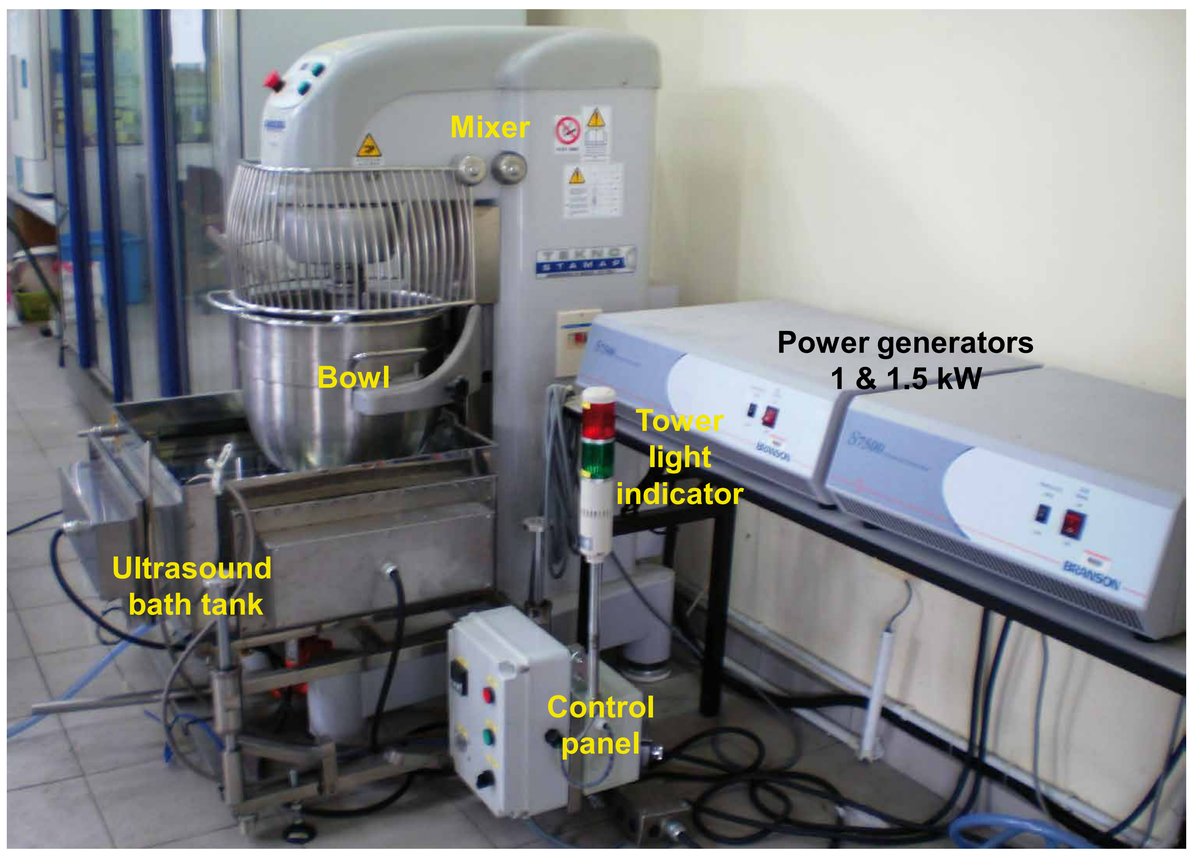
ULTRASOUND BATH AIDED MIXING SYSTEM

PI2010004677 (MY); 1305850.8 (UK);
13/878,002 (US); 2013/02457 (ZA)



Introduction

- A high intensity ultrasonic treatment method and apparatus is used with an existing commercial dough/batter mixer to enhance rheological, aeration and textural properties of bakery products
- The changes in properties is result of acoustic cavitation phenomenon induced in the dough/batter through propagation of high intensity ultrasonic waves

Invention

- The present invention discloses a mixing bowl of an existing mixer system that is preloaded with mixing medium. The bowl is located at the center of the ultrasonic bath tank filled with a working fluid
- The ultrasonic waves of the present invention are generated by a plurality of generators and piezoelectric transducers mounted on its stainless steel tank
- The electric energy received in each transducer is converted into mechanical expansion and contractions in the piezoelectric ceramics of the transducer thus leading to pressure waves being transmitted to the mixing medium

Benefits

- Ultrasonic cavitation effects create and modify bubbles structure
- Bubbles size and distribution are controlled for aeration and textural quality
- Contribution towards appearance and mouthfeel of bakery products without the use of food additive

Usefulness And Application

- To differentiate premium market from the general
- Refined bakery products through processing improvisation
- Bread dough produced has lower dynamic density and results in breads with lower density (14%) & firmness (32%)
- Cake batter has lower density (2%), higher viscosity (10%) and produced cakes with higher springiness & cohesiveness, plus lower hardness (12%)

Potential consumer

- Bakery industry in Malaysia and globally
- Company interested: Tiger Brands Milling & Baking, South Africa

Bakery Products: Market Value

Year	Malaysia (RM Billion)	Global (USD Billion)
2009	2.406	411.7
2010	2.475	433.2
2011	2.555	469.6
2012	2.658	470.9
2013	2.752	480.1
2014	2.838	493.6

Source: Euromonitor International

Project Leader : Assoc. Prof. Ir. Dr. Chin Nyuk Ling
Co. Researcher : Dr. Tan Mei Ching, Dr. Nasrul Fikri Che Pa and Assoc. Prof. Dr. Yus Aniza Yusof
Faculty : Engineering
Email : chinnl@upm.edu.my
Tel : +603-8946-6353
Expertise : Food Engineering, Food Properties