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A valve controlled lead-acid storage battery without harm to the environment

FIELD OF THE INVENTION

This invention relates to a valve controlled lead-acid storage battery without
5 harm to the environment, and more particularly, to a valve controlled lead-acid
storage battery without harm to the environment which can eliminate the generated
deleterious acid gas.

DESCRIPTION OF THE PRIOR ART

10 With the rapid development of the communication industry, the need for the
communication power supply is increasing gradually. In order to meet the
requirements of the miniaturized and decentralized arrangement of the
communication products, more and more batteries of 12V and 6V are increasingly
used in the communication system. The built-in storage battery is employed
15 increasingly in an access net and a small GSM base station. Since the valve
controlled sealed lead-acid storage battery (VRLA battery) has various advantages,
it is a good choice for communication equipment. The VRLA battery is normally in a
floating charge state (namely constant voltage charge state). The VRLA battery
always generates a small quantity of gas, because its gas combined efficiency can
20 not reach 100%(generally, the efficiency is 98-99%). The overflowed gas will bring
out some vitriol mist within the interior of the storage battery, thus eroding the
communication equipment, endangering human's health and polluting the
environment.

Furthermore, it is tested by experiments that most of the overflowed gas is
25 hydrogen while the storage battery is used in normal conditions. There will be a
danger of detonation when the hydrogen is accumulated to a certain extent in the
equipment. The overflow speed of the gas will be increased by some reasons, for
example, the storage battery is uniform and the environment is too steady and so on,
thus affecting the steady operation of the communication equipment. The above
30 problems have disadvantageous effects on the safe operation of the communication

power supply. Especially, in a whole closed environment, the generated hydrogen must be discharged out of the operation environment.

A storage battery with gas collecting device was disclosed in Chinese patent application No. 00126156.8 entitled "a storage battery with gas collecting device", comprising a battery jar containing the chemical reagent, and a battery cover used for sealing the battery jar. A gas collecting channel formed by a safety valve port and a gas channel top cover used for sealing the safety valve port is provided on the upper surface of the top cover. On one side surface of the safety valve port are provided vent holes. The above battery can prevent the equipment from being eroded by the acid mist and avoid the potential safety hazard caused by the combustible gas to some extent. However, it is to discharge the collected acid mist and the gas out of the equipment (or outdoor), so the acid mist and the gas also pollutes the atmosphere.

SUMMARY OF THE INVENTION

An object of this invention is to solve the above problems, and to provide a valve controlled lead-acid storage battery without harm to the environment. The valve controlled lead-acid storage battery can eliminate the acid mist, collect the generated gas and discharge the generated hydrogen out of the operation environment. It can assure the safety of the power supply equipment of the storage battery, be harmless to the equipment and the operation, and protect the environment.

Accordingly, there is provided a valve controlled lead-acid storage battery without harm to the environment, comprising a main body with a gas collecting and discharging device, wherein a gas guide pipe and a neutralization pot containing alkalic substance are provided, the neutralization pot is provided with a gas inlet and a gas outlet connected to a duct, the incoming gas is discharged from the outlet of the neutralization pot after being filtered by the alkalic substance, the duct of the outlet can be extended as long as possible, the cleaned gas (the main portion

thereof is hydrogen) can be discharged out of the operation environment as required, the main portion of the neutralization pot contains the alkalic substance, the inlet of the gas guide pipe is connected to the outlet of the gas collecting and discharging device, and the outlet of the gas guide pipe is connected to the inlet of the neutralization pot.

With the above scheme, the storage battery according to the invention can eliminate the acidic components by neutralization, and discharge the cleaned gas out of the operation environment, thus eliminating the eroding of the acidic substance to the equipment and the harm to the human, avoiding the potential safety hazard, and achieving safety and environment protection.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects, features and advantages of the invention will be understood clearly by the detailed description with reference to the accompanying drawings, wherein:

Fig. 1 is a schematic view showing a valve controlling type lead-acid storage battery without harm to the environment according to an embodiment of the invention;

Fig. 2 is a structural view showing the storage battery with a gas collecting and discharging device according to the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The invention will be further described in detail through the embodiments with reference to the drawings.

As shown in Fig.1, a valve controlled lead-acid storage battery without harm to the environment comprises a main body 10 having a gas collecting and discharging device 1. The valve controlled lead-acid storage battery without harm to the environment is further provided with a gas guide pipe 2 and a neutralization pot 3 containing alkalic substance, the inlet of the gas guide pipe 2 is connected to the outlet of the gas collecting and discharging device 1, and the outlet of the gas guide pipe 2 is connected to the gas inlet of the neutralization pot 3. The main portion of the

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neutralization pot 3 contains the alkalic substance. There is provided a final outlet 4 on the upper portion of the neutralization pot 3. The incoming gas guided from the gas collecting and discharging device 1 to the gas guide pipe 2 is discharged from the outlet of the neutralization pot 3 after being filtered by the alkalic substance. A duct used for discharging the neutralized gas out of the operating environment is connected to the outlet of the neutralization pot 3. The duct connected to the outlet of the neutralization pot 3 can be extended as long as possible, the cleaned gas (the main portion thereof is hydrogen) will be discharged out of the operating environment as required.

Fig. 2 illustrates the structure of the storage battery with a gas collecting and discharging device. The storage battery with a gas collecting and discharging device comprises a battery jar 11 containing chemical reagent and a battery cover 12 used for sealing the battery jar 11. A gas collecting channel formed by a safety valve port 13 and a channel top cover 14 used for sealing the safety valve port 13 is provided on the upper surface of the battery cover 12. Plural vent holes 15 are provided on one side surface of the safety valve port 13. The safety valve port 13 is arranged around safety valves 18 regularly arranged in rows, and in a shape of a stripe groove. A handle 17 used for carrying is provided on the upper surface of the battery cover 12 adjacent to the side surface of the central portion of the safety valve port 13. Terminals 16 expose to the upper surface of the battery cover 12. The vent holes 15 are provided on one side wall of the safety valve port 13 adjacent to the terminals 16. There is provided a protecting frame at the periphery of the vent holes 15, and also provided indentations for connecting hoses to the vent holes 15. The gas collecting and discharging device 1 comprises a safety valve port 13 disposed on the top surface of the battery cover 12, and a channel top cover 14 used for sealing the safety valve port 13. The safety valve port 13 and the top cover 14 form a gas-collecting channel. The vent holes 15 provided on one side surface of the safety valve port 13 are used as the outlets of the gas collecting and discharging device 1.

The gas and acid mist generated during using passes firstly through the gas collecting channel formed by the top cover 14 and the safety valve port 13, and then

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is guided to the gas guide pipe 2 via the outlet of the gas collecting and discharging device 1.

In the communication equipment, the series and parallel connections of a plurality of batteries are generally used, for example, a communication system of 48V needs 24 batteries of 2V or 4 batteries of 12V. For this, in the present embodiment, there are several main bodies 10, each main body 10 has at least one gas collecting and discharging device 1, a plurality of inlets are provided on the gas guide pipe 2, and connected to the outlets of the gas collecting and discharging device 1 on the main bodies 10 respectively.

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INDUSTRIAL PRACTICAL APPLICABILITY

This invention has the following functions by gathering the gas collected by the gas collecting and discharging device 1 via the gas guide pipe 2 and then guiding the gas into the neutralization pot 3: gathering the gas generated by the valve controlled storage battery during charging process thereof; then, removing the acid substance from the gas by chemical neutralization action; finally, discharging the neutralized gas out of the operation environment via the duct connected to the outlet of the neutralization pot 3, thus eliminating the eroding of the acidic substance to the equipment and the harm to the human, avoiding the potential safety hazard, and achieving safety and environment protection.

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CLAIMS

5 1. A valve controlled lead-acid storage battery without harm to environment, comprising a main body (10) having a gas collecting and discharging device (1), wherein a gas guide pipe (2) and a neutralization pot (3) containing alkalic substance are provided, said neutralization pot (3) is provided with a gas inlet and a gas outlet (4), said gas outlet(4) is connected to a duct used for discharging the
10 neutralized gas out of the operation environment, the main portion of the neutralization pot (3) contains the alkalic substance, the inlet of said gas guide pipe (2) is connected to the outlet of said gas collecting and discharging device (1), and the outlet thereof is connected to the inlet of said neutralization pot (3).

2. The valve controlled lead-acid storage battery without harm to the
15 environment according to the claim 1, wherein there are provided a plurality of the main bodies (10), each of which has at least one gas collecting and discharging device (1), a plurality of inlets are provided on the gas guide pipe (2), each of the inlets is connected to the outlet of said gas collecting and discharging device (1) on each main body (10) respectively.

20 3. The valve controlled lead-acid storage battery without harm to the environment according to claims 1 or 2, wherein said gas collecting and discharging device (1) comprises a safety valve port (13) disposed on the top surface of said battery cover (12), and a gas channel top cover (14) used for sealing the safety valve port (13), said safety valve port (13) and said top cover (14) form a
25 gas collection channel, plural vent holes (15) are provided on one side surface of said safety valve port (13).