



Infrared Sensor based Laptop Security System to Avoid Theft & Misuse: A Patented Idea

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ABSTRACT

Data security is very important to businesses and even personal computer users across the world. Confidential data from payment information, client information and bank account details to personal files and documents should be stored safely. A lot of personal data is stored in individual laptop, whose security is to be ensured. There are so many techniques available in the market through which laptop security can be ensured. But existing laptop security mechanisms use very expensive components or come in the form of software that need to be installed in the laptop. The existing software's provide security to the data but they need to be unlocked every time before use of the laptop. So there is a need to develop a simple, low cost and easy to use mechanism that can be easily fixed to laptop and provide security to the user. In this article a novel approach for laptop security has been discussed.

Keywords: Infrared sensor, LED, Infrared rays, Laptop security system (LSS)

I. INTRODUCTION

A laptop, often called a notebook or "notebook computer", is a small, portable personal computer with a "clamshell" form factor, an alphanumeric keyboard on the lower part of the "clamshell" and a thin LCD or LED computer screen on the upper portion, which is opened up to use the computer. Laptops are folded shut for transportation and thus are suitable for mobile use. Although originally there was a distinction between laptops and notebooks, the former being bigger and heavier than the latter, as of 2016, there is often no longer any difference. Laptops are commonly used in a variety of settings, such as at work, in education, and for personal multimedia and home computer use. A laptop combines the components, inputs, outputs and capabilities of a desktop computer, including the display screen, small speakers, a keyboard, pointing devices (such as a touchpad or track pad), a processor, and memory into a single unit. Most 2016-era laptops also have integrated webcams and built-in microphones and some have touch screens. Laptops can be powered either from an internal battery or by an external power supply from an AC adapter. Laptop is nowadays a very common device and is used by students, professional like writers, 20 scientist, businessman etc. for their daily work operations. The problem that occurs in existing laptop

a security mechanism is that either it uses very expensive components or come in the form of software that need to be installed in the laptop. The existing software's provides security to the data but they are needed to be unlocked every time before use of the laptop. The other low cost mechanism that exists is in the form of security lock that does not allow separating the screen and keyboard or a sheet is put up on the screen and does not allow the user to use to view the screen and block the keyboard also. This sheet is fastened to laptop using screws. So very complicated mechanism exists for securing the laptop and other methods are very costly.



S.no.	Patent application no.	Summary of invention	Comparison with present invention
1	US 6216499 B1	In the present invention a locking mechanism is provided that locks the laptop the desk or table on which it rests.	In the present invention a laptop security system is disclosed that does not use any mechanical means to secure the laptop and uses only simple electronic components. Whereas the comparative patent application discloses a security system that includes engaging and disengaging mechanism to lock and unlock the laptop
2	US 5836183 A	A portable device for securing a laptop computer from theft. Provision is made for locking the device to an immovable object by cable or by padlock.	The present invention uses an infrared emitter on one side and on the other side infrared smart sensor that receives the infrared red and gives a signal when any obstruction occurs in the path of infrared rays. Whereas the comparative invention uses a cable or padlock for which a special base of the laptop is designed for fixing cable onto it.
3	CN 202939545 U	The notebook computer with the safe using reminding function comprises a notebook computer body, an infrared sensing device, a central processing unit (CPU), a storage device, a display device and a voice device.	In the present invention an infrared emitter and sensor is fixed that gives a signal when any obstruction occurs in the path of infrared. Whereas in the comparative patent application The infrared sensing device is connected with the storage device storing safe distance comparison data, and transmits a detected distance between a person and a computer to the storage device.
4	US 6425084 B1	A multilevel infrared (IR) type security system prevents unauthorized use of a computer. A program resident on the computer implements a user-validation procedure. An IR key device carries a first serial number and an encryption key.	In the present invention a simple infrared emitter and receiver is used that gives a signal when any obstruction occurs in the path of the infrared rays i.e. when anyone open or close flap of the laptop. Whereas in the comparative patent application a multilevel infrared (IR) type security system is provided that included an unencrypted portion and an encrypted portion that prevents unauthorized use of a computer.



5	US 20080022417 A1	In the present invention collection of laptops communicates with other laptops within the collection of laptops utilizing a wireless connection. In response to detecting that a disruption in communication has occurred, the security manager issues an alarm	The present invention can be used for single laptop or multiple laptops that uses very simple electronic components to detect the use of laptop.
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II. HARDWARE REQUIRED & CONSTRUCTIONAL FEATURES

In order to make the circuit for LSS, the following hardware is required

1. Infrared emitter
2. Infrared Rays
3. Infrared sensor
4. Transmitter
5. Receiver
6. LED
7. Buzzer

The laptop security system consists of an infrared emitter that emits infrared rays. Infrared Sensor is a low cost, low power and reliable sensor [2, 3]. This infrared emitter is fixed on to one side of the laptop and on other side an infrared sensor is fixed that receives the infrared rays. Infrared (IR) light is electromagnetic radiation with a wavelength between 0.7 and 300 micrometers [4, 5]. A transmitter is connected with the infrared sensor that gives a signal when any obstruction occurs in the path of the infrared rays. The transmitter sends this signal to the receiver fixed on to the back of mobile of the owner. A buzzer with an LED is fixed that intimates owner about the use of the laptop by some other user.

III. WORKING OF LAPTOP SECURITY SYSTEM

Whenever, some other person tries to use the laptop i.e. he moves up screen flap and leads to an obstruction to the path of the infrared rays the infrared sensor gets activated and sends an output to the transmitter connected to it. The transmitter then sends a signal to the receiver connected on the back of the mobile of the owner. A LED and a buzzer) is connected with the receiver that intimates the owner about the misuse of the laptop. The infrared emitter infrared sensor and transmitter is powered using an external 12V DC battery. Whereas the receiver LED and Buzzer need only 9V external battery for its operation. So the power requirement is very less small external battery can be connected to the system. The range between receiver and transmitter can be increased according to the requirement of distance between them and accordingly high range transmitter can

be used. So the inventors have developed a simple and easy to use system to prevent misuse of the laptop. As the components used in the invention are easily available and inexpensive so the present invention is a low cost system.

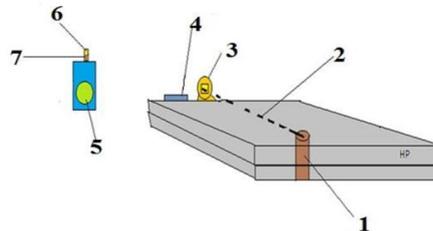


Fig 1

IV. NOVELTY

The novelty of the present invention lies in developing a laptop security system that prevents its misuse. The problem that occurs in existing system was that either the system was very expensive or it needs to be installed in the system as a software. So there was a need to develop a low cost and easy to use system that can be easily fixed on any laptop without making any changes to its internal components. So the inventors have developed a novel laptop security system that uses 15 infrared sensors to detect the misuse of laptop by any other person. The components used in the invention are easily available and inexpensive so the present invention is a low cost system. As simple components are use so the system is very easy to fix on to the laptop by any unskilled person. The inventors of the present invention have developed a laptop security system that prevents its misuse. The inventor has used an infrared emitter that emits infrared rays. This infrared emitter is fixed on to one side of the laptop and on other side an infrared sensor is fixed that receives the infrared rays. A transmitter is connected with the infrared sensor that gives a signal when any obstruction occurs in the path of the infrared rays. The transmitter sends this signal to the receiver 25 that is fixed on to the back of mobile of the owner. A buzzer with an LED is fixed that intimates owner about the use of the laptop by some other user. So the inventors have developed a low cost and easy to use system on laptop for preventing its misuse.

V.CONCLUSION

In this article a detailed method for laptop security system has been discussed. Also a brief comparison of the proposed technique with the existing patents has also been discussed. This particular of laptop security is of very low cost and efficient.

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