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**CLAIMS:****We Claim:**

- 1) **A Home Automation System** involving the :
  - Automation of the operation of all switches at home
  - Use of a Raspberry Pi as a controller at home which monitors the state of devices and frequently updates the state by sending the updates to the database, and controls the switching of the devices using relays.
  - GPRS as a means of communication facilitating automation through the use of a GSM shield over the said raspberry pi
  - Remote access to system when connected to the internet from anywhere in the world
  - Simultaneous ability to toggle the switches using the mechanical switches already installed at the home
  - Storage of state online in a database
  - Detection of mechanical switching in the system and corresponding state updation
  - An android application which will be the user interface for the user to remotely access the home automation system
  - A reverse mapping circuit to detect the current device state of ON/OFF that can be relayed to the user.
  - A control circuitry which has a hierarchical structure that will help the raspberry pi to access the switches at home
  - The control circuitry allowing easy extensibility of the system by plug and play of new devices to the system
  - Switches of any manufacturer connected to devices of any manufacturer
- 2) The system as described in claim 1 wherein the reverse mapping is achieved through the use of a flip flop that will store the state and is connected to the raspberry pi which in turn can update this in the database periodically, to be displayed to the user.
- 3) The system as described in claim 1 wherein the control circuitry makes use of demultiplexers to map the large number of devices onto a limited number of pins on the raspberry pi and multiple layers of demultiplexers in case the number of devices increases, thus forming the hierarchical grouping of the home appliances.
- 4) The system as described in claim 1 wherein the control circuitry allows easy extensibility by plug and play of devices through a set of relays associated with every room and having extra slots to which devices can be connected and will be detected when they are first switched ON.
- 5) The system as described in claim 1 wherein the ability to toggle switches using the mechanical switches at home is facilitated by the usage of a two way switch circuitry with the relay connected to the control circuitry serving as one end of the switch

**DATE and SIGNATURE**

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