VOICE CONTROL SMART HOSPITAL BEDS WITH PATIENT HEALTH MONITORING SYSTEM

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Introduction:

Medical science is working on different technological developments day by day. Though the medical science has been successful in making people's lives better, a very little focus has been on those who are handicapped, paralyzed and other people who lose their control over body parts due to spinal cord damage.

Some people do not have the capability of moving themselves in the bed, especially those who are immobilized or those who suffer from the spinal injuries. Furthermore it is very difficult for those people to attend the doctor in case of any problems. With the number of patients being admitted in the hospitals day by day it has become quite difficult for doctors to attend each and every patient on time. In multi bed hospitals where number of doctors to attend a patient is limited, it is very difficult to maintain timely observation of such patients.

A number of cases have be observed where a patients emergency condition remains unattended due to the busy schedule of hospital's or the dedicated doctor busy attending patients in the hospital somewhere in the cabin.

Hospital beds are the place most patients spend most of their times which need firm awareness regarding help patients remain safe while keen capacities help attendants investigate data and improve patient care. A definitive goal is to give patients a specific independency accordingly, enabling them to take some indispensable activities when nurses or care-takers are late or inaccessible. Therefore, such solutions help most of the patients when their conditions are inevitable and require sudden change in their movements. The accessibility of good medicinal assistance in hospitals turns into a critical issue. The two fundamental purposes behind that are the expanding cost of therapeutic consideration and the decrease in the number of guardians, (for example: medical caretakers). Such an issue turns out to be increasingly critical if the patient is experiencing lock-in disorders. Dealing with those patients requires a great deal of exertion and concern. In this manner, it is essential to

give specialized answers for assistance guardians of those patients in homes or hospitals. In this paper, a hospital bed is proposed for patients with full powerlessness to move, patients who experience the ill effects of the secured disorder, long term coma, quadriplegia, clinical demise and so on. These patients require exceptional consideration since they can't move by any stretch of the imagination. Moreover, rotating each a few hours implies that somebody ought to be every now and again accessible to carry out the responsibility; including at the times of night. The project scope is to build a smart intelligent bed in such a way that it is prompt in responding to the user's instructions using voice commands to achieve desired outputs and is mainly concentrated on a small-scale prototype which can be scaled on a larger proportion if found effective. The principal aim of the proposed framework is to streamline the way towards dealing with a patient who can't move and enduringly lies on a bed. The continuous lying on a bed for a long time get various medical issues. The system also proposes on bed health monitoring and display system which will measure the body parameters of the patient and display the same on the LCD display..

Objectives:

The main objective of the project is to develop voice control smart hospital beds with patient monitoring system. The detailed objectives of the project are:

- To develop a prototype of smart beds which can be inclined and reclined using motorized mechanisms without the need of human effort.
- To develop a voice command system which will permit the patients to give voice commands to the bed to perform incline or recline system using developed motorized bed prototype.
- To Develop a voice recognition system using android smart phone which will detect the patients commands and perform the requested action
- To develop A sms based food request system which permits the patient to request food the hospital using voice command which will send sms to the concerned authorities to request for food.
- To implement on bed patient monitoring system which will automatically measure the body parameters such as body temperature and heart rate and display it on the display present on the bed itself

Methodology:

The project deals with the unique concept of automation in hospital beds which are not an existing system. So we have planned to carry out the work step by step For the purpose of simplification the following experimental and fabrication work is proposed in the project.
1) Material Selection:
The material selection forms the important step in this project. It is very necessary to choose the optimal material in the project and hence it is very important the choose the material wisely.
The phase of material selection involves the following.

a) Choosing the chassis material.
b) Choosing the material for the drive train.
c) Choosing the sensors.
d) Choosing the Controller system
e) Motor selection
f) Power selection.

2) Chassis/ bed fabrication:
Once the material selection is done the next step involves the chassis fabrication. The chassis forms the integral part of the project and forms the structure which holds all the other material of the project. The chassis of the bed needs to be fabricated in such a way that it optimally holds all the materials of the project, can withstand the loads and is also economical to implement on the large scale.

3) The incline/recline drive system implementation:
The drive system is implemented for driving the mechanism for automatic incline or reclines of the beds. The mechanism will be useful to incline & recline of the beds on the basis of voice commands received by the patient.

4) Implementing voice control system
In this phase the voice control system is implemented which will help the patient to give the voice commands to the bed to incline or recline the bed to prevent the bed sore. The android based system is developed which will help the patient to give the voice commands to patient to control the bed using voice commands

5) The SMS notification system:
In this phase the sms notification system is developed. The Sms notification system developed will send the food ordering requests of the patient to the hospital staff. The patient can give the voice command to the bed to order the food and the bed sends the sms to the hospital staff that the patient has requested food.
The SMS notification system will also send alert to the doctor of the patients health is critical.

6) The Patient health monitoring system:
The patient health monitoring system will measure the body parameters of the patient such as temperature and heart rate and display it on the display present on the system. Additionally the system will send a sms alert when the parameters exceed the critical threshold.

7) Assembly and Testing:
Once all the phases are implemented, the final phase would be assembly and testing for performance.

VOICE CONTROL SYSTEM

LCD DISPLAY FOR PATIENT HEALTH MONITORING

SMART BED

Mechanism to
Incline Recline Beds
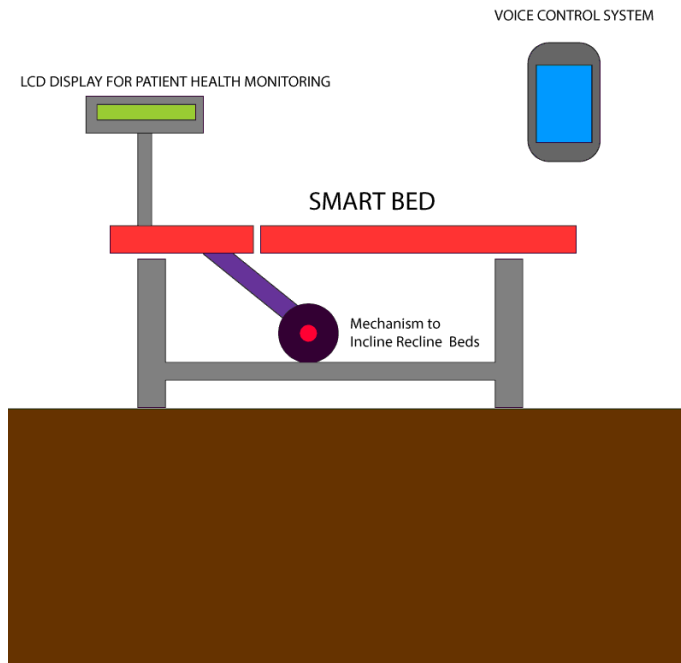
Conclusion:

- It is automated, hence can automatically incline or recline the system
- The system is voice controlled hence the system be operate by patient with ease
- The smart beds can prevent bed sore due to prolonged sleeping
- Temperature monitoring directly displays the body temperature of the patient.
- The bed sore prevention system incrementally inclines the bed to different position hence making it more comfortable for the patient.
- Economical
- Does not require any complex system, hence can be implemented in any hospital.
- The system can send sms notification to the doctor if the patients health is critical

Scope for future work:

- To reduce man power.
- To help the patients by developing automation system in the hospital beds.
- To help the hospital staff in monitoring the patients health.