

TRANSLATOR CERTIFICATION

Date: October 30, 2024

To whom it may concern:

I, FANG CHEN, a translator fluent in the Chinese and English languages, on behalf of Morningside Translations, do solemnly and sincerely declare that the following is, to the best of my knowledge and belief, a true and correct translation of the document(s) listed below in a form that best reflects the intention and meaning of the original text.

The document is designated as:

- CN201110409190.9.pdf



Signature

FANG CHEN

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**DOCUMENT MADE AVAILABLE UNDER THE
PATENT COOPERATION TREATY (PCT)**

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CERTIFICATE

The attachment to this certificate is a copy of the following patent application document submitted to this Office.

Application number: 201110409190.9

Type of application: Patent of invention

Title of the Invention-Creation: PORTABLE BACKUP POWER SUPPLY

Filing date: 09 December 2011

Applicant: Xingliang LEI

Inventor or designer: Xingliang LEI

**Director of National Intellectual Property
Administration of the People's Republic of China**

Lipu TIAN

02 April 2013



Claims

1. A portable backup power supply, comprising a battery pack, characterized in that: the battery pack comprises lithium iron phosphate or lithium cobalt oxide batteries, and is connected to the output end of a charging circuit; the battery pack is also connected to multiple DC-DC voltage regulation circuits, each of which is connected to an MCU microcomputer control circuit; the LED lamp is connected to the battery pack through an LED driving circuit; the battery pack is also connected to a high-current output circuit for starting vehicles.

2. The portable backup power supply according to claim 1, characterized in that the DC-DC voltage regulation circuits include regulation circuits with output voltages of 19 V DC, 12 V DC, and 5 V DC.

3. The portable backup power supply according to claim 1, characterized in that the output voltage of the high-current output circuit for vehicle starting is 12 V DC, with an instantaneous current of 100 A to 400 A.

4. The portable backup power supply according to claim 1, characterized in that the battery pack is equipped with a charge and discharge protection circuit.

5. The portable backup power supply according to any one of claims 1-4, characterized in that the MCU microcomputer control circuit is connected to an intelligent LED power display device to indicate the remaining battery capacity.

6. The portable backup power supply according to any one of claims 1-4, characterized in that a 150 A to 250 A fuse is connected in series with the high-current output circuit for starting vehicles.

7. The portable backup power supply according to any one of claims 1-4, characterized in that the output end of the high-current output circuit for vehicle starting uses a reverse connection-proof plug, and the external connection wires use silicone wires of different lengths for the positive and negative electrodes.

8. The portable backup power supply according to any one of claims 1-4, characterized in that the lithium iron phosphate or lithium cobalt oxide batteries are designed for high power, with a discharge rate of 20 c to 70 c.

9. The portable backup power supply according to claim 6, characterized in that the fuse is connected in series with either the positive or negative wire of the external connection cable.



Description

PORTABLE BACKUP POWER SUPPLY

Technical Field

The present invention relates to the field of DC power supplies, specifically to a portable backup power supply capable of providing DC power to various devices.

Background Art

With the continuous improvement in people's living standards, items such as cars, mobile phones, computers, and digital cameras have become essential in daily life, outings, and travel. All of these devices rely on batteries for power, and once the power is depleted, they lose their functionality, causing significant inconvenience. To address this issue, manufacturers generally provide specific chargers for each product, which can convert 220 V AC power to the appropriate DC voltage for charging. However, this approach results in inconvenience due to the need to carry multiple chargers, and also does not solve the problem of charging outdoors.

Chinese patent document CN101009434A discloses a portable mobile power supply device, which includes an elongated casing with an axially arranged storage slot. Inside the slot, there is at least one set of conductive contact points for positive and negative poles, allowing a designated battery to be inserted to form a power supply terminal. It also includes a DC-DC boost control circuit located on the first circuit board inside the casing, which boosts the low voltage, high current from the battery to a 5 V DC power supply. A USB output socket is aligned axially with the storage slot, functioning as a female connector, with its open terminal located at the front end of the casing. The first pin inside the socket is electrically connected to the first circuit board to receive the 5 V DC power output from the boost control circuit, thereby providing the required power for a connected USB plug. This design is multi-functional, convenient to carry, and cost-effective. However, this device lacks a self-charging function and can only provide 5 V DC current, making it incompatible with a variety of electronic devices.

Chinese patent document CN101685974A discloses a mobile power supply that includes a battery pack, a charging circuit, an MCU microcomputer control circuit, and a DC-DC voltage regulation output circuit. The charging circuit has an input terminal that can connect to an external power supply, and its output terminal is electrically connected to the battery pack. The battery pack is simultaneously connected to the MCU microcomputer control circuit and the DC-DC voltage regulation output circuit. The MCU microcomputer control circuit is electrically connected to and controls both the charging circuit and the DC-DC voltage regulation output circuit. This design allows the device to be charged using AC power and to power or charge various electronic devices by replacing different output adapters, making it easy to manage, carry,



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and use. This technical solution addresses the need for multiple voltage-level outputs and includes a self-charging function. However, it lacks high-current output capability, making it unsuitable as a car starter power supply.

Summary of the Invention

To address the issues mentioned above, this invention provides a portable backup power supply that not only has charging capabilities and offers multiple voltage-level DC outputs, but also features high-current output capability, making it suitable as a car starter power supply.

The object of the present invention is achieved through the following technical solution:

A portable backup power supply that includes a battery pack comprises lithium iron phosphate or lithium cobalt oxide batteries, which is connected to the output terminal of a charging circuit. The battery pack is also connected to multiple DC-DC voltage regulation circuits, each of which is connected to an MCU microcomputer control circuit. An LED lamp is connected to the battery pack through an LED driving circuit. Additionally, the battery pack is connected to a high-current output circuit designed for car starting.

Preferably, said DC-DC voltage regulating circuit includes a voltage regulating circuit with an output voltage of 19 V DC, 12 V DC, 5 V DC.

Preferably, the output voltage of said high-current output circuit for vehicle starting is 12 V DC, and the instantaneous current is 100 A to 400 A.

In particular, said battery pack is connected to a charging and discharging protection circuit.

In particular, said MCU microcomputer control circuit is connected to an intelligent LED power display device for displaying the power stock.

In particular, in order to reduce the probability of short-circuiting due to collision of two battery clips during emergency starting, the high-current output circuit for car starting is connected in series with a 150 A to 250 A fuse. The output end uses a reverse connection-proof plug, and the external connection cables use silicone wires of different lengths for the positive and negative wires. The lithium iron phosphate or lithium cobalt oxide batteries are designed for high power, with a discharge rate reaching 20 c to 70 c.

The fuse is connected in series with either the positive or negative wire of the external connection cable.





Description

This portable backup power supply uses lithium iron phosphate or lithium cobalt oxide batteries as the battery pack, featuring light weight, compact size, durability, high instantaneous discharge current, and the ability to be recharged repeatedly, meeting the high-current requirements for starting cars. The battery pack connects to various voltage regulation circuits and, through the MCU microcomputer control circuit, can provide outdoor power supply for devices such as mobile phones, computers, and digital cameras. The LED lamp can provide outdoor illumination, making it versatile, easy to carry, and able to meet various power supply needs in daily life, outings, and travel.

Brief Description of the Drawings

The present invention is described in further detail below according to the attached drawings and embodiments.

FIG. 1 shows a schematic diagram of the principle structure of the portable backup power supply described in the present invention;

FIG. 2 shows a schematic diagram of a division of a specific circuit diagram of the portable standby power supply described in the present invention;

FIG. 3 is an enlarged view of section 4-1 as shown in FIG. 2;

FIG. 4 is an enlarged view of section 4-2 as shown in FIG. 2;

FIG. 5 is an enlarged view of section 4-3 as shown in FIG. 2; and

FIG. 6 is an enlarged view of section 4-4 as shown in FIG. 2.

In the figures:

1. Lithium iron phosphate or lithium cobalt oxide battery pack; 2. charging circuit; 3. LED driving circuit; 4. DC-DC 19 V boost output circuit; 5. 12 V output circuit; 6. DC-DC 5 V buck output circuit; 7. MCU microcomputer control circuit; 8. Intelligent LED power display device; 9. 12 V high-current output circuit; 10. LED lamp; 11. protection circuit.

Detailed Description of the Preferred Embodiments

As shown in FIG. 1, the schematic structure of the portable backup power supply described in this invention is provided. The lithium iron phosphate or lithium cobalt oxide battery pack 1 is connected to multiple DC-DC voltage regulation circuits, namely the DC-DC 19 V boost output circuit 4, the 12V output circuit 5, and the DC-DC 5 V buck output circuit 6. Each of these DC-



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DC regulation circuits is connected to the MCU microcomputer control circuit 7. Through the MCU microcomputer control circuit 7, users can flexibly select the desired voltage output to meet the outdoor power supply requirements for devices such as mobile phones, computers, and digital cameras. Furthermore, by connecting the MCU microcomputer control circuit 7 to the intelligent LED power display device 8, the battery status of the lithium iron phosphate or lithium cobalt oxide battery pack 1 can be monitored in real-time.

Since this power supply uses the lithium iron phosphate or lithium cobalt oxide battery pack 1 as an energy storage device, it has the advantages of being lightweight, compact, durable, having a high instantaneous discharge current, and being able to be recharged repeatedly. By connecting it to the output end of the charging circuit 2, it achieves a charging function. It is also connected to a 12V high-current output circuit 9 that can provide a current output of 100 A 400 A at 12 V, which can be used as an emergency power supply to start a car. The high-current output for starting cars is connected directly across the battery pack without passing through the discharge protection circuit. To prevent the battery from overheating due to short-circuiting or reverse connection of the positive and negative clips during emergency car starting, a 150 A to 250 A fuse is included in the circuit. To reduce the probability of short-circuiting due to collisions between the two battery clips during emergency starting, a 150A 250A fuse is also included in the high-current output circuit for car starting. The output end uses an anti-reverse connection plug, and the positive and negative external connection wires are made of silicone wires of different lengths. To ensure safe charging and discharging of the battery pack, the lithium iron phosphate or lithium cobalt oxide battery pack 1 is connected to a protection circuit 11 that provides overcurrent and overload protection.

Additionally, to meet outdoor lighting needs, the lithium iron phosphate or lithium cobalt oxide battery pack 1 is sequentially connected to the LED driving circuit 3 and the LED lamp 10, which can be used as an emergency lighting power supply. Specific circuit diagrams of the power supply are shown in FIGS. 2 to 6.



Drawings

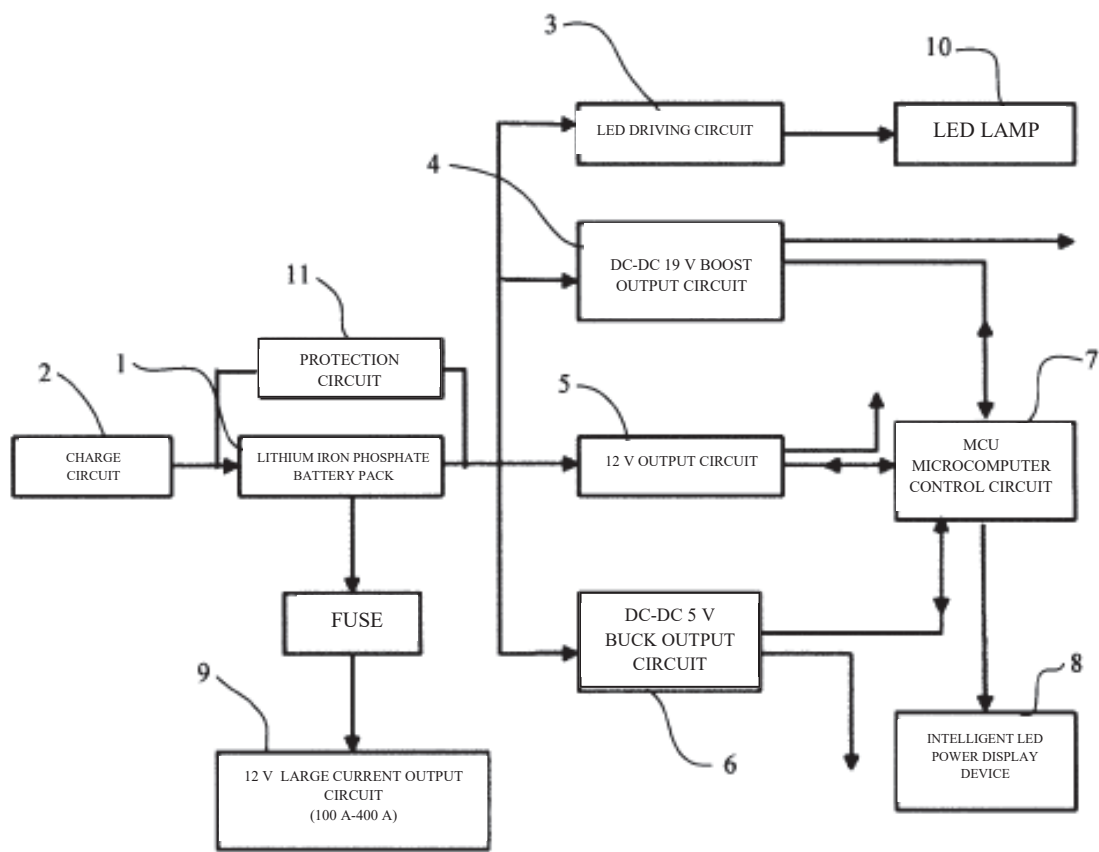


FIG. 1





Drawings

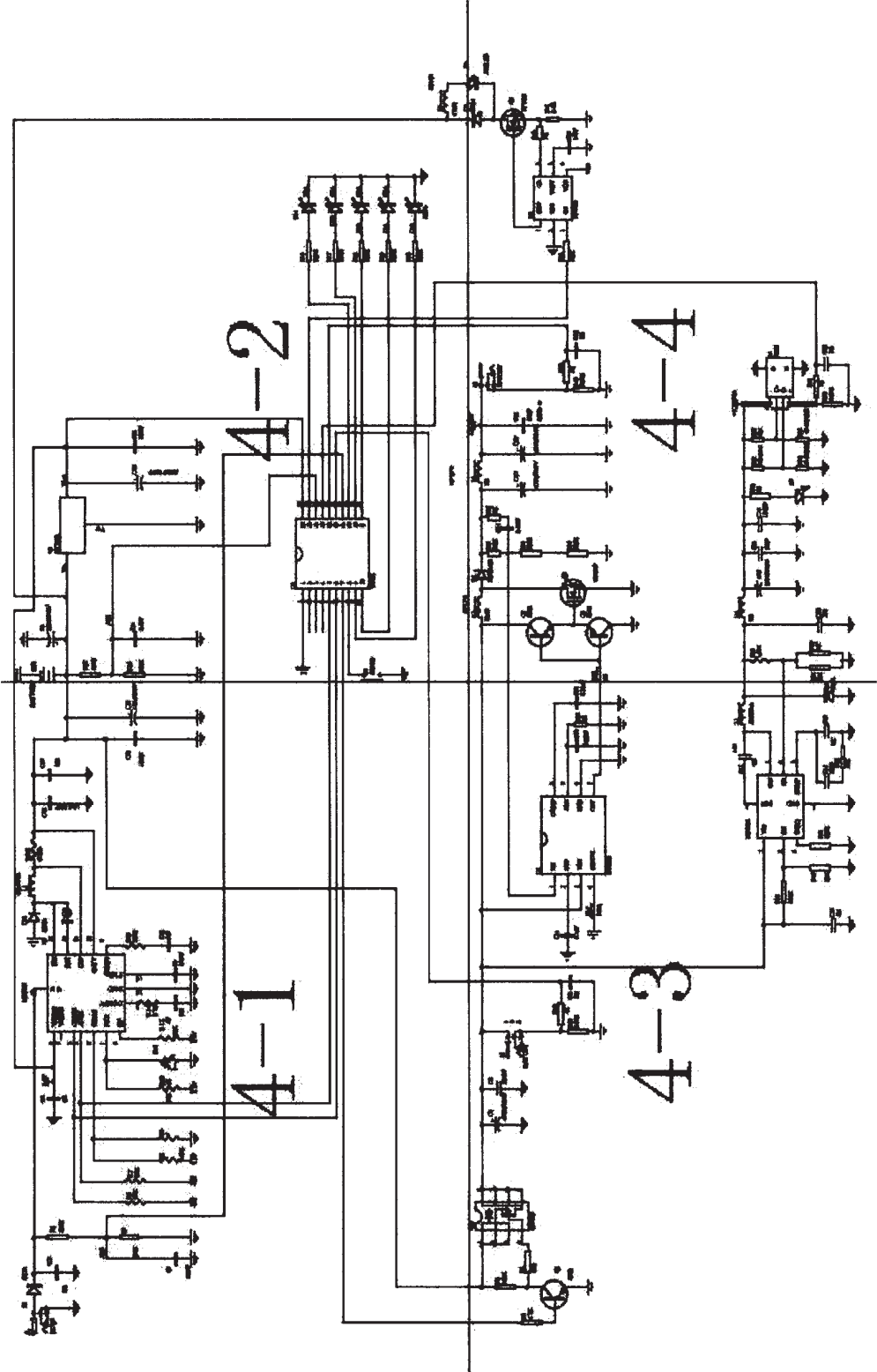


FIG. 2



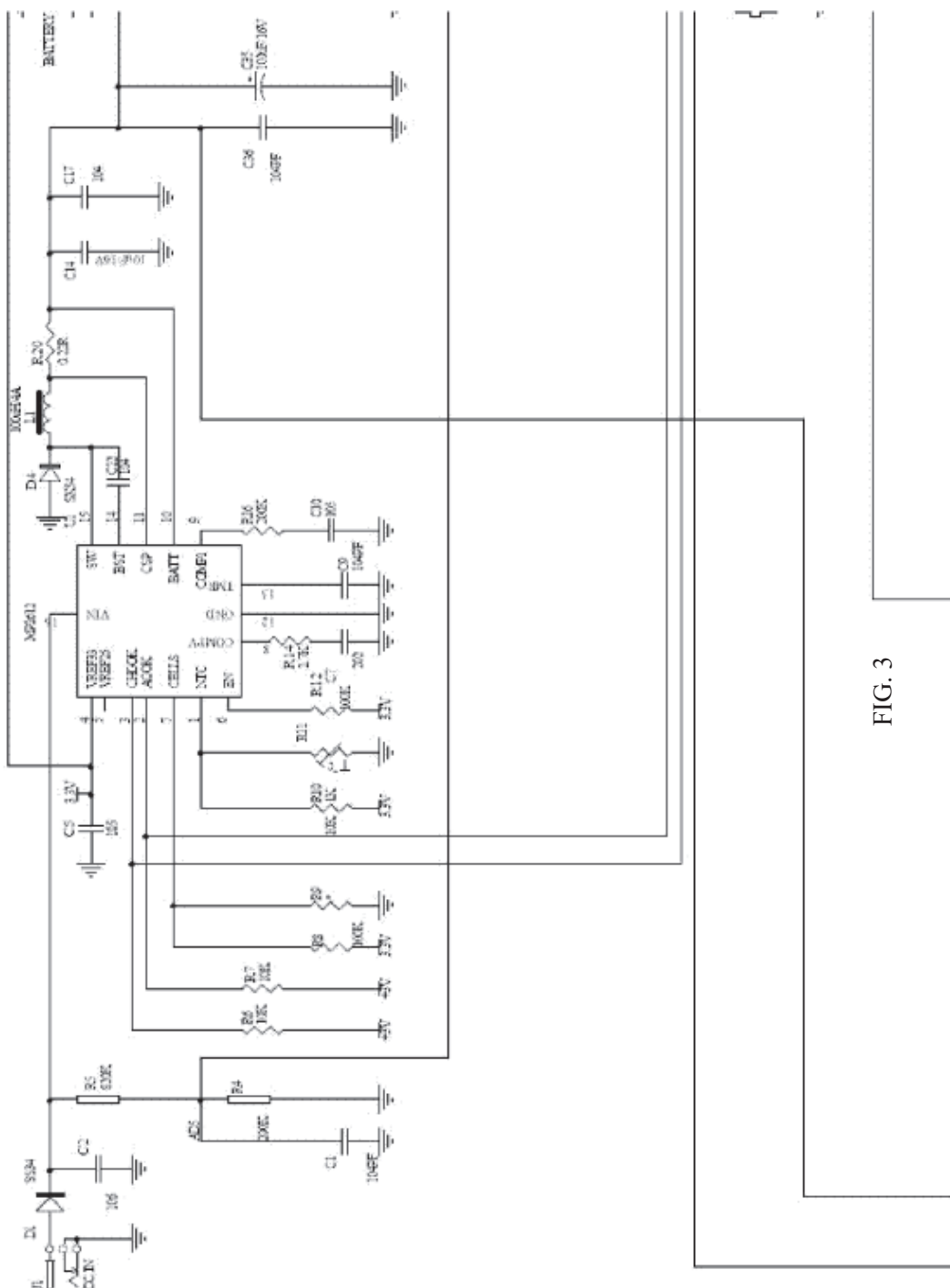


FIG. 3



Drawings

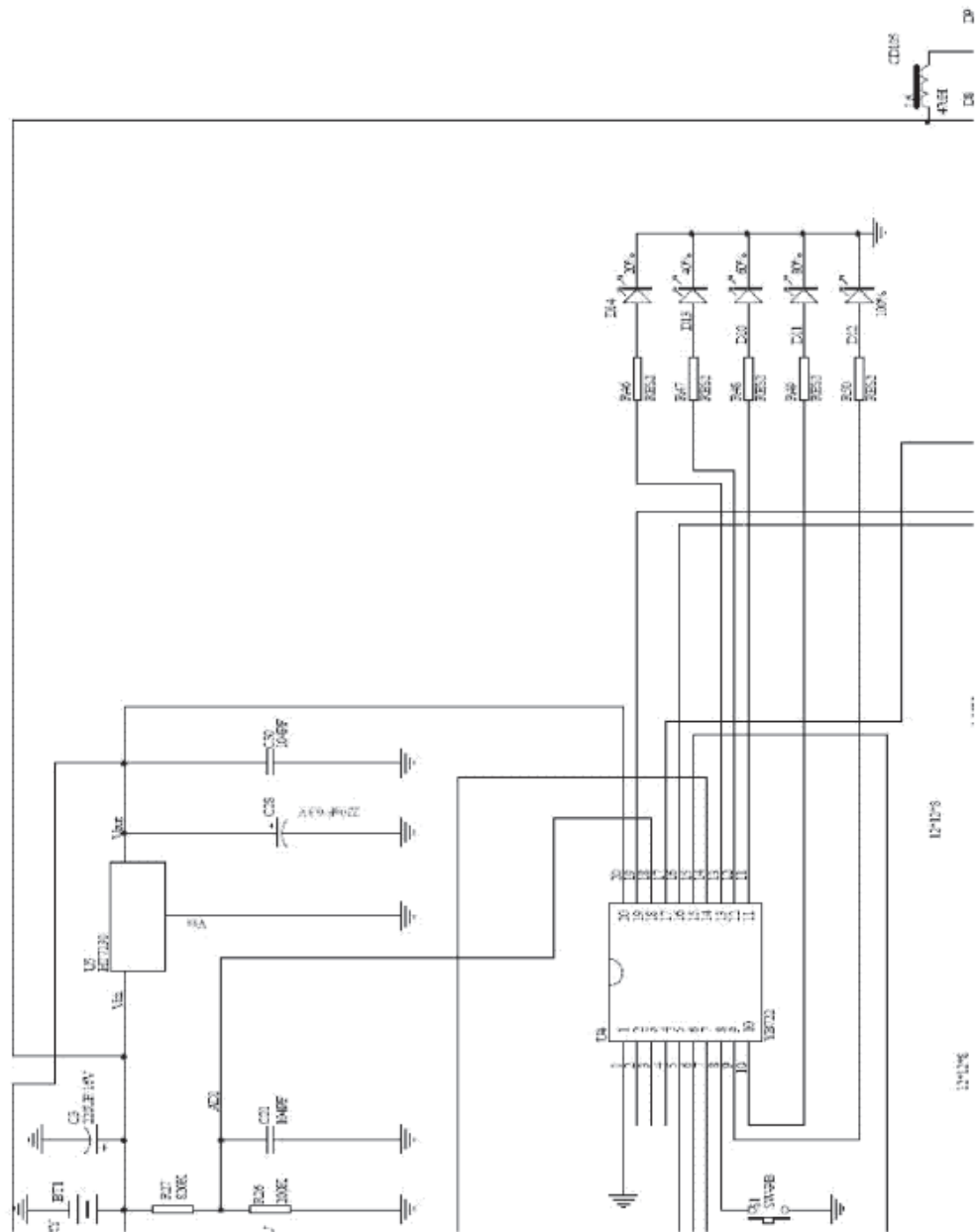


FIG. 4



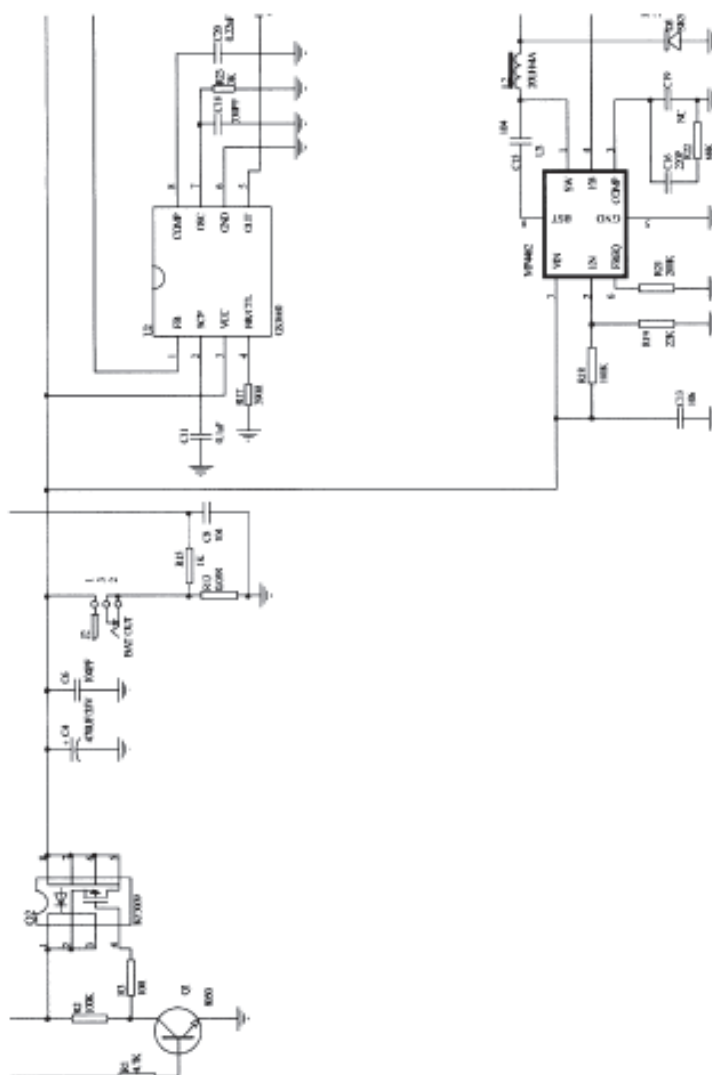


FIG. 5

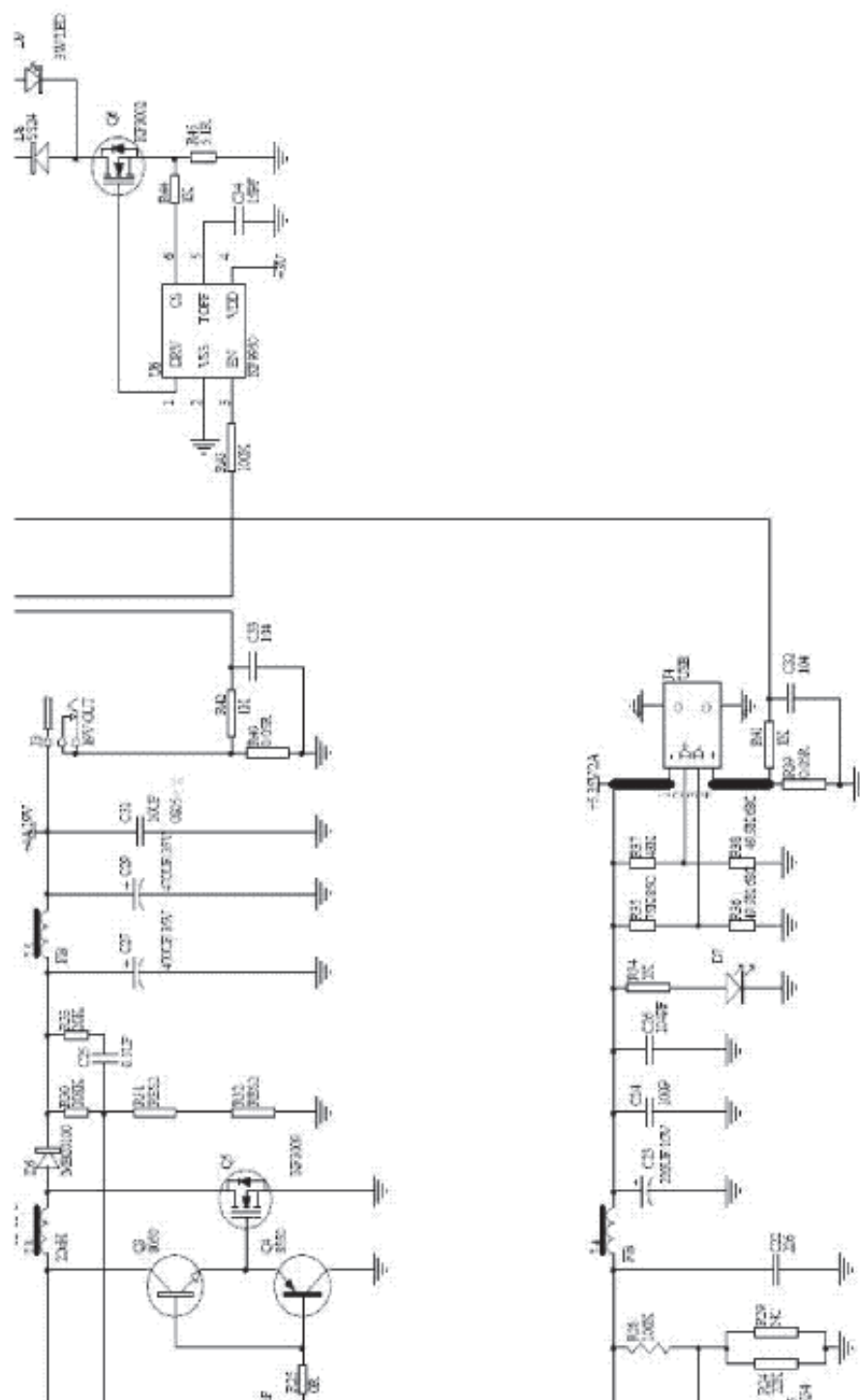


FIG. 6