

A Review on Prevention of bed sore by using Peltier module

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Abstract: Bedsores also referred to as pressure ulcers results in injuries to skin and underlying tissue ensuing from prolonged pressure on the skin. Bedsores most frequently develop on skin that covers bony areas of the body, like the heels, ankles, hips and tailbone. individuals most in danger of bedsores are those with a medical condition that limits their ability to alter positions or people who spends most of their time in an exceedingly bed or chair. This paper outlines an anti-bedsores bed which is a medical device that prevents or delays occurrence of pressure ulcers by alleviating contact pressure exerted on a patient due to a contact with a bed. In this work, a Peltier module and a fan are fitted in a bed to reduce the temperature and humidity in the bed to optimal condition to prevent pressure ulcers. The bed set consists of more than four Peltier modules and a brushless fan aligned with a patient's head, hip, thighs and heels which are generally the bedsores occurring areas. The air flow and temperature changes periodically as per required using controller unit. This can also reduce the patient uncomfortable conditions.

I. INTRODUCTION

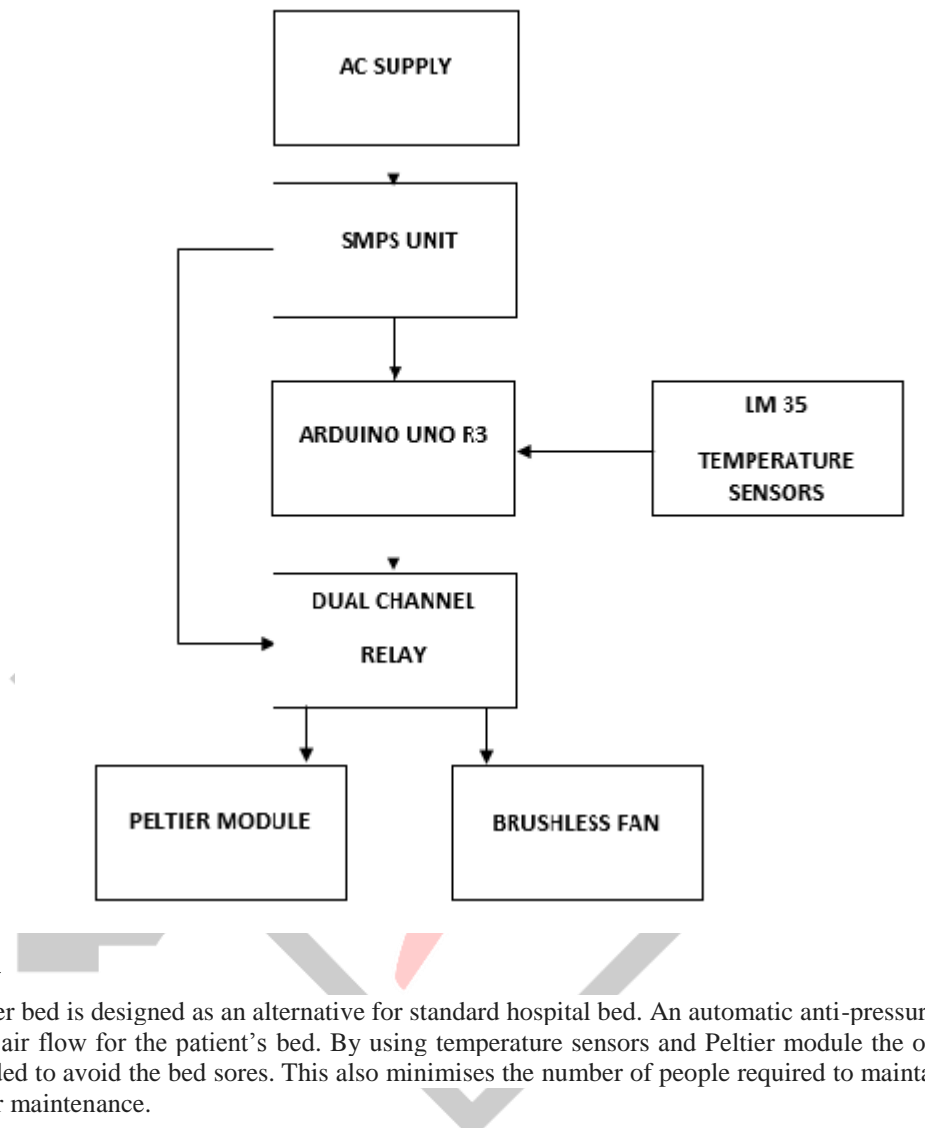
Bedsores or pressure ulcers are localized injuries to skins and/or muscles caused by poor blood flow in weight-bearing areas, e.g., hip and heels, of bed-ridden patients. High wetness and hot temperature increase the speed of prevalence of ulceration. Severity of pressure sore depends on the magnitude and also the time of pressure exerted on a patient's body. A typical recommendation for prevention of pressure sore is to roll over the patient each 4 hours to alleviate contact pressure. Some patients WHO recuperate at home have to be compelled to expensively rent a private caretaker to do this work. Such luxury isn't accessible for poor patients. Another technique to scale back the chance of pressure ulcers to develop a system that may facilitate to alleviate the pressure on the patient's body. a variety of anti-bedsores product are accessible within the market. Anti-bedsores product with active mechanism cut back risk of pressure build-up by moving points of contact between the patient and also the support. The partitions can be fitted with Peltier modules and fans with air ducts below the generic bed. The objectives of this work are to design a new anti-bedsores mechanism such that shortcomings of existing products, for example, leakage of inflatable bags or limited adjustability of rigid frame, are fully addressed. The proposed design is mattress with all the components on it are installed below the regular hospital bed. It consists of four sections of Peltier modules for four main weight carrying areas of the body: head, hip, thigh and heels. Each set can work independently, but its temperature and RPM of fan is controlled from an electronic control unit (ECU) board. Thus, all Peltier modules work in a synchronized programmable pattern.

II. RELATED WORK

Pressure ulcers keep a significant unhealthiest touching getting ready to three million adults. the attention value and Utilization Project (HCUP) report found from 1993 to 2003 a sixty-three hundred increase in pressure ulcers, however the total vary of hospitalizations throughout presently amount exaggerated by completely eleven cyphers. Pressure ulcers are overpriced with a median charge per keep of \$37,800. Among the fourth annual Health Grades Patient Safety in although the bar of pressure ulcers will be a multidisciplinary responsibility, nurses play a significant role. In 1992, the U.S. Agency for attention analysis and Quality (AHRQ, erstwhile the Agency for Health Care Policy and Research) written clinical follow recommendations on preventing pressure ulcers. many of the proof on preventing pressure ulcers was supported Level three proof, skillful opinion, and panel agreement, still it served as a foundation for providing care. Though the AHRQ document was written fifteen years past, it still is that the muse for providing preventive pressure lesion care and a model for varied pressure lesion tips developed anon. Nurses are galvanized to review these comprehensive tips. Suggest that following these specific processes of pressure lesion care can scale back the incidence of ulcers. Analysis additionally suggests that once the health care suppliers are functioning as a team, the incidence rates of pressure ulcers will decrease. Thus, pressure ulcers and their bar got to be thought-about a patient safety goal. Since the initial publications of the AHRQ pressure ulceration bar and treatment pointers in 1992 and 1994, some progress has been created in our understanding of pressure ulceration care. Nursing analysis is required to handle several gaps in our understanding of pressure ulceration bar and treatment. Several risk factors for pressure ulceration development unit identified; but, a hierarchy of risk factors has not been determined. Thus, analysis to check the essential risk factors continues to be required. There additionally remains a scarceness of study decisive the role that race and quality could wear pressure ulceration development, low body of study is rising to counsel that people of color could have associate exaggerated risk for pressure ulceration development. Thus, nurses got to actively recruit minority participants to additional explore this necessary variable. Another promising house of nursing analysis is that the use of pressure ulceration prediction tools. Though the Braden Scale was originally in full view nearly twenty years past, it remains the gold ancient.

III. PROPOSED MODEL

The working of the proposed model consists of converting the AC supply by switch-mode-power-supply (SMPS) into DC. This DC supply is regulated throughout the setup by SMPS. However, the supply to each parts of the setup is controlled by the brain of the whole setup Arduino-R3. The temperature sensors (LM35) are connected with the Arduino-UNO R3 for the reference of the ambient and bed temperature. Peltier plates are provided with the bed in order to modify the temperature if there are any changes in the surrounding temperature. The modification is carried out by the switching conditions ON/OFF using dual channel relay. Also, the brushless fans are provided for air circulation throughout the bed for almost 24 hours. The whole set up is fitted in the chassis of the bed.



IV. CONCLUSION

An anti-pressure ulcer bed is designed as an alternative for standard hospital bed. An automatic anti-pressure ulcer bed can change the temperature and air flow for the patient's bed. By using temperature sensors and Peltier module the optimal temperature for patient can be provided to avoid the bed sores. This also minimises the number of people required to maintain the patients. This is efficient and easy for maintenance.

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