

DESIGN AND FABRICATION OF PORTABLE NOODLE MAKING MACHINE

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Abstract: Many of us enjoy eating noodles, considering it healthy and delicious fast food. This project aims to help people in making noodles easily, quickly and on a wider scale. The first stage of the project with brainstorming, visualizing the idea, forecasting all our needs in the project and deeper research was held between all competitive noodle machines in the market. Proposed Noodle machine with compact Design, portable and operated. single person. Extrusion of noodle at shaping die by a continuous feed of dough in the hopper which is pushed towards shaping die by thread conveyor to achieve the desired shape of noodle. Design and development of noodle machine by integrating all ideas together and testing of Automatic noodle machine which is operated by DC-power source.

I. INTRODUCTION

The inadequacy of production equipment in the food manufacturing industries, there a common problem that is usually encountered which is the inadequacy of equipment and other production facilities. In the case of the noodles production process, this challenge could be seen in the form of lack of instant noodle making machines. For noodle production enterprises, how to improve the quality of noodles and solve the problem of noodles is very important.

With the rapid improvement of people's living standards, noodle consumption has also turned to refined, high-grade, and nutritious. When the noodles are turned off, the noodles are cooled and cooled out of the drying room The noodle production line has become a big problem in China's noodle production industry. Many enterprises have lost their credibility and caused incalculable losses. The production of crispy noodles is related to production technology, mechanical equipment, temperature and climate, etc., but the root cause of crispy noodles is drying.

Temperature and humidity control in the dry process, the rationality of the process. When the noodles enter the first cold air strip of the drying room, the surface layer of the noodles evaporates, forming a shaped capillary hole, which causes a channel for the next evaporation of the water content in the noodle, and enters the main drying stage after the strip is fixed.

Reasonably utilize the different speeds of air flow and drying in each section of the drying room, simulate the principle of natural drying, create good ventilation and tide conditions, timely control the temperature and humidity specifications of the drying room, and make the temperature and humidity of the main drying zone form a "gradient". The drying curve keeps the rate of diffusion of water inside and outside, which avoids the evaporation of internal water, and the outside is too fast, resulting in external dryness, causing conjunctival cracking on the surface of the noodles.

When the noodles are turned off, the noodles are cooled and cooled out of the drying room. After a period of time, the water inside and outside will return to balance, so that the crisp phenomenon occurs, the gluten is destroyed, and the soup is broken and broken under the pot. Not resistant to cooking. In response to this phenomenon, Dongfang Shangwu Company jointly researched and discussed a new set of techniques to solve the phenomenon of hanging noodles, crispy noodles, sour noodles and split ends. Improved oily taste and extended shelf life. The new process consumes less heat, saves coal, and has lower operating costs. Even if there is no experience, the noodle machine uses the new process to control certain unfavorable factors in the production process, and will produce high quality noodles.

OBJECTIVES:

- This type of ready-to-eat food items is very popular in the developed countries because of its versatility of form, composition, and ease of preparation, nutritional content and excellent storage stability as well as increased consumer interest in ethnic foods in the western world at consumer end, which has made these products so widely, accepted world over.
- Due to improving the standard of living in the cities and the rapid urbanization taking place in the rural areas, consumption of these products is widely expected to go up steadily. At present, the market of noodles, especially in the urban areas, is dominated by brands like Maggi. Some medium & small companies are also engaged in its production. Besides the boom in the food service sector, including fast food chain, has widened the demand potential for Noodles.

II. LITERATURE SURVEY

Soba (buckwheat) noodles are one of the oldest noodle cuisines in Japan. Turning buckwheat seeds into delicious noodles requires a skill that needs years of training. Also handmaking noodles requires a lot of energy and wears workers on a daily basis. BandoTaro makes soba making easy with its designs that mimic handmaking professionals. Its mixer, presser, roller, and cutter components are specifically designed for that purpose allowing anyone with only little learning and practice to start producing master-level buckwheat noodles, including 100 percent buckwheat noodles.

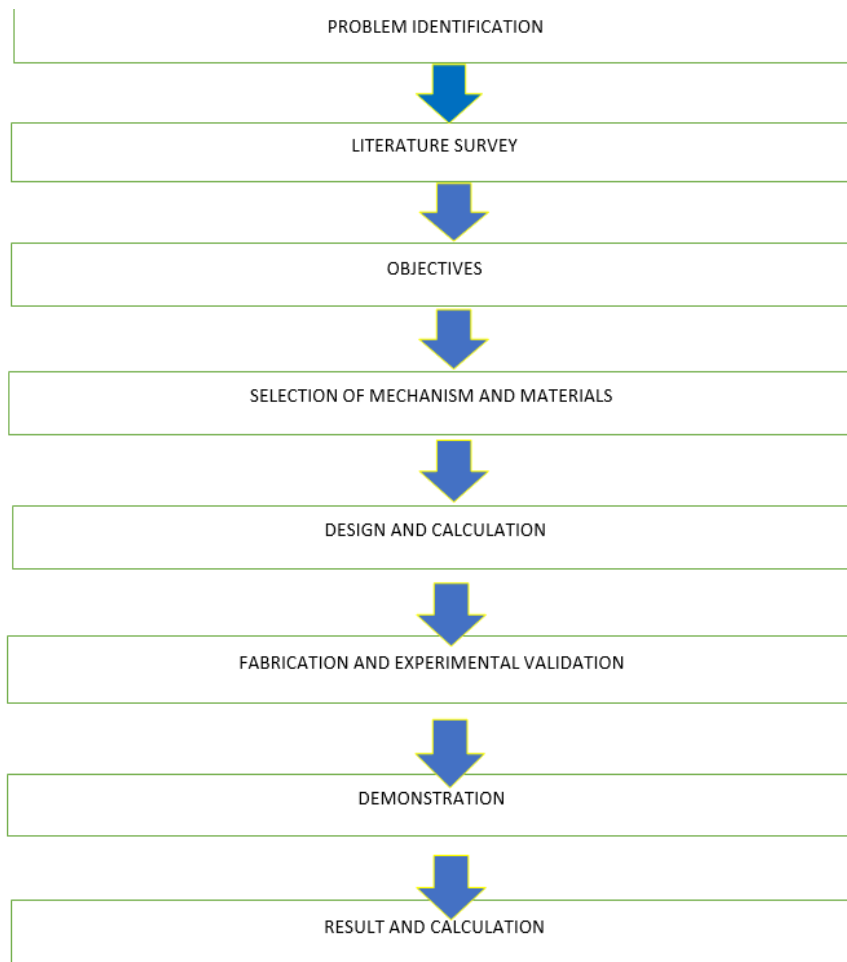
Shinuchi Udon noodle machine, you can make noodles that are high in water content with ease. (noodles that are soft and chewy) With proper noodle making methods and right ingredients, this machine can make authentic Udon noodles. For example, the machine can make superb Sanuki Udon noodles that are thick, soft, and viscoelastic. This all-in-one stand-alone Udon-making machine may be the best choice for your Udon restaurants.

Richmen Ramen noodle machine is the most versatile of all Yamato Noodle Machines. It is capable of producing all types of noodles at the highest quality. This noodle machine is especially good at producing noodles that are low in water content. (i.e. hard and firm noodle textures) It can make a variety of fresh ramen noodles, such as Hakata Tonkotsu Ramen noodles. Tsukemen / Mazemen noodles as well as gyoza / dumpling / wonton skins. It can be a Ramen machine of choice for a Japanese / Asian noodle restaurant, cafeteria or a Small-Mid size noodle factory.

Each type of our noodle machines is capable of producing a variety of different noodles. For example, our ramen noodle machines can make not only various types of ramen noodles (from thin and dry noodles for Hakata-style broths to thick ones with high water content for Tsukemen-style dishes) but also udon and soba noodles (with certain limitations in terms of water-to-flour ratio). To make your craft noodles with perfect quality and consistency, please check specifications for each model. And you can consult with us for recipes and production procedures.

III. METHODOLOGY**TRADITIONAL METHOD OF NOODLE MACHINE MAKING:**

1. Noodles appear as hand-made noodles prevail, because they are thus easily prepared and can be cooked into various dishes.
2. One can boil them and then add in different meat for noodles with minced meat, tomato and egg sauce for tomato and egg noodles and one can also steam and then electrocute them with different veggies.
3. Homemade noodles dough prepared using the just flour, eggs, salt, and olive oil.
4. Shevai (noodle) is a specialty of Maharashtra and is also widely prepared in our family.
5. Preparing noodle is quite laborious and needs at least two people to help. Noodle is quite versatile and we prepare sweet as well as spicy varieties with it. The picture below display's how the Noodle press looks which is employed to prepare noodle. This machine is quite lightweight with a handle to turn and a perforated cylindrical

METHODOLOGY PROCEDURE**MARKET POTENTIAL OF NOODLE MACHINES:**

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IV. DESIGN & CALCULATION

Noodle machine which is operated by DC motor which has its own features. Motor Torque and Speed of the thread conveyor calculation as shown below.

TORQUE AND SPEED REQUIRMENTS:**TORQUE:**

- In the case of our Gear, the force exerted is due to the mass being accelerated by gravity: $T = (\text{Mass}[\text{kg}] \times g) \times \text{Radius}[\text{m}]$
- We want to lift a 0.63 kg mass using a 0.36 m diameter pulley. We can find the torque load created by the mass using equation
- $T [\text{Nm}] = \text{Mass} [\text{kg}] \times g \times \text{Radius} = 0.63 \times 9.81 \times 0.18 \text{ T} = 1.112 \text{ Nm}$

SPEED OF THE THREADED CONVEYOR:

- No. of teeth on DRIVEN Gear (T2) = 75 No. of teeth on DRIVER Gear (T1) = 25
- Smaller driver gear must turn six times to get the larger driven gear to make one complete turn
- Gear ratio = T2 / T1
- $1 = 75 / 25 = 6.81$ or 6.9
- Motor speed = 60 RPM
- No. of teeth on Driven Gear = Speed of Motor, No. of teeth on Driver Gear x 75/25 = 60/X
- X=8.82 rpm, Speed of thread Conveyor = 8.82 RPM

V. FABRICATION

ARC WELDING Manufacturing MACHINE:



Arc welding is a welding step that is used to join metal to metal by using electricity to create enough heat to melt metal ,and the metal melts when cool result in binding of the metal. It is a type of welding that uses a welding power supply to create an electric arc between metal stick (elctrode) and the base material to melt the metal at the point of contact. Arc welding can use either (DC) OR (AC) current and consumable and non- consumable electrodes.The welding area is usually protected by some type of shielding gas, vapour or slag, ac welding steps may be manual or automatic.

INPUT	SPECIFICATION
INPUT VOLTAGE	AC415V+-15%,3 PHASE
INPUT FREQUENCY	50/60Hz
RATED INPUT POWER	18.2 KVA
RATED INPUT CURRENT	27.6 A
NO LOAD VOLTAGE	67.5 V
OUTPUT CURRENT RANGE	40-400A
RATED OUTPUT VOLTAGE	36V
DUTY CYCLE	60%
NO LOAD POWER	60W
EFFICIENCY	85%
POWER FACTOR	0.93
INSULATION CLASS	B
PROTECTION CLASS	IP21
WEIGHT	17KGS
OVERALL DIMENSION	480*203*360MM

DRILLING MACHINE:

- A drilling machine, also called a drill press, is a powerful tool used to cut a round hole into or through metal, plastic, wood, or other solid materials by turning and advancing rotary drill bits into a workpiece.
- This drilling cutting tool (Drill Bit) is held in the drill press by a chuck and fed into the work at variable speeds. The speed and feed should be set properly and coolant needs to be provided for the desired finished part. The drilling machine can not only be applied in the drilling process but is also useful for many other machining operations.
- There are various operations that can be performed on a drilling machine, such as plane There are various operations that can be performed on a drilling machine, such as plane drilling, step drilling, core drilling, boring, counterboring, reaming, countersinking, spot facing, tapping, and trepanning.
- Drills are commonly used in woodworking, metalworking, construction, machine tool fabrication, construction, and utility projects. Specially designed versions are made miniature applications.

**GRINDING MACHINE:**

- A grinding machine, often shortened to grinder, is a power tool (or machine tool) used for grinding. It is a type of machining using an abrasive wheel as the cutting tool. Each grain of abrasive on the wheel's surface cuts a small chip from the workpiece via shear deformation.
- Grinding is used to finish workpieces that must show high surface quality (e.g., low surface roughness) and high accuracy of shape and dimension. As the accuracy in dimensions in grinding is of the order of 0.000025 mm, in most applications it tends to be a finishing operation and removes comparatively little metal, about 0.25 to 0.50 mm depth. However, there are some roughing applications in which grinding removes high volumes of metal quite rapidly. Thus, grinding is a diverse field.
- The grinding machine consists of a bed with a fixture to guide and hold the workpiece, and a power-driven grinding wheel spinning at the required speed. The speed is determined by the wheel's diameter and manufacturer's rating. The grinding head can travel across a fixed workpiece, or the work piece can be moved while the grind head stays in a fixed position.
- Fine control of the grinding head or table position is possible using a vernier calibrated hand wheel, or using the features of numerical controls.
- Grinding machines remove material from the workpiece by abrasion, which can generate substantial amounts of heat. To cool the workpiece so that it does not overheat and go outside its tolerance, grinding machines incorporate a coolant. The coolant also benefits the machinist as the heat generated may cause burns. In high-precision grinding machines (most cylindrical and surface grinders).

VI. EXPERIMENTAL PROCEDURE**8.1 Measuring dimensions**

(fig no. 8.1.1)

8.2 cutting the square pipe

(fig no. 8.2.1)

8.3 Arc welding operation

(fig no. 8.3.1)

8.4 Drilling operation

(fig no. 8.4.1)

8.5 Grinding operation

(fig no. 8.5.1)

8.6 Thread measuring

(fig no. 8.6.1)

VII. CONCLUSION & FUTURE WORK**Conclusion:**

We started the result analysis with the load 50 gm & increase load gradually At every trail the thread rod pushes down the load in different time with gradual load incresement. It can load the maximum 150 gm of raw material at one time till the thread rod complete its cycle & came from bottom dead centre to top dead centre. In Automatic noodle machines, right proportion of flour and water ratio is predefined for the machine before feeding to the mixing container. From a variety of noodle machine this project proposed to present a new semi-automatic noodle machine with real dimensional model. It is a simple switch control mechanism that operates complete design. This machine utilizes a simple mechanism compared to other machines, cheaper components, easily detachable and portable device.

Future Scope:

A Lot of future work can be done to increase the functionality of this machine. As researching decreasing serving time and decreasing the size/weight of the machine. Adding new flavours to the dough is also a proposed addition, as well as introducing a more user-friendly interface between user and machine. A lot of research is to be done on ways of starting the machine. A proposed research is communication between machine and operator through modems and Internet connections.

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