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Smart VB Backpack

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***Abstract*— A bag is a need for every traveler. It is more than just a storage facility; it guarantees the security of each traveler's possessions. The goals of creating this backpack were to give travelers a comfortable and safe self-vacation wherever they are, to push for innovation in tourism, especially when it comes to making useful and easy-to-use products, and to help travelers stay organized even on their restless trips. Unlike most backpacks, the Smart Vector Backpack SVB is unique. It helps travellers recharge their phones, computers, and other electrical gadgets; this bag is built with a solar panel on the front side of the bag. This bag also includes a Global Positioning System (GPS) that enables users to trace the bag if it goes missing. Because the bag is made of polyester fabric, it is both lightweight and water-resistant. Available in fluorescent colours like green, yellow, and pink so that the user can see and find it day or night. It also helps prevent theft because the zipper is hidden on the back of the bag and can't be seen or found while the bag is being used. All travellers must have it because it addresses their needs and security concerns.**

Keywords—smart backpack, backpacks, travel, GPS, Solar

I. INTRODUCTION

A backpack is a bag with shoulder straps that allows you to carry items on your back while walking or climbing. We are all aware that, in this twenty-first century, tourists have evolved into modern tourists who want to travel anywhere with a piece of equipment or items that must be brought with them to expedite travel and provide a pleasant experience. Travelers will bring electronic devices such as a smartphone, laptop, or tablet, and the majority of them will require a battery backup. The issue arises when they fail to charge their device or use it excessively, causing it to shut down. Then they look for a power bank to carry with them. The power bank will normally be used to charge a smartphone; however, it cannot charge a laptop. As a result, the Smart Vector Backpack was born. The Smart Vector Backpack was named after the fact that it is unlike any other backpack on the market. The GPS, USB charging station, and solar system are all included in the Smart Vector backpack. This project was created as one solution to help people travel around the world more easily by using this Smart Vector Backpack.

II. MATERIALS AND FEATURES

A. Global Positioning System (GPS)

The Smart Vector Backpack was created with long-distance travel in mind and can be located quickly in the event that it is stolen. The Smart Vector Backpack equipped with a global positioning system (GPS), which is a device that broadcasts signals that may be picked up by anyone who possesses a GPS receiver. These details are analyzed by GPS receivers, which then utilize the results to pinpoint the exact location of the user. The Global Positioning System (GPS) is a navigational system that can calculate the exact location of the user and identify their position anywhere on this world.

B. Polyester Fabric

The Smart Vector Backpack (SVB) was created specifically to ensure the security of travelers' valuables. SVB implies a fabric that is robust, resistant to water, and long-lasting [1]. Moreover, the fabric is not easily torn. Therefore, polyester material is used in the production of this backpack. Polyester fabric, also known as polyethylene terephthalate, is a type of synthetic woven textile that is known for its durability and is frequently worn for outdoor activities [1]. Additionally, because polyester fibers are hydrophobic, the fabric will drain away moisture rather than absorb it because of this attribute. So, using this material will protect the user's things from being stolen or damaged by sharp objects.

C. Universal Serial Port

The Smart Vector Backpack is designed with the intention of making the user's travel experience more pleasurable by incorporating a charging station for a variety of electronic devices, including mobile phones, tablets, laptops, and more. As a direct result of this, the USB input and output is attached on this bag. The term "Universal Serial Bus" (USB) refers to a standard interface that facilitates communication between various devices and a host controller. This USB ports is located on the backpack's side so that the user can quickly reach it when charging their electronic items.

D. Solar Panel

Solar panels are one of the materials that are required to be employed in the creation of this backpack. Solar panels, also known as photovoltaic panels, are used to convert the light from the sun, which is made up of energy particles known as "photons," into electricity that may be used to power various electrical loads. Solar panels are also known as "PV panels." It is necessary to position the solar panel in front of backpack so that it is facing the sun for it to be able to function. This solar panel will turn on the Universal Serial Bus (USB), which will enable customers to power up their electronic gadgets whenever they need to.

III. METHODS

A. System Block Diagram

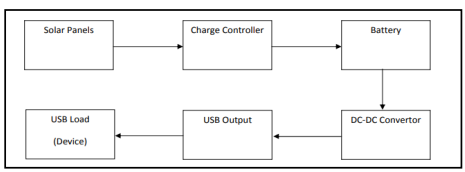

Fig. 1. System Block Diagram for the Smart Vector Backpack (SVB)

The system block diagram is shown in Figure 1 above. This diagram can assist in understanding how solar panels work. According to figure 1, some components are required, such as solar panel cells as the main component, a charge controller, a battery, a DC-DC converter, a USB output, and a USB load.

The solar panels will be used to generate energy needed to drive the second box in the block diagram, which will be referred to as the "charge controller" as noted in figure 1. Photovoltaics are the solar energy technology of choice for this project's architecture. It is necessary to have two solar panels, each able to endure 6V of sunlight, and a battery capable of holding 12V of electrical energy. [2]

The next component is the charge controller, which is where most of the electronic components will be used, such as resistors, diodes, a voltage regulator, and a BJT transistor. The charge controller will control the current running through the system and limit the current as needed, as well as control any unwanted discharging and overcharging. After passing the voltage and current through the charge controller, the output voltage is regulated to 6 volts in order to charge the battery [3]. The 6V 4.5Ah sealed lead acid rechargeable battery was selected since it was rechargeable. To meet USB requirements, a DC-DC converter was used to lower the battery's 6V output to 5V. The USB port was removed and connected to the DC-DC converter's output. After all the components have been installed, the Smart Vector Backpack can be used to charge your devices, such as phones and power banks [3].

IV. RESULT AND FINDINGS

A. The design of the solar panel

This Smart Vector Backpack has a measurement of (18.1 x 12.5 x 4.7) inches and has two panels on each side (7.5 cm). One or more solar photovoltaic (PV) modules are present on the solar panel, and they are electrically connected; they are also fixed to a base structure. Thin-film solar panels are appropriate for applications involving a single device, such as charging a battery-operated device or running a particular appliance [4]. Solar cells or solar photovoltaic arrays are used in photovoltaic, or PV, technology to transform solar energy into electricity. Solar cells use the sun's rays to generate direct current electricity that can be used to run devices or replenish batteries. Each module has a rating for the DC output power it will produce under typical test conditions, and this rating typically falls between 100 and 320 watts.

B. The design of the backpack

The top handle for carrying the backpack is located at the top of the bag. There are six buckles on each side of the backpack to make attaching and detaching components easy and to make sure they are fastened firmly during outdoor activities. A USB port connector is attached to the bottom side of the backpack to create a lovely and orderly arrangement and make it useful for use when engaging in outdoor activities. The wires are steered underneath, along with the USB port. The smartphone is organized to be carried inside the left-side lower pocket of the backpack so that it can be quickly removed from a concealed compartment. There is a hole inside the pocket of the backpack for the wires for charging to pass through, and the wires from the hole go directly to the USB port at the bottom panel on the left side, making it the least vulnerable to theft or pickpocketing. Figure 2 displays the layouts and placements of the solar panel, GPS, and USB port.

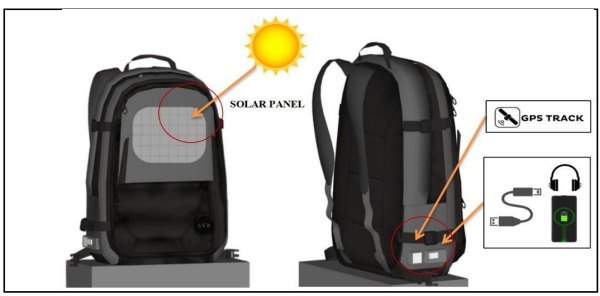

Fig. 2. The solar panel, GPS, and USB port layouts and placements.

C. The Smart Vector Backpack with a solar panel is convenient to use when out.

This kind of design of a backpack could be practical to use in both indoor and outdoor settings because most travelers are constantly on the go and want their bags to be as durable as possible. Carrying all of the necessary items for a vacation or adventure must be practical and effective. A mesh bottle pocket is located inside the lower right side of the bag when it is worn. The mobile smartphone fits in the left bottom pocket, which also has a hole for the earphones and charging cable to pass through. A laptop pocket and a buckle for fixing in-town use are both located inside the bag. Furthermore, it gives the props access to multiple-use hidden zipped pockets. The buckle was mounted on the top and bottom of the left and right sides of the pocket to secure it for charging smartphones that are solar-cell equipped. The backpack backside design system is shown in Figure 3. The ventilation system creates a space between itself and the bag. The body of the ventilation system is made of breathable mesh. It comes into contact with the wearer's back while being worn, and the cushion pads help to absorb shock. There is a horizontal spacing region in the middle of the system. Depending on the wearer's body size, it alters the distance between the back of the person wearing it and the bag to maintain a perfect fit.

Most of them can use these types of bags to ensure that their batteries do not run out and that they can also carry their bag with them and use the technology installed in the bag. Anyone who frequently travels far from home can benefit from this. Additionally, the bag would be affordable for mass production. This integration of power banks will aid startups that produce these batteries or power banks in expanding their businesses, which will indirectly assist in the economic growth of the nation and the ability to use the developed technology. If the built-in battery is being used, it must be charged once every night.

Fig. 3. SVB's backside ventilation system

V. CONCLUSION

This project combines hardware, software, and Internet of Things technologies. Because the backpack's design is user-friendly, individuals of all ages may utilise it to meet their needs. The most important feature of this backpack is GPS tracking, as well as the ability to power the whole circuitry and charge mobile phones using solar energy via the solar panel. This device will be beneficial to students, employees, and others since it includes functions such as missing item notice and weight computation as supported by study [5]. It is a really useful tool that allows users to operate from anywhere, and it is secure due to GPS monitoring.

REFERENCES

[1] Palacios-Mateo, C., van der Meer, Y., & Seide, G. (2021). Analysis of the polyester clothing value chain to identify key intervention points for sustainability. Environmental Sciences Europe, 33(1). doi: 10.1186/s12302-020-00447

[2] Simba, Nyika, W., & Zambia, U. (2019). DESIGN OF SOLAR POWERED BACKPACK Bachelors of Science Energy Technology and Management (BSc ETM) with Cavendish. http://155.0.3.194:8080/jspui/bitstream/123456789/534/1/SIMBA%20WALTER%20NYIKA.pdf

[3] Poonsopin, T. (2011). Solar Powered Backpack Senior Project by Saagar Sabharwal. https://core.ac.uk/download/pdf/19143465.

[4] Nrel.gov. (2018). Solar Photovoltaic Technology Basics | NREL. https://www.nrel.gov/research/re-photovoltaics.html

[5] Amin, P., K, A., & Karanth S, K. (2020). Smart Travel Bag (Pp. 74 And 78). Www.Ijert.Org.