patches, instead of only using a small cutter to machine a whole blade and a Strangulation of the genitalia by a metallic device is a rare occurrence. However, such cases present a challenge to any healthcare professional because of the difficulty associated with removing the device.

Zhaohuang Zhang et.al predicting the cutter consumption and the exact time to replace the worn-out cutters in tunneling projects constructed with tunnel boring machine (TBM) is always a challenging issue. In this paper, we focus on the analyses of cutter motion in the rock breaking process and trajectory of rock breaking point on the cutter edge in rocks. The analytical expressions of the length of face along which the breaking point moves and the length of spiral trajectory of the maximum penetration point are derived.

Pryhorovska et.al a finite element model of the process of polycrystalline diamond compact (PDC) drill bit cutters cutting rocks was built, and the rock linear and circular cutting processes for different shapes of PDC drill bit cutters were simulated. The following initial data was stated before modeling: spatial form of cutter, cutting speed, cutting depth, rheological model of the processed material, and frictional model. Simulation results show that: there is no essential difference between curricular cutting and linear cutting; all the obtained relations of cutting forces were oscillatory and unevenly for all types of cutters.

Tengku Hanidza et.al purpose of this study is to determine noise exposure among grass cutters. Eighteen grass cutters were monitored for 8 hours each, using the Noise dose meter. The workers were exposed to noise levels.

Wang yanyana et.al an intelligent infrared windscreen wiper based on infrared rain sensor was designed based on the STC12C5616AD. The infrared diode of high luminance is used as the lamp-source to irradiate the windscreen of automobile. The optical signal is received by the infrared receiver and will be changed into voltage. After shaping and filting, the voltage will be sampled and manipulated by the MCU, and then the MCU will send out different duty cycles, which is used to control the intermittence of the motor of windscreen wiper.

V.V.Kuts et.al despite their obvious benefits, profile connections currently are not adequately applied in the domestic engineering industry due to the lack of technology and poor elaboration necessary for their production process and tool support. The work contains suggestions on how to improve the performance for the RK-core processing shafts cutters with radial constructive feed and describes the processing method allowing one to exclude the reciprocating harmonic motion. Despite their obvious benefits, profile connections currently are not adequately applied in the domestic engineering industry due to the lack of technology and poor elaboration necessary for their production process and tool support. The work contains suggestions on how to improve the performance for the RK-core processing shafts cutters with radial constructive feed and describes the processing method allowing one to exclude the reciprocating harmonic motion.

R.M.Khisamutdinov et.al the mathematical relations between the helical surface on the sphere, the form lining, and the process of forming the spherical cutter by the disc-shaped tool are revealed. An algorithm and a program for calculating the spherical milling parameters based on kinematics of formation were developed.

V.V.Kuts et.al demountable joints for torque transmission are some of the most important of the machine elements. High requirements on fatigue value, lifetime, etc are made for them. In this paper, we discuss the method of profiling rolls treatment with the application of the internally cutting milling cutter with radial advance.

Nabeel Ibraheem Jaafar et.al noise-induced hearing loss results from accumulated repetitive noise exposure of high amplitude. Grass-trimming workers are exposed to a noisy motorized machine that is carried on their back. We studied the prevalence of noise-induced hearing loss and its characteristics among the workers. Methods: A comparative cross sectional study was conducted on a group of grass-trimming workers. Ear examination was conducted, followed by pure tone audiometry in a soundproof room at least 48 h after the subjects were free from the noise exposure.

Masakazu Soshia et.al the spindle rotational speed fluctuates during milling due to intermittent cutting forces applied to the spindle, but the speed effect when machining with a relatively large cutter at low cutting speeds is still not clear. The focus of this paper is to investigate the effect of spindle servomotor dynamic characteristics on milling processes at various rotational speeds. Based on the simulation and experimental studies, it was found that the cutting speed fluctuation is not negligible at low operation speeds and that the spindle servomotor dynamics affect the machining process and tool life. Chatter-free cutting parameter selection is a very important topic in milling process. Thus, numerous researches have been done to predict the stability lobes of milling process. Practical milling process is always influenced by multiple modes and cutter run out which may induce multiple delays. However, in most previous work conducted in time domain, stability lobes were traditionally predicted by only selecting the most flexible mode, which inevitably loses the accuracy in some speed ranges and products for an assembly oriented product family identification. An optimization method for calibrating cutting force coefficients and cutter run out parameters is developed in this study. The optimization technique works by minimizing the difference between the measured force and predicted force for all force components. Formulation of the instantaneous uncut chip thickness demonstrates that the total measured cutting forces can be separated into a nominal component independent of cutter run out and a perturbation component induced by cutter run out.

Fei Shia et.al high-speed milling is commonly used to improve the cutting efficiency. However, chatter is still an obstacle limiting the performance of high-speed milling. In this work, an active chatter control strategy is proposed based an almost disturbance decoupling problem. Firstly, a cutting force model is introduced to simulate the milling force under given milling conditions.

Li Sian Low et.al the use of penile constricting devices is usually associated with the intention of improving or maintaining longer erections prior to intercourse. Various methods for removal of offending agents in cases of penile strangulation have been described. As far as we know, we report on the first case in the medical literature, in which the GEM ring cutter system is used to treat a case of penile strangulation from a metal ring without the need for general anesthesia.

Ke Xu et.al five- axis flank milling has been commonly used in the manufacturing of complex work piece because of its greater productivity than that of three-axis or five-axis end milling.

The advantage of this milling operation largely depends on effective cutter location planning. The finished surface sometimes suffers from large geometrical errors induced by improper tool positioning, due to the non-develop ability of most ruled surfaces in industrial applications.

Conclusions

This system is developed in order to feed more than a calf in the same time and reduces the assistant activity. It is provided with automatic cutting unit driven by the high torque wiper motor. This system is provided with automatic distribution unit for distributing the chaff with the help of conveyors. This system is developed with an individual program of feeding in which each calf is benefited.

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