

Design of an Automated Snacks and Beverages Dispensing Unit



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Abstract:

Vending machine is an electronic machine used to dispense a product to a consumer after a certain amount of money has been inserted into the machine. Vending machines are popular and extensively used around the world but fairly new to Indian market.

Project was started with an aim to design an automated snacks and beverages dispensing unit for Indian fast food considering ergonomics, aesthetics and functionality. After primary and secondary research a need was identified for a snack and beverage dispensing unit which would prepare fresh snacks in lesser time with good quality and hygiene. As a result, dosa is the snack that has been selected that will be freshly prepared and dispensed by the vending machine along with Coffee and Tea. On the basis the identified needs, PDS was defined and QFD generated, to develop the concepts.

Brain storming was used for generating concepts. After understanding the manual dosa making process, five different concepts were generated for external housing of the dispensing unit keeping a single mechanism working principle and operating features similar for all concepts. The working principle was as follows, initially the type of dosa and kind of money transaction (note or card) is selected by the customer using touch screen display panel. After selection the dosa batter stored in the hopper is dispensed on the hot plate placed on the induction stove along with oil or ghee stored in other containers with the help of electronically controlled flow valves. Simultaneously the stacked plastic plate is placed on the belt conveyer with the help of vacuum gripper. The chutney, sambar and butter containers with electronically controlled valves placed along the path of belt conveyer fills required amount on to the plate as it moves along the conveyer. Finally dosa is scraped on to the plate and moves to the collection tray, where it will be collected by the customer. Pugh Matrix was used to select the final concept. A scaled (1:3) mock up model was developed with digital animation of the working principle as proof of concept.

Concepts 1



Concepts 2



Concepts 3



Concepts 4



Concepts 5



Concepts generated



Rendered images of final concept

Final mock up model