Robotic Weight Lifter

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Abstract- *The fundamental focal point of this undertaking was to structure and build up the instrument for mechanical arm for mining. The mechanical arm was planned with four degrees of opportunity and modified to achieve precisely straightforward light material lifting errand to aid the mining work. In this way, it gave increasingly exact measurements and colossal time and cost-sparing. The automated arm is furnished with 4 servo engines to interface the parts and bring arm development. Arduino, an open-source PC equipment and programming is connected to control the automated arm by driving servo engines to be proficient to alter the position. Remote control was finished by utilizing an advanced mobile phone with android working framework through a Bluetooth module. The automated arm was under trying and approving its execution and the outcomes shows that it can play out the lifting task appropriately.*

Keywords- Arduino uno, Servo motor, Buck converter, DC motor, Sliding resistors.

I. INTRODUCTION

A mechanical robot is a re-programmable multifunctional controller configuration to move material, parts, instruments, or concentrated gadgets through factor modified movement for execution of an assortment of errands. This is the definition from the Robot Establishment of America to reflect primary highlights of current robot Frameworks. A modern robot framework can incorporates any gadgets or sensors together with the mechanical, robots to play out its assignments just as sequencing or checking correspondence interfaces [3, 9]. In 1970, Stanford College built up a PC controlled robot arm with electric drive engines, known as Stanford Arm. In 1973, the main mechanical robot outfitted with a minicomputer-based control framework was created in Cincinnati Milacron Enterprise. In 1977, an European organization, ASEA, additionally created electrical fueled modern robots furnished with the microcomputer-based control frameworks. Around the same time, a robot vision framework was created by Stanford Exploration Foundation (SRI) at Stanford College. In 1978, the Jaguar (programmable widespread machine for get together) robot was created dependent on the Stanford arm in America. This is the definition from the Robot Establishment of America to reflect primary highlights of current robot Frameworks. This robot utilizes servomotors outfitted with a propelled control framework utilizing a couple of chip and advance programming. In 1079, Sankyo and IBM built up the well known SCARA (particular agreeable verbalized robot arm) at Yamanashi College in Japan [10].

II. METHODS AND MATERIAL

A. Block Daigram:

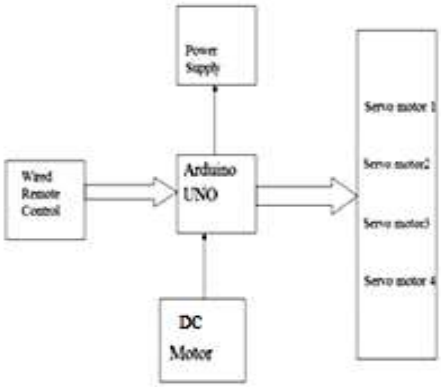

Fig 1. Block Diagram

So as to comprehend automated weight lifter, it is imperative to comprehend something about weight lifting. This mechanical arm is Arduino based arm it would be model can be utilized for different applications. We can work this robot utilizing remote controller which wired Correspondence we have utilized arduino uno as chip for working the usefulness and working of undertaking. A supply to the framework is given to the processor. Servo engine is given to the base with processor so it can move every one of the bearings for working. The principle part is mechanical part which is utilized to make arm for working it has given servo engine for every development like ups and down and can even get moved to different sides effectively.

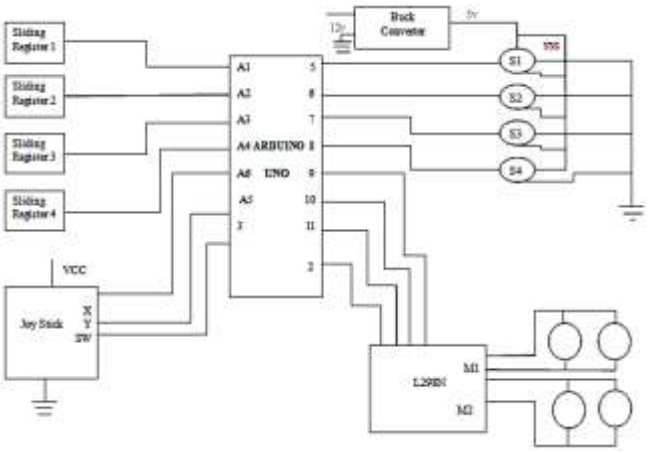

Fig 2. Circuit Diagram

B. Hardware Implementation:

Detail description of each block of design is provided below.

Servo Motor: Servo identifies the activity mistake of a system, gives criticism and revises shortcomings. The servo engine can have substituting current (air conditioning), direct current (DC) or stepper engines. Notwithstanding these, there are drive and control circuits. Servo engines are the sorts of engines that can full-fill the directions we need. They can work consistently even at extremely little or vast paces.

Fig 3. Servo Motor.

Specifications of Servo Motor

- Size- 32 × 11.5 × 24mm (Include tabs) 23.5 × 11.5 × 24mm
- Weight- 8.5g (Not include a cable and a connector) 9.3g
- Speed- 0.12sec/60degrees(4.8V)0.10sec/60degrees (6.0V)
- Torque- 1.5kgf-cm (4.8V) 2.0kgf-cm (6.0V)
- Voltage- 4.8V-6.0V
- Connector type- JR type (Yellow: Signal, Red: VCC, Brown: GND)

Ardunio Uno: The ATmega328 provides the following features: 4/8/16/32K bytes of In- System Programmable Flash with Read-While-Write capabilities, 256/512/512/1K bytes EEPROM, 512/1K/1K/2K bytes SRAM, 23 general purpose I/O lines, 32 general purpose working registers, three exible Timer/Counters with compare modes, internal and external interrupts, a serial programmable USART, a byte-oriented 2-wire Serial Interface, an SPI serial port, a 6-channel 10-bit ADC (8 channels in TQFP and QFN/MLF packages), a programmable Watchdog Timer with internal Oscillator, and five software selectable power saving modes.

A sensing system is also made that generates an equivalent voltage corresponding to the amount of water used by the consumer.

Fig 4. Arduino UNO board

The ADC Noise Reduction mode stops the CPU and all I/O modules except asynchronous timer and ADC, to minimize switching noise during ADC conversions. USART, 2- wire Serial Interface, SPI port, and interrupt system to continue functioning. The Power-down mode saves the register contents but freezes the Oscillator, disabling all other chip functions until the next interrupt or hardware reset. In Power-save mode, the asynchronous timer continues to run, allowing the user to maintain a timer base while the rest of the device is sleeping. In Standby mode, the crystal resonator Oscillator is running while the rest of the device is sleeping. This allows very fast start-up combined with low power consumption. The Power-down mode saves the register contents but freezes the Oscillator, disabling all other chip functions until the next interrupt or hardware reset.

C. Flowchart: Next part of design procedure is software design. For coding purpose, C language is used. Flowchart for same is provided in figure 3

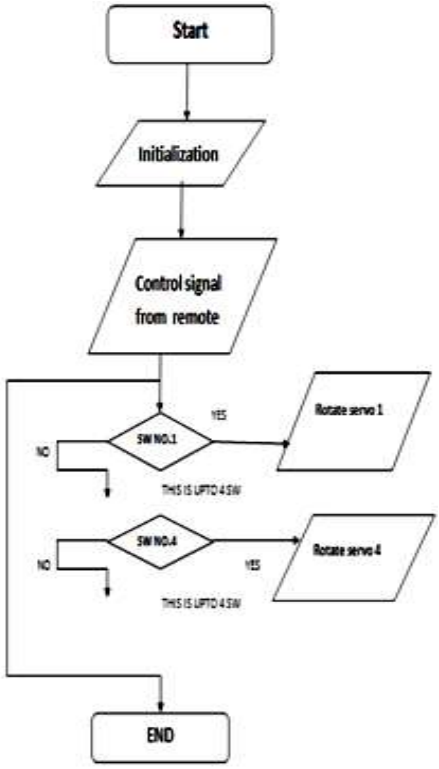

Fig 5. Flow chart.

III. RESULT

Robotic weight lifter is used to lift the small objects near about 2 kgs. It is a prototype which can used in industries. Robot has its specific range of motion. Arm can move in 180 degrees and robot itself move in 360 degrees. Remote is provided to control the device operation. It has less speed and torque is more therefore it can sustain weight which is provided.

Fig 6. Working Model.

Fig 7. Working Model.

IV. FUTURE SCOPE

Future Scope: In future we can make changes in this robot as per the requirements of the clients.

1) It can widely get in use for industries where a human being cannot work.
2) Even we can improve its travelling range.

V. CONCLUSION

Automated weight lifter is the activities were the labour isn't proficient to deal with the errand, so this arm robot is utilized. In this robots are commonly used to perform risky, perilous profoundly dreary and upsetting undertakings. A mechanical arm is generally utilized in the gathering or pressing line by lifting the little articles with tedious movement that human couldn’t bear to do in a significant lot of time.

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