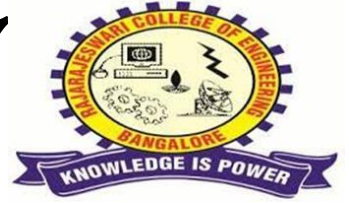




VISVESVARAYA TECHNOLOGICAL UNIVERSITY

RAJARAJESWARI COLLEGE OF ENGINEERING



#14, Ramohalli cross, Mysore Road, Kumbalgodu, 60074
affiliated to VTU, Belagavi, Approved by AICTE, New Delhi
(Accredited by NAAC 'A+' Grade and NBA)



DEPARTEMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
SUBJECT CODE: 21EEP584

TOPIC: “SOLAR CAP WITH MOBILE CHARGING”

Presented By:

Bhumika K Ramesh (1RR21EE004)

Vishal G (1RR21EE013)

Under the guidance of :

Prof. Kiruthika K

Assistant Professor

Department of EEE



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ABSTRACT

This project explores the solar cap benefits to its users. The reason behind the main focus on this is because it is very commonly used in summer and in sports game like golf, cricket, and badminton. Even the people who are working outdoors, tourists and those who are willing to climb mountain basically prefer a cap for preventing from huge sunshine. In addition to that, electronic gadgets can also be charged even in hilly areas or any remote areas with abundant sunlight.



INTRODUCTION

- The world is facing major issues like huge reduction of fossil fuels on daily basis.
- So, solar harvesting devices like solar photovoltaic cells that are capable of producing electricity by utilization of solar energy should be used.
- The aim is particularly on summer days, the users may get relaxed.
- Also, it works efficiently in charging our mobile phones in remote areas.





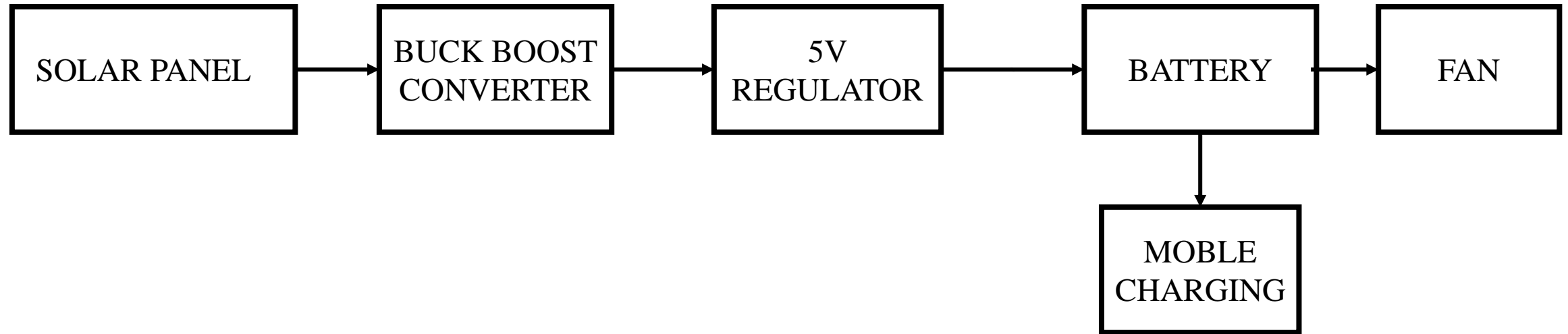
LITERATURE SURVEY



SL.NO	TITLE	AUTHOR	YEAR	METHODOLOGY	PARAMETER AND INFERENCE	RESOURCE
1.	Solar Powered Fan Cap For Outdoor Workers	Badri Narayan Mohapatra	2020	It explores the use of solar energy to power a fan in the cap, providing cooling and protection from the sun, highlighting its potential applications and benefits for outdoor workers.	solar cells and photovoltaic panels	IEEE
2.	UR-SolarCap: An Open-Source Intelligent Auto-Wakeup Solar Energy Harvesting System for Supercapacitor Based Energy Buffering	Moeen Hassanaliieragh	2017	an open-source energy harvesting system using solar panels and supercapacitors	battery-less sensor networks, and power management techniques	IEEE
3.	Autonomous Solar Smart Cap (ASSC) for Pedestrian Safety	Ekambir Sidhu	2017	Use of super capacitors for buffering solar energy in self-sustainable field systems is discussed, highlighting advantages over conventional battery-based energy storage.	solar energy harvesting, power management systems	IEEE
4.	SOLARCAP: Super Capacitor Buffering of Solar Energy for Self-Sustainable Field Systems	Amal Fahad	2012	Feasibility of using supercapacitors for solar energy buffering in self-sustainable field systems is discussed, along with the development of control software for managing energy flow and powering a computing board.	mobile-cloudlet-cloud acceleration	IEEE
5.	Solar cycle dependence of polar cap patch activity	B. S. Dandekar	2000	polar cap patch activity changes significantly over a solar cycle and is dependent on solar activity levels.	Solar power stored in battery	IEEE

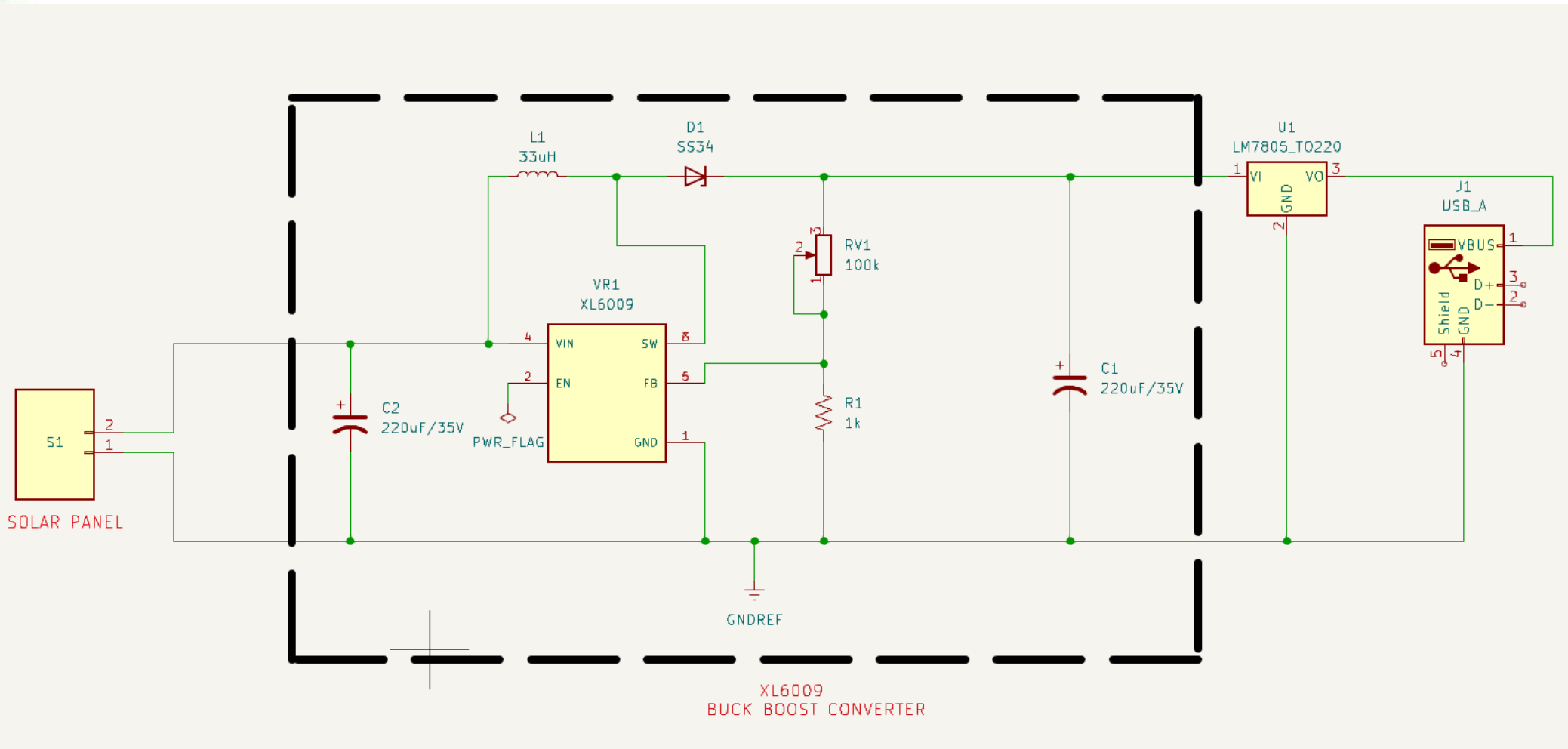


BLOCK DIAGRAM





CIRCUIT DIAGRAM





COMPONENTS

SOLAR PANEL

- It converts sunlight into electricity using PV(Photovoltaic)Cells





COMPONENTS

RECHARGABLE BATTERIES

- The Battery is used to energize the fan which is connected to the cap (i.e Solar Cap)

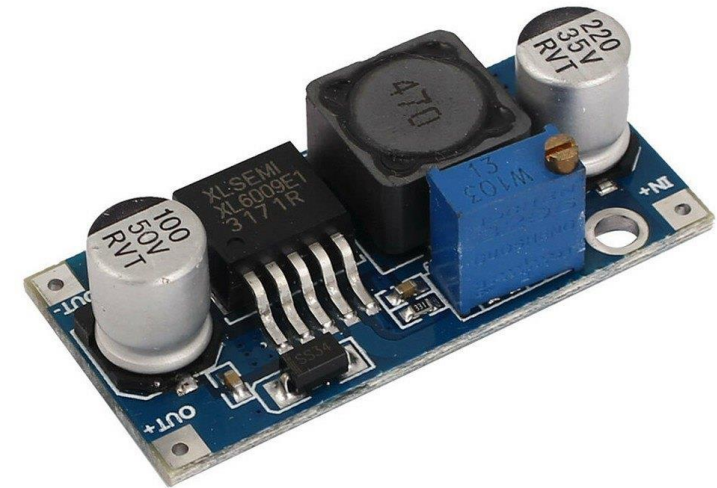




COMPONENTS

BUCK-BOOST CONVERTER

A buck-boost converter is a type of DC-DC converter that can step up or step-down voltage levels efficiently, making it useful for maintaining stable power supply in systems with varying input voltages.

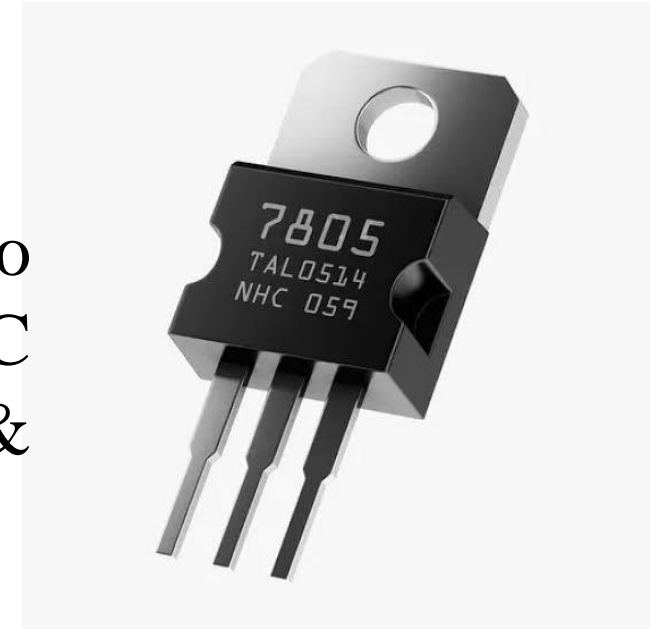




COMPONENTS

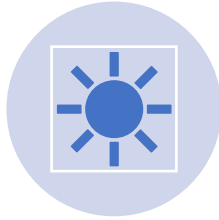
5V REGULATOR

- The 5V regulator (7805) is used to regulate the produced voltage into 5V DC to supply energy to the mobile charger & fan





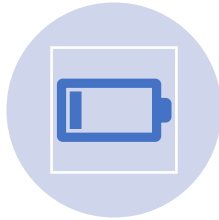
WORKING PRINCIPLE



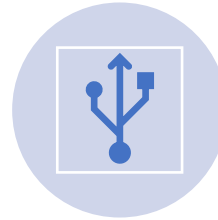
The solar panel converts sunlight into electrical energy.



This energy is stored in the battery.



Battery power is used to run the fan.



It is also connected to the charging module wherein devices upto 5V can be charged.



RESULTS



WE ARE GETTING 5.2V
FROM THE SOLAR
PANEL



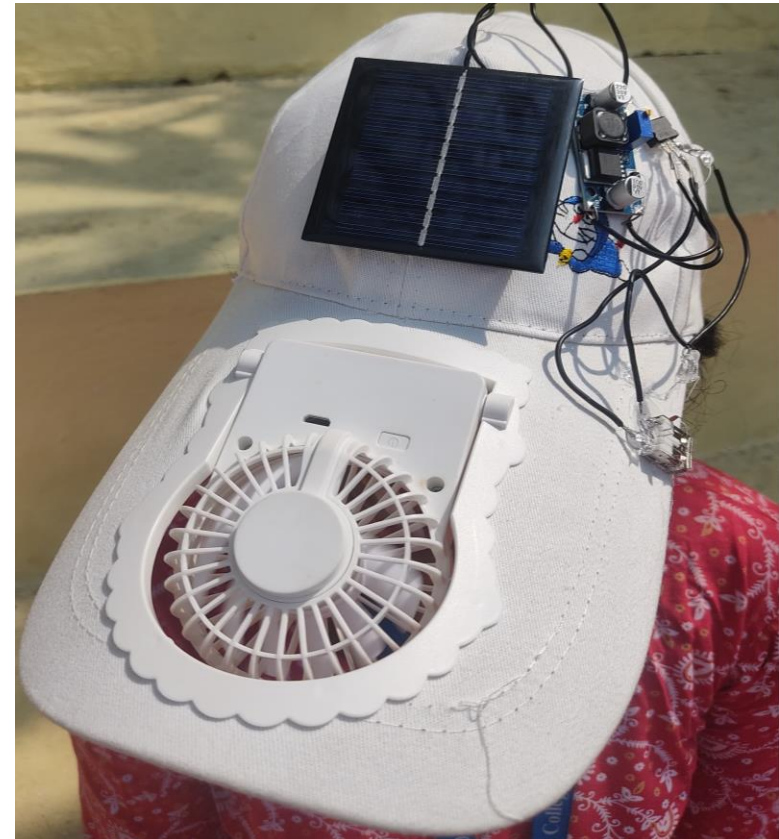
WE ARE BOOSTING
THE VOLTAGE USING
BUCK BOOST
CONVERTER TO
AROUND 12V



THE OUTPUT OF THE
BUCK BOOST IS GIVEN
TO LM7805 VOLTAGE
REGULATOR TO
REGULATE THE
VOLTAGE FOR 5V



THE OUTPUT OF THE
REGULATOR IS GIVEN
TO THE USB HEADER
TO POWER UP THE
APPLICATIONS



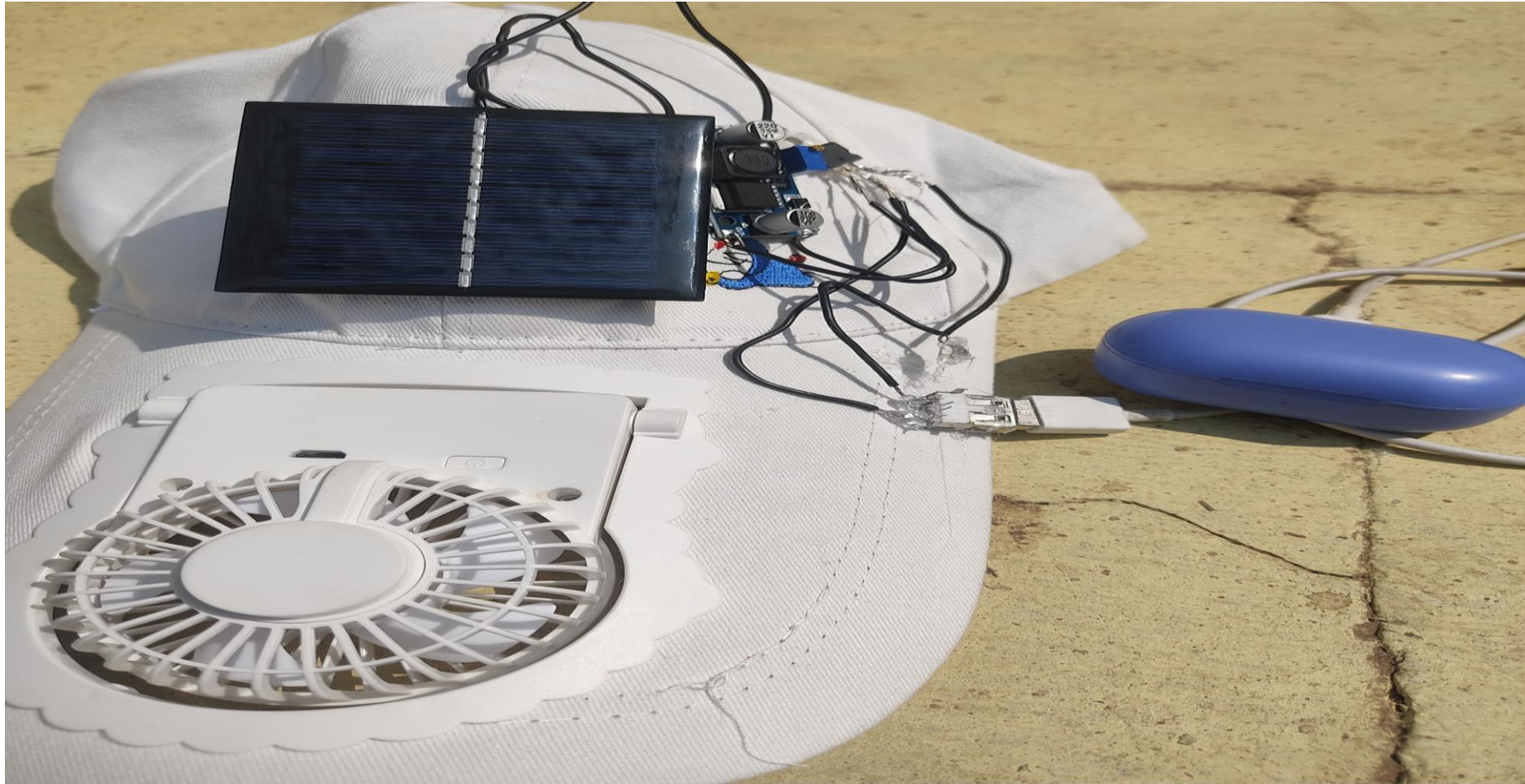


MOBILE CHARGING



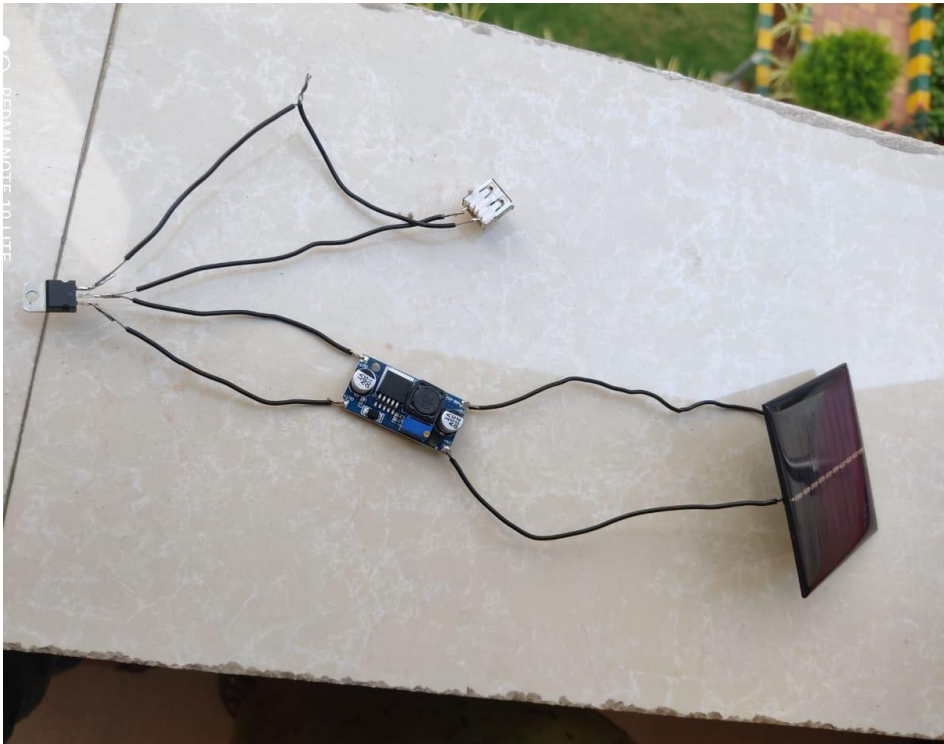


AIRPODS CHARGING



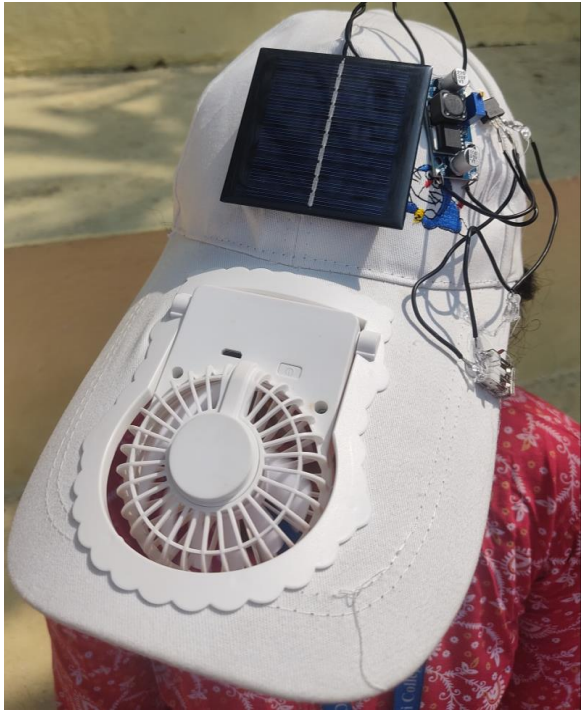
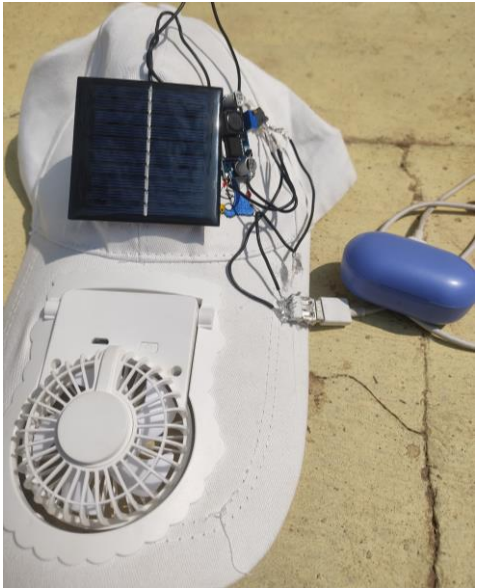


RESULTS





RESULTS





ADVANTAGES & DISADVANTAGES

➤ ADVANTAGES

1. Portable Power Source
2. Convenience
3. Environmentally Friendly
4. Versatility
5. Use of Renewable Energy
6. Less Cost

➤ DISADVANTAGES

1. Limited Power Generation
2. Dependence of Sunlight
3. Limited Battery Storage



APPLICATIONS

- Solar caps can be used during outdoor activities such as hiking, camping, fishing, or gardening to provide shade from the sun.
- It is used for charging small electronic devices like smartphones or GPS devices.
- In emergency situations or during power outages, solar caps can serve as a reliable source of power for lighting.
- Workers in construction or other outdoor labor-intensive industries can benefit from solar caps by having access to hands-free lighting and charging capabilities, enhancing safety and productivity on the job.



FUTURE SCOPE

- Integration with Smart technologies
- Pedestrian safety
- Direction guidance



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[3] Autonomous Solar Smart Cap (ASSC) for Pedestrian Safety Sidhu, Assistant Professor (IEEE member), Department of Electronics and Communication Engineering Punjabi University Patiala-2017 IEEE

[4] UR-SolarCap: An Open-Source Intelligent Auto-Wakeup Solar Energy Harvesting System for Supercapacitor Based Energy Buffering Moeen Hassanali, Tolga Soyata, Andrew Nadeau, Gaurav Sharma, Department of Electrical and Computer Engineering, University of Rochester, Rochester-2017 IEE

[5] Solar Powered Fan Cap For Outdoor Workers, Badri Narayan Mohapatra,Department of Instrumentation, AISSMS IOIT, Pune, INDIA,10, January 2020-IEEE



THANK YOU