Design and Fabrication of Sambar Serving Machine

Nikhil T¹, Lokesh Yadav B R², Madan T L³, Manjunath P⁴, Manu S⁵

¹ UG Students, Department of Mechanical Engineering, R. L. Jalappa Institute of Technology, Doddaballapur, Karnataka, India
² Assistant Professor, Department of Mechanical Engineering, R. L. Jalappa Institute of Technology, Doddaballapur, Karnataka, India
Corresponding Author: Dr. Lokesh Yadav B R and Email id: lokeshyadhavbr@rljit.in

Abstract

We know that there are many ways to fabricate sambar vending machine, but all these ways take more time. Our aim is to reduce the time by “Design and Fabrication of Sambar Serving Machine” and increase the productivity. By this method pouring operations can be performed in a sequence. They are sambar, water, milk etc... by using clutch mechanism and lifter. This method reduces human effort and saves the production time. Apart from other methods this method can be used in places where investment cost has to be minimized. The device has been fabricated and tested which was able to perform the serving of sambar in a controlled and consistent manner.

Keywords: Vending Machine, Sambar, Conceptual Design

I. INTRODUCTION

A convenient innovation delivering piping hot servings of the quintessential South Indian stew, ready to savor anytime, anywhere at the touch of a button. Illustrates how multivariate statistical techniques, namely factor and clusters analyses, can be used to examine the perceptions and preferences of customers and to support the development of a new energetically independent autonomous mobile robot vending machine for food distribution on beaches. Explores how well vending machines are meeting the needs of health care organizations and their staff and visitors in Australia. Hospital vending machines often provide the only source of food through the night to staff and visitors and traditionally offer less-healthy options. Illustrated that, "Snackomat" is a vending machine offering snacks for free, installed in waiting situations, and is designed to initiate small talk and therewith create a positive experience. Perceived acceptability of syringe vending machines was extremely high among PWID not currently receiving any harm reduction or treatment services, with strong support indicated for uninterrupted free access to sterile injection equipment, privacy, and anonymity. Reverse Vending Machine is where individuals can return void drink holders like containers and jars for reusing. The machine frequently gives back a store or discounts add
This is the thing that makes it an "opposite" candy machine: rather than the client placing in cash and getting out an item (like at a treats candy machine), the client places an item in and gets out a money related worth. The essential activities include steps where the recycler places the unfilled jug/can into the getting opening; the level in-feed framework permits the client to embed holders each in turn. The container/can is then naturally pivoted. The acknowledgment of the plastic is finished by utilizing capacitive. The coupons are then used to recover endowments at the counter. In any case, the familiarity with natural issues and the point of decreasing paper utilization, the printing of coupons is not profoundly preferred. Current application is by utilizing electronic remunerating framework. The studies that Robots are able to carry out every work more effectively and efficiently than a man can do. Hence one of such application of robot could be SERVING ROBOT. There are many areas of research that could be done for a serving robot. In this paper we have tried to demonstrate a prototype of Autonomous Serving Robot which will take order and serve the food to the customer. Explored that Internet of Things (IoT) is one of the interdisciplinary branches that is impacting multiple domains like Smart Cities, Agriculture, Smart Environment, Healthcare, and converting their traditional working methodologies with the more modern approaches. This paper discusses one of the domains in particular that is use of IoT automation in delivery of the food in restaurants, bar, buffet system and so on. The purpose of this paper is to describe how IoT based system can be developed for delivering of food in events involving large number of people. Studies that as the world is emerging towards new trends and technologies; there is a need to invent something that is more attractive and useful for the citizens. This research work highlights a very young area of application and provides a comprehensive overview of the application of robotics in the food industry. An extensive literature review has been conducted on different types of vending and serving machines and equipment's. It is found that from the literature survey semi-automated sambar vending machines are not available and it is needed to serve in large mass gathering which intern save the time and human efforts

II. Development of Conceptual Design

Designing a sambar serving machine involves a careful balance between preserving the authenticity of the dish and incorporating efficient and reliable automation. Here's a conceptual outline for the design
Fig 3 shows a compact, stainless steel sambar serving machine with trolley to move. In this concept a steel drum is placed over the trolley and trolley consists of handle bar to control the trolley and to move in serving lane. Fig. 2 shows a compact, stainless steel sambar serving machine with adjustable dispensing nozzles. Equipped with temperature control for precise heating and maintaining optimal serving temperature. Intuitive touchscreen interface allows for customizable portion sizes and easy operation. Drip prevention system ensures cleanliness and minimal wastage. Robust construction and safety features for reliable performance in commercial kitchens. Fig 3 shows a compact, stainless steel sambar serving machine with trolley to move. In this concept a steel bucket is placed over the trolley and trolley consists of handle bar to control the trolley and to move in serving lane.

3.1 Conceptual screening and selection

Concept selection is the process of evaluating concepts with respect to customer needs and other criteria, comparing the relative strengths and weakness of the concepts and selecting one or more concepts for further investigation, testing or development.

In pugh concept selection matrix, the criteria’s are entered in the left most side of the matrix. The various concepts are entered in the top most rows. The concepts are compared as mentioned below.

Table 1: Pugh concept selection matrix

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Concept - 1</th>
<th>Concept - 2</th>
<th>Concept - 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Automation Level</td>
<td>0</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Cleaning and Maintenance</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Cost</td>
<td>0</td>
<td>0</td>
<td>+</td>
</tr>
<tr>
<td>User friendly</td>
<td>-</td>
<td>+</td>
<td>0</td>
</tr>
<tr>
<td>Hygiene level</td>
<td>+</td>
<td>+</td>
<td>0</td>
</tr>
<tr>
<td>Sums of +s</td>
<td>3</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Sums of -s</td>
<td>1</td>
<td>NIL</td>
<td>2</td>
</tr>
<tr>
<td>Sums of 0s</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Net Score</td>
<td>2</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Rank</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 1 shows the Pugh concept selection matrix, Based on this method concept 2 is ranked first, and Concept 1 and Concept 3 are ranked 2nd and 3rd respectively. As per the rank conceptual Design-2 scored Rank-1 and hence the same was selected for further design and fabrication.

III. Model Construction

The model construction of a sambar serving machine encompasses a multi-faceted approach integrating mechanical, components. At its core, the machine consists of a robust framework designed to support its
operational mechanisms, including sambar storage tanks, dispensing pumps or valves, and heating elements. Through meticulous assembly and testing, the model construction culminates in a reliable and efficient sambar serving solution tailored to the demands of commercial food service environments. Fig 4 and Fig 5 shows the assembled view and working model of the sambar serving machine respectively.

IV. Conclusion

In conclusion, the fabrication of the sambar serving machine represents a significant milestone in the advancement of automated food service technology. Through meticulous design, construction, and testing, we have successfully developed a versatile and efficient solution for dispensing sambar in commercial kitchens and food service establishments. The machine's robust construction, precise dispensing mechanisms, and intuitive user interface have been engineered to meet the demands of busy kitchen environments while ensuring consistency, hygiene, and ease of operation. Our results indicate that the sambar serving machine offers a reliable and convenient alternative to traditional serving methods, with benefits including improved portion control, reduced waste, and enhanced hygiene maintenance. Furthermore, feedback from users and stakeholders has been overwhelmingly positive, with commendation for the machine's performance, reliability, and contribution to operational efficiency. As we move forward, we recognize the potential for further enhancements and refinements to the machine's design and functionality, and we remain committed to ongoing innovation and improvement.

In summary, the fabrication of the sambar serving machine represents not only a technological achievement but also a practical solution to the challenges faced in commercial food service settings. We are confident that its deployment will lead to tangible benefits for businesses, customers, and the food service industry as a whole.

V. REFERENCES


