

DESIGN AND FABRICATION OF PEDAL OPERATED POTATO CHIPS AND FRIES MACHINE – A REVIEM

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ABSTRACT

The project is generally based upon the making chips and fries from Potato. This machine is all about reducing and the cost of this kind of machine and being affordable to farmers and small scale industries which in turn generate employment. This machine represents the ease, how potato chips and fries can be made with help of simple mechanism of sliding crank motion. The mechanism provides the motion and force the potato towards the die. The Die is placed in the end of the stroke which guide and perform the cutting. For the initial stage the machine produce only chips and fries and it requires further innovation. The previous invented machines were electrically operated, the machine is the pedal operated as the name same. By this, we avoid various problems related to this process, as this machine is pedal operated there is no need of electrical power for feed which is a plus point. As the machine avoid electrically issues it can be used in rural areas also. There is no requirement of skilled labour for this machine as the feed is done by operating pedals only. The productivity of the machine is totally depend upon the commitment of the worker, the more worker spend time on it the outcome will be obtained.

Keyword : - Potato Chips and fries, Slider crank mechanism, Cutting die

1. INTRODUCTION

Promotion of tiny scale potato process machinery within the potato growing region would be a chance to scale back post-harvest loss. Maharashtra is the region where the production of Potato is more, this depart the fact that, the tiny industry based on such type of activities which requires some skills for increased rate of cutting of chips with the minimum effort. Making potato slicer and fries cutter machine will be a possible process technique at house hold and industry levels. In spite of a high acceptance of chips among all ages of individuals, the quantity of tiny scale potato processing industries in Maharashtra isn't notable. One in every of the most reasons for such outcome is that the non-availability of low value, simple and high capability potato process machinery like potato slicer and fries cutter at local market. The reduction in size is brought about by mechanical means without change in chemical properties of the material and uniformity in size and shape of individual units of the end product. Locally and easily available materials like cast iron, mild steel are used for the fabrication.

Therefore, a manual potato slicer and fries cutter is design and development by Division of K.D.K. college of engineering, Nagpur during 2019-2020. In through of value, weight, simple operation and capacity, the slicer and fries cutter was found appropriate for industry and restaurant uses.

1.1 Problem Identification

- The problem that we have identified which is being faced by industry is “ low production” due to unavailability of workers & lack of innovative technology.
- In this fast moving life, food industry is also growing rapidly. But the labours in the industry are not sufficient. This scarcity of labours in the industry is due to difficulties faced in the work.
- The owner of the industry has to rely too much on the workers, therefore developing an innovative solution will reduce reliance on workers and consequently increase production .
- Due to scarcity of electricity, delay in production and delivery occurs for the companies in rural areas.
- Complex structures of machine requires more space and maintenance which leads in increases in overall cost of the product.
- Hygiene of the product is difficult to maintenance due high maintenance and high productivity.

1.2 Objective

The main objective of this study is to develop a affordable, compact and simplified machine to match the demands of the modern day fast food. So in order to overcome above mentioned problem, we need to come up with a solution which all have following features :-

- To replace the traditional method of slicing.
- It must improve the production rate & also achieve the target according to requirement.
- It must reduce overall production cost. effectively by reducing the size of machine and maintenance.
- It must reduce reliability upon worker.

2. CONSTRUCTION

- A. Pedal: Pedal are one of the most important part of the whole machine as the name of the manchine indicates. Pedal are on the extreme right side of the machine, which is further attached to a shaft and a bearing.
- B. Crank and Piston: Crank and Piston are present in the centre of the machine. This combination is held together by means of bearings. There is a proper arrangement of crank and piston. The crank and piston connects the chips and fries mechanism.
- C. Chipa Cutting Mechanism: This mechanism is present in the extreme left of the machine. This mechanism consist of a plunger and cutter. The cutter is connected to the the crank by means of a shaft. Fig. 1, indicates schematic diagram of chips cutting mechanism.

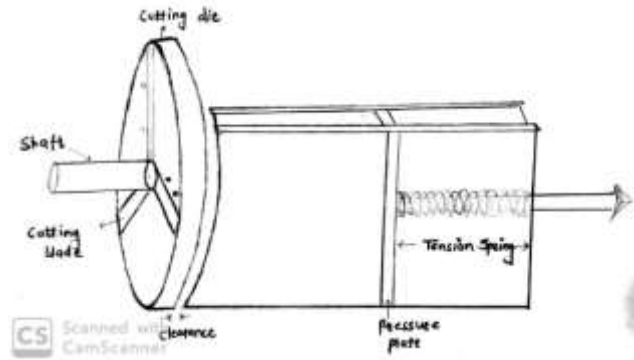


Fig -1: Chips Cutting Mechanism

- D. Fries Cutting Mechanism: This mechanism is present below the crank and piston arrangement. It consist of a piston and cutter. The outlet of the cutter is right below it. Fig. 2, indicates the schematic diagram of the fries cutting mechanism.

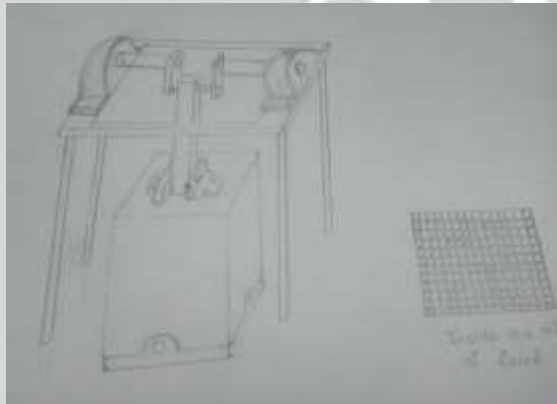


Fig -2: Fries Cutting Mechanism

3. WORKING

The working principle of the this machine is very basic and simple. The power is feed in the machine with the help by rotating the pedal. The pedal rotate the shaft connecting the pedal and crank. Now, here's the real working of the machine begins. The crank is connected to the chips and fries mechanism at the same time. The crank is connected to the chips mechanism by means of a shaft and with the fries mechanism by means of piston.

The piston provide the necessary motion to the fries mechanism for its working. When the piston is in the top dead centre , then the potato is inserted the slot . When the piston started approaches towards the bottom dead centre, the piston pushes potato on the cutting blades and the formation of fries begins. After the piston reaches to the bottom dead centre, the potato is cut into the fries completely. The fries are obtained and collected under the cutter.

A shaft from the crank and piston arrangement is connected to the chips cutter. This shaft provides the necessary motion to the chip cutting mechanism which is a rotary motion. The motion is provided to the cutter which rotates along the axis of the motion providing shaft. The potato is feed to the cutter with help of plunger. This plunger forces the potato towards the cutter and hold it firmly. As the cutter rotates, the slices of potato begin to form. The chips are get collected below the cutter.

4. ADVANTAGES

- It is use where electricity is not available. Which makes this machine more reliable.
- Cheap in cost. Manufacturing cost of this machine is very low so that, every person can afford it.
- No skilled labour is required. As this machine is easy to use therefore, any work start working on it from day one.
- Operation is easy. One just have to rotate the pedal that's all it required.
- Raw material is easily available to build the machine as well as the product' raw material is easily available as this machine is mainly focused on village and small cities

5. CONCLUSIONS

In this era of technology, the investors and manufacturers are easily accepting the latest electronic machines which could save the time and increase the production. Because of the employment rate are getting lower and lower. This machine is alternative to stop this scenario and can provide employment and can help many small scale business and industries.

6. ACKNOWLEDGEMENT

With profound feeling of immense gratitude and affection, we would like to thank our Guide **Dr.V.N.VAIDYA** and class In-charge **ER.A.N.MADNE** , Department of Mechanical Engineering for their continuous support, motivation, enthusiasm and guidance. Their encouragement supervision with constructive criticism and confidence enabled us to do this project. We gratifying to **Dr.C.C.Handa** and **Dr.S.K.chaudhary**, Department of Mechanical Engineering for motivating to put our best efforts in this project work.

Finally, a special thanks to all the faculty members and non-teaching members of the department for their co-operation for the project work.

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