

“Hybrid Dust Suspension System” (Used In Stone Crusher)

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Abstract

The volume of airborne dust produced by gravestone crushing conditioning presents a substantial trouble to the terrain and mortal health. Different dust operation systems have been used to palliate these worries, but they constantly have downsides in terms of effectiveness, cost of operation, and sustainability. The unique mongrel dust suspense system for gravestone clinchers is described in this exploration report. The technology minimizes dust emigrations, improves operating effectiveness, and fosters a healthier atmosphere by combining the benefits of water- grounded repression with slice- edge air filtration ways.

Keywords mortal health, Stone clinchers, , Solar Energy, MPPT charge regulator, bus change over, Environment pollution and safety,

INTRODUCTION:-

The product of crushed gravestone in colorful sizes according to demand, which serves as the raw material for colorful construction conditioning similar as the construction of roads, road slumbers, roadways, islands, structures, hospitals, shopping complexes, and conduits, etc. represents a significant artificial sector in the nation. It's an undesirable change in the physical, chemical or natural characteristics of air, water and soil that may harmfully affect the life or produce a implicit health hazard of any living organism and in particular for man. Engineering's safety discipline focuses on precluding accidents, lowering the threat of mortal error, and icing that designed systems and structures are safe. In order to be safe, the significance of engineering is exaggerated because of the part it plays in every assiduity and ménage. unforeseen, unanticipated, and dangerous events can disrupt a machine's smooth operation and put people or property in peril, including by causing accidents, injuries, and indeed deaths. The solar panel is mounted on mongrel dust suspense system it receives the solar power from the sun. The solar panels convert solar energy into electrical energy, using photovoltaic effect and stored in battery. Motor is used for when cloudy days or Night use only this Mills affair is AC and that is needs to convert into pure DC force and for that therapy and sludge unit is used to make pure DC force in this system supereminent acid batteries are used to store energy and this this is apply is give to microcontroller battery position operation. substantially three element are used to any control system that is seeing processing and controlling in this system we're using dust sensor detectors for seeing and for processing we're using snap microcontroller this microcontroller is also connected to TV display that's indicating the system status and for controlling relays contactor are used, the relay contractor is act as switch, which is connected in series with dc diaphragm grounded spurt pump. spurt pumps is connected to water tank when contractor is amp pump is starters to rotating and pressure is developed in water pipe water pipe is connected to rain gun foggers.

OBJECTIVES:-

1. To analysis dust emission near crushing plant
2. To create small scale models for dust collection
3. To compare air quality index data of before and after implementation of model
4. To settle down the dust particles form the air.

5. To minimize the health related problems like respiratory health.
6. To improve the visibility in that area.
7. To improve the air quality.

PROBLEM STATEMENT:-

Despite being a significant socioeconomic sector, the gravestone crushing assiduity produces large quantities of fine fugitive dust emigrations that jeopardize the health of both the workers and the general public by producing respiratory ails. Dust emigrations harm the material as well as the atmosphere, people's health, and shops. In order to access the lung and irritate the interior membrane, or to carry absorbed dangerous feasts and vapors further into the lung than they would generally go, air patches have physical rates that have an impact on mortal health. The goods of aerosol deposit on accoutrements include expensive junking of accumulated patches, which harm shops by impeding photosynthesis

PROPOSED DESIGN & METHODOLOGY:-

Sprinklers or water sprays are used to bedew the material being crushed or the areas where dust is most likely to form. By tying the dust patches together and causing them to settle, this aids in lowering the quantum of airborne dust. Sealing and Closes To stop dust from escaping, the gravestone crushing ministry might be housed inside a structure.

Block diagram

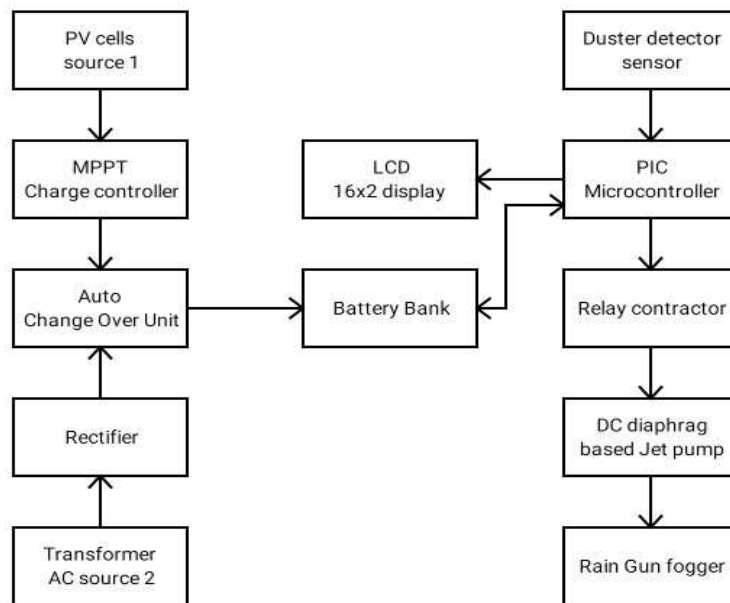


Fig1. Block Diagram of Hybrid Dust Suspension System

WORKING:-

The mongrel dust suspense system has two motor's affair is AC, it must be converted into pure DC power, which is done using a therapy and sludge unit. The bus change over outfit is employed to switch from an ac Transformer source to a solar cell source. programmed to make the utmost of solar energy In this system, supereminent acid batteries are employed to store DC power and the bus change over device is attached to the battery for battery position control via the microcontroller. Any control system uses three main factors seeing, recycling, and controlling. In this system, we're power sources an ac motor and a PV cell. The PV cell converts

solar energy into green electrical energy with a DC 12 volt affair. It's connected to an MPPT(Maximum Power Point Tracking) charge regulator, which controls the affair voltage of the PV cell. The alternate power source is an AC motor, and it's only employed at night or on cloudy days. Because the using dust sensor detectors for seeing and recycling; this microcontroller is also connected to an TV display; and for controlling, we're using relays contactor; the relay contactor acts as a switch and is connected in series with a dc diaphragm- grounded spurt pump. When the contractor is powered up, spurt pumps are linked to the water tank. Pump starts to rotate, creating pressure in the water line that's attached to the foggers and rain gun

SOLAR PANEL:-

Solar technologies can deliver heat, cooling, natural lighting, electricity, and energies for a host of operations. Solar technologies convert sun into electrical energy either through photovoltaic panels or through glasses that concentrate solar radiation.

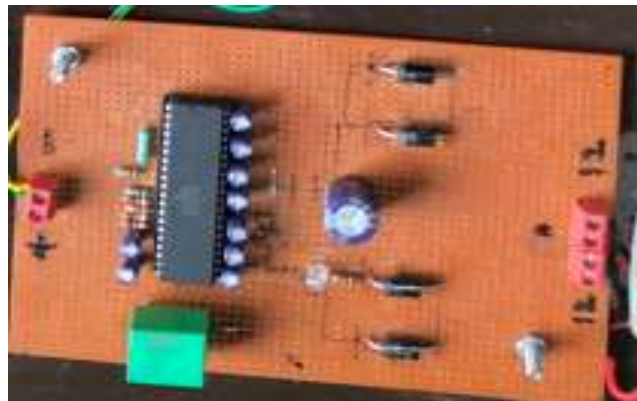


MPPT Charge Controller:-



Fig 7. MPPT Charge Controller Circuit

MPPT (Maximum Power Point Tracking) charge controllers are electronic devices used in photovoltaic (PV) systems to optimize the power output from solar panels. The main function of an MPPT charge controller is to maximize the efficiency of the solar panel by tracking the maximum power point (MPP) of the panel's output voltage and current.

BRIDGE RECTIFIER:-

A bridge rectifier is an electronic circuit used to convert alternating current (AC) into direct current (DC). It is commonly used in power supplies and electronic devices that require a steady DC voltage. The bridge rectifier consists of four diodes arranged in a bridge configuration, hence the name. The diodes are connected in such a way that they allow the current to flow in only one direction.

AUTO CHANGE OVER UNIT:-

A ground therapy is an electronic circuit used to convert interspersing current(AC) into direct current(DC). It's generally used in power inventories and electronic bias that bear a steady DC voltage. The ground therapy consists of four diodes arranged in a ground configuration, hence the name. The diodes are connected in such a way that they allow the current to flow in only one direction.

ADVANTAGES:-

- i. The airborne dust particles should calm down.
- ii. Defend the ecosystem and ecology in the area.
- iii. Reduce health-related issues like respiratory issues.
- iv. Increase the area's visibility.
- v. the crusher plant's air quality should be improved

FUTURE SCOPE:-

To insure that the dust repression system operates as efficiently as possible, detectors, selectors, and slice- edge control systems are integrated. This might involve monitoring dust attention in real- time and automatically modifying water spray and fogging settings in agreement with the clincher's functional circumstances. Advanced water operation and includes advanced water recycling treatment systems to reduce water use and guarantee system effectiveness. Enhanced Filtration The creation of enhanced pollutants with increased dust collecting effectiveness and extended service lives, which lowers conservation requirements and boosts system performance overall. Energy Efficiency To minimize power consumption and keep strong dust repression capabilities, concentrate on energy-effective corridor and systems

RESULT:-

Environmental Protection By reducing the amount of dust released into the atmosphere, the hybrid system contributes to environmental protection. Dust particles generated during stone crushing may have a negative impact on the flora, the air quality, and human health. The technology aids in reversing these effects by lowering dust emissions.

CONCLUSION:-

The hybrid technology successfully reduces dust production when crushing stone. Dust is controlled and kept from spreading into the environment by using a mix of water spraying and dust collecting techniques. The hybrid system helps to safeguard the environment by minimizing the emission of dust into the atmosphere. The air quality, vegetation, and human health may all be adversely affected by dust particles produced during stone crushing. By reducing dust emissions, the system helps to offset these effects. Safety and health of employees The dust produced during stone crushing activities can put workers at risk for respiratory difficulties and other health issues. By lowering airborne dust levels and limiting worker exposure to dangerous particles, the hybrid system contributes to the creation of a safer work environment .

While putting in place a hybrid dust suspension system takes an initial expenditure, doing so can result in long-term cost savings. The solution lowers the need for costly dust control procedures and maintenance, such as routine water spraying or manual dust suppression efforts, by minimizing demission's.

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