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Space Saving Smart Furnishing Using IR.

Sonawne P.N.[1], Joshi D.[2] & Shaikh S.[3]
[1,2,3](E&TC Engg. Dept., Shatabdi Institude of Engineering, Nasik, SPP Univ., Pune(MS), India)

Abstract : *We want to offer furniture that makes a difference in everyday life. Good design that combines style, comfort and functionality. Innovation is not just a name, but what we do. Innovations in small space living have never been as in-demand as they are now. As people move closer to the city, they're being forced to move into apartments with tighter spaces as architecture in metropolitan cores grows upward instead of out. This cluster highlights some of the most useful small space living innovations, from ceiling-mounted beds to wall decals that stand in for those replaces or pets you just don't have room for anymore. Implications - Partly due to the lay out and administration of modern mega cities, space has become an increasingly rare commodity. Here's a brilliant way to increase storage space in an incredibly small room.*

The space saving smart furniture is the electronic operated furniture which will be operating through the IR sensors. The IR transmitting module will be used for the operation. Here the project will be build up using the microcontroller PIC18F4550.

Keywords – *PIC18F4550***.**

1. INTRODUCTION

Domestic furniture in the sense is known in Europe was not traditional in India before the 16th century, and even such familiar objects as tables and chairs were rarely used until the spread of Portuguese, Dutch, and English furniture.

Innovation was founded in 1971 in Denmark by Mr. Flemming Hoejfeldt, owner and CEO of the company. Innovation was supplying the furniture industry for about 15 years until the end of the 80s when the desire to produce and design our own collections took over. A concept for contemporary sofa beds was born in a competition among Danish design students at the School of Architecture in Aarhus. This resulted in several design awards and a very fruitful cooperation with the famous Danish designer, Verner Panton. Today Innovation is an international furniture enterprise with production facilities in both Denmark and China.

Now the innovation is taking a step ahead. Before the innovation was just the creativity of designs look and the structure. It was just designed for the sake of space saving. But now we are trying to design furniture adding some new concept which would save the time and will reduce the human efforts. This cluster highlights some of the most useful small space living innovations. Here's a brilliant way to increase storage space in an incredibly small room. Not only for the sake of domestic use, this cluster, will also help us in the hospitals, colleges, and in the industries.

The space saving smart furniture is the electronic operated furniture which will be operating through the IR waves. The IR transmitting module will be used for the operation. Here the project will be build up using the microcontroller PIC18F4550.

This concept is mechatronics based which means the combination of mechanical and electronics. Many technical processes or products in the field of engineering are mechatronics based. Microcontroller plays major role in the field of mechatronics. The development of mechatronics involves finding an optimal balance between the basic mechanical structure, sensors and actuator implementation, automatic digital information processing and overall control and this results in innovative solutions.

The fold-up wall bed has quietly been making a resurgence in recent years, as the world's population becomes increasingly urban, family sizes are shrinking, more people are choosing to live alone, and the price of real estate in crowded cities becomes more and more unaffordable. Here we are designing beds that disappear into walls, can be stowed via remote control, or are even stored on the seiling. Wall enclosed beds are the closest thing I have ever seen to furniture performance art. Thanks to sophisticated engineering, they can be opened and closed in seconds with almost no effort, a huge part of their appeal.

Fig1: conceptual diagram.

2. DESCRIPTIVE STUDY

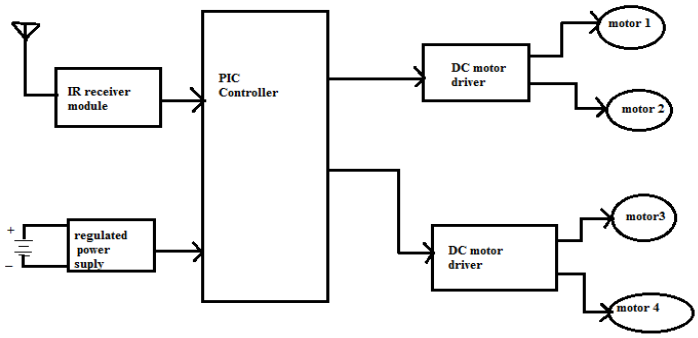

Fig2: Block Diagram.

IR Receiver:

Infrared (IR) light is electromagnetic radiation with a wavelength between 0.7 and300micrometers, which equates to a frequency range between approximately 1 and 430 THz. IR wavelengths are longer than that of visible light, but shorter than that of terahertz radiation microwaves. Bright sunlight provides an irradiance of just over 1 kilowatt per square meter at sea level. Of this energy, 527 watts is infrared radiation, 445 watts is visible light, and 32 watts is ultraviolet radiation.

Most common consumer electronic remote controls use infrared light. They typically generate infrared using light emitting diodes (LEDs), and the main component of a receiver unit is usually a photodiode. A remote control flashes a pattern of invisible light, which is picked up and then turned into an instruction by the receiver module. The parts necessary to construct transmitter and receiver are typically inexpensive, but these systems are limited to line of sight operation

PIC controller: (PIC18F4550)

The PIC18 has a RISC architecture that comes with some standard features such as on chip program ROM, data RAM, data EEPROM, timers, ADC, USTAR, and I/O port. Those are explained as follows:

1. I/O ports: The PIC18F4550 is DIP 40 pin IC. The ports PORTA, PORTB, PORTC, PORTD and PORTE use a total of 33 pins. All the ports upon RESET configured as input port, because TRISA-TRISE have the value FFH on them. The number of I/O ports depends on packaging itself.
2. Program ROM: the ROM is use to store the program and for that reason it is called program or code ROM. Although the PIC18 has 32768 bytes. The PIC18 exist in terms of speed and amount of on chip

RAM/ROM, they are compatible with each other as far as the instructions are concerned. This means that if you write you program for one, it will run on any of them regardless of chip number.

3. RAM and EEPROM: while ROM is use to store the program (cades), RAM space is use for data storage. The PIC 18 has a maximum of 2048 bytes of data RAM space. RAM is having two parts namely general purpose registers RAM (GPR) and special function register (SFRS). EEPROM is use to store the critical data that does not need to be changed very often.

DC Motor driver:

The L298 is an integrated monolithic circuit in a 15 lead Multi watt and PowerSO20 packages. It is a high voltage, high current dual full-bridge driver designed to accept standard TTL logic levels and drive inductive loads such as relays, solenoids, DC and stepping motors. Two enable inputs are provided to enable or disable the device independently of the input signals. The emitters of the lower transistors of each bridge are connected together and the corresponding external terminal can be used for the connection of an external sensing resistor. An additional supply input is provided so that the logic works at a lower voltage.

DC Motor:

DC motor relies on the fact that like magnet poles repels and unlike magnetic poles attracts each other. A coil of wire with a current running through it generates an electromagnetic field aligned with the center of the coil. By switching the current on or off in a coil its magnetic field can be switched on or off or by switching the direction of the current in the coil the direction of the generated magnetic field can be switched 180°. A simple DC motor typically has a stationary set of magnets in the stator and an armature with a series of two or more windings of wire wrapped in insulated stack slots around iron pole pieces (called stack teeth) with the ends of the wires terminating on a commutator. The armature includes the mounting bearings that keep it in the center of the motor and the power shaft of the motor and the commutator connections. The winding in the armature continues to loop all the way around the armature and uses either single or parallel conductors (wires), and can circle several times around the stack teeth. The total amount of current sent to the coil, the coil's size and what it's wrapped around dictate the strength of the electromagnetic field created. The sequence of turning a particular coil on or off dictates what direction the effective electromagnetic fields are pointed. By turning on and off coils in sequence a rotating magnetic field can be created. These rotating magnetic fields interact with the magnetic fields of the magnets (permanent or electromagnets) in the stationary part of the motor (stator) to create a force on the armature which causes it to rotate.

3. CONCLUSION

This project is more reliable in metropolitan cities where space is a capital problem. These space planning guidelines form an important part of the project delivery process, helping to define the magnitude of the space requires for a proposed project which directly affects both the capital budget and the use of space on campus, whether in new or existing buildings. This project will be space saving and the electronics makes it time saving and it also reduces the human efforts. Thus costs of the project could come down if the furniture gained more mainstream appeal.

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