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Design & Development of Smart Scarecrow Review

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ABSTRACT

In our project we have used flapping mechanism to move the smart scarecrow hands in upward and downward direction. The details for flapping mechanism is given below. A smart scarecrow is used to scare the birds and to the animals to save the crops in the field. A farmer put the scarecrow in the middle of the of the field to save his crop from birds and animals. We have seen that scarecrow has no movement when the birds are come in the field. The flapping mechanism is used to convert the rotary motion of the motor into linear motion of flapping hands when the crank rotates, the connecting rods pushes the hands in up and down direction. The flapping consists of crank, connecting rod, flapping arm, support structure, nuts and bolts. Crank is join with one end of connecting rod and second end of connecting rod is join with flapping bar, when crank rotates the crank push the connecting rod connecting rod push the flapping arms ups and downs. Machinery such as windmills have been employed as scarecrow, but the effectiveness lessens as animals become familiar with structure. Farming contribute a major income to the Indian economy, it is a huge concern t0 the farmer when they are away from their crop and exposing it to crop threat such as crow damaging the crop and theft. farming has contributed to nearly up to 60% land of a country.

Key words: Scarecrow, Arduino, Sensors, Mobile device, Smart farm, Wireless network

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INTRODUCTION

Agriculture is the main source of livelihood of many people in different parts of the world. Unfortunately, farmers are still reliant on traditional techniques that have evolved hundreds of years ago. Due to this the yield of crops are becoming low. Also, there are a number of factors that contribute to the low yield of crops animal intrusion is also one among them. In recent years' wild animals are special challenge for the farmers throughout the world, Animals like wild boars, elephant, tiger and monkeys, etc., cause serious damage to crops by animals running over the field, and trampling over the crops. The scarecrow of popular tradition is a mannequin stuffed with straw; free-hanging, often reflective parts movable by the wind are commonly attached to increase effectiveness. In this project a surveillance camera and vibration sensors are used. The farmer can see check the intrusion of animal in his agricultural field and can toggle between few options allowed to scare the animal away from his field, without his physical presence in the field. The farmer can control it from a remote area. It is effective in both day and night. It works Automatically. Automatic Scarecrow provides all time security to the crops.
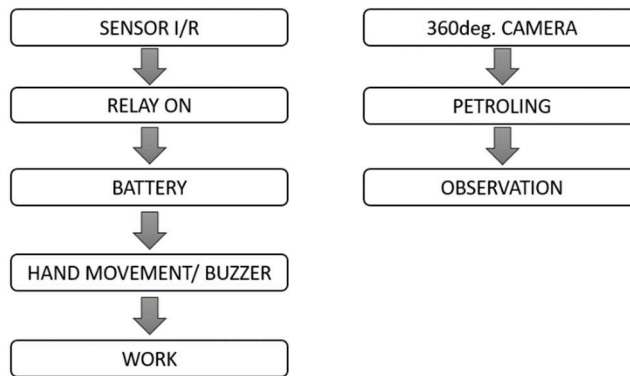
Fig. 1 Flow chart of Different components used in Manufacturing Smart crow

LITERATURE SURVEY

[1] Many types of research have been made to involve controlling birds by the use of sound alarms to scare them off. One of the research implemented the use of sound wave which is also a type of technique used to produce some kind of sound alarm which affects birds discouraging them from attacking the vineyard. In this system, the farmers can view their agriculture fields in their mobile phones, with the help of a camera. Infrared(IR) sensors are used to detect any movement into the farm. Once the sensor sence any movement the buzzer will beep high frequency sound as well our smart scarecrow will do up & down hand movemetn to scare birds and animals. IR detectors are safe and do not affect human and pets health. These functions will scare birds & animals without hurtin them. Advantages of the proposed system: [2] Cost-efficient and easy to use. [3] This system is accurate. [5] It an eco-friendly system which will not harm the animal as well as the cultivated crops.[6] Needs small power and voltage use in practical usag.
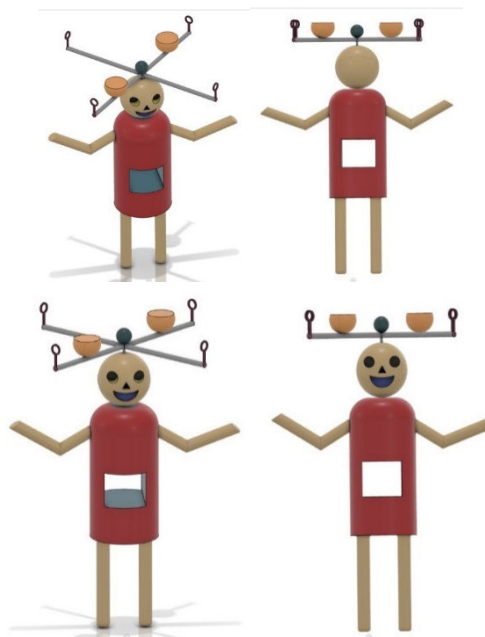
CAD MODEL

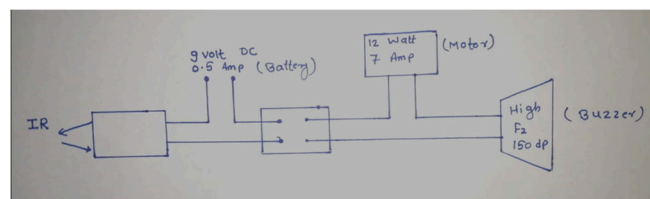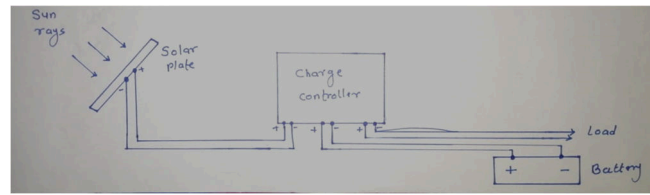**Fig. 2** Cad Model

WORKING

Fig. 3 System Circuit Diagram

Fig. 4 Solar Panel to Battery

In Fig. 3, 12V, 7Amp battery is used. Which is connected to the 12W, 5Amp motor. In this 100-rpm DC motor is used to avoid vibrations. The working principle is like when any bird & animal is come near to scarecrow & if IR sensor sense any movement, then buzzer will beep high frequency sound which is nearly 150 dB & while beeping, scarecrow will do hand movement in up & down position. The movement of hand will last for 10- 12 sec. the flapping mechanism is used to do hand movement. The aim of the flapping mechanism is to convert the rotary motion of the motor into the linear motion of flapping hands when the crank rotates, the connecting rods pushes the hand up and down. The flapping mechanism consists of crank, connecting rod, flapping arm, support structure, nut and bolts. Crank is joint with one end of connecting rod and second end of connecting is joint with flapping bar, when crank rotates the crank push the connecting rod and connecting rod push the flapping rod up and down. The flapping mechanism used in automatic smart scarecrow is shown in fig. 1.

COMPONENTS

- Infrared sensor   = 4 nos
- Wireless camera   = 1 nos
- Solar panel   = 1 nos
- Charge controller   = 1 nos
- 12-volt dry battery   = 1 nos
- Scare crow   = 1 nos
- DC gear motor for hand movement   = 1 nos
- High frequency sound Buzzer   = 1 nos

RESULT AND DISCUSSION

A System is developed to avoid the intrusion of animals in to the field. The problem with respect to the intrusion of animals in to the farm land has become a major issue for the farmer. Our project will address these issues and provides the security for the field using the motion detection sensor. This method of monitoring the crop will increase the efficiency and productivity of the crop using technologies.

CONCLUSION

The capabilities of technology have been shifting forward together with time and its intervention has been helpful. Applying technology in the agriculture sector has significantly enhanced the country's agriculture sector.

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