Animal Food Feeder System

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Abstract— This project deals with development of a food Feeder machine. The fabricated machine employed food transport by using conveyer system. This project suggests an integrated system which provides a whole new different option for Automatic Food Feeder. It aims in classifying the foods by weight. The fruits will be weighed first and then moved on the conveyor. The conveyor will delivered each food to its respective Areas storage unit thereby eliminating the monotonous work done by human, achieving accuracy and speed in the work. For this we use conveyor system to convey the food to the respective animal. The choice of pneumatic is preferred because it is cheap than hydraulic and air is freely available.

Keywords: Animal Food Feeder System, Easy Food Handling, Reduce Human Effort, Conveyor Mechanism

I. INTRODUCTION

Agriculture sector plays an important role in economic development of India. As compared with development in electronic and automobile sector, development in agriculture sector is very slow. Hence, there is a need to come up with some novel techniques so as to fore front the agriculture sector again. As food plays vital role in day today's animal life, Feeder of food according to different animal is necessary in evaluating agricultural produce, meeting quality standards and increasing market value. It is also helpful in planning and packaging. In India, human power in agricultural sector is widely used. If the Feeder and grading of food is done through manual techniques, the process will be too slow and sometimes it will be error prone. After the harvest, animal food and grass of all types have to be sorted, packaged and transported. A wide range of technologies have been developed or refined over the years for Feeder according to density, weight, quantity.

Automation is increasingly getting important in the food Feeder process because computers or machines are capable of handling repetitive task quickly and effectively. Thus machines are also capable to sort food according to the grades, weights and quantity without mistakes.

In this automation system, which comprises of mechanical hydraulic structure in addition with electronics segment separately, is designed to be used in small agricultural animal purpose. There are several reasons to need this machine as a solution for agriculture industrial problems. Nowadays, usage of human power especially in agriculture sector is critically and widely use. One of these project objectives is replacing man power with machine. Usually a lot of human error occurs during the process of fruit Feeder. Therefore this system is proposed to minimize or overcome those errors. Usually people can work around 7-8 hours per day. Working more than this period sometimes, makes the workers lose their focus and to concentrate on the job becomes challenging for them.

Automation systems nowaday are chosen to overcome this problem and moreover the designed system produces efficient and high productive results. Usually in industries, designed machines are big in size, therefore are not portable. The aim is to design a fruit Feeder machine which is portable. For this, the main task is to integrate AVR microcontroller as a main control system with entire electro-pneumatic system. ATmega16 microcontroller is used to control the sequence of operations performed by the system. This project is divided into two major sections. First is mechanical part and another one is electronics segment. The mechanical part includes conveyor assembly, while the electronics part consists of PCB designing and mounting of various electronics components with the microcontroller.

II. PROBLEM STATEMENT

We have done a project on "Animal Food Feeder System" for the application of feeding food in agricultural industry without making extra effort.

III. OBJECTIVE

- To reduce 25% of the labour work.
- To improve inventory managements.
- To reduce the labor cost and maintenance cost.
- To develop this system with better design flexibility and performance

IV. CONSTRUCTION AND WORKING

The complete system is divided in three main parts:

A. Conveyor Belt:

A single motor driven conveyor system is the major segment of this system. The food to be sorted will be conveyed by this conveyor for further proceedings.

A conveyor belt is the carrying medium of a belt conveyor system (often shortened to belt conveyor). A belt conveyor system is one of many types of conveyor systems. A belt conveyor system consists of two or more pulleys (sometimes referred to as drums), with an endless loop of carrying medium—the conveyor belt—that rotates about them. One or both of the pulleys are powered, moving the belt and the material on the belt forward. The powered pulley is called the drive pulley while the unpowered pulley is called the idler pulley. There are two main industrial classes of belt conveyors; Those in general material handling such as those moving boxes along inside a factory and bulk material handling such as those used to transport large volumes of resources and agricultural materials, such as grain, salt, coal, ore, sand, overburden and more.

Conveyors are durable and reliable components used in automated distribution and warehousing. In combination with computer-controlled pallet handling equipment this allows for more efficient retail, wholesale, and manufacturing distribution. It is considered a labor saving system that allows large volumes to move rapidly

through a process, allowing companies to ship or receive higher volumes with smaller storage space and with less labor expense.

Rubber conveyor belts are commonly used to convey items with irregular bottom surfaces, small items that would fall in between rollers (e.g. a sushi conveyor bar), or bags of product that would sag between rollers. Belt conveyors are generally fairly similar in construction consisting of a metal frame with rollers at either end of a flat metal bed. The belt is looped around each of the rollers and when one of the rollers is powered (by an electrical motor) the belting slides across the solid metal frame bed, moving the product. In heavy use applications the beds which the belting is pulled over are replaced with rollers. The rollers allow weight to be conveyed as they reduce the amount of friction generated from the heavier loading on the belting.

Belt conveyors can now be manufactured with curved sections which use tapered rollers and curved belting to convey products around a corner. These conveyor systems are commonly used in postal Feeder offices and airport baggage handling systems. A sandwich belt conveyor uses two conveyor belts, face-to-face, to firmly contain the item being carried, making steep incline and even vertical-lift runs achievable.

Belt conveyors are the most commonly used powered conveyors because they are the most versatile and the least expensive. Product is conveyed directly on the belt so both regular and irregular shaped objects, large or small, light and heavy, can be transported successfully. These conveyors should use only the highest quality premium belting products, which reduces belt stretch and results in less maintenance for tension adjustments. Belt conveyors can be used to transport product in a straight line or through changes in elevation or direction. In certain applications they can also be used for static accumulation or cartons.

Fig: Conveyor belt system

1) Applications:

- Agriculture
- Construction: heavy building material
- Food & beverage processing
- Forestry-logging, sawmill, paper pulp,etc
- Factory production line

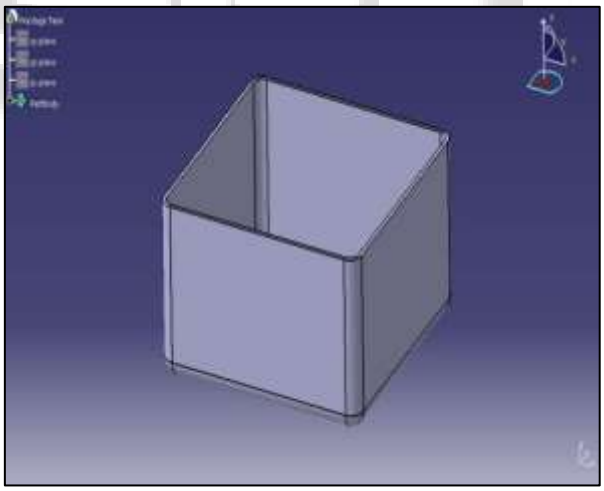
B. Rail- Guided feed wagons:

Steer a middle course between stationary conveyor belts or chain link table. Here a feed hopper with a weighing device is suspended from a rail. Power is provided by batteries. This rails delivered food, near to the animal's food table. Control is mostly carried out by a way of computer directly with feed hopper.Tractor-pulled feed wagons are mainly used on small feedlots. Feed wagons, either mixer or nonmixer, are self-unloading and have capacities of about 2 to 4 tons (Redman, 1978). The feed wagons may be equipped with electronic scales. The mixer feed wagon is very popular on farm feedlots. At least one large feedlot^ uses nonmixer feed wagons; five 4-ton wagons, hauled by 75-kW tractors, distribute feed to 15,000 head. The morning feeding run lasts about three hours while the afternoon feeding run takes about two and one-half hours

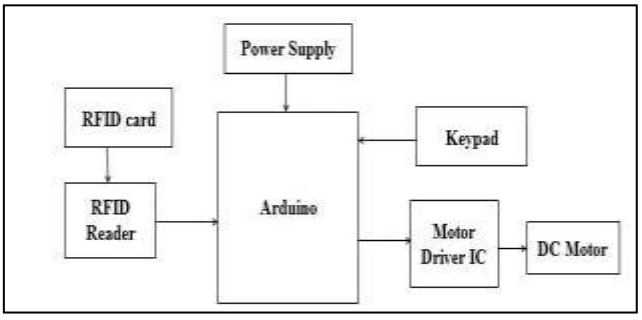
Fig: Rail guided feed wagons

C. Baskets:

Baskets are used to load the food. For every class of weight a separate basket is allotted. The food on the basis of their respective weight class will be pushed by the arms into these baskets.



V. BLOCK DIAGRAM OF ANIMAL FOOD FEEDER SYSTEM:-



A. Arduino

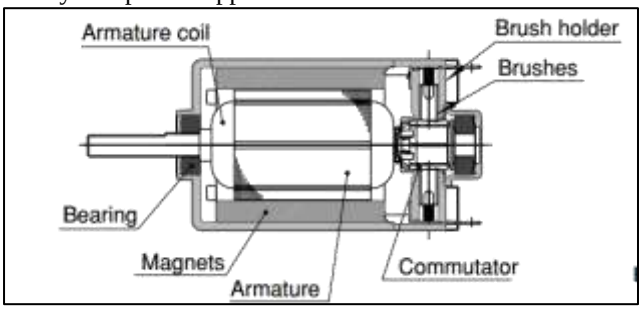
The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

B. RFID Reader Module

This is a low frequency (125Khz) RFID reader with serial output with at range of 8 to 12cm. It is a compact units with built in antenna and can be directly connected to the PC using RS232 protocol.

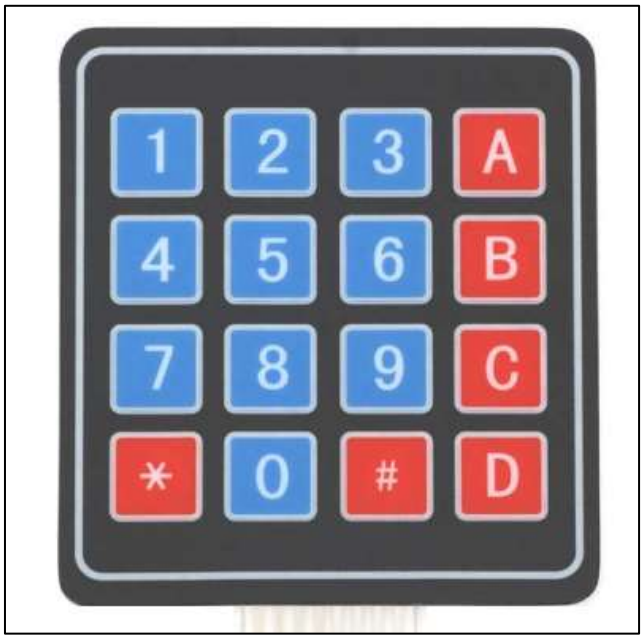
C. DC motor

Japan Servo's DC Miniature Motors are widely used in a variety of application fields, from copiers and other office equipment, to remote-controlled equipment, medical equipment, vending machines, and game machines. These motors may be combined with Japan Servo's full line of gear heads to meet a wide range of torque and output speed specifications. Japan Servo provides a practical and economic choice as drive actuators. Strict quality control ensure reliable performance as well as prompt delivery at reasonable price. Japan Servo provides a full variation line-up of stock model and customized design motors to best meet your specific application needs.



D. 4x4 Matrix Membrane Keypad (#27899)

This 16-button keypad provides a useful human interface component for microcontroller projects. Convenient adhesive backing provides a simple way to mount the keypad in a variety of applications.



1) How it Works

Matrix keypads use a combination of four rows and four columns to provide button states to the host device, typically a microcontroller. Underneath each key is a pushbutton, with one end connected to one row, and the other end connected to one column.

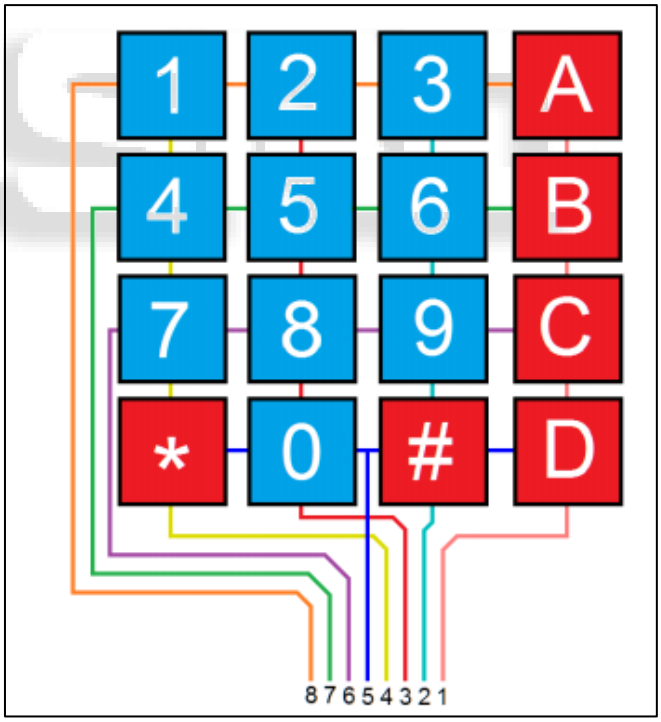


Fig. 1: matrix keypad connections

In order for the microcontroller to determine which button is pressed, it first needs to pull each of the four columns (pins 1-4) either low or high one at a time, and then poll the states of the four rows (pins 5-8). Depending on the states of the columns, the microcontroller can tell which button is pressed. For example, say your program pulls all four columns low and then pulls the first row high. It then reads the input states of each column, and reads pin 1 high. This means that a contact has been made between column 4 and row 1, so button 'A' has been pressed.

2) Sample of Model

The ranging accuracy of ultrasonic sensor in this prototype is about 2cm to 1m and works effectively within the prescribed limit. Final Overview of Project In this project, we have checked the working of our project, we connected it with a batteries and whose braking system is controlled by a DC gear motor and servomotor. This technique is eco-friendly and this work is an attempt to reduce accidents while in critical driving conditions. We have tested the working of the system by placing various objects ahead as obstacles. The system responded by reducing the speed of the vehicle when the obstacle is placed at various distances from it. Also the system stopped automatically in restricted areas. It gave very accurate measurement according to limit of values interpreted.

3) Advantages & Applications

Advantages

- It saves time to feeding food animals.
- It reduces manual efforts.
- Increase in flexibility.

Applications

- Agriculture
- Construction: heavy building material
- Food & beverage processing
- Forestry-logging, sawmill, paper pulp etc
- Factory production line

VI. Conclusion

The interaction between humans and physical devices and objects is attracting increasing attention. Many stud-ies have attempted to provide a natural and intuitive ap- proach to request services. The current trend of combin- ing pet control and IoT technology offers exciting future developments. The proposed system is also referred on smart-home technology, including the smart pet door andpet feeder. The results not only present the key im- provement of the pet monitor system involved in the IoT technology, but also meet the demand of pet owners.

The basic vision behind the IoT, it may have a new way of operational method, it may have a new method of connecting devices, and there might be the even com- plete clean-slate approach. As the full operational defini- tion is not yet finalized, there are numerous research is- sues that can be worked on. As a next step, we will fully integrate the other pet care devices into our system, in- cluding litter boxes, pet cam, etc. With that, the diverse needs of the owners can be met, and the health, monitor, and entertainment topics for pets are all covered. Besides, standing as the cloud term, how to connect the numerous networking devices around the globe is the next issue. In the future, we will centralize on the study of the IoT gateway and long distance detection of the pets.

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