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Fabrication of Portable Noodle Making Machine

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Abstract- This project (Phase 2) presents the fabrication of an innovative, portable noodle making machine aimed at providing a cost-effective and user-friendly solution for small-scale and home-based noodle production. Traditional noodle machines tend to be expensive, and require considerable expertise, limiting their accessibility especially for households and micro-entrepreneurs. To address this gap, the proposed machine utilizes a lightweight frame built from available materials, with food-grade stainless steel components for all parts in contact with the dough. The core mechanism involves a threaded extrusion system powered by a small electric motor, which efficiently transforms freshly prepared dough into uniformly shaped noodles. The process comprised conceptual sketches, noodle quality, and portability. Test results demonstrate consistent noodle extrusion with ease of operation and quick cleaning, making it suitable for diverse environments including homes, street vendors, and small eateries. The modular construction further enhances maintainability and transport convenience. This project not only offers a practical fabrication approach but also supports entrepreneurial activities by enabling affordable fresh noodle production. Overall, the project contributes an innovative, accessible, and sustainable noodle-making solution that promotes food variety and small business empowerment.

Keywords- Portable Noodle Making Machine, Food Processing Machinery, Noodle Production, Small-Scale Manufacturing, Home-Based Food Processing.

I. INTRODUCTION

Noodles are a widely consumed staple food, favored for their convenience, versatility, and cultural significance across many regions. Traditional commercial noodle-making machines, while efficient for large-scale production, tend to be expensive, and often unsuitable for small businesses or household use. This creates a barrier for entrepreneurs and families wanting fresh, homemade noodles without relying on packaged products or industrial manufacturers. To address this issue, this project focuses on fabricating a portable noodle making machine that is compact, affordable, and user-friendly.

The primary goal is to develop a machine that can be fabricated using commonly available materials and simple manufacturing techniques, ensuring accessibility even for those with limited technical resources. This machine operates using a threaded extrusion mechanism powered by a low-power motor, enabling consistent dough processing to produce uniform noodle strands. Key considerations include portability, hygiene, ease of cleaning, and durability, achieved by using food-grade stainless steel parts and lightweight framing materials.

The machine’s modular construction allows easy assembly, maintenance, and transportation, making it ideal for home cooks, small eateries, and street vendors. This project not only provides a practical tool for fresh noodle production but also promotes small-scale entrepreneurship and enhances food variety at the grassroots level.

II. LITERATURE REVIEW

Many previous noodle making machines focus on fixed, industrial-scale models that remain heavy or complex. While some studies describe compact or motorized machines, these often lack true portability, heavily on electrical power, or use materials and mechanisms difficult for self-fabrication. Limited attention has been given to lightweight, modular machines that are easy to assemble, disassemble, and clean, which are critical for home users and small businesses.

This project innovates by focusing on self-fabrication capability, allowing individuals or small enterprises to build and repair the machine with basic tools, reducing dependency on expensive commercial equipment.

Bharathraj M. and Murali Kumar L. (2017) presented a compact, DC-powered portable noodle making machine using a threaded conveyor to push dough from a hopper through a shaping die, emphasizing single-person operation and hygienic, food grade construction; their work establishes a baseline for portability but does not prioritize modular, DIY self-fabrication or off grid manual operation as key design goals.

Prof. V. S. Nikam, Nilesh Bule, Pratik Konde, Nikhil Ghongade, and Zuber Sheikh (2021) designed an axial noodle making machine driven by a heavy duty DC motor with belt–pulley transmission, highlighting compactness and the ability to start with small dough charges; while compact, the design still assumes continuous power and a heavier frame, leaving opportunities for weight reduction and tool friendly maintenance practices.

Po Po Thin, Htay Htay Win, and Aung Kyaw Soe (2023–2024) developed and tested semi automatic portable noodle machines with focus on cutter shaft geometry (2 mm and 4 mm), validating performance via FEA and experiments that achieved about 93% efficiency; their emphasis on cutting mechanics complements your approach, while your work adds portability via modular, lightweight assemblies and optional manual drive for power limited contexts.

Our work bridges the durability, speed control, a compact, lightweight, affordable, and easy-to-operate by fabricating a truly portable noodle making machine that combines multipurpose die which is used for noodle and chakli is easy to use with affordability and hygiene. The low-power motor-driven threaded extrusion mechanism housed in a lightweight frame composed of food-grade stainless steel and readily available materials. Unlike prior models, our machine prioritizes modular construction for quick assembly and cleaning, enhancing portability and maintainability.

III. PROBLEM IDENTIFICATION

The demand for fresh homemade noodles is growing globally, but many existing noodle making machines remain unsuitable for small-scale or domestic use. Commercial noodle making machines are often large, heavy, and expensive, making them inaccessible to many home users, small eateries, and micro-entrepreneurs. These machines typically require significant space, electrical power, and technical know-how to operate and maintain, which limits their adoption in resource-constrained environments. The cost of purchasing and maintaining such machines can be costly for small businesses that lack capital and technical support.

Additionally, many commercial machines focus on high production rates suitable for industrial settings, making them inefficient and excessive for low-volume needs. Then often lack portability, making them difficult to relocate or use in multiple settings. Cleaning and maintenance are frequently complex due to internal mechanisms, negatively impacting hygiene and operational up time.

There is also a limited availability of machines that allow for easy fabrication or repair using locally available materials and simple manufacturing processes. This gap means users are dependent on imported or specialized equipment, increasing costs and delays.

Therefore, the problem is to develop a compact, lightweight, affordable, and easy-to-operate noodle making machine that can be self-fabricated or repaired at low cost. Such a machine should enable fresh noodle production at home or small commercial settings without the drawbacks of size, complexity, and maintenance burden found in existing machines. Addressing these challenges is vital to expanding access to fresh noodles and supporting small food ventures

IV. OBJECTIVES

The main aim of this project is to fabricate an innovative, portable noodle making machine that simplifies fresh noodle production for household and small business use. This project specifically targets the need for a compact, affordable, and user-friendly machine that can be assembled, operated, and maintained with minimal resources.

The specific objectives are as follows:

1. 1. To construct a lightweight, modular noodle making machine: Develop a device using food-grade and locally available materials, ensuring the structure is compact for easy transport, assembly, and storage while maintaining hygiene and durability

2. To enable efficient noodle extrusion with low-power drive: Incorporate a threaded extrusion mechanism operated by small DC motor, allowing the machine to function in resource-limited or off-grid environments and offering flexibility for various user needs.

V. METHODOLOGY

This section describes the systematic approach adopted for the fabrication, and evaluation of the portable noodle making machine. The core methodology is divided into two structured steps: requirement specification, component selection and procurement.

1: Requirement Analysis & Specification

The project begins with identification of the precise requirements for a truly portable, affordable, and user-friendly noodle making machine. A thorough review of existing commercial and technical literature reveals that most available options are either heavy, costly, or too complex for student or home use.

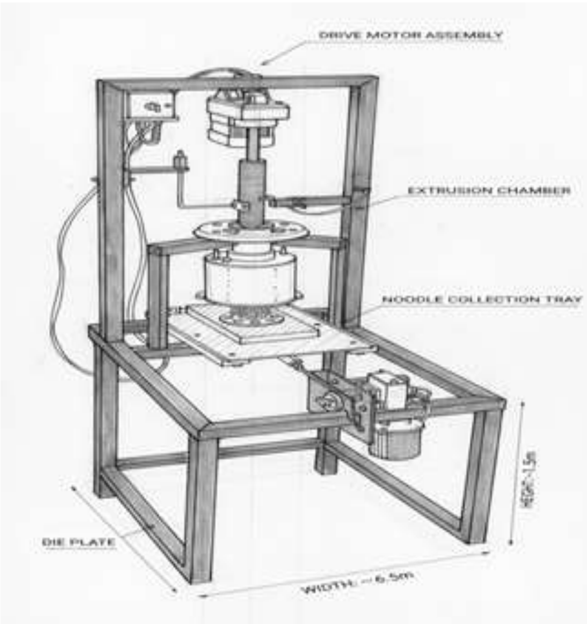


Fig 5.1: Assumed sketch of the model

Therefore, target specifications are set as follows:

- Modular construction for easy assembly and disassembly.
- Food-grade stainless steel for all dough-contact parts to meet hygiene standards.
- Operation by a low-power DC motor to ensure accessibility in areas with limited electricity.
- Material sufficient for home and micro-business settings.
- All parts sourced locally, and standard fasteners are used for easy maintenance and repair.

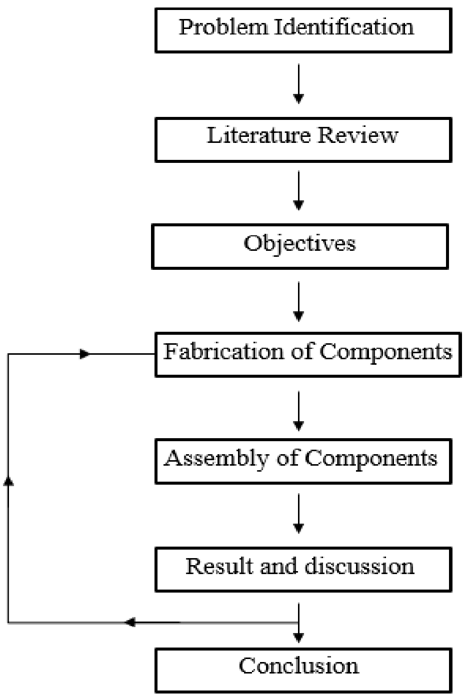
Establishing these specifications forms a strong foundation for the subsequent phases and ensures that the project's goals are aligned with real-world needs and practical constraints.

2. Component Selection and Procurement

- The extrusion rod is selected as stainless steel 430 (for food safety) with consistent thread pitch to ensure even dough movement.
- A 12v DC wiper motor is chosen for electric drive, with torque and speed calculated according to gear ratios required for dough extrusion..
- Supporting frame materials are high-strength, lightweight mild steel metal or rigid food-safe polymers.
- Additional consumables and safety features include food-grade grease for bearings, electrical isolation for wiring, and clear labels for operational controls.

VI. PROJECT FLOW CHART

Flow Chart



VII. COMPONENTS USED

3D Model for Portable Noodle making Machine

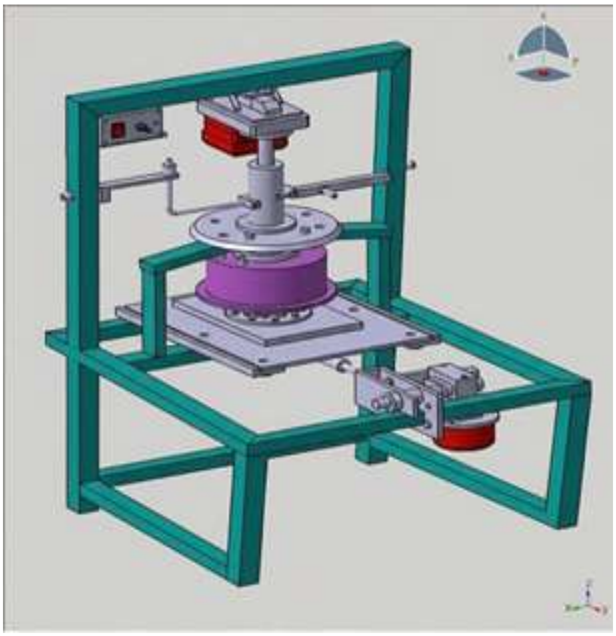


Fig 7.1: Portable Noodle Making machine

Components used

1. Mild Steel Metal Frame

Fig 7.2: Mild Steel Metal Frame

2. Gear motor (Actuator)

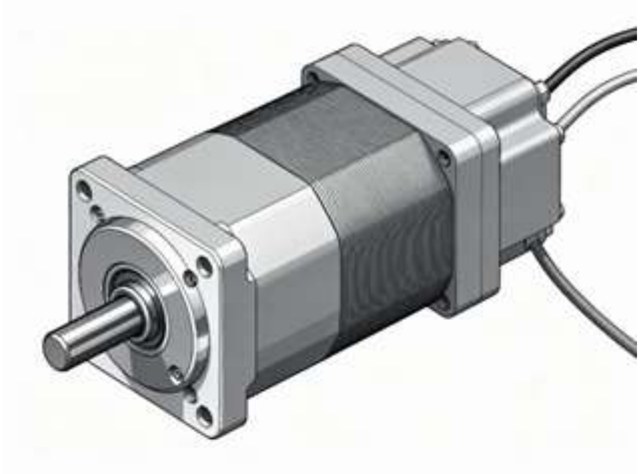


Fig 7.3: Gear motor (actuator)

3. Die Chamber

Fig 7.4: Die

Fig 7.5: Die Chamber

4. Tray with Bearing Support

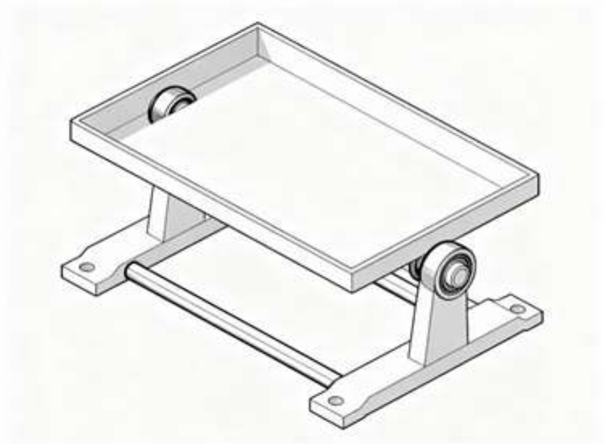


Fig 7.5: Tray with Bearing support

5. 12v DC Wiper Motor

Fig 7.6: 12v DC wiper Motor

VIII. DEVELOPMENT

Material description and calculation
Motor

2SW60 wiper motor operating at the 3.5A current and 12V power which has output rotating at a speed of 60 rpm with rated torque of 13 N-m.
P = VI
P = 12X3.5=42W

Choice of motor based on the requirement for the task, it has provided variable speed, low initial cost high durability, simple control of motor velocity. Simple mounting mechanism with three holes. But these motors with the high maintenance cost because of its internal gear mechanism.

Motor Specifications
Voltage=220V
Frequency=50 – 60Hz
RPM= 45 – 60 rpm
Horsepower =1 – 20W

Fig 8.1: Wiper Motor

Ampere=0.4–1.0 A
Angular speed, $\boldsymbol{\omega}=(rpmX2\pi)/60$
Force, F =$\boldsymbol{\tau}$/r = 1.86/0.125 = 14.88N= $(45X2\pi)/60$ = 4.71 rad/s
P in=I XV = 0.4X220= 88W
Torque,
$\boldsymbol{\tau}=(IXVXEX60)/rpmX2\pi=(0.4X220X0.1X60)/45X2\pi=1.86$N-m
Pout=$\boldsymbol{\tau}X\boldsymbol{\omega}$=1.86X 4.71=8.76 W

Screw Rod
Screw rod plays a major character in the noodle making task which pushes the dough towards the shaping die, thread rod is made up of stainless steel with uniform pitch.

Major Diameter = 25mm
Minor Diameter = 23mm
Screw Rod Length=280mm

To find Torque of the screw rod
W = 14.88N
P = 1mm Di = 23mm Do =25mm
μ=0.1, μc=0.20

Dc=$Di+Do/2$=25+23/2=24mm
d1 =d – P =25 – 1 =24mm
d2=$(d+d1)/2$ = (24+25)/2 = 24.5mm
tan$\alpha=l/\pi d2=1/\pi X24.5$=0.0129
Torque, Mt=W[$(d2/2)$ $(tan\alpha+ \boldsymbol{\mu})$/ $(1- \boldsymbol{\mu} tan\alpha)$ + $\boldsymbol{\mu}$c dc/2]
=14.88/2[24.5(0.0129+0.15)/1-0.15X0.0129+0.2X24/2] = 65.46N-m

Mixing Container
Thread rod, which is inside the container pushes the dough with tight tolerance towards shaping Die. Simple stand which carrying complete setup with high vibration absorbs capacity.

Diameter, D=55mm Length, L = 80mm
Area, $A=\pi D2/4$
=π×55²/4=2375.82 $mm2$
Volume,
V=A XL = 2375.82 X 80 = 190066.35 $mm3$

IX. BILL OF MATERIAL

Sl no	Component Name	l/Part no	Quantity	Cost of Rupees
01	TVS Wiper Motor	26071095A	1	1500
02	12v DC Motor	ADC12	1	450
03	Bearing	SAE4140/304 stainless steel	1	200
04	Switch	Spring bush button	1	50
05	Rubber bush	Urethane	4	50
06	Stand Rod	MS-IS277	4	3250
07	Stand Plate	MS-IS277	1	100
08	Mixing chamber/container	SAE4140/304 stainless steel	1	1500
09	Container connection	SAE4140/304 stainless steel	1	300
10	Stand Cover	SAE4140/304 stainless steel	1	100
11	Shaping Die	SAE4140/304 stainless steel	1	550
12	Thread Rod	SAE4140/304 stainless steel	1	350
13	Fabrication Cost	SAE4140/304 stainless steel	1	3500
			Total	11900.00

1.TVS Wiper Motor: Motor Torque Range: 13 to 120 Nm, Wipe Angle Range: 70 to 110 degrees, Life: 1.5/3 million Cycles as per SAEJ903C & J198, Over load protection EMI/EMC to CISPR25, High corrosion resistance.

2. Bearing: SAE4140/304 stainless steel Manufactured using high quality material range is used to carry heavy loads. Having an aim of meeting all the market requirements, we offer these bearings in different sizes and dimensions. Customers can avail these products from us at market leading prices.

3. Switch: Voltage/Current is AC 250V 8A/128A 5A/80A. Mounting Hole Diameter is 3mm/0.12 Hole Distance (center) is 17.3mm/0.68

4. Thread Rod: Screw rod plays a major character in the noodle making task which pushes the dough towards the shaping die, thread rod is made up of stainless steel with uniform pitch.

5. Mixing chamber/container: Thread rod, which is inside the container pushes the dough with tight tolerance towards shaping Die. Simple stand which carrying complete setup with high vibration absorbs capacity.

6. Rubber bush: Rubber bushing, sometimes simply called a bushing, is a kind of vibration isolator. Its main purpose is to serve as an interface between two parts, acting as a buffer and absorbing some of the energy produced by the interaction of two parts. It separates two parts while allowing a limited amount of movement, thus minimizing vibration and even noise.

7. Shaping Die: Shape dies are used to reduce the diameter or to transform one wire shape into another. Applications include various types of ferrous and non-ferrous rods and wires. They are used in wire drawing and extrusion machines where material is drawn through or forced under pressure through the die. Shaped dies consist of the same profile parts as regular wire drawing dies for forming round wire.

X. RESULTS AND DISCUSSIONS

After the fabrication of the model, it was concluded that the distance from the top dead center to bottom dead center of the extruding device is 80 mm and the diameter is 55mm.

We conducted number of trials in order to find the quality of noodles being produced from the model. To be precise, we conducted seven trials for various speed of the motor and noted the time taken for different speeds and tabulated the quality of the product obtained in the scale of 2-5.

Quality scale:

5 points: The noodle strings surface is excellent in transparency, very smooth and glossy, very similar to the appearance of rice noodles and very good.

4 points: There is a transparent feeling on the surface of the noodle strings, it is quite smooth and glossy, and it is similar to the appearance of rice noodles and is good.

3 points: The surface of the noodle strings is relatively smooth and does not feel rough and is somewhat similar to the appearance of rice noodles.

2 points: The connection of the noodles is slightly poor, the surface of the noodle strings is slightly rough, or the surface of the noodle strings is slightly melted, and is not very similar to the appearance of rice noodles, which is poor.

1 point: The connection of the noodles is poor, the surface of the noodle strings is rough, or the surface of the noodle strings is melted out, not resembling the appearance of rice noodles, and very bad.

Initially, a batch of dough was prepared with proper proportion of water, rice flour and salt. For the same batch of dough, around seven trials were taken for the extrusion of noodles. We started with lowest speed and increased it gradually for different trials. For each trial of speed, the time taken for the extrusion was tabulated.

Parallelly, the quality of the noodle obtained was classified in the scaled of 1-5.

As the speed was increased, the time taken for extrusion was less and quality was increased.

Description of trail:

Trail 1- At the speed of 45 rpm, the time taken was 25 sec and the quality was rated as 2 which means It is poor (only bits was formed).

Trail 2- At the speed of 48 rpm, the time taken was 23 sec and the quality was rated as 3 which means it was intermediate (improper texture).

Trail 3- At the speed of 50 rpm, the time taken was 21 sec and the quality was rated as 3 which means it was intermediate (improper texture).

Trail 4- At the speed of 52 rpm, the time taken was 18 sec and the quality was rated as 4 which means it was good (continuous but length was small).

Trail 5- At the speed of 58 rpm, the time taken was 15 sec and the quality was rated as 5 which means it was Excellent (continuous, proper texture and long noodle was formed).

Trail 6- At the speed of 62 rpm, the time taken was 13 sec and the quality was rated as 5 which means it was Excellent (continuous, proper texture and long noodle was formed).

Trail 7- At the speed of 65 rpm, the time taken was 10 sec and the quality was rated as 3 which means it was intermediate (improper texture).

REFERENCES

1. Bharathraj M., Murali Kumar L. (2017). Fabrication of Portable Noodle Making Machine. International Journal of Engineering and Applied Sciences, 4(10), 92-95.
2. Nikam V. S., Bule N., Konde P., Ghongade N., Sheikh Z. (2021). Design and Performance Analysis of Axial Noodle Making Machine. International Journal of Scientific Research in Engineering and Technology, 8(4), 123-130.
3. Po Po Thin, Htay Win, Aung Kyaw Soe (2021-2024). Design and Testing of Semi-Automatic Portable Noodle Making Machines with Optimized Cutting Shafts. Journal of Food Engineering and Processing, 15(2), 45-5.