

“Review on Fabrication of Coconut Vending Machine”

¹Ketan K. Tonpe ²Ankit H. Kalambhe, ³Atif A. Khan, ⁴Rakesh P. Thakur, ⁵Amit K. Sontakke,

¹ Assistant Professor, ² UG Student, ³ UG Student, ⁴ UG Student, ⁵ UG Student,

¹Department of Mechanical Engineering,

¹Suryodaya College of Engineering and Technology, Nagpur, India.

Abstract: In this automation world vending machine plays important role in product selling without shopkeeper. The coconut vending machine can serve coconut for drinking coconut water to customer. The concept behind this project to improve the efficiency of selling the coconut with zero effort for cutting of coconut. This research work includes the study of problems that were faced during the effort for cutting of young coconut in commercial purpose. By studying such problem the need of efficient coconut cutting machine was developed. If the developed machine is commercialize the problem of use of coconut water at hotels and restaurants will get benefited. The purpose of this research is to develop, test, and evaluate the young coconut vending machine. This research work include the description of such a machine which will not only used to cut the coconut but also can be a used to drink coconut water at parks and beaches and anywhere. This machine consume very less space. The application and mechanism of this machine reduces the cost of fabrication.

This project involves the process of designing the different parts of the vending machine considering the forces and ergonomic factor for people to use. This project mainly about generating a new concept of coconut vending that would make easier to bring anywhere and easier to vend. After design has completed, it was transformed to its real product where the design is use for guidelines.

Index Terms – Coconut, Vending machine, Actuator, Coin sensor, Arduino, DC motor

I. INTRODUCTION

When the world is running hastily with advancement, time is the undisputedly the most valuable resource of all. It becomes inevitable to save the time by all possible means. A vending machine is designed for the automatic material dispense without manpower. It works in manner that when a currency is inserted in to the machine it delivers the product according to the user choice.

There are different types of vending machine used for different applications for reducing the effort and error caused by the human begin due to their carelessness and lack of concentration in work. The types of vending machine used in day to day are coffee and other hot drink vending machine, soda and other cold drink vending machine, snack and sweet vending machine, ice cream and frozen food vending machine, food vending machine, gumball and novelty machine, water coolers and ice dispensers, medicine and hygiene product, healthy vending machine, newspaper vending machine, custom vending machine etc. can be increasingly found to encroach the shops nowadays, which reduces the time and also reduce the human effort required to recognize, search, count and deliver the product along with the cash handling. The Automatic Teller Machine (ATM) is the best example of all, for the application of engineering principles to reduce time and human effort.



Fig.1 Green coconut

So, we have to decide to make coconut vending machine. This project to improve the efficiency of selling the coconut with zero effort for cutting of coconut. Coconut is the “tree of heaven”, provides many necessities of life including food and shelter. Water from tender coconut is a common refreshing drink and has been used as an excellent isotonic in several tropical countries. It is not only a thirst-quenching liquid, but also a mineral drink, which is beneficial to human health. It contains traces of proteins, fats, and minerals like Na, K, Ca, Fe, Cu, P, S, Cl, and vitamin C, vitamins of the B group like nicotinic acid, pantothenic acid, riboflavin and biotin. Coconut water contains organic compounds possessing healthy growth promoting properties. It carries nutrients and oxygen to cells, raise the human metabolism, boost human immune system, detoxify and fight viruses, control diabetes and also aids the human body in fighting against viruses that causes flue, herpes and AIDS.

These kinds of vending machines operate based on the application of electronics engineering, mechanical engineering and electrical engineering, which are collectively termed as the Mechatronics. Thus, it is proposed in this project to design and fabricate an automatic coconut vending machine, with the application of mechatronics principles, so as to reduce the time taken and the human effort taken to deliver the coconut to the customer in required quantity, and also meet the higher demand for

coconut juice, such as at hospitals, gardens, marketplace, near educational institutions and almost everlasting demand in summer season at any places.

This project involves the process of designing the different parts of the vending machine considering the forces and ergonomic factor for people to use. This project mainly about generating a new concept of coconut vending that would make easier to build anywhere and easy for customer. After design has completed, it was transformed to its real product where the design is use for guidelines. The performance and fabrication of this project cost factor is most important. In the other vending machines has very complicated shapes and are very costly but these coconut vending machine conducted very easy mechanism hence it has very low cost. Its cost is very cheap rather than other vending machines. Hence any retailers buy this machine easily.

II. LITERATURE REVIEW

The innovation in such types of new thinking is that, it increase the level of easily work doing by adding the various mechanism and the engineering techniques.

In the old cutting process or the work for cutting the coconut is too hard and so more energy is required, to improve the working condition this type of idea is developed.

It will really helpful for human being or the person who wants to open this own business related to coconut juice centers. This ideas being going to improve his business speed with high earning, also with the high improved the quality of juice i.e. coconut water.

An important object of the present invention is to provide a machine for cutting the one coconut immediately after the other, to the end that one machine can cuts coconut rapidly to supply a number of workman who have to job of removing the coconut.

SINGH, Rishi (Flat- 402, Plot No. 505 Surya Lukkani Residency, Road No. 10, Kakatiya Hills, Madhapur, Hyderabad 1, 500081, IN) (1), Automated Tender Coconut or Tender Coconut water vending machine is specially designed for dispensing tender coconut water or tender coconut with one or any combination of the following options: 1. Buyer can purchase tender coconut with a hole/slit made, to reach coconut water in the kernel just before dispensing, as means for buyer to drink natural coconut water, using a straw 2. Buyer can purchase tender coconut with a groove as means for buyer to shove/extend groove from outer surface to inner kernel and scoop out the inside endosperm of coconut. Same can be used as takeaway option by buyer 3. Buyer can purchase tender coconut water which is dispensed in a disposable glass, after a hole/slit is made in tender coconut to pour fresh coconut water to a disposable glass.

Satip Rattanapaskorn, and Kiattisak Roonprasang "Design and development of semi-automatic cutting machine for young coconuts" (2) this research work includes the study of problems that were faced during the cutting of young coconut in commercial purpose. By studying such problem the need of efficient coconut cutting machine was developed. If the developed machine is commercialize the problem of use of coconut water at hotels and restaurants will get benefited. The purpose of this research is to develop, test, and evaluate the young coconut fruit cutting machine. This research work include the description of such a machine which will not only used to cut the coconut but also can be used to drink coconut water at parks and beaches. The application of screw jack for the development of this machine reduces the cost of fabrication.

M.A. Oommen, *Kerala economy since independence* (Oxford & IBH Pub. Co., New Delhi, 1979).(3) In India, coconut is cultivated mainly in the coastal tracts of Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, Orissa, West Bengal, Pondicherry, and Maharashtra and in the islands of Lakshadweep, Andaman and Nicobar. By the late 1970s it accounted for some 68% of total production in India and at one stage some 899, 198 hectares were reportedly under cultivation. Today Kerala produces roughly 45% of India's coconuts, with some 92% of total production lying in the southern Indian states and Kerala's neighbors [1].

III. OBJECTIVES

The aim of this is to give the complete design information about the coin based coconut vending machine. The design of cutting mechanism of the machine was the major objectives of design, so that the machine thus designed could be stationed easily at any place. Also the machine had to be simple in design and construction such that it could aid easy maintenance. Thus it is important of it to have a zero usage of effort. Accordingly the mechanism was designed. The conceptualized machine should also have the ability to punch and cutting of coconut of different size and hence the size and other design aspects were chosen accordingly. This project is a fabricated of the coconut vending machine where all the factors are considered like:

- Cost factor
- Safety factor
- 24*7 hours service
- Less effort
- Automation

IV. FORMULATION OF WORK

A. DESIGN METHODOLOGY

To start of this project, a meeting with supervisor in the first week is done to manage the schedule of weekly meetings. The purpose is to inform the supervisor on the progress of the project and guided by the supervisor to solve difficulty. Briefing based on the introduction and next task of the project is given by supervisor. Make research of literature review with the means of the internet, books, available published articles and materials that is related to the title. Do it comparison for choose the best concept.

Software applications are downloaded from internet to design the model based on the sketches. Software creo parametric 2.0 helps to draw the better dimension. The preparation of mid-presentation of the project is next. Before presenting, the supervisor will see through the slide presentations and comment on corrections to be made. Then, presentation on the knowledge attained and instilled in the design phase is presented to a panel of three judges. Following up, is the fabrication of make some method for this project. Choose the material, make some list for the material and dimension. Do it planning of fabrication process for this project. After that, start the fabrication process. It would take seven weeks to get this design and fabrication process alteration done. Make some analysis and testing for the project. Do it correction for error this project. Finish the fabrication process with painting process. After that, the final report writing and final presentation will be the last task to be accomplished. The supervisor will review the final presentation and revise mistakes to be amended. The final presentation then again will be presented to three panels. A draft report would then be submitted to the supervisor to be point out the flaws.

It involve the study of present design method. In this we will first identify the mechanical element to use to design and will find out the dimension of the machine component by analytical as well as graphical method.

- i. Estimation of power required: Assumption for calculations of power and force required in drilling processing material, stainless steel is considered as processing (work) material and drilling is considered as drill and related calculations were made on the basis for can drilling operation.
- ii. Selection of drive: For the less speed for operation of drilling, they must be driven by providing power through a drive mechanism. Out of the available drive systems like chain, belt, gear, etc. we can select the one suitable for our machine. We are selected drive mechanism. According to requirement of power.
- iii. Selection and Design of Bearing: A bearing is a machine element that constrains relative motion between moving parts to only the desired motion. The purpose of bearing is they avoid the direct contact between the outer and inner surface and thus reducing the friction and the given power can be used economically. For light duty purpose single groove roller contact bearing is used and selection and life of bearing.
- iv. Selection of motor: It include the selection of dc usually dc motor of 12 volt to rotate stirrer during drilling purpose in operation.
- v. Selection of Actuator: In coconut vending machine drilling operation is carried out by actuator. An actuator requires a control signal and source of energy.

B. PROBLEM IDENTIFICATION

In traditional coconut water shops there are more time required for extracting the coconut water. In this process coconut is cut manually by person who is carried out this whole process manually. So problem in this process unnecessary and more time is required, which is eliminated by some modern techniques and machines, so we are making that machine for eliminating this problem of unnecessary time which is use in extracting water from coconut.

In the effort point of view manual process of coconut water extracting, the person who is working in this process applying more efforts to sharp the coconut for compete the process. So eliminate this problem, we are making coconut vending machine in which without sharpening the coconut extracting water from coconut with the use of drilling phenomenon. In manual process there is major risk of injuring of working person. So we are making the machine in which this problem of injuring the working person is eliminated.

C. RESEARCH METHODOLOGY

It involves the study of present process of extracting water from coconut. In this we will identify various problem which is overcome by design and fabrication of coconut vending machine with the use of modern techniques and science.

Use of vending machine- We use vending machine in our project so that customer doesn't need go out of the premises just to buy coconut water. The steps which are used for vending operation is easy and reliable, even uneducated persons can handle this system. There is no manpower is required to run this machine. So this machine become economical and efficient and easy to use.

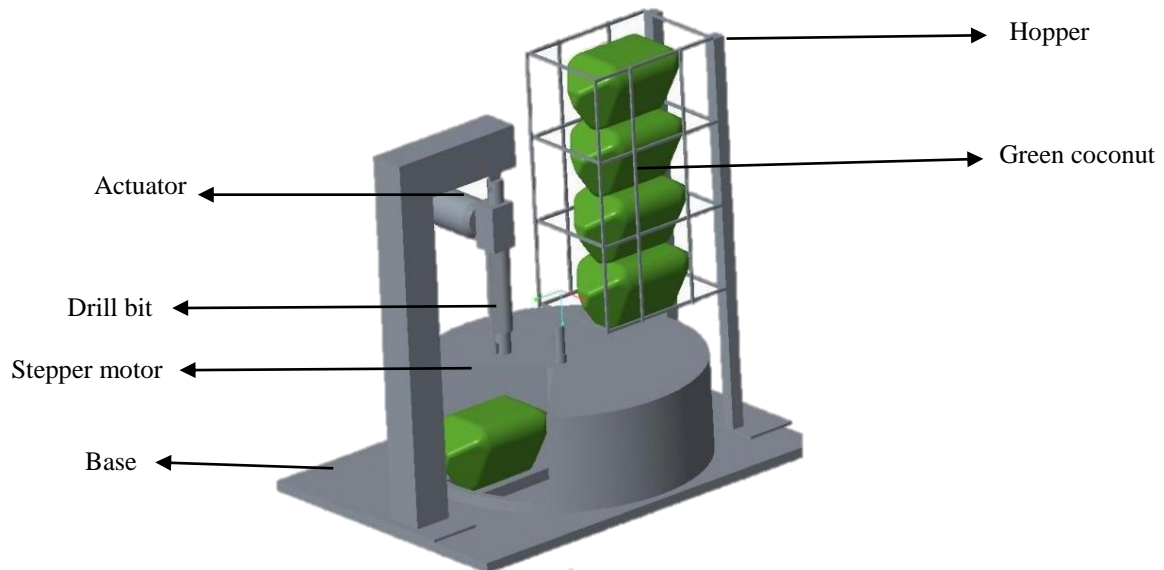


Fig.2 Constructive model of drilling operation

Actuator- An actuator is a component of a machine that is responsible for moving and controlling a mechanism or system, for example by opening a valve. In simple terms, it is a "mover". An actuator requires a control signal and a source of energy. In this machine in the place of drilling machine for drill the hole in coconut, we use actuator which is efficient and economical. There is no Human effort for cutting the coconut .Coconut can punch the hole with the help of actuator

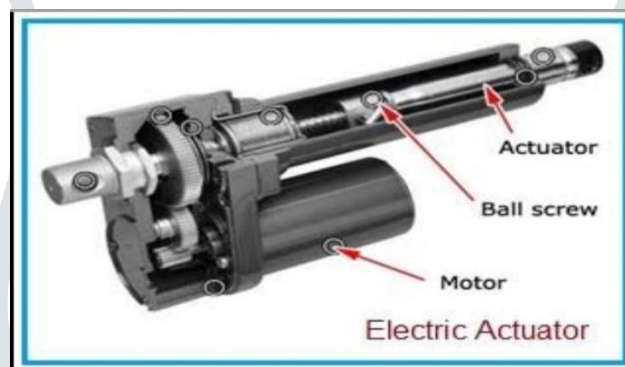


Fig.3 Electric actuator

D. CONCLUSION

We are proposing the modern system of coconut vending machine, which is works efficiently and this machine consume less time for perform the operation with less effort . the coconut vending machine very easy to use and any person can handle this machine. This machine can reduce human efforts with improved accuracy.

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