



The Untouchable ~ A Safety Feature for Workshop Machines and Electrical Appliances

Shi Ting Pan, Ng Ching Man, Chan Ying  
Sheng Kung Hui Li Ping Secondary School, Hong Kong, HONG KONG

Accidental cuts by rotating blades and moving fans are seldom covered by the media unless fatal injuries are caused. In fact, numerous accidents occur daily at home, school and workplace for using machines even with so-called protective shields of wires. According to the Bureau of Labor Statistics (BLS)\* in USA, fatalities from moving machine related incidents accounted for approximately 13% of all industrial accidents. Foreseeing that severe hurt could be avoided if machines are stopped immediately whenever they are touched by an organic substance, we aim at using circuit mechanism to stop machines-related accidents.

Although the concept of "The Untouchable" is new, the electronics needed for its implementation is not. Available in the market is a touch lamp that is turned on/off by touching its surface. Based on this electronic circuit, a moving machine can be stopped as soon as the capacitance of the shielding mesh is changed due to a direct contact with a foreign object such as a finger. We have experimented with many types of switches, adding relays and on/off selectors for an optimal operation with the right time of response and adequate sensitivity.

The effectiveness of "The Untouchable" has been validated through in-situ field-tests by installing it in many machines, such as electrical jigsaw, metal cutting lathe, and electric fan. We believe that with adequate resources and further improvements, "The Untouchable" can be adopted as a standard safety feature in all machines and electrical appliances. By then, many domestic and industrial accidents could be avoided.

\*<http://www.cdc.gov/niosh/topics/machine/>

Category  
Pick one only--  
mark an "X" in  
box at right

- Animal Sciences
- Behavioral and Social Science
- Biochemistry
- Cellular & Molecular Biology
- Chemistry
- Computer Science
- Earth Science
- Eng. Electrical & Mechanical
- Eng. Materials & Bioengineering
- Energy & Transportation
- Environmental Management
- Environmental Sciences
- Mathematical Sciences
- Medicine and Health
- Microbiology
- Physics and Astronomy
- Plant Sciences

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check ALL that apply):  human subjects  vertebrate animals  microorganisms  rDNA  tissue  Potentially hazardous biological agents:
2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.  Yes  No
3. I/We worked or used equipment in a regulated research institution or industrial setting.  Yes  No
4. This project is a continuation of previous research.  Yes  No
5. My display board includes non-published photographs/visual depictions of humans (other than myself):  Yes  No
6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.  Yes  No



*This embossed seal attests that this project is in compliance with all federal and state laws and regulations and that all appropriate reviews and approvals have been obtained including the final clearance by the Intel ISEF Scientific Review Committee.*