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Boiled tea making machine for customised taste¹²

GENERAL UTILITIES NATIONAL FIRST

Ashok Kumar Dhiman (21), a native of Firozpur, Haryana has had a keen interest in science from his early childhood. While studying in the sixth standard, he made a photo enhancement system in which, on a reel of 35mm, one could take 44 photos instead of the usual 36. By the time he was in the tenth standard, he was the proud innovator of a pair of binoculars, a number based locker, and an automatic curfew siren. After his tenth standard he underwent ITI training.

Genesis The responsibility of making tea for his ailing mother often fell to Ashok and he found this a tedious process, essentially because there was no LPG or kerosene stove at home. Preparing two cups of tea meant that he had to go through the entire process of lighting the wood fire in the conventional *chulas*. Also, if nothing else needed to be cooked then, the wood which had already been lit would be wasted. This forced him to think of a solution which could prepare tea using electricity. He didn't use the conventional electric heater as it consumed too much electricity and he thought of a creative new solution. He took four months to develop the prototype. The initial prototype had cost him about Rs.8000 but he maintains that with a degree of redesigning and refinement the cost can be brought down to Rs.3000.

The Innovation

This machine facilitates the Indian method of making tea by separately pumping in water, adding tea-leaves and sugar, heating, adding milk, boiling and filtering, and dispensing the tea automatically into cups in pre-assigned proportions. Each user can set these proportions according to his/her taste. Apart from putting the cups and setting the number to deliver up

to four cups, the entire tea making process is automatic and the cups are laid out on a sliding tray once the tea is ready. It produces four cups of tea in five minutes and can be used as many times in a day as required

In this machine, the water, tea leaves, sugar and liquid milk are taken automatically from different containers within the machine and are boiled in a vessel equipped with a heater. The water is collected from the container in this heating vessel with the help of a pump. After the water boils for some time, tea leaves and sugar are added from their respective chambers (placed just above the heating vessel) with the help of a motor operated mechanism. This mixture is boiled for some time and thereafter liquid milk is added from the milk container. This whole mixture is then boiled for about 30 seconds to one minute and the tea is ready. The tea is then poured into cups with the help of an outlet tube. The boiling time at each stage and the timing of the operation is controlled with the help of a mechanical timer.

Advantages

This device has the capacity to store tea-leaves and sugar for a month and milk and

water have to be filled only once a day. An additional advantage is the provision for personalising the taste. Since processing happens in a closed system, contamination or evaporation of milk is minimized. By circulating hot water in the system, the entire unit can be cleaned effectively. The heater being of low capacity, the machine can also be run with the help of an inverter during power power cut. This machine is easy to build and operate and requires minimal maintenance.

Various other tea-making machines are available in the market, made by different companies but each has its disadvantages. First, they are not suitable for preparing the tea as per the process followed in India. In the existing machines premix powder or tea-bags are used and the water is boiled in one container and added to tea leaves in another container and thereafter black tea is collected in cups. Further the devices available in the market are rather complicated and are very costly with the cheapest model costing Rs.15,000 as compared to the Rs.3000 required to make this machine. Cleaning is also difficult in such machines.

Current status

Initially the tea-making machine had 18 motors and the structure was quite fragile. GIAN (N) took up the task of making modifications in the machine. One of the first objectives of the value addition process was to reduce the number of mechanical moving parts and replace these with electronic parts so as to make the machine sturdier and easier to maintain. This would reduce the weight, increase efficiency and cut costs. Later a market survey was conducted by a student to assess the features that consumers wanted and additional price they were willing to pay. A focus group discussion was also organised to discuss with experts the best strategy to take the device forward. The experts feel that there is a market waiting to be tapped

with the main users being hostels, restaurants, offices/ corporate and families. They also feel that thorough market research and test-marketing should be done before commercialisation. Some prototypes should be installed in selected localities for demonstration and for collecting direct feedback from users. The modifications are still going on and NIF is quite hopeful that once modified, the machine would change the way Indians make tea. An amount of Rs. 37,500 has been sanctioned for prototype development of the machine under the Micro Venture Innovation Fund of NIF. Also, NIF has filed a patent application for the machine (994/DEL/2004, 31/05/2004).

Triumph amidst adversity

Ashok's first job was that of a turner-fitter in a local company where he worked for two years. He has recently found a job with a company. He earns around Rs.2500 p.m. and that is the sole income of the family. He recalls that, while making the device, he faced a lot of financial difficulties and regrets that he did not receive any support from his family. He was discouraged in his endeavours and there were even attempts to break his tea making machine.

In spite of all this he never lost his zeal. His model has been displayed at GIAN (North) and various exhibitions. It was also featured in the "Dainik Jagaran" newspaper and a couple of other local newspapers. Ashok hopes to start a business of his own with this innovation. Even now he spends more than 50% of his meagre income on experiments, gadgets, scientific equipments, books etc. At present he is working on a water reactor which would produce electricity at a minimal cost for which he would require Rs.20, 000-25,000 to meet the initial construction costs. One salutes the indomitable spirit of this grassroot innovator.