

## Modified stick for the visually challenged<sup>31</sup>

### STUDENT AWARD SECOND

**Sanket V. Chitagopkar** (17) and **Prashant V. Harshangi** (17) are from Gulbarga, Karnataka. They are both in the second year of their Pre University Course. Prashant's parents are doctors and his brother is studying medicine. Sanket's father is a doctor and his mother is a housewife. His brother is studying in the tenth standard.

**Genesis** It was on the 17<sup>th</sup> of July, 2002 and Gulbarga city had received the first showers of the year. There were puddles everywhere and Sanket happened to observe that a blind man who was walking by with a stick fell in one. It was a sad sight. The next day Sanket discussed this incident with his friend Prashant and they conceived the idea for the stick.

Under the guidance of their teacher Mr. R. Hemant of the Sharnabasaveshwar Public School Gulbarga, they contacted Prof. Y.N. Ravindra who gave them a brief idea of the circuit and they started the project. Both relate that they faced a number of technical problems while developing the innovation. The main hitches were in fixing the circuit onto the stick and fixing the IR sensors and IR LEDs. They acknowledge the guidance of Prof. Y.N. Ravindra who gave them many useful tips and hints, which made the development easier. After days of hard work they prepared the circuit and the model. Next, the prototype was given to the local blind school for testing. The students of the blind school found the innovative stick more convenient than the existing alternative.

### The Innovation

The electronic blind stick uses a PCB with

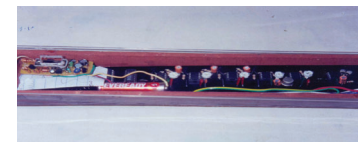
a host of components including Integrated Circuits (IC 555, IR Sensor), semiconductors (Transistor-BC557, IR LED), passive components such as resistors, preset, capacitors and diodes along with headphones, IC base and the base 1" PVC pipe which functions as the stick and a separate handle. This device makes use of a total of five sensing circuits. Three of them use IR reflective sensing techniques to sense the presence of obstacles. Each sensor (IR) is individually AMV gated, stimulated by a switching circuit with assigned frequency. The principle of working consists of generating 32 KHz wave using the IC1 (555), which is fed as input to the IR LEDs emitting IR rays. These rays are reflected back from the obstacle and the IR sensors absorb these rays and activate the gated oscillator, which respectively turns the speaker on. An obstacle on the right side turns on the right side speaker; if it is on the left side, the left oscillator triggers the speaker on that same side. In case the object is in front, the forward sensor sends the signal to both the oscillators, so both speakers are turned on. The present system thus uses time decision multiplexing technique to transmit all the gated AMV frequencies sequentially. There are also moisture-sensing electrodes and micro-switches. All the



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gated assigned frequencies are multiplexed and transmitted with the help of a FM transmitter. The use of FM transmitter and receiver makes a wireless system possible.

### **Advantages**

Multiplexers are used to sense obstacles in different directions simultaneously. This means, the blind person might receive different signals on obstacles in different directions around him through the headphone. The moisture sensing electrodes sense the moist soil or stagnant water. This can be especially helpful during the rainy season. It also contains micro-switches, to detect manholes. Finally, in order to make the system more versatile, an anti-theft alarm is also incorporated to warn the user if the stick is being stolen. It is known that in most of the visually challenged, the other sense organs are highly developed. That's why the creators think the stick will effectively serve the purpose. They haven't made any move to commercialise it. This device costs Rs.800.

### **Social relevance**

Blind people totalling over 1.5 million have difficulty in travelling and successfully sensing obstacles, manholes and puddles of stagnant water. They need support for all their activities. They need a third leg i.e. the stick to walk. One of the primary problems faced by the visually challenged is to walk freely in a public place. The outside world is rife with dangers especially when they leave their dwelling place, as they may fall down and injure themselves or stumble against an electric pillar or meet with an accident. Thus this innovative stick has great social impact as every visually handicapped is a potential user. Considering the various features and its superiority over the existing alternative even at the present cost, this stick is an essential accessory for blind people as it greatly enhances their mobility.

Other applications of this innovation could be its use by sewage workers, miners etc or in situations where light is dim/not available or for military applications where the need is to move around without using any

light source. While such sticks are generally known in literature, the specific combination of features such as water sensor, alarms, FM transmitter etc., have not been reported in any one stick.

### **Pride of the family**

*"Till now nobody in our family has done anything innovative. But they may now get inspired from us and do something in the near future!"* declare Sanket and Prashant. These young innovators have always had a tendency to try and understand everything. This tendency and flair for improvisation coupled with a curious nature played a vital role in making their innovation a success. Their family's pride in them is revealed in one sentence, *"These two have a genius dancing between their ears"*. They go on to explain, *"What made us support them in this course was their attitude towards this project. It was not merely mechanical but it was for a cause- to help the blind. Of course we were a bit worried about their studies. In this competitive world we just lay stress on our children's academics. Yet, innovative thinking is necessary and there lies the real creativity of every person."* Sanket and Prashant have also made a project titled 'Automatic dipper'- the main use of which is to automatically dip the headlights of the vehicle at nights on highways. Many accidents are caused, because of bright light. So this innovation helps in avoiding such accidents. Currently Sanket and Prashant aren't working on any other idea. These students are grateful for the considerable encouragement they received from their family, friends and teachers. They have exhibited this innovation in the Intel Science Talent Discovery Fair- 2002 and won a prize. After this it was covered in a number of newspapers. They also recall with happiness, the fact that the community had rained applause and appreciation on them in the wake of their innovation. On asking about their dreams for the future, Prashant explains he would like to become an engineer in the stream of either electronics or automobiles. But Sanket is categorical in stating that he doesn't want to reveal his future plans to anybody, as yet.