

Remote operated device for firing crackers⁶⁷

CONSOLATION

Balram Singh Saini from Pasiyala, Haryana is a third year B. A. student. In his free time he assists his elder brother in his electronic devices repair shop. Both his elder brothers, class eight and nine dropouts respectively, are actively into the field of electronics. Balram has also developed a pistol for firing crackers and is now working on a low power clothes iron. Apart from these technical pursuits, he also finds time to write novels and does some freelancing for local newspapers. The Honourable President, Dr. A.P.J Abdul Kalam has been a source of inspiration for Balram.

Genesis

Balram Singh Saini was quite disturbed by the news of mishaps caused by firecrackers during Diwali and once in 2001 when his nephew was injured due to a firecracker, he decided to develop a device to minimise accidents. He discussed the idea with his brothers and they encouraged. Till date, two prototypes have been built and tested and each unit costs about Rs.300. The first prototype developed by the innovator was a simple model having a strong platform for igniting a single cracker with the help of a remote control. This model was further modified for several crackers in model two. The third prototype with modifications and additional features is under development for better control and compactness of the design. This version of the device will run on LP gas lighter and will have an advancing feed mechanism to make the firecrackers move in one by one in sequence as the relay switch turns on and off and it would run on a 3V DC motor power supply. Some of the problems that Saini faced during developing this innovation were financial and lack of moral support from outsiders but he also remembers with gratitude, the constant technical and financial support offered by

his elder brother, Prem Singh Saini. Balram wants to start his own manufacturing setup for his device provided he gets some financial help.

The innovation

This fireworks remote control firing and securing system consists of an ordinary Infra Red TV remote control unit(transmitter), an electronic receiving unit, switching circuitry, relay switch, separate LED for each firework loaded, separate heating element for each cracker, a timer for switching current to each heating element and a LED platform and attachment for holding fireworks/ crackers.

The remote control generates and sends the Infra Red signal to the electronic receiver. The receiving unit receives the signal and sends an electric current that runs through the timer and cables to the heater, which ignites the fuse of the fireworks. The heater is a coil made of tungsten wire or any other suitable heating element. This heating element is connected to the fuse of the fireworks. It has a base for placing a number of crackers (noise bombs) and a separate



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attachment for holding aerial fireworks (rockets) connected to the base and a hollow pipe for holding or guiding the fireworks.

The device currently works on 12 V DC, which can either be fed directly from a DC power source/ battery or AC mains through a power supply. A timer is incorporated within the device to select each cracker one by one and this selection is indicated by the glow of respective LED beside each loaded cracker. Once the LED at a particular cracker glows, the signal from the remote can be transmitted at that instance to ignite that particular cracker.

Many kinds of firecrackers such as bombs, rockets and flower pots can be deployed on the mild steel base fireworks loading platform. This unit has the provision to keep up to 10 crackers simultaneously on the platform and choose the order of burning with the remote control unit. It is stationary at the time of usage but is handy and can be installed at any place and for various fireworks. NIF has sanctioned Balram Singh Saini a sum of Rs. 8,750 from the Micro Venture



Innovation Fund for the prototype development and test marketing of his innovation.

Advantages

This is a unique and one of its kind solution for the Indian firework market. As it helps in maintaining a distance from the place of the ignition of the crackers, it saves the person who ignites the crackers from exposure to a very toxic mixture of gases which contains more than eight kinds of metallic compounds which are hazardous to human health. This is especially relevant as it has been recommended by the health agencies to maintain at least three metres of distance from the place of ignition of crackers. Further there is no need to buy a remote as any standard TV remote could be used. This device could also be used for scaring birds and animals in agricultural fields. Other applications could include bomb disposal, remote explosions in quarries and mining industries and by railways and road building authorities for the safe explosion of rock-faces and rock profiles from a distance.

Impact of the Technology

According to rough estimates, nearly 10,000 people get injured by crackers every year and most of the victims are children in the age group of 8-16. Growing concerns towards the menace of firecrackers has sensitized many in society, which is quite evident from the several cases of Public Interest Litigation in the recent past.

The impact of this technology would be enormous on our society, particularly, among those sections of society which use firecrackers extensively for expressing their joy. This device has great market potential especially given the fact that the crackers used during the Diwali season alone costs more than Rs.1000 crores and no similar device is available in the Indian market. Further this device is based on the innovator's understanding of the psyche of children as this device ensures that control of bursting crackers lies with a person who stays away from the actual place of burning.