Design and Development of a Manually Operated Agarbatti Powder Mixer for Micro Enterprises in India

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Abstract:

Incense sticks called agarbattis in India, are becoming internationally known as a ritual product used for spiritual purpose producing fragrance for aromatherapy and meditation. The agarbatti workers in India lack efficient tools and education to develop better means of processing agarbattis. The current manual mixing processes are physically exhausting and time demanding to complete. In order to help agarbatti producers, this project focuses on providing a better means of mixing the raw materials involving in making incense sticks.

In-depth study was carried out using several methodologies including personal interview, observation, and site visit. The data was collected and analyzed using QFD, to select the characteristics of mix, types of materials, manufacturing processes and ergonomic issues involved. In addition easy of manufacturability, cost consideration and safety factors were considered while designing the machine, and PDS was arrived upon. The final concept was selected by participatory and weighted ranking method to show the problems faced by the manual labours in this industry.

Capturing the form and shape of rugged products in an efficient manner, a real-time full scale prototype was developed for converting manual mixing process to semi-automatic mixing, which helps in reducing the mixing time successfully from 5 min to 2 min per kg. Through the success of the design small scale micro enterprises will be able to generate more revenue with increased production, creating more opportunity in manufacturing agarbattis in rural India.

Agarbatti ingredients

Concepts inspired from rugged form and shapes

| CAD model | Components | Mixer assembly | Prototype | Model ergonomic |