Multi-Purpose Transportable Mixer

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Abstract

Recent advances in mixer and blender designs have contributed to the growing success of food companies, meeting their requirement for consistency and developing new products while also lowering production costs. This white paper discusses both traditional and new specialty mixing technologies available to food manufacturers today. Phase and viscosity are used to classify different mixing categories. Sample applications are presented as well to illustrate certain processing challenges and the mixing technologies used to resolve them. The current processes are physically exhausting and time demanding. This project seeks to develop a better means of mixing using a manually and automatically operated machine. After thoroughly researching, designing and experimenting, a final machine was developed optimizing the mixing process. The mixing time was successfully reduced form several hours.

Keywords: *Paint mixing, Chocolate mixing, Food Industries*

Introduction

At the heart of transforming raw ingredients into food for human consumption is the mixing operation. One of its main tasks, which other processing steps also share, is to establish consistency. Whether a product requires small-scale mixing by hand or high volume blending of multiple ingredients, at-home cooks and process engineers alike know the importance of proper mixing. Even with the right amount of ingredients. Consumers expect that the products they patronize will be exactly the same as the one they had last. It is easy to understand that within the industry a high level of consistency is required not just batch-to-batch but facility-to-facility. In this market, consistency is the backbone of consumer loyalty. Various types and styles of mixing equipment are utilized within the industry. Their use and application are determined by the phases being mixed (liquid-liquid, solid-liquid, or solid-solid) as well as physical characteristics of the end product (like viscosity and density). In reality, many mixing technologies overlap in use and function such that certain applications can actually be successfully produced by two or more types of mixing systems. In these situations, economics rule out the more costly initial investments, but differences in efficiencies must also be taken into account. Proper mixer selection is vital to process optimization.

Principle

A mixer is a Machine which uses a gear-driven mechanism to rotate a set of beaters in a bowl containing the product which has to be mixed and to be prepared. It automates the repetitive tasks of stirring, whisking or beating.

Mixers require blades that turn easily and consistently during the mixing process. Electric mixers typically have several mixing speeds either in numbered settings or simply low, medium, and high speeds. More settings give more control over the mixing process.

Construction

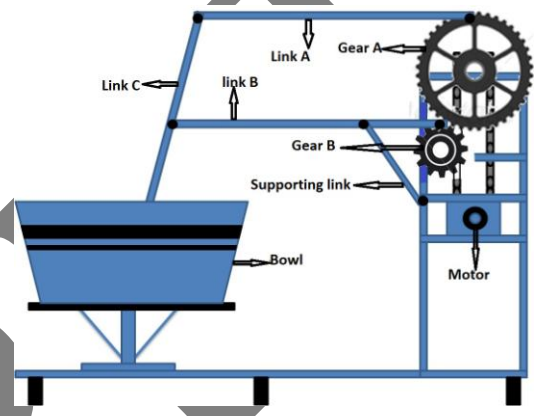

Fig. 1 Constructional Detail

- The automatic mixer consist of a two gears with different diameter and different number of teeth placed on a non-collinear axis over a frame with the help of bearings
- The two mechanical linkage are attached to the gears with help of screw joint and one more link which joins that two linkage, in such a manner that they form a ‘F’ structure
- Under that there is one more floor on which a motor is mounted with the help of nut and bolt arrangement between motor and large diameter gear there is a chain drive to give motion to the gear.
- Along the floor there is one more link which is used to support the ‘F’ structure and prevent unnecessary movement of the ‘F’ Structure.

- On the other hand of the mixer there is a bowl, which is placed over a stand rotating by a motor with the help of chain/rope drive.

- Over a bowl there is a splash guard to protect mixture from external impurities.

Working

- Firstly the bigger diameter gear (A) is rotated with motor help of chain/rope drive as shown in construction, due to the meshing of a small diameter gear (B) with the big gear it also starts to get rotate along its axis.

- Due to the rotation of both gears the mechanical linkage starts acting there motion.

- The link 'A' starts moving in horizontal axis to the left hand side, as shown in above construction, and the link 'B' pulls the link 'C' to the right hand side, due to which the link 'C' gets starts acting its motion.

- the gear is rotating, the mixing action with the help of that link, will be like up-down and moves horizontal

- At a time bowl is also free to rotate about its axis with the help of motor, which is given to the bowl by a chain/rope drive.

- By using this simple construction we can mix the mixture fast and in proper manner.

Conclusion

Evolutionary improvements in mixing technologies such as those discussed above present an opportunity for food companies to periodically update processes, upgrade efficiencies, and improve product consistency efforts. It is recommended to plan a thorough testing program with a reliable and experienced equipment manufacturer before even committing to a specific type of mixer system. Confirm you're mixing strategy by trying a variety of potential candidates utilizing your own raw materials and simulating operating conditions as close to your actual process as possible. The rewards will be sweet and fulfilling.

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