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DEVELOPMENT OF POWER CABLE MONITORING ROBOT

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Abstract - *Preventive maintenance of the system can solve many fore coming problem. This same condition applies for the power cable. Power cable are life line of the any developing nation it support it critical infrastructure. Power line is so important is some remote area that the entire economic and daily life of that region is depend on that single line. Hence to provide it security and safety the preventive maintenance play an important part in system. Due to this resign this robotic system is design so that it can ensure the preventive maintenance of the system. This robotic system is manly included with the number of sensor and the two joint robotic arms which can operate in harsh environments for the measurements of the power cable. This system also compliments the power cable.*

Key Words: **Robotic arm, Sensor, Preventive maintenance**.

1. INTRODUCTION

Power system include various system mainly transmission system and distribution system. The core function of the power system is done by power cab are the most critical and important part of the system. Its mainly the connation probe between the power sources and the end consumer. Hence the functioning of the power cable is important. To function properly system has to be Robotic arm, Sensor, Preventive maintenance regularly .of that purpose the observation of the physical condition of power cable is important. Hence to perform this regular observation of the power cable this robotic system developed. Its main function of the system is to monitor the power cable physical condition so that the any kind of failure can be prevented.

To perform this job this system is included with the sensor box which has the heat and smoke sensor and also the ultra meter .This are the some parameter which decides the physical health of the power cable. Now when system is acting on the heavy load condition the system tends to get overheated this will directly affect the physical condition of the conductor. Hence to measure the operation temperature of the power cable and the ultra meter is places .By providing various elements and the independent robotic arm and the internal wheel system cable of moving on cable this system can detect the any kind of serious fault in power cable.

2. SYSTEM OVERVIEW

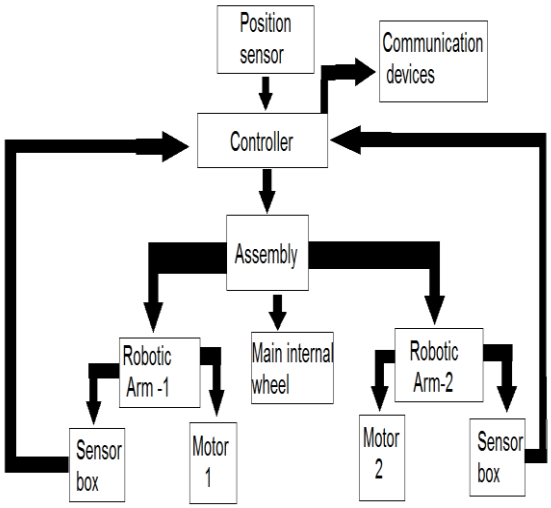

Fig 1 Block diagram of system

This block diagram present the overall system .This mainly include the controller the robotic arm and the internal wheel system and the communication system.

2. 1. MECHANICAL SYSTEM

2.1.1. MECHANICAL FAREM

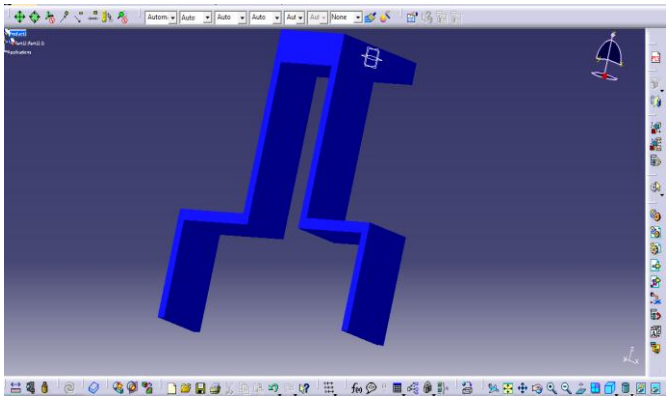

Fig 2-Mechanical frame for robot

Mechanical system will provide the addition support for the system. The main function of the frame to counter the weight of the system. This system will balances the weight of robot

on the cable and additionally it will also support to the external robotic arm system.

2.1.2 INTRENAL MOTOR ASSEBMLY

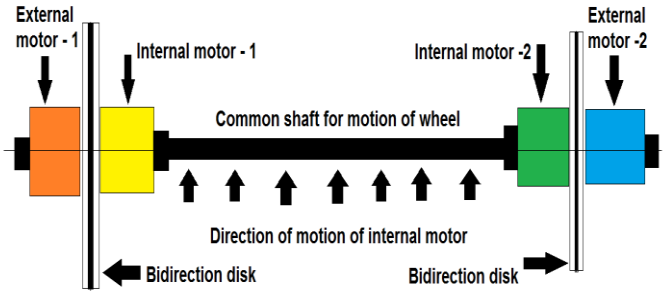

Fig 3-Functing of the internal motor system

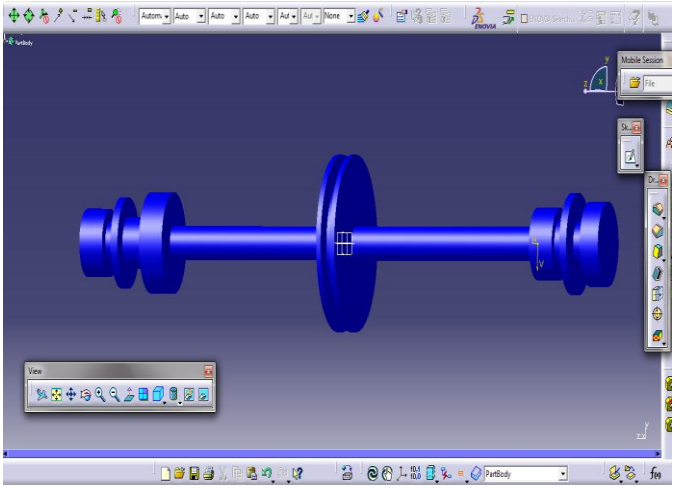

Fig 4- Internal motor system

Internal motor system will be responsible for the motion of the robotic system. This system includes the one wheel system that has the one wheel which is mainly design for the operating on the cable system. This system includes the two independent motor which are place on the single rod system so that the net movements of the motor can directly pass through the wheel.

2.1.3 ROBOTIC ARM ASSEMBLY

For this type of system the one joint and two joint robotic arms does not useful because it has its own dynamic limitation. Hence the three joint robotic arms for this system is include. This system first motor will be at the joining link between the robotic arm and the internal wheel assembly. Due to this construction system has the ability to move the robotic arm in the upward and downward direction .The second joint of this arm is conned to the internal motor so that it can move in the horizontal direction. The third motor is place on the end product of the arm this mainly connected the sensor box and the robotic arm. With the help of this motor system the sensor box will move any desire direction.

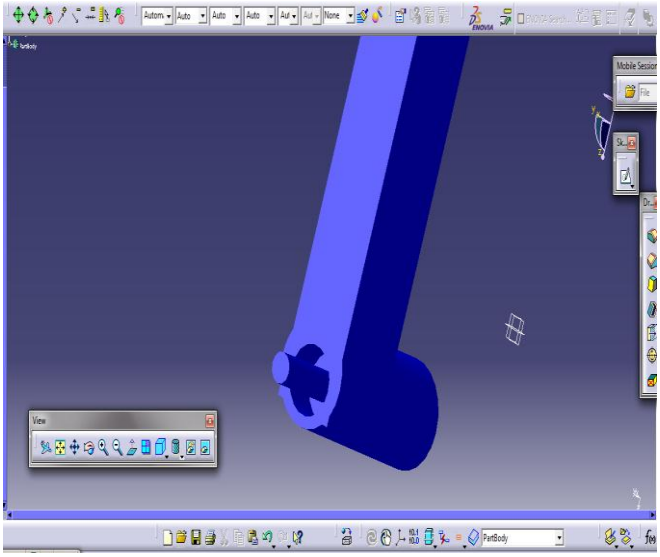

Fig 4-Joining link of the robotic system

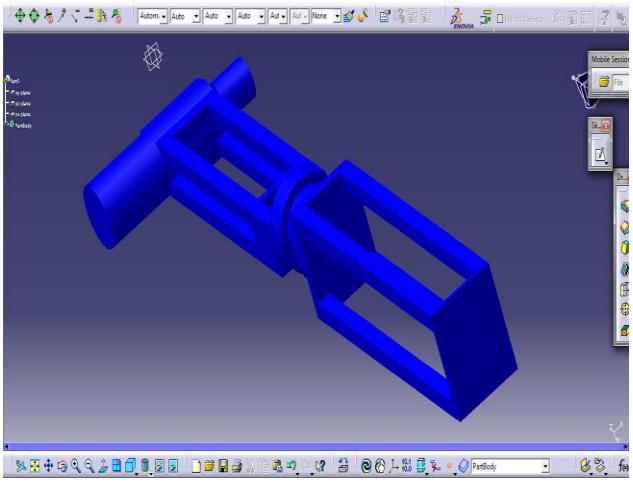

Fig 5-secondary joining link of the robotic system

2.2 CIRCUTE FOR THE SYSTEM

This system mainly consists of the four system control unit. Each system will operate it specific Task it will increase the efficacy of the system and also the operation capacity. Following block diagram explain the operation for the four different system and the controlling system.

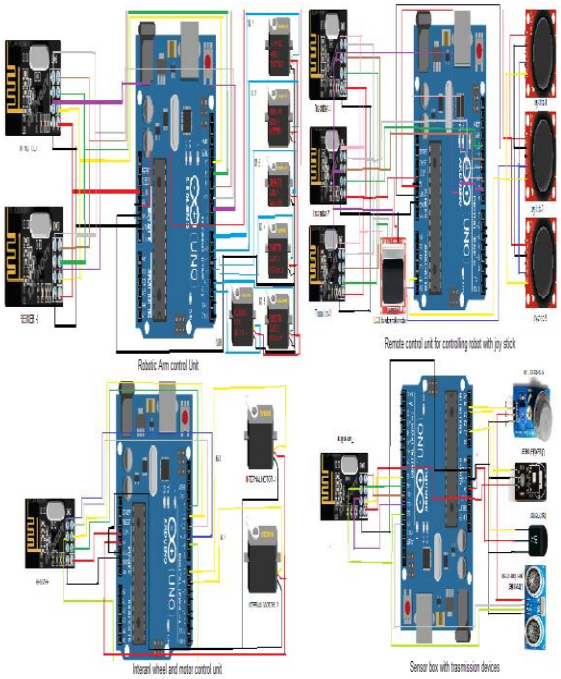

Fig 6-Circute diagram for the system

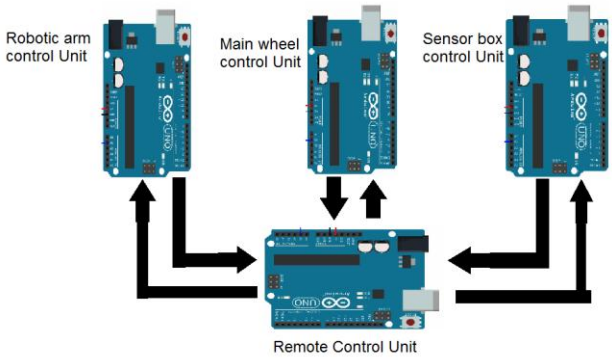

Fig 7-Block diagram of system controlling unit

3. POWER UNIT

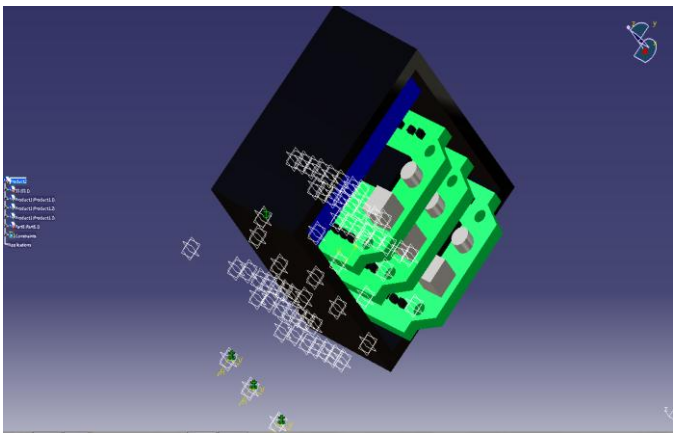

Fig 8-Power block of the system

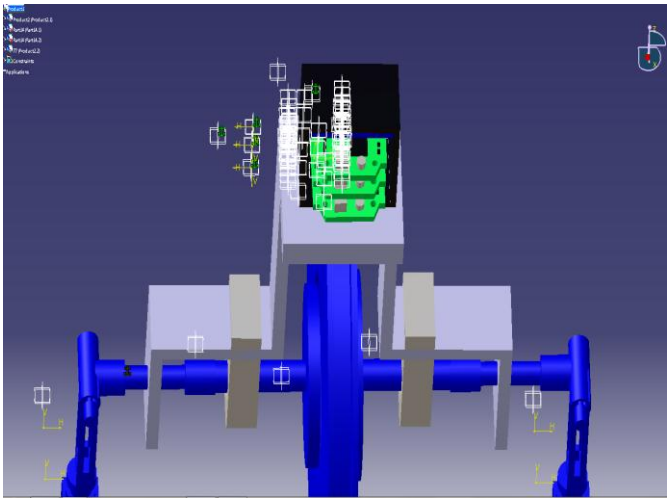

Fig 9 –Placement of the power unit for system

Power unit for this system in mainly places at the mechanical frame. This system consists of four control system so that to provide e power to the system the common power supply is provided. This system is manly consists of the box like shape where the controlling unit for the robotic arm and the sensor box controlling unit and the internal wheel system control unit is places.

In this system the controller are places over each other so that it covers the least amount of space on the system .this system also provide the heating problem solution .Because of the placement of this system the controller has the more free space for dissipation of the heat. This system also provides the advantage foe the providing power to the controller system.

4. CONCLUSION

Hence for the observation and the preventive maintenance of the power cab this system is very useful. Due to number f compotes attached to the system this system has the number of advantages over the other robotic system. And the sensor box place at the end product of the system has the ability to add more number of elements if needed hence this system has the scope for improvements also. This system is economically more relay able and affordable .Hence this system should be in vast amount of use.

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