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Innovative Fish Feeding System

G. S. Molly Irine[1], S. Annamalai[2], R. K. Kannadhasan[3], A. Mohanraj[4]

[1,] Associate Professor, [2]Assistant Professor, [3,4]Student, Department of Mechanical Engineering, IFET College of Engineering, villupuram, Tamilnadu, India.

Abstract: In the modern world with advanced technological departments, a smart fish feeding system is imperative in hatcheries. Hatcheries to sustain their production and to be effectual it has to produce fishes with greater weight. Fishes gains weight only with proper feeding and exercising. Proper feeding of fishes needs equal distribution of pellets in ponds which poses lot of difficulties in hatcheries today. A floating smart fish feed system is developed to provide the solution to distribute the pellets equally and at specific intervals, which enables fishes to be fed properly and at the same time, forcing the fishes to swim around and thereby exercise. The movement of smart fish feed system is controlled by arduino.
Keywords: Pellets, Arduino, Floating system, fish exercise (swim) and feeding.

I. INTRODUCTION

In existing fish feeding system, feeding process is done by manual hand feeding and demand feeding. Modern aquaculture needs advanced feeding system are the benefits of latest technologies. It needs efficient technology which will develop the aquaculture productivity. Feeding system poses major difficulties in Hatcheries, for growth of fishes and selling it. In order to gain the weight, the fishes have to swim around the pond for taking food. So, that the gadget floating around the pond. In market basis, major selling factor is weight of the fishes in hatcheries. Feeding is one of the most important aspects of fish growth and production. The major challenge faced by the aquaculture development is the management of feeding systems. The development and profitability of aquaculture method could be improved with modern technology. This needs the design, development, and construction of automatic feeding system. Statistics reveal in Asia itself, the production of aquaculture dominated the market, contributing around 91% of the world's total by volume and 82% by value. Asian countries, such as Thailand, have been the top ten aquaculture producers in the world. Asia has also been the highest seafood consuming region of the world, accounting for two-third of the world's food fish supply, the increase of which mainly came from aquaculture in recent years. As stated by edan et al 2010 the fisheries sector in Malaysia has provided direct employment to 89,453 fishermen and 21,504 fish culturists. The consumption of fish in Malaysia is expected to increase by 145 by 2010 and currently, the country is producing 89% of fish supply for its own consumption. With the marine harvest almost stagnating, industry is dependent on the aquaculture to cater for the growing demand.Currently, the aquaculture industries produced 13.2% of total fish production. Malaysia has the potential to become a major player in the aquaculture industry in Asia pacific.

II. METHODOLOGY

The design and implement of automatic fish feeder using Adriano application. The gadget designed combination of hardware and software. Figure 1 depicted the flowchart of the process conducted .the literature review involved studies and collecting information, particularly from the previous papers. Problems or shortcomings were identified and remedies were proposed in hardware and software development stage. In integration stage, all the circuit developed will be combined and integrated with the programming code such as C, C++., to The output for this system speed and torque , generated by the DC motor and control by the arduino.as the result , data for output of the system and pellets covered area in the pond discussed in last stage.
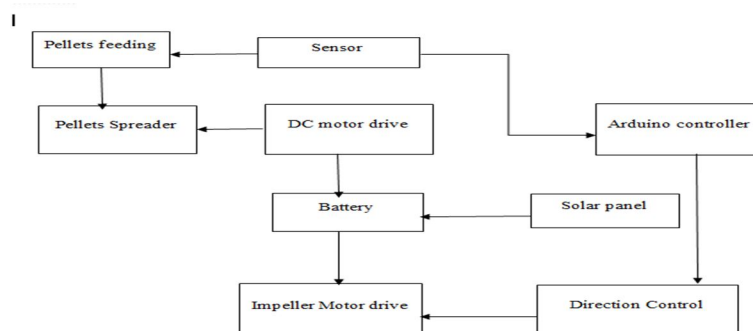

Fig.2 Methodologies of innovative fish feeding system

A. Gadget Design

The whole setup designed of controller (Arduino), pellet storage supporting elements, spreader, floating member, impeller drive motor. The controller function as input to device for switch on and off and also to spread the food around the pond. Apart from that Arduino controlled the direction of floating member moving over the pond by impeller motion.

B. Mechanical Design

The mechanical components of the gadget consists of pellet hopper supporting elements, spreader, floating member, and impeller. The system designed simple in construction and operations. The hopper allowed the pellets depends on the motor speed starts to rotating the pellets dispensed at wide range based on the speed only. So the motor has efficient to operate. Hopper placed on top of the system it is act as storage device. And then spreader connects the DC motor shafts. The impeller is connected with the motor drive which tends to move the gadget. The whole setup is supported by floating member.

C. Software Design

The motor drive controlled by software development(Arduino). When gadget is switch on the Arduino control speed of DC motor of spreader. Apart from this operation it also direct the floating member with the help of motor drive attachments. When the feeder falls lower amount of pellets the indicating sensor sends the signal to Arduino as the results, the speed of the motor getting decreased after few minutes it get stopped. After filling up the pellets the motor starts to rotate at optimum speed. The spreader dispense the food depends on the speed range of DC motor with moving conditions. Arduino play vital role for controlling and moving gadgets around the pond.
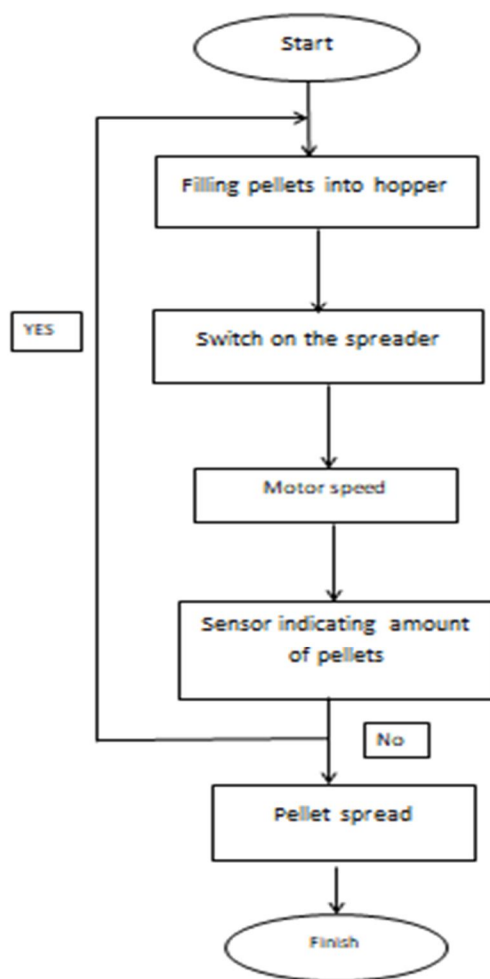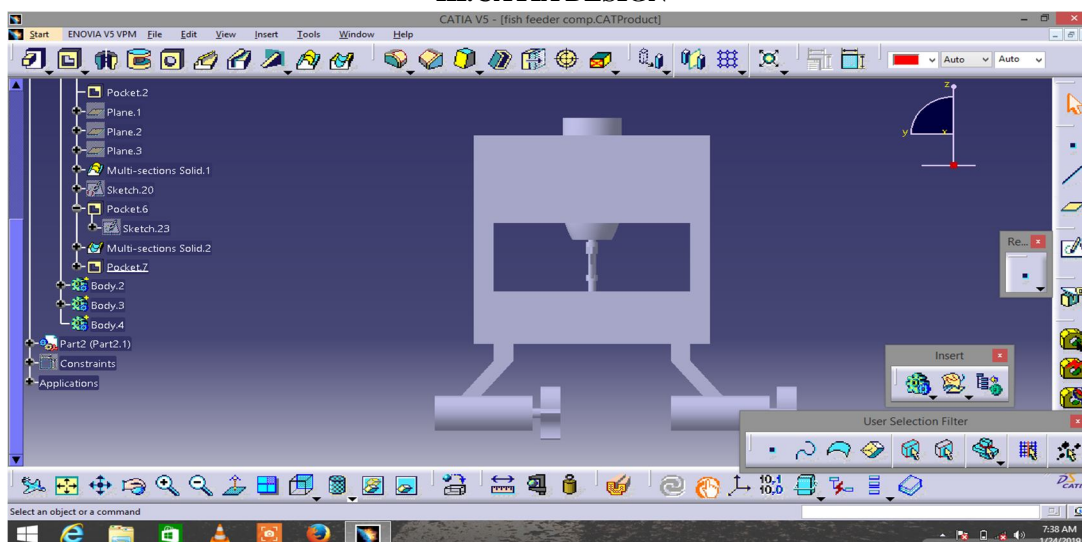

Fig 2, Operations of system

III. CATIA DESIGN
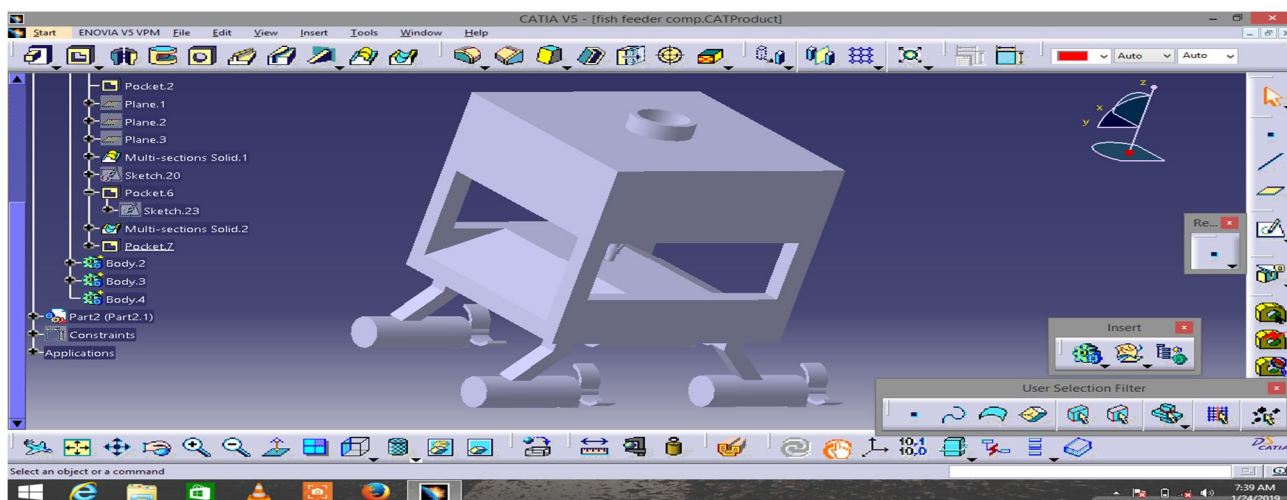

Fig 4, proposed view

Fig 5, Proposed view

IV. CONCLUSIONS

In this fish feeding system is one of the alternative and easy ways to feed the fish at the right cycle time. This system can reduce the more labours, because of speed of the motor have been controlled by Arduino. The main purpose of this system is to develop an innovation which is used to overcome some of the problems that occurred nowadays. Arduino has been used for present control system. Therefore, this system allows the owner to adjust the cycle time and dispensing time. One of the modifications is to control the pellets flow from the storage device into spreader. In future, the project is developed as IOT applications to aquaculture growth in modern way.

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