The length of the exposed bundle of wires 322d is selected so that exposed bundle of wires 322d directly connects with each set of connector pins 442c of each and every relay 442 to provide the maximum electrical conductivity (i.e. maximum ampacity) between the negative cable 322 and the battery 412.

3) Increase Conductivity of Positive Cable Connection

The positive cable 318 can be connected to the battery 412 in a manner to increase the conductivity (i.e. ampacity) between the battery 412 and positive cable 318. For example, the positive cable 318 can be rolled up in the positive battery tab 414 and soldered together thoroughly. The connection between the positive cable 318 and battery 412 is shown in FIGS. 16-22.

The positive cable 318, for example, can be stranded wire comprising an inner electrical wire conductor 318b composed of an untwisted or twisted bundle of wires 318d disposed within an outer electrical insulating sheath 318c. The electrical insulating sheath 318c of the positive cable 318 can be removed from the positive cable end 318a exposing the inner electrical conductor 318b at the positive cable end 318a.

The battery 412 is provided with a positive battery tab 414. The positive battery tab 414 is a metal sheet (e.g. copper sheet) connected to the positive terminal tab 414 of the battery 412.

The exposed bundle of wires 318d of the inner electrical conductor 318b can be soldered with tin, and then rolled up within the positive battery tab 312a. Solder 415 (FIG. 21) is applied to the exposed bundle of wires 318d and the positive battery tab 312a.

WINPLUS Ex. 1003, p. 581

The length of the exposed bundle of wires 318d is selected so that exposed bundle of wires 318d directly connects with the full width of the positive battery tab 414 to provide the maximum electrical conductivity (i.e. maximum ampacity) between the battery 312 and the positive cable 318.

4) Increase Conductivity of Diode Connection

The positive cable 318 can be provided with a diode connection 450 configured to increase the conductivity along the positive cable 318, as shown in FIGS. 23 – 25.

The diode connection 450 comprises a plurality of diodes 454 connected between positive cable sections 318e and 318f (FIG. 25). For example, the diode connection 450 comprises six (6) back-charge type diodes (e.g. Schottky barrier diodes).

The diodes 454 are soldered between the positive cable sections 318e and 318f. Specifically, the diode conductor tabs 454a are soldered to the positive cable section 318e and the diode conductor prongs 454b are soldered to the positive cable section 318f. More specifically, the diode conductor prongs 454b of the diodes 354 extend through the diode circuit board 452, extend into the bundle of wires 318b, and then are soldered in place completing assembly of the diode connection 450.

The diode connection 450 is then insulated, for example, using a shrink wrap insulator 455 (FIG. 25), which is applied around the diode connection 450, and then shrunk by applying heat (e.g. using heat gun).

5) Redesign Resistor/Diode Printed Circuit Board (PCB)

e.g. redesign of resistor/diode PCB to eliminate the diodes extending therefrom;

6) Reconnect Resistors

e.g. reconnect resistors R134A&B, R135A&B that are on the Resistor/Diode PCB to be connected again.

TEST #1

The battery connection device 100 shown in FIG. 5 was subjected to a 1250A Load Test. The results are shown in FIG. 27, and as follows:

Pulse #1 Average Power of 4799.01W

Pulse #2 Average Power of 5528.99W

Pulse #3 Average Power of 6101.63W

TEST #2

The battery connection device 400 shown in FIG. 13 was subjected to a 1250A Load Test. The results are shown in FIG. 28, and as follows:

Pulse #1 Average Power of 6584.61W

Pulse #2 Average Power of 7149.60W

Pulse #3 Average Power of 7325.91W

This results in a significant increase of approximately twenty percent (20%) for peak power compared to the results of TEST #1.

Another enhanced conductivity battery conductor device 500 is shown in FIGS. 29 - 37. The enhanced conductivity battery connector device 500 provides a significantly increased conductivity compared to the battery connector device 100, as shown in FIGS. 5 – 10.

The battery conductor device 500 comprises the battery assembly 410, including the battery 512 connected to the positive cable 518 and the negative terminal conductor plate 530. A positive wire 519 is connected directly or indirectly to the positive tab or positive cable 518 of the battery 530, and a negative wire 523 is connected directly or indirectly to the negative tab or negative terminal conductor plate 530. The battery conductor device 500 can further include a bundle of wires 570 connected to or associated with the operation of the battery 512 (e.g. battery temperature sensor, power supply, etc.).

The battery 512 can comprise a single battery cell 512c (FIG. 30), or multiple battery cells 512C connected end-to-end in series. Three (3) separate battery cells 512c are shown in FIG. 30.

The battery cells 512c each have positive and negative tabs 512d located at opposite ends of each battery cell 512c. The battery cells 512c are connected together in series by welding (e.g. sonically and/or thermally welding) and/or soldering respective positive and negative tabs 512d together. For example, the tabs 512d are positioned so as to overlap each other (e.g. edges overlapping opposite tab 512d, or edge-to-edge).

The tabs 512d are metal plates (e.g. relative thin metal foils) extending outwardly from the body and opposite edges of each battery cell 512c. As shown in FIG. 30, the tabs 512d extend along opposite edges at the width of each battery cell 512c. The tabs

512d are each centered and extend most of the width of each opposite edge of each battery cell 512c.

As shown in FIGS. 30 and 31, a separate tab 512e is added or connected to the right side of the battery cell 512c to extend the length of the tab 512d. The separate tab 512e is shown as having the same width as the tab 512d; however, this width can be different. To assemble the separate tab 512e to the tab 512d, for example, the separate tab 512e is positioned to overlap over the tab 512d, and then welded (e.g. sonically and/or thermally welded) and/or soldered together. The exposed end of the positive cable 518 is then wound up inside the separate tab, as shown in FIGS. 32 and 34. For example, the initially flat separate tab 512e is wrapped around the exposed end of the positive cable 518, and then connected to the exposed end by welding (e.g. sonically and/or thermally welding) and/or soldering. For example, a layer of solder is applied to one or both sides of the separate tab 512e, and then after wrapping the separate tab 512e around the exposed end of the positive wire 518, the assembly is heated to melt the layered solder and solder the assembly together.

The three (3) battery cells 512c once connected together, as shown in FIG. 32, are then folded over each other into the layered battery cell arrangement shown in FIG. 33. The layered battery cell arrangement can be packaged (e.g. the three (3) battery cells can be taped or shrink wrapped together), or placed within a battery cover or casing, as shown in FIG. 34.

As shown in FIG. 35, the negative tab 512d can be attached to the negative terminal conductor plate 530. For example, the negative tab 512d can be wrapped partially or fully, as shown, around the negative terminal conductor plate 530. The

negative tab 512d can be provided with a plurality of through holes 512f to facilitate welding and/or soldering the negative tab 512d to the negative terminal conductor plate 530. For example, the through holes 512f can be square-shaped through holes arranged into a matrix, as shown in FIG. 35. The negative wire 523 is shown connected (e.g. soldered) to the negative tab 512d.

A separate tab 512e (see FIG. 30) can be connected to the negative tab 512d to lengthen same, so that the lengthened negative tab can be wrapped or wound around the negative terminal conductor plate 530 more than one time (e.g. 2, 3, 4, or more times). In this manner, the electrical connection between the negative tab 512d and the negative terminal conductor plate 530 can be enhanced. The separate tab 512e can be provided with a layer of solder on one or both sides, so that after the separate tab 512e is wrapped or wound around the negative terminal conductor plate 530, this assembly can be heated up to solder the separate tab 512e onto the negative terminal conductor plate 530.

The completed assembly of the battery conductor device 500 with the connected separate positive tab 512d ready to be wrapped or wound an exposed end of the positive cable 518 (FIG. 29) can be seen in FIG. 36. The bundle of wires 570 shown in FIG. 36, includes wires 572 for a temperature sensor embedded within the battery 512 (e.g. temperature sensor located near battery tab or between battery cells. The temperature sensor 574 having two (2) wires 572a, 572b is shown in FIG. 37.

The battery conductor device 500 can comprise a diode connector 550 connected inline or splice into the positive cable 518, as shown in FIG. 38.

The battery conductor device 500 comprises a diode circuit board 552 having a plurality of diodes 454 assembled thereon. The diodes 454 each have a diode conductor tab 454a connected (e.g. soldered) to an exposed end of the positive cable 518. The prongs of the diodes 454 extend through holes in the diode circuit board 552, and are soldered to both the conductive traces and exposed end of the positive cable 518 along with a resistor 576 to complete the assembly.

WINPLUS Ex. 1003, p. 587

70557-104

CLAIMS:

1. A rechargeable battery with connector device for use in a battery jump starting device, the device comprising:

a rechargeable battery comprising at least one battery cell having a positive tab and a negative tab;

a positive cable having a conductor connected to the positive tab of the at least one battery cell of the rechargeable battery; and

a negative terminal conductor bar connected to the negative tab of the at least one cell of the rechargeable battery.

2. The device according to claim 1, further comprising a separate tab connected to the positive tab of the at least one cell of the rechargeable battery to extend a length of the positive tab of the at least one cell of the rechargeable battery.

3. The device according to claim 4, wherein the separate tab connected to the positive tab of the at least one battery cell of the rechargeable battery wraps around and connects to a conductor of the positive cable.

4. The device according to claim 1, wherein the positive tab wraps around and connects to the conductor of the positive cable.

5. The device according to claim 1, wherein the negative tab wraps around the negative conductor bar to electrically connect the at least one battery cell of the rechargeable battery to the negative conductor bar.

6. The device according to claim 4, wherein the conductor of the positive cable is soldered to the positive tab of the at least one battery cell of the rechargeable battery and the negative terminal conductor bar is soldered to the negative tab of the at least one battery cell of the rechargeable battery.

7. The device according to claim 1, wherein the rechargeable battery is rectangular-shaped, and the negative terminal conductor bar is L-shaped and wraps around a respective corner of the rechargeable battery.

8. The device according to claim 7, wherein the positive tab and the negative tab of the at least one battery cell of the rechargeable battery extend from opposite sides of the rechargeable battery.

9. The device according to claim 1, wherein the positive tab and negative tab of the at least one battery cell of the rechargeable battery extend along opposite edges along a width of the at least one battery cell of the rechargeable battery.

10. The device according to claim 2, wherein the separate tab has a same width as the positive tab of the at least one battery cell of the rechargeable battery.

11. The device according to claim 2, wherein the separate tab overlaps the positive tab of the at least one battery cell of the rechargeable battery.

12. The device according to claim 2, wherein the conductor of the positive cable is wound up inside the separate tab.

13. The device according to claim 1, further comprising another separate tab connected to the negative tab of the at least one cell of the rechargeable battery to extend a length of the negative tab of the at least one cell of the rechargeable battery.

14. The device according to claim 13, wherein the another separate tab wraps more than one time around the negative conductor bar to enhance the electrical connection between the negative conductor bar and the negative tab of the at least one battery cell of the rechargeable battery.

15. A jump starting device having a smart switch controller, the jump starting device comprising:

a rechargeable battery with connector device according to claim 1;

a positive clamp connected to the positive cable of the rechargeable battery assembly device;

a smart switch interface connected to and controlled by the smart switch controller, the smart switch interface comprising a circuit board having a first circuit board conductor bar connected to the negative terminal conductor bar of the rechargeable battery assembly and a second circuit board conductor spaced apart from the first circuit board conductor bar on the circuit board, the smart switch interface further comprising one or more relays connected between the first circuit board conductor bar and the second circuit board conductor bar for providing isolation between the negative terminal of the rechargeable battery and a battery being jump started by the battery jump starting device;

a negative cable connected to the second circuit board conductor bar of the smart switch interface; and

a negative clamp connected to the negative cable.

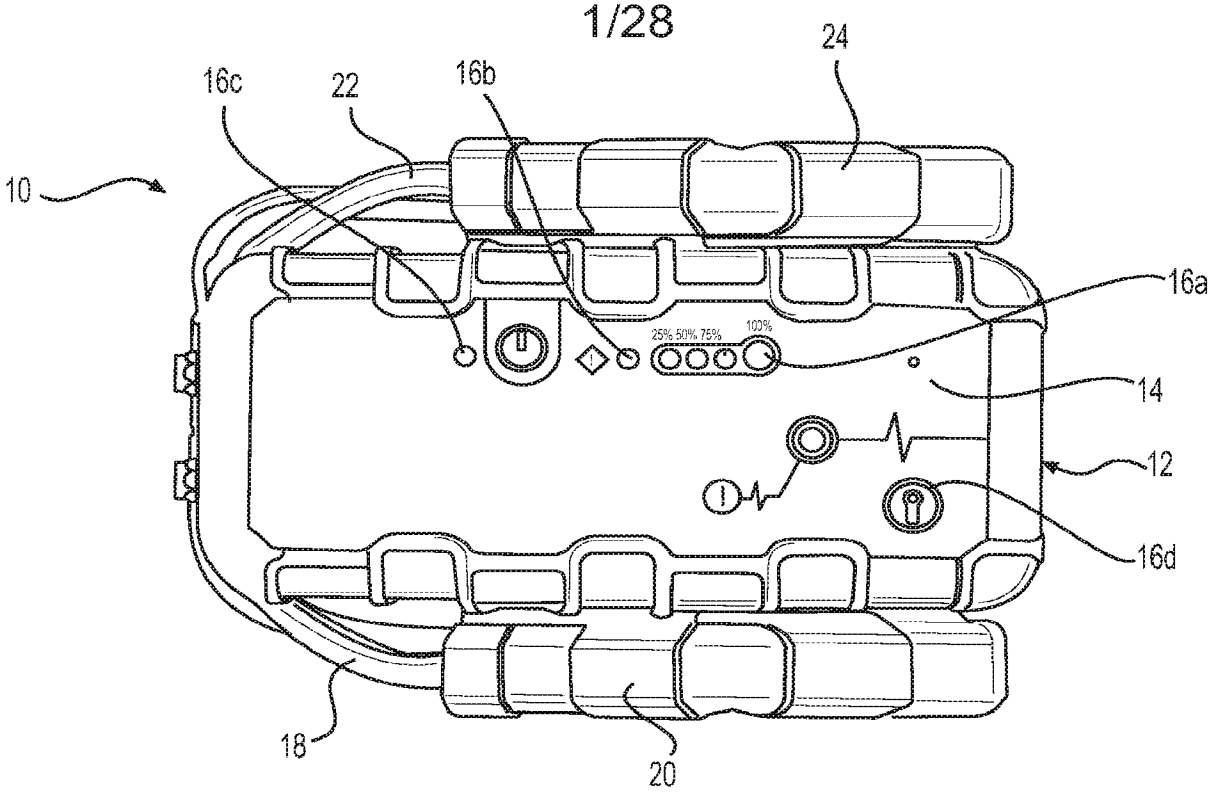


FIG. 1

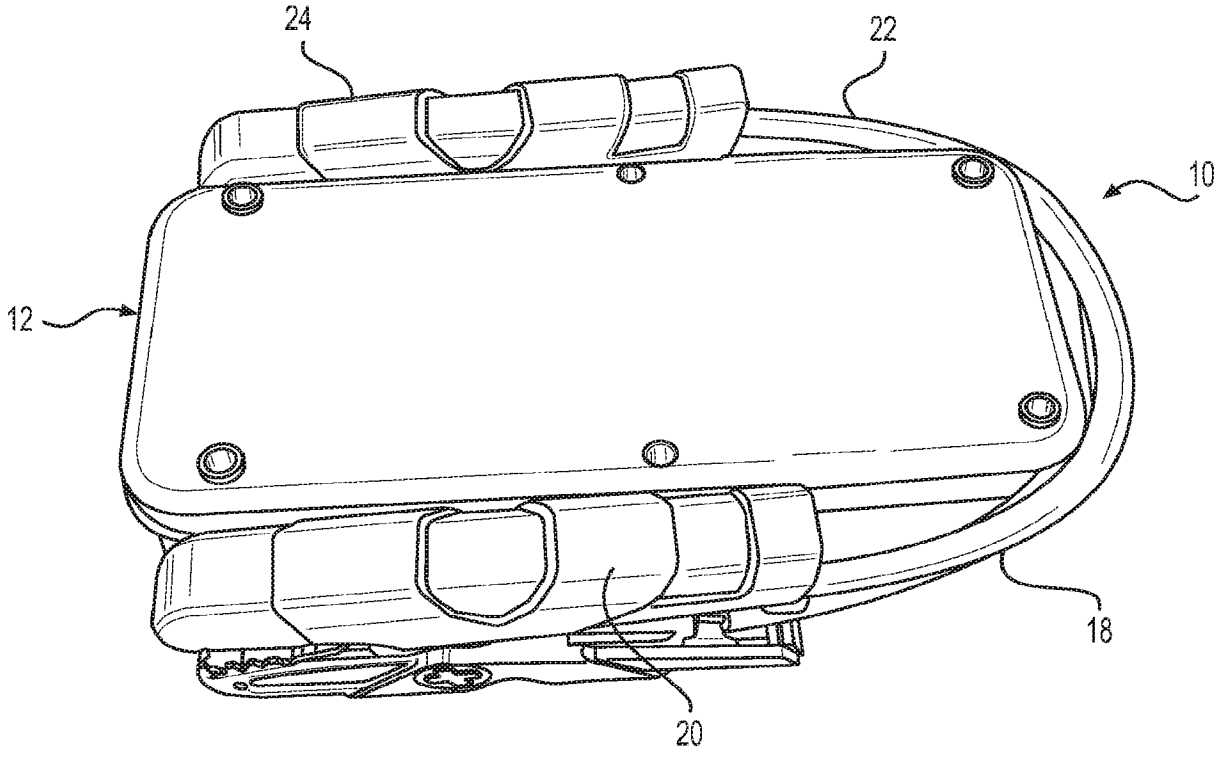


FIG. 2

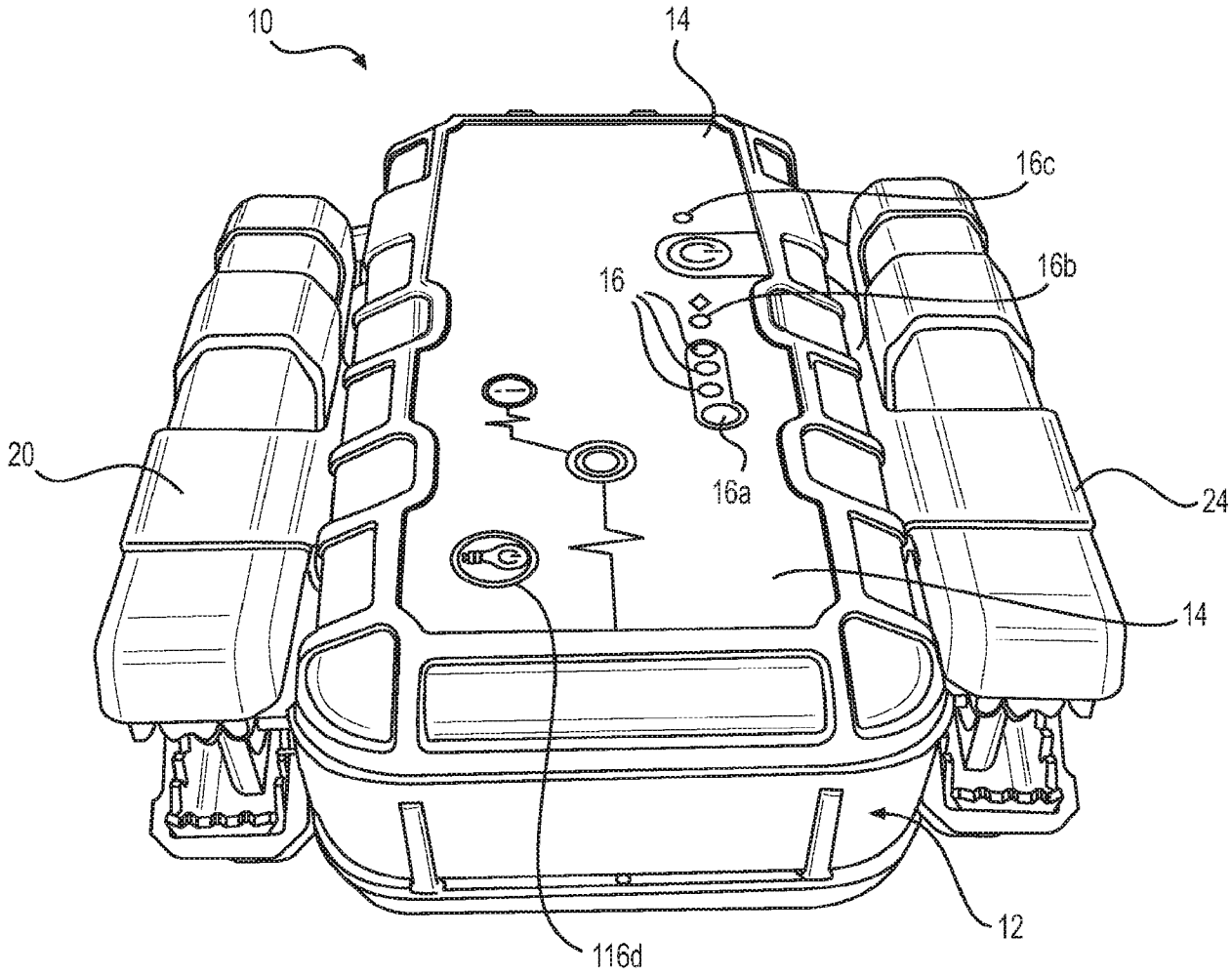


FIG. 3

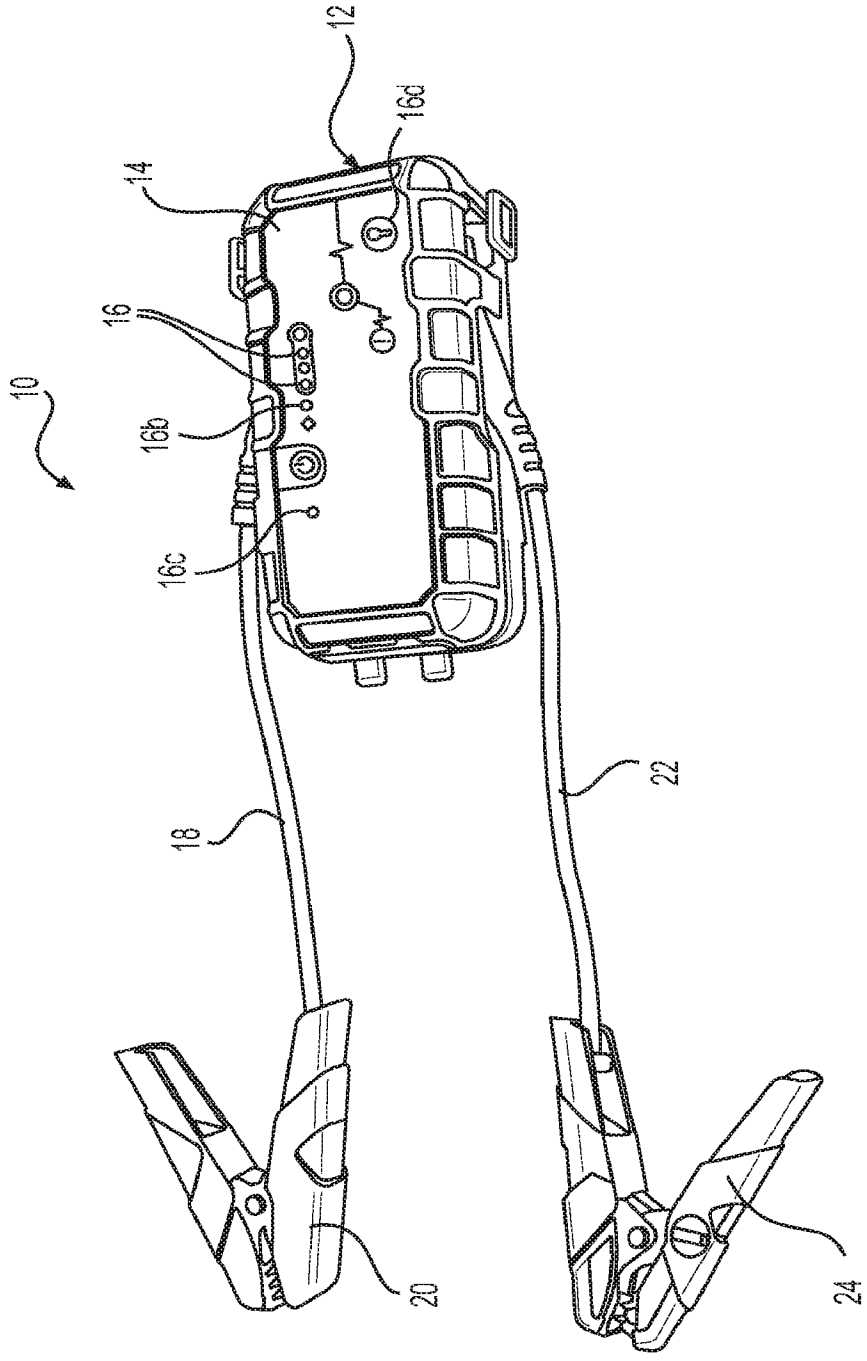
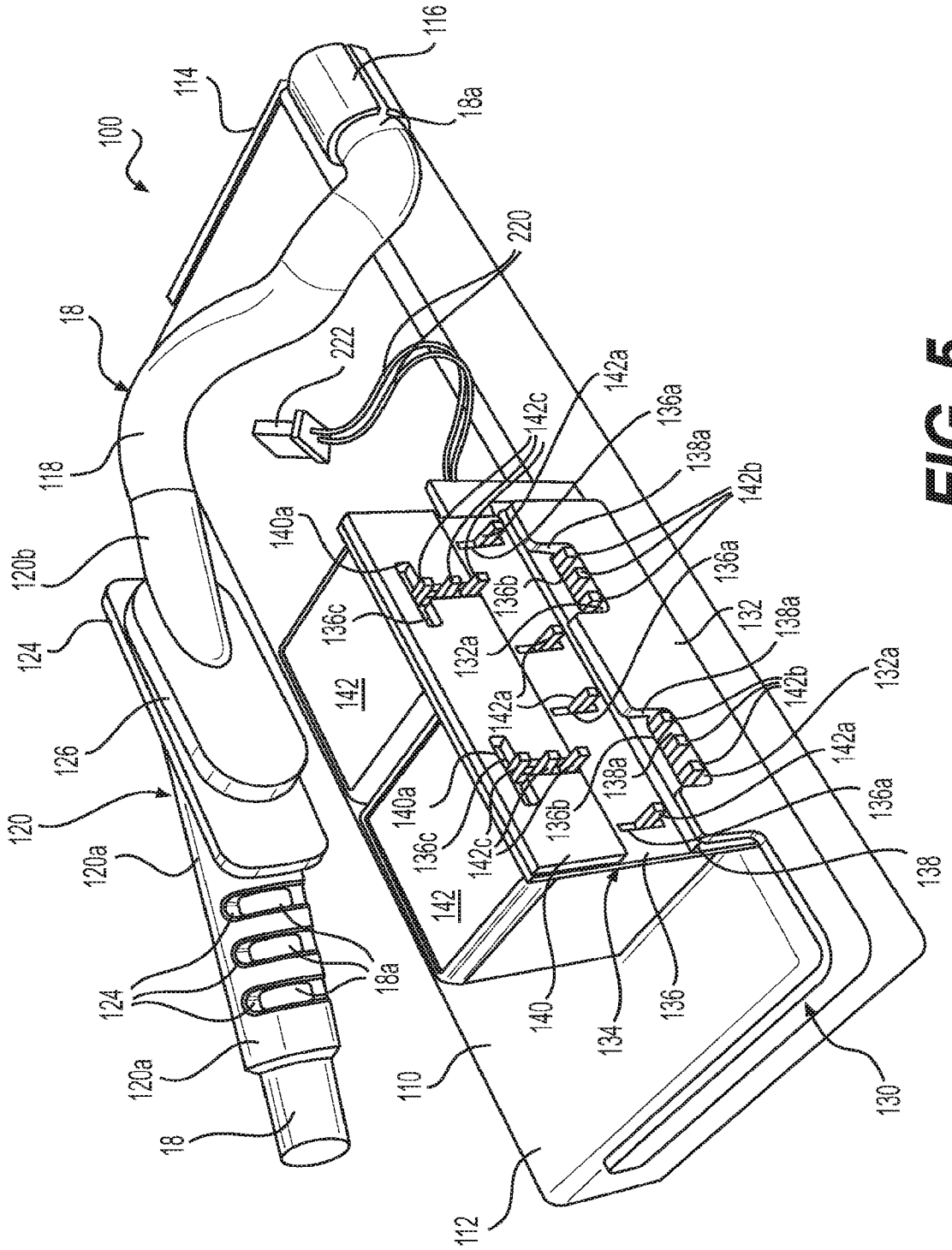


FIG. 4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114
116
18a
18
220
222
118
120b
124
126
120
120a
142a
142c
136a
138a
142b
140a
136c
136b
132a
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138
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136
110
112
130

FIG. 5

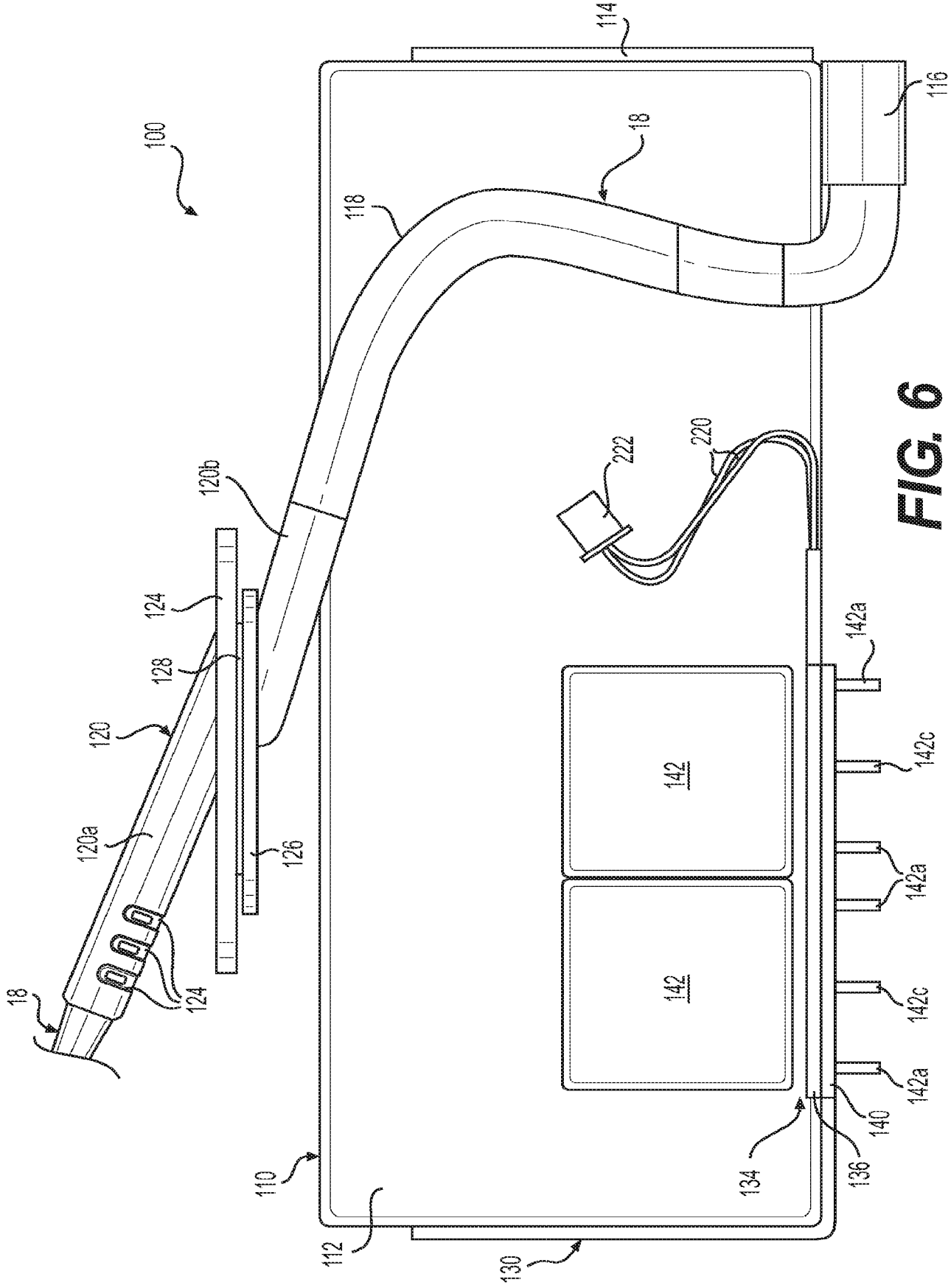
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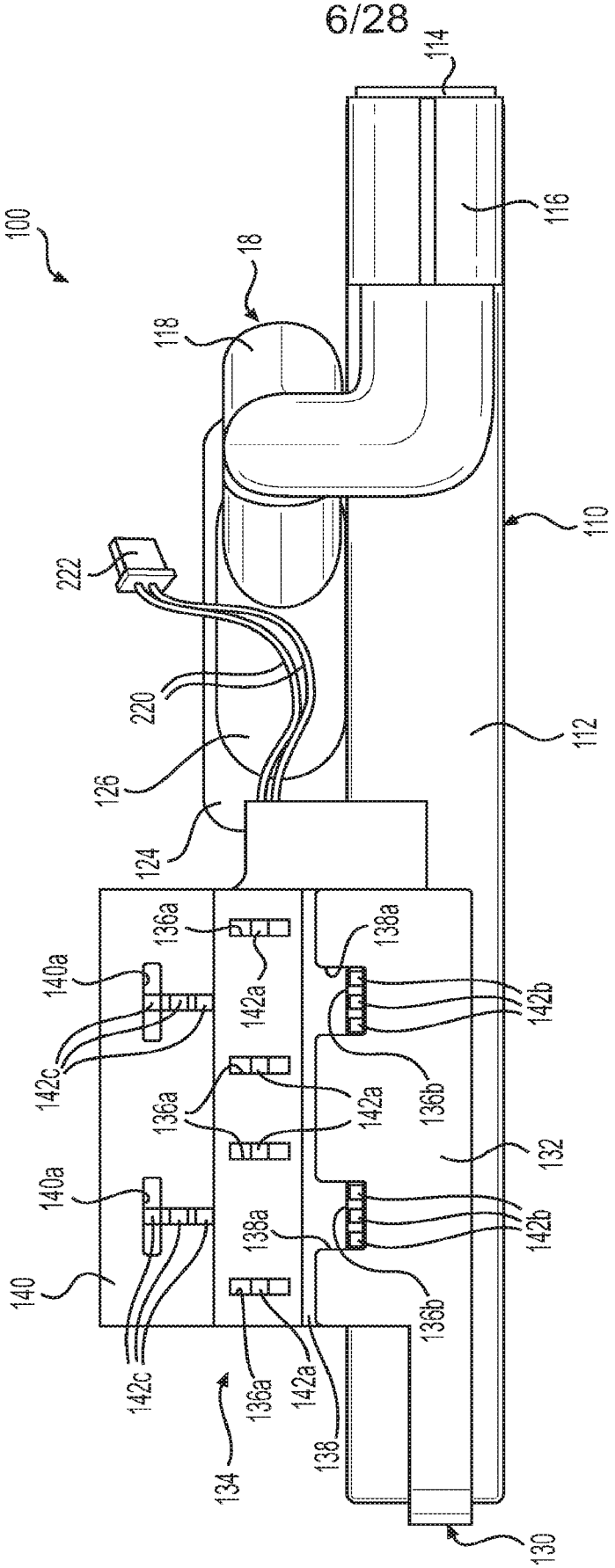
FIG. 6


100
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136a
138a
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142a
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142c
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134
130

FIG. 7

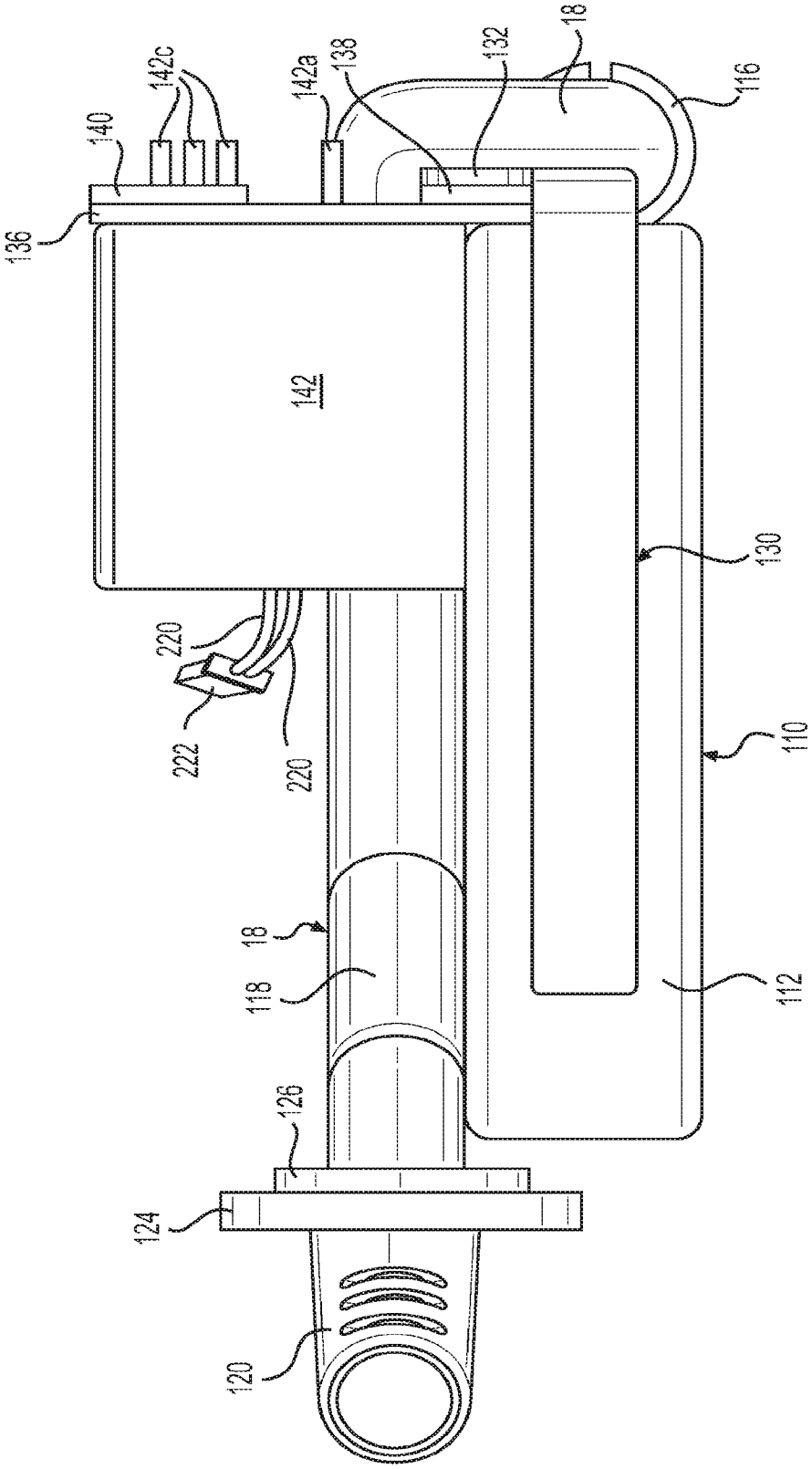
18
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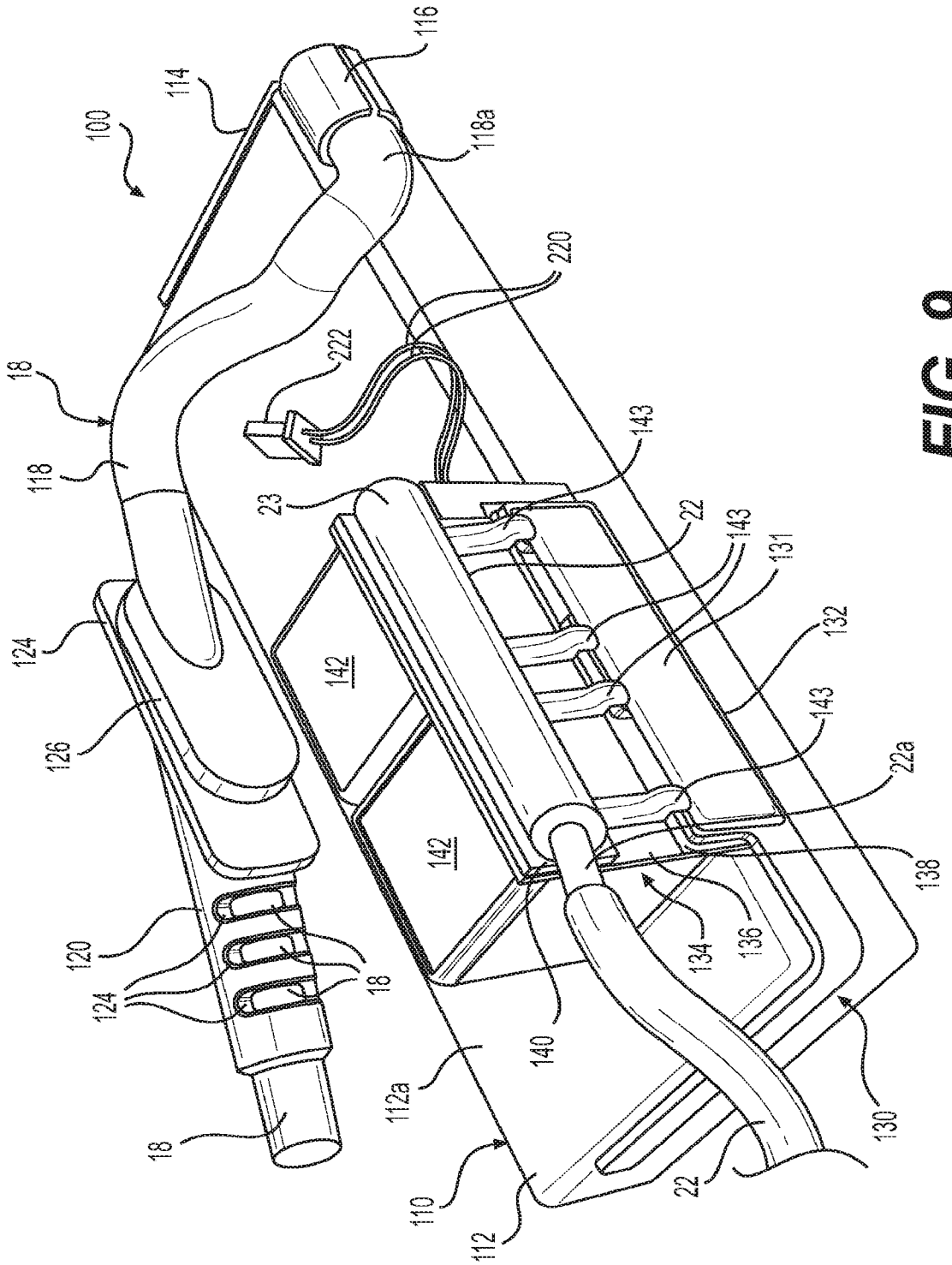
FIG. 8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112a
130
18
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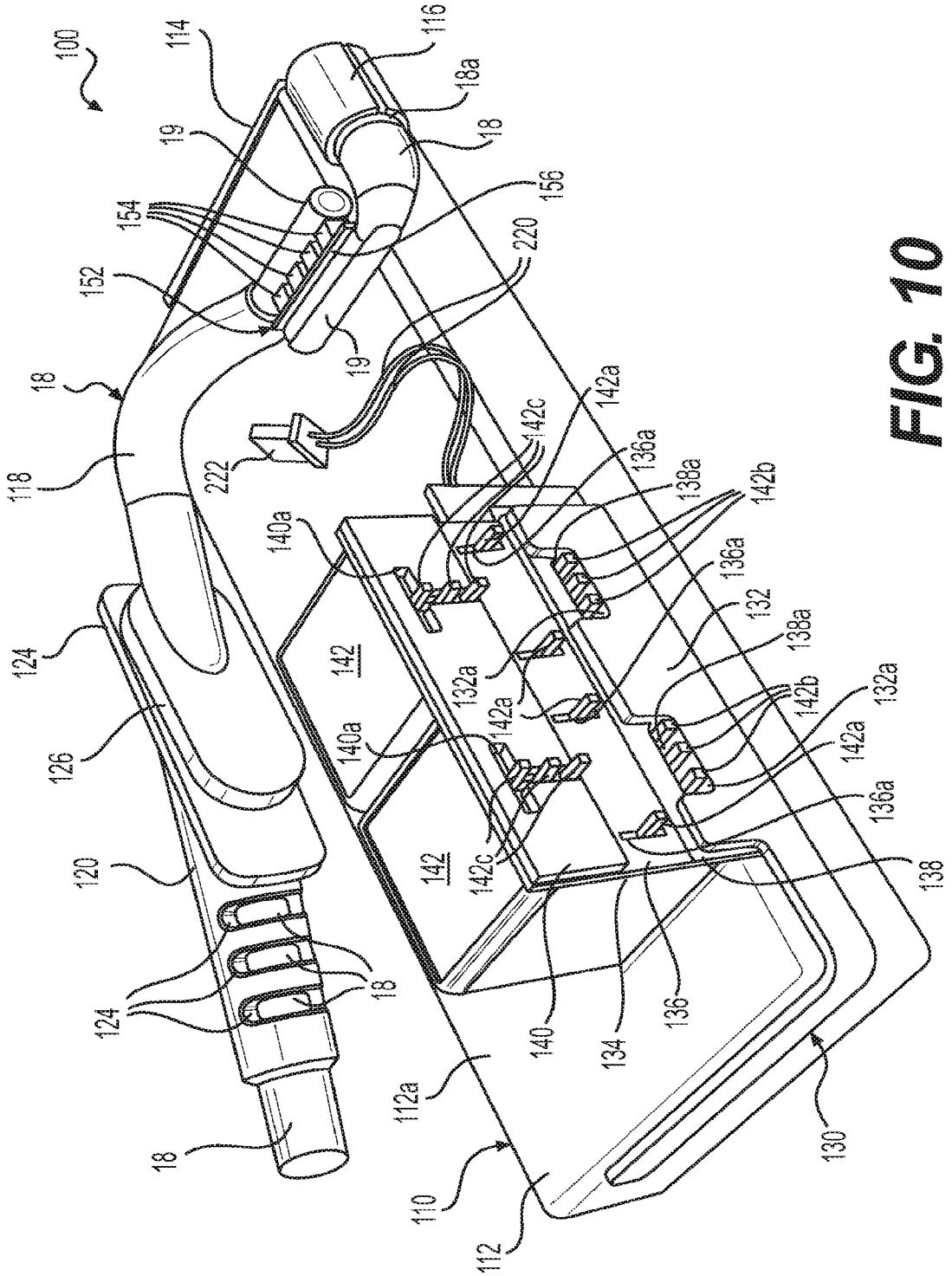
112
22

FIG. 9


100
114
116
18a
18
19
154
156
152
220
19
18
118
222
142a
142c
136a
138a
142b
140a
136a
132
138a
124
142
132a
142a
142b
132a
126
140a
142a
136a
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142c
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136
112a
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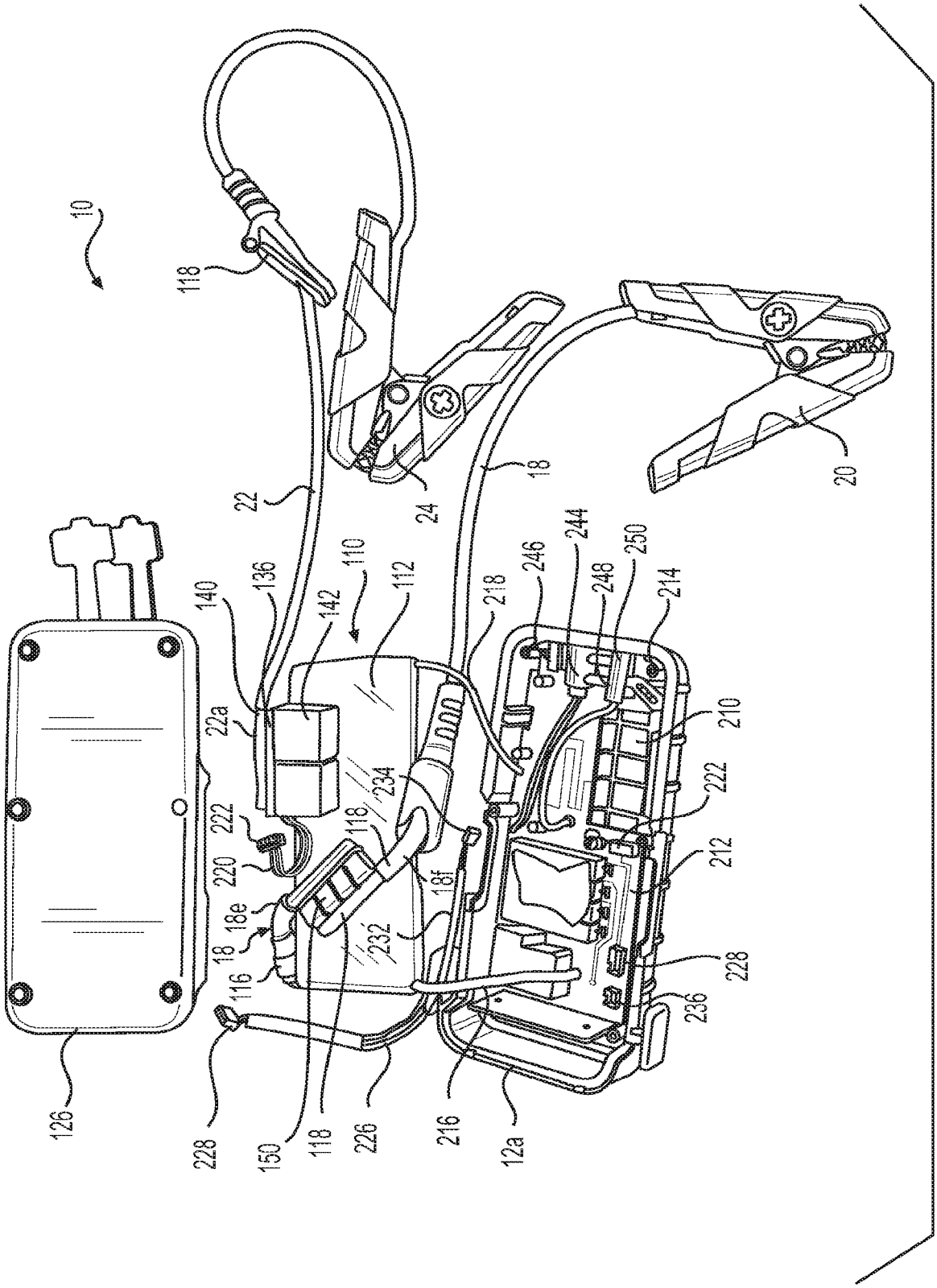
FIG. 10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18
20
110
112
136
140
142
22a
218
246
244
248
250
214
210
222
212
228
236
234
118
222
220
18e
18
18f
232
116
126
228
150
118
226
216
12a

FIG. 11

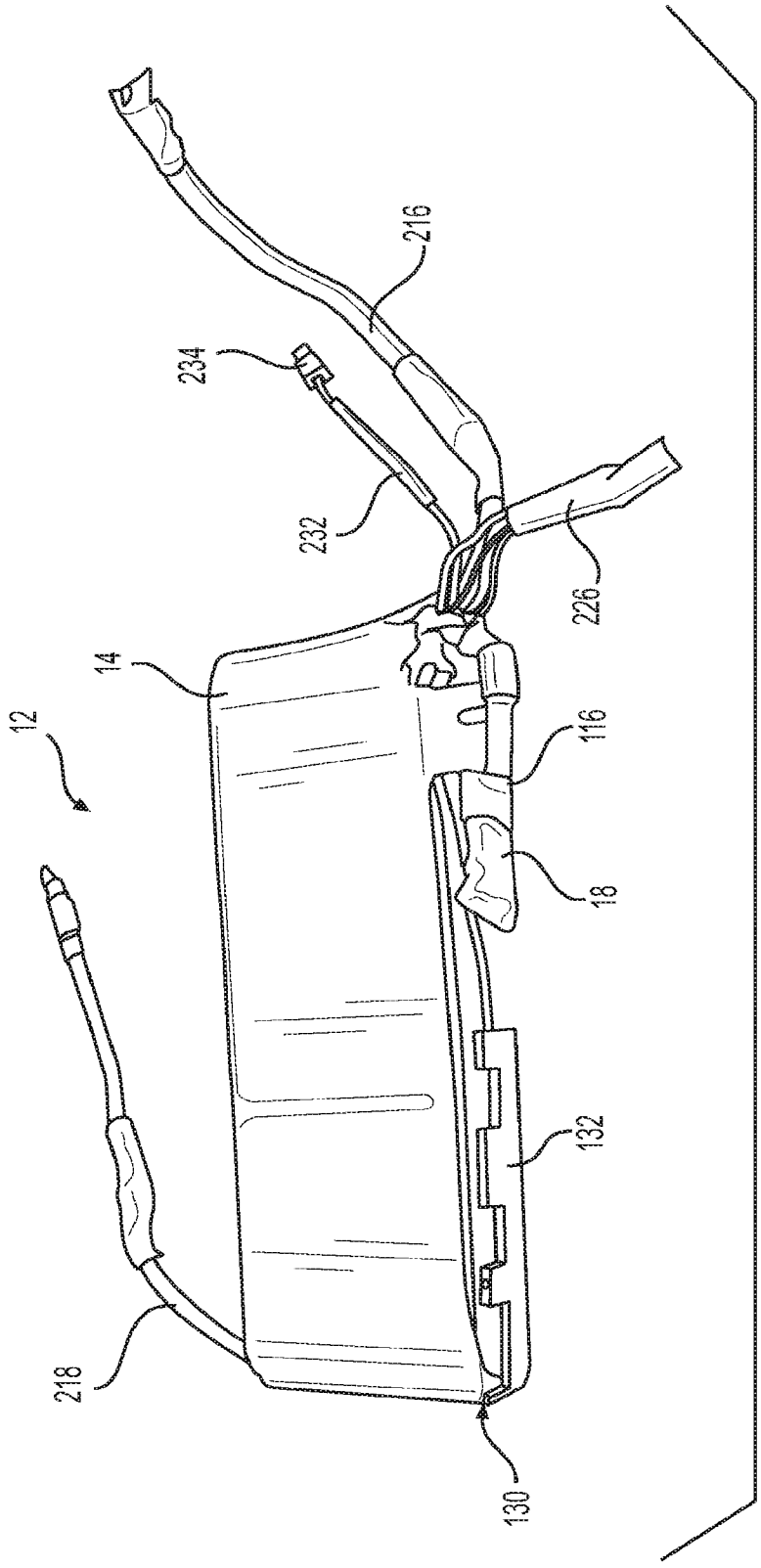

FIG. 12

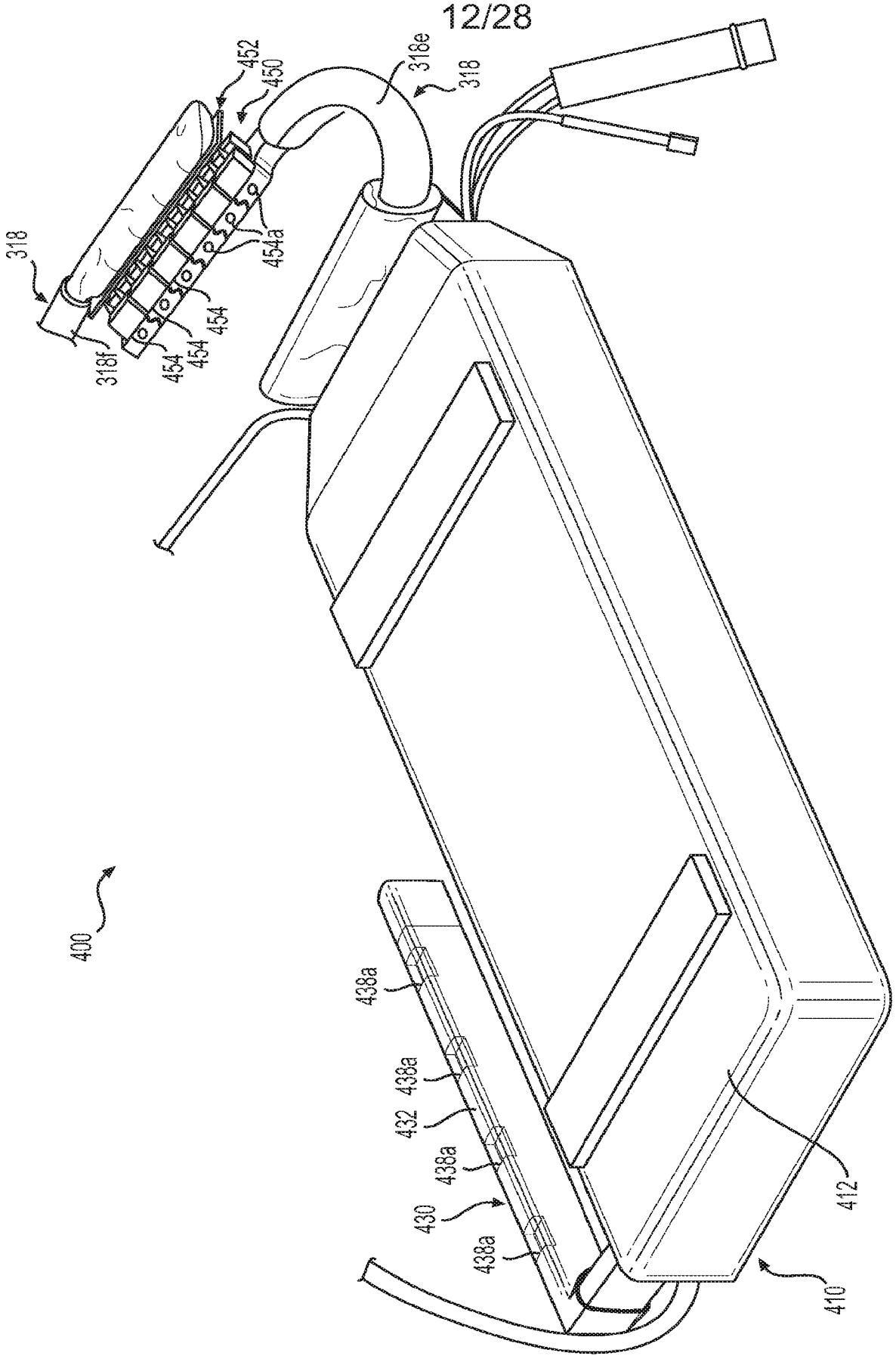
452
450
318e
318
318
454a
454
454
454
318f
400
438a
438a
432
438a
430
438a
412
410

FIG. 13

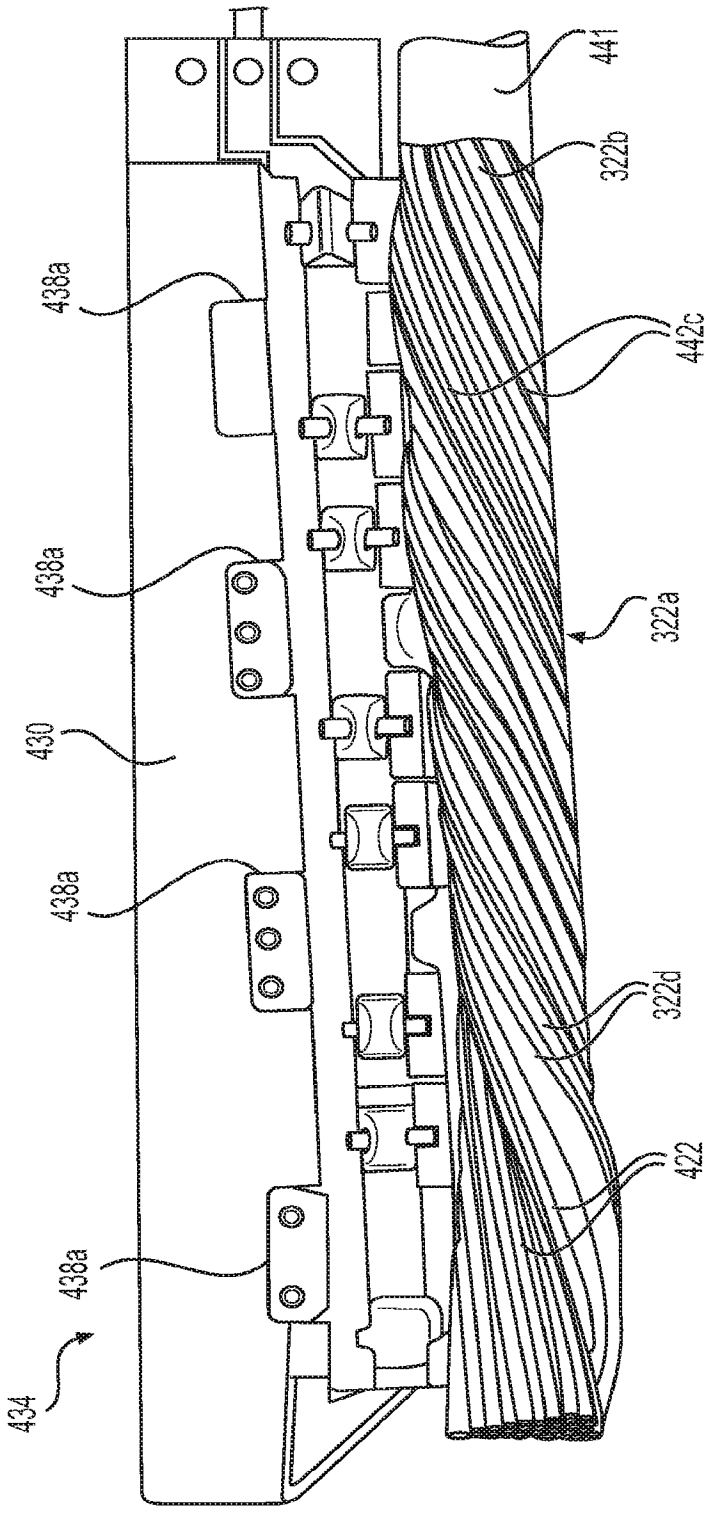

FIG. 14

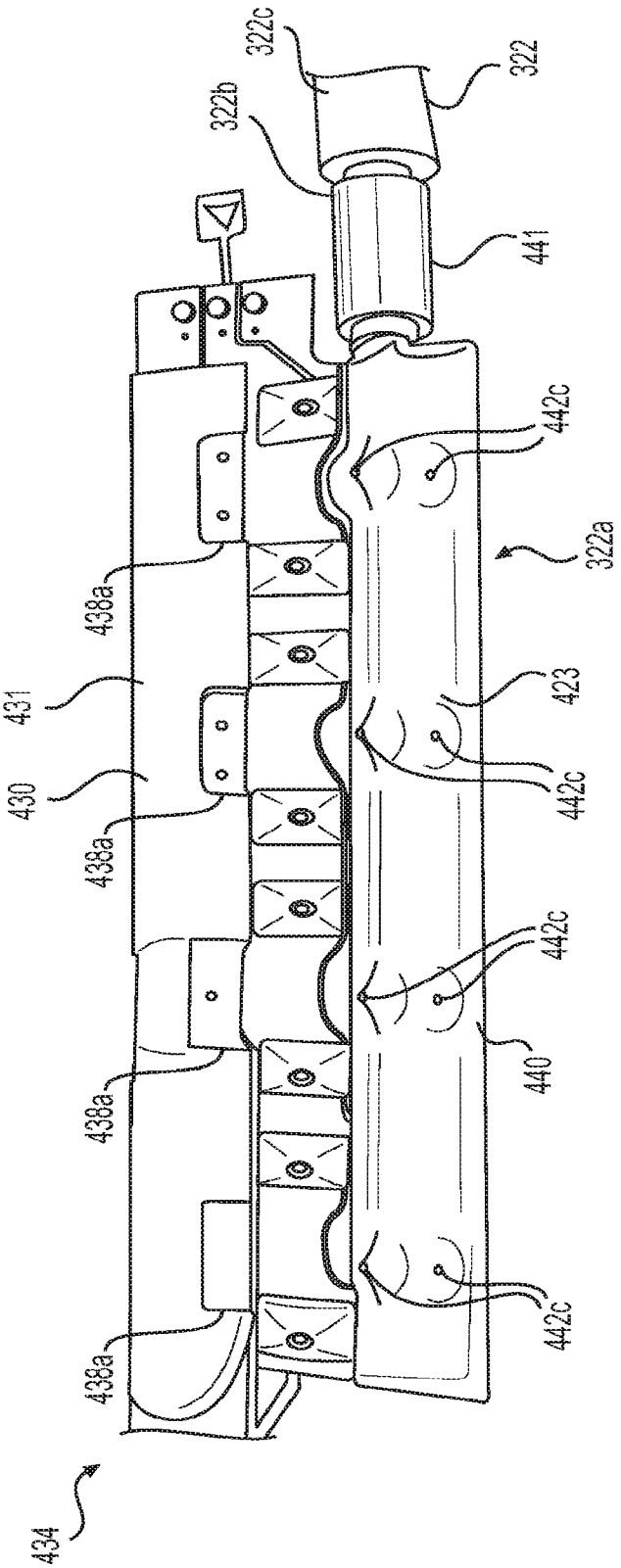
322c
322
322b
441
442c
322a
438a
431
423
430
442c
438a
442c
440
438a
442c
438a
434

FIG. 15

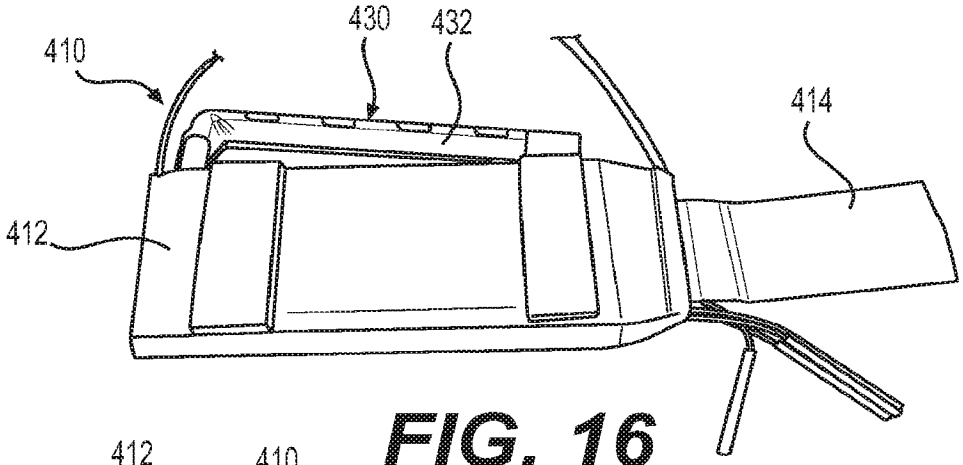

FIG. 16

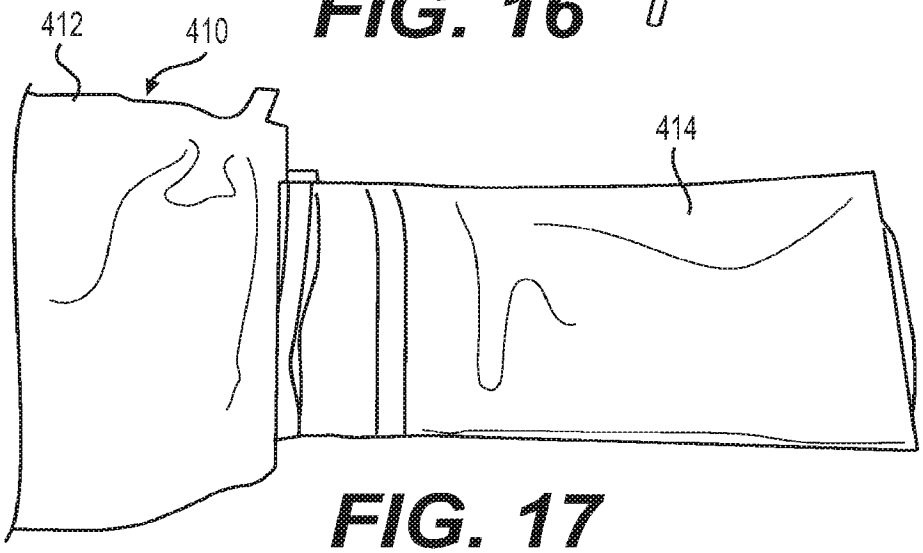

FIG. 17

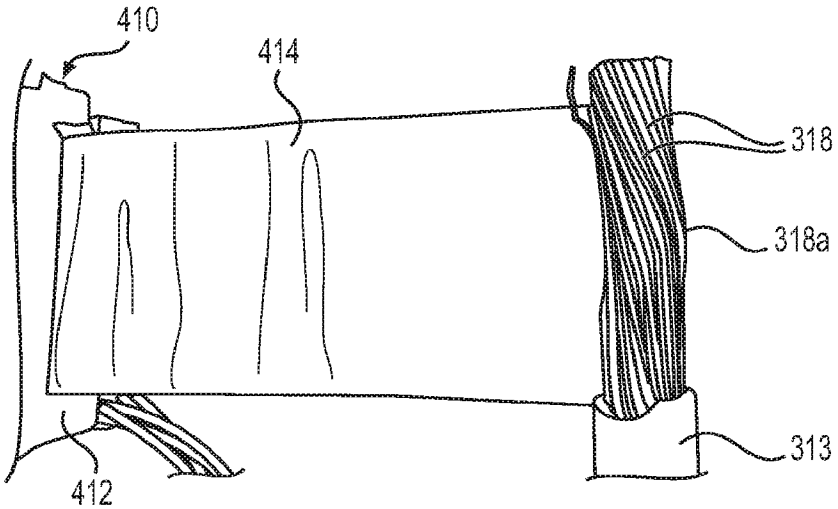

FIG. 18

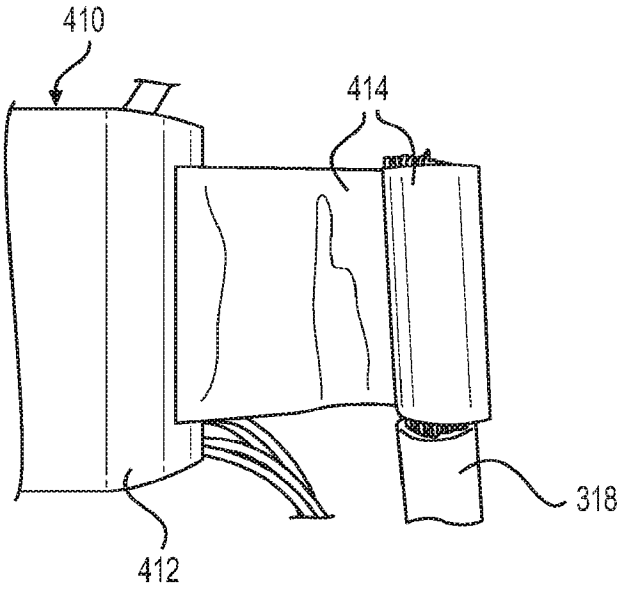

FIG. 19

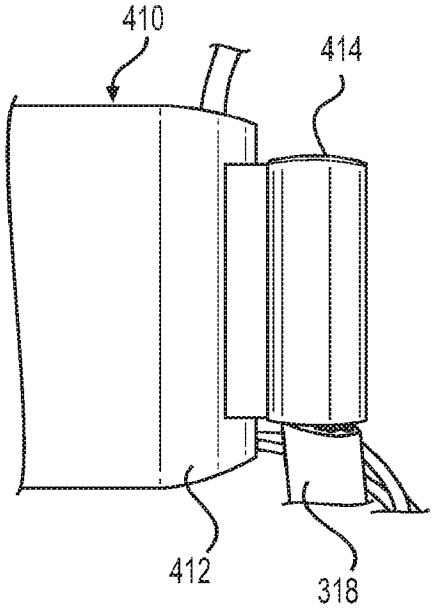

FIG. 20

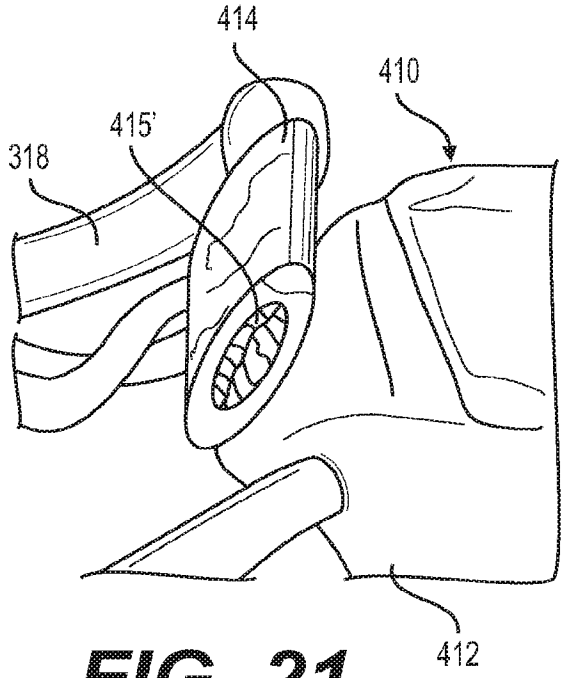

FIG. 21

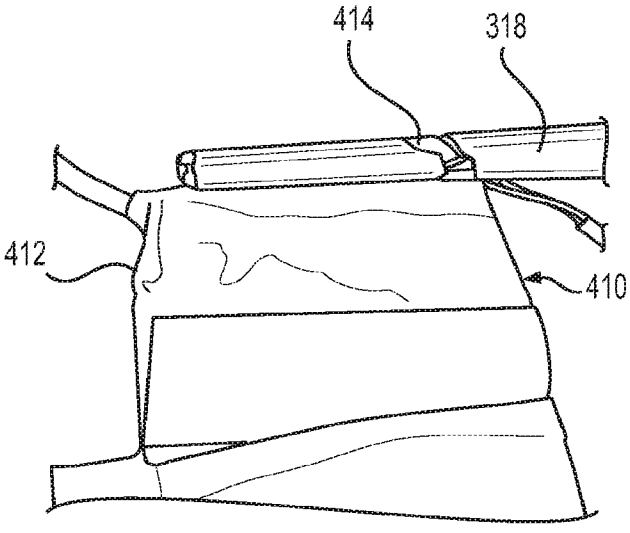

FIG. 22

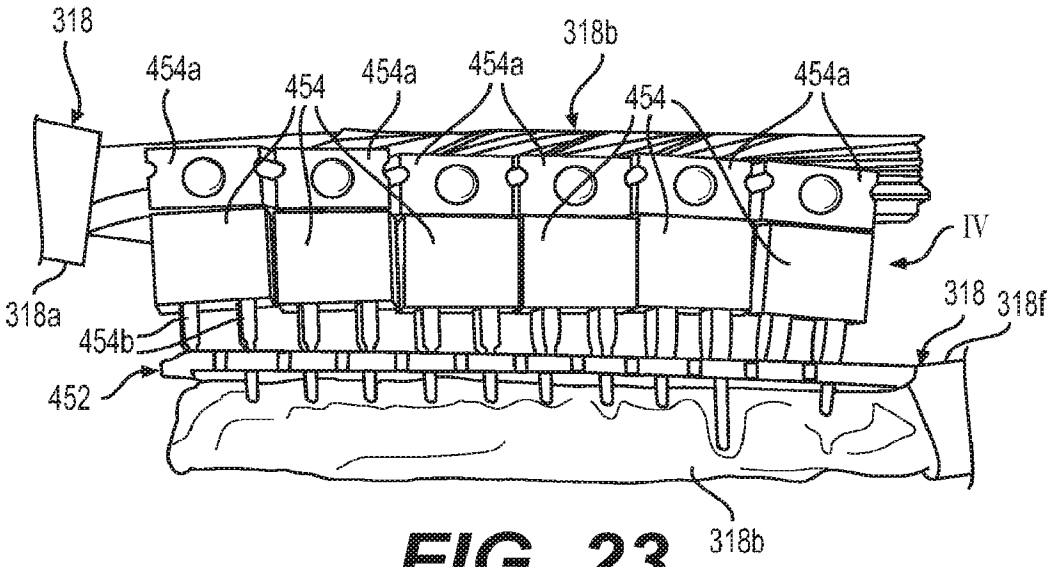

FIG. 23

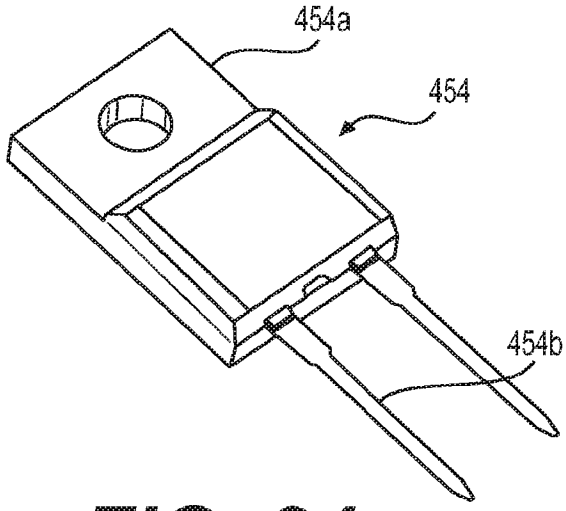

FIG. 24

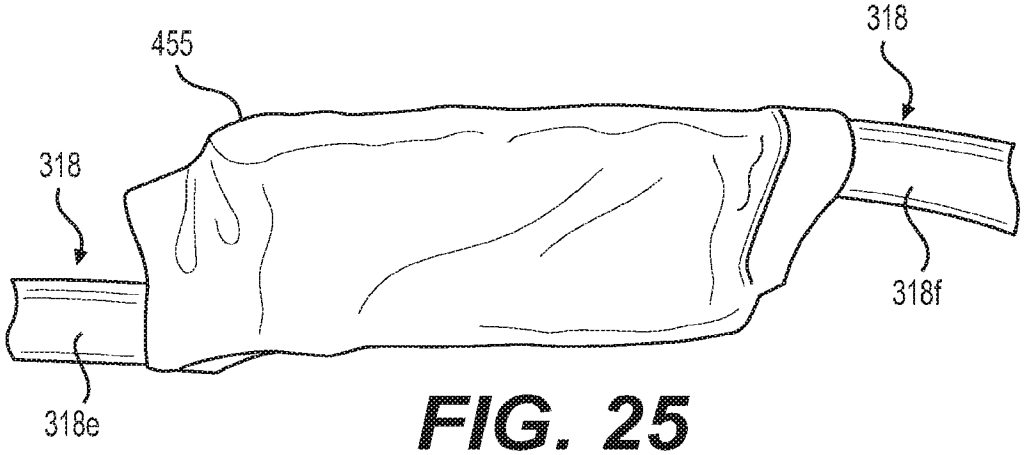

FIG. 25

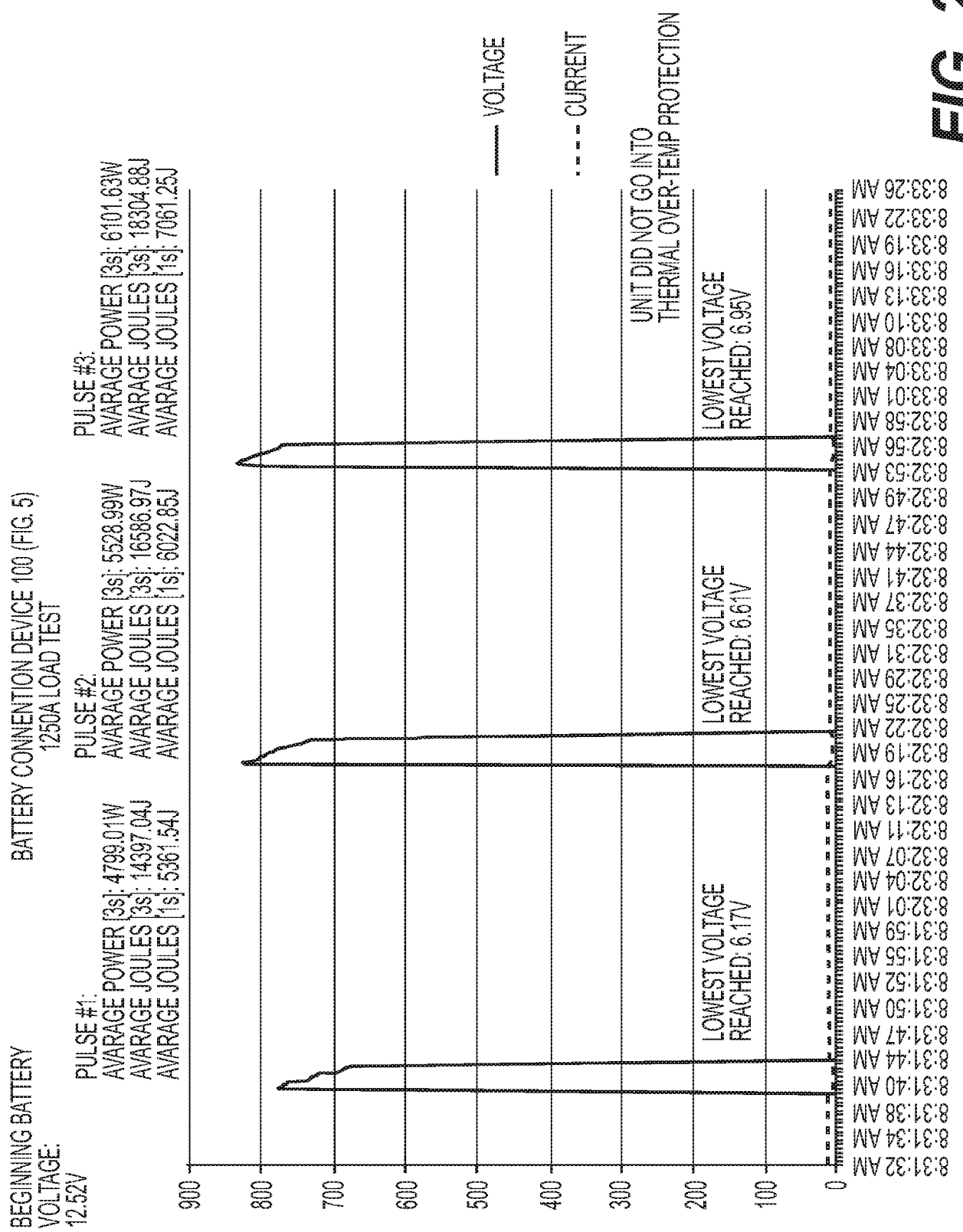
BEGINNING BATTERY VOLTAGE: 12.52V
BATTERY CONNENTION DEVICE 100 (FIG. 5)
1250A LOAD TEST
PULSE #1:
AVARAGE POWER [3s]: 4799.01W
AVARAGE JOULES [3s]: 14397.04J
AVARAGE JOULES [1s]: 5361.54J
PULSE #2:
AVARAGE POWER [3s]: 5528.99W
AVARAGE JOULES [3s]: 16586.97J
AVARAGE JOULES [1s]: 6022.85J
PULSE #3:
AVARAGE POWER [3s]: 6101.63W
AVARAGE JOULES [3s]: 18304.88J
AVARAGE JOULES [1s]: 7061.25J
VOLTAGE
CURRENT
UNIT DID NOT GO INTO THERMAL OVER-TEMP PROTECTION
LOWEST VOLTAGE REACHED: 6.17V
LOWEST VOLTAGE REACHED: 6.61V
LOWEST VOLTAGE REACHED: 6.95V
900
800
700
600
500
400
300
200
100
0
8:31:32 AM
8:31:34 AM
8:31:38 AM
8:31:40 AM
8:31:44 AM
8:31:47 AM
8:31:50 AM
8:31:52 AM
8:31:55 AM
8:31:59 AM
8:32:01 AM
8:32:04 AM
8:32:07 AM
8:32:11 AM
8:32:13 AM
8:32:16 AM
8:32:19 AM
8:32:22 AM
8:32:25 AM
8:32:29 AM
8:32:31 AM
8:32:35 AM
8:32:37 AM
8:32:41 AM
8:32:44 AM
8:32:47 AM
8:32:49 AM
8:32:53 AM
8:32:56 AM
8:32:58 AM
8:33:01 AM
8:33:04 AM
8:33:08 AM
8:33:10 AM
8:33:13 AM
8:33:16 AM
8:33:19 AM
8:33:22 AM
8:33:26 AM

FIG. 27

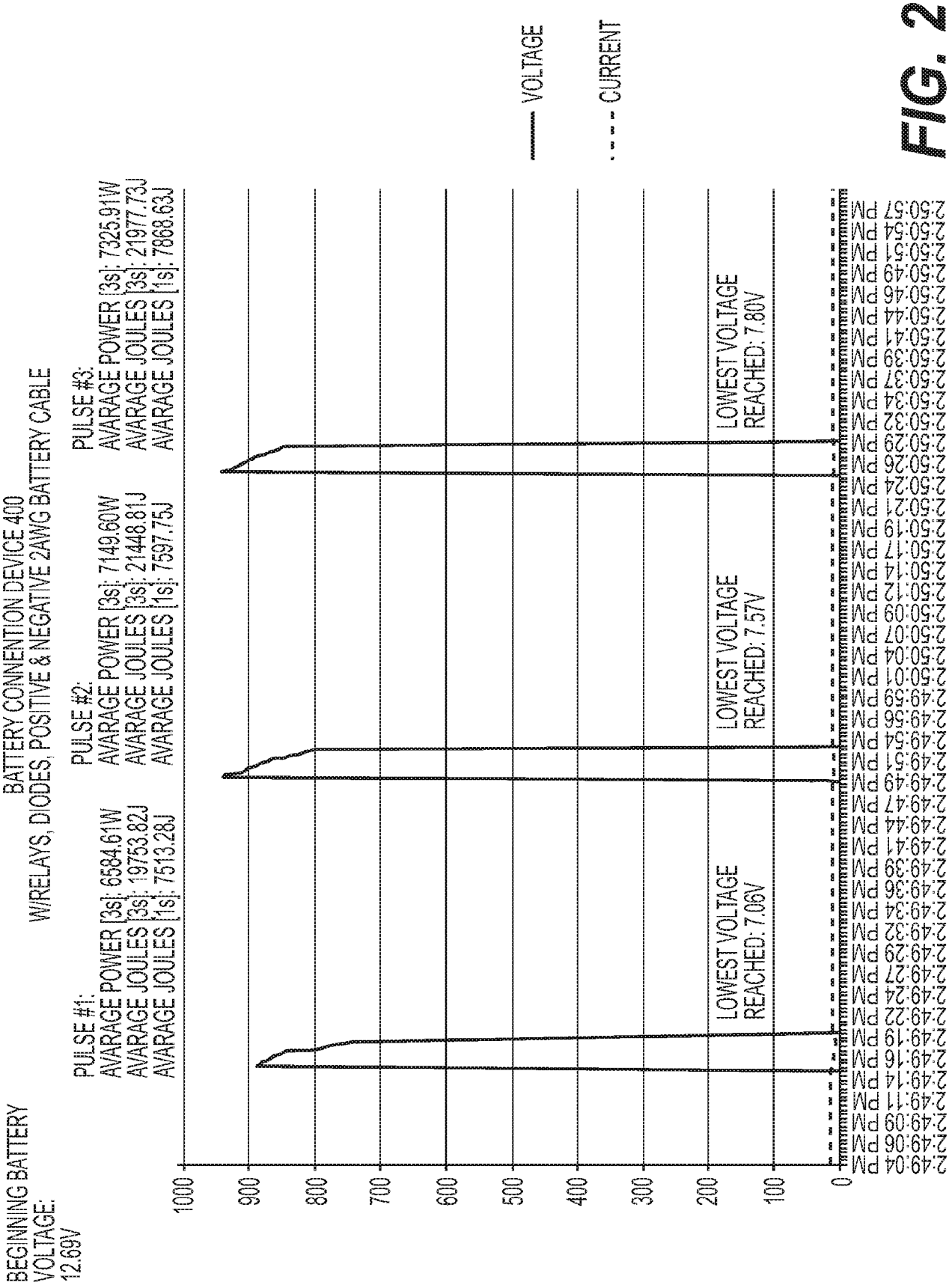
BEGINNING BATTERY VOLTAGE: 12.69V
BATTERY CONNENTION DEVICE 400
W/RELAYS, DIODES, POSITIVE & NEGATIVE 2AWG BATTERY CABLE
PULSE #1:
AVARAGE POWER [3s]: 6584.61W
AVARAGE JOULES [3s]: 19753.82J
AVARAGE JOULES [1s]: 7513.28J
PULSE #2:
AVARAGE POWER [3s]: 7149.60W
AVARAGE JOULES [3s]: 21448.81J
AVARAGE JOULES [1s]: 7597.75J
PULSE #3:
AVARAGE POWER [3s]: 7325.91W
AVARAGE JOULES [3s]: 21977.73J
AVARAGE JOULES [1s]: 7868.63J
VOLTAGE
CURRENT
LOWEST VOLTAGE REACHED: 7.06V
LOWEST VOLTAGE REACHED: 7.57V
LOWEST VOLTAGE REACHED: 7.80V
1000
900
800
700
600
500
400
300
200
100
0

FIG. 28

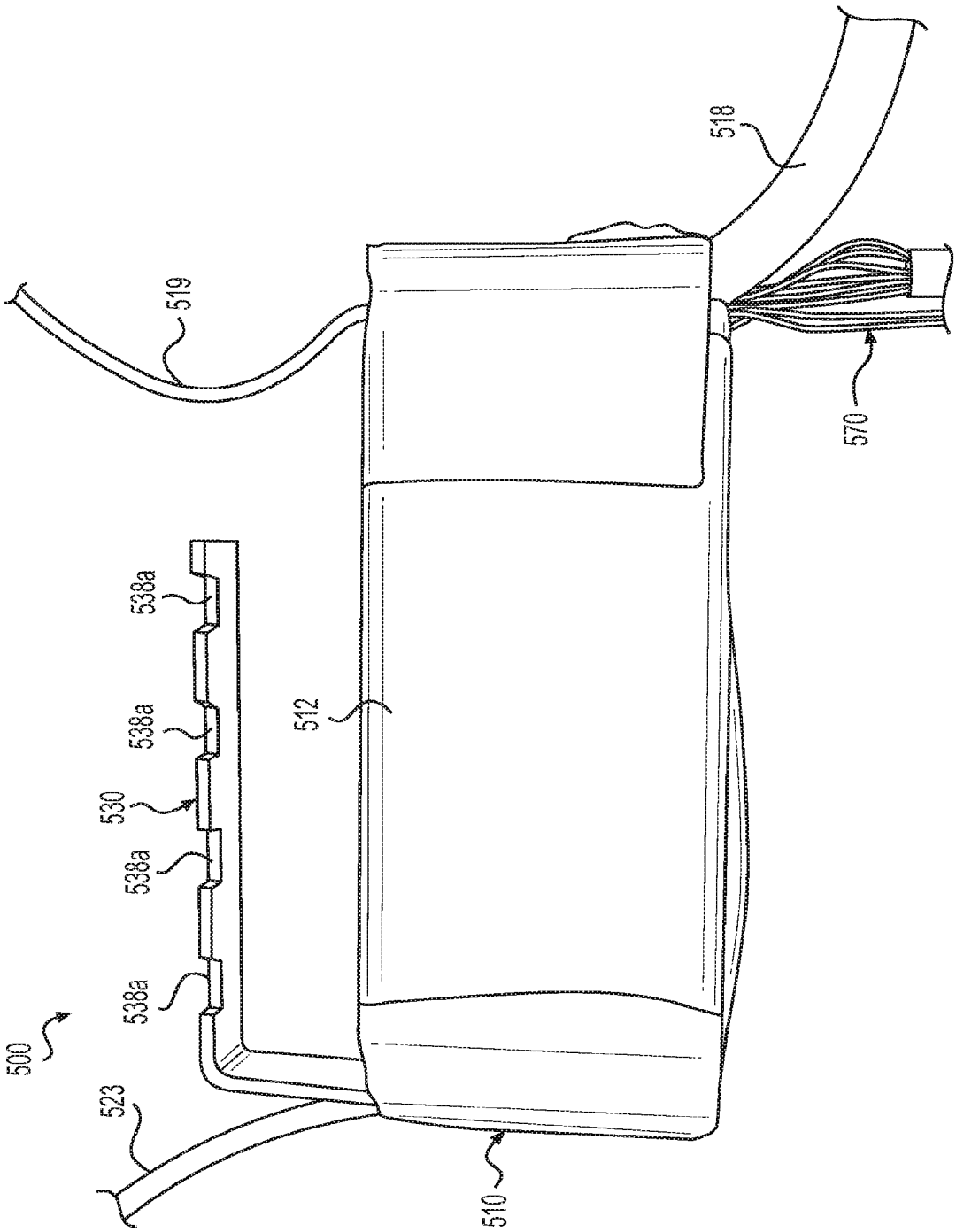

FIG. 29

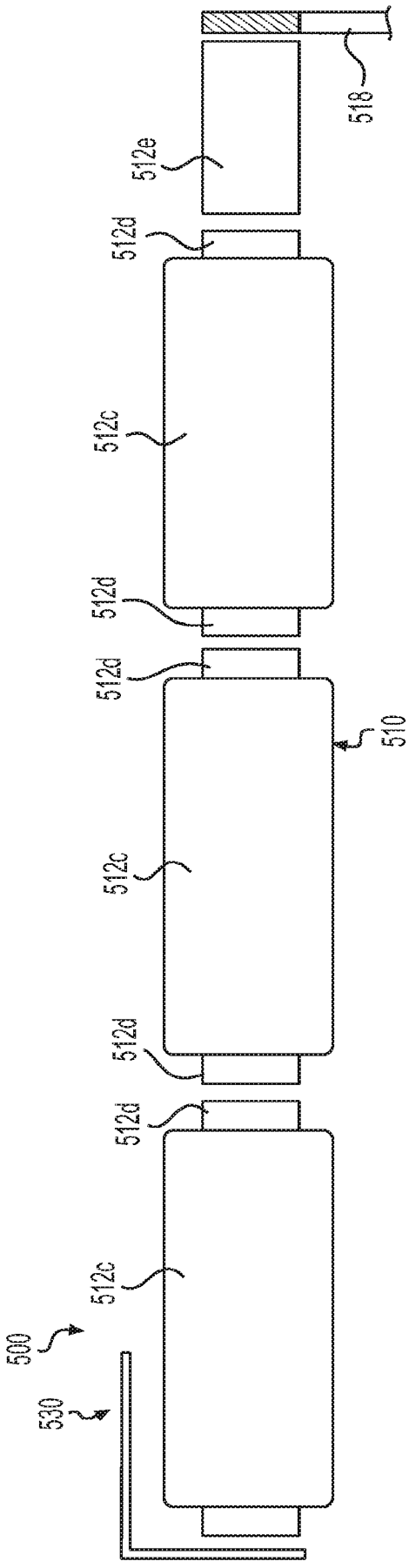
518
512e
512d
512c
512d
512d
510
512c
512d
512d
512c
500
530

FIG. 30

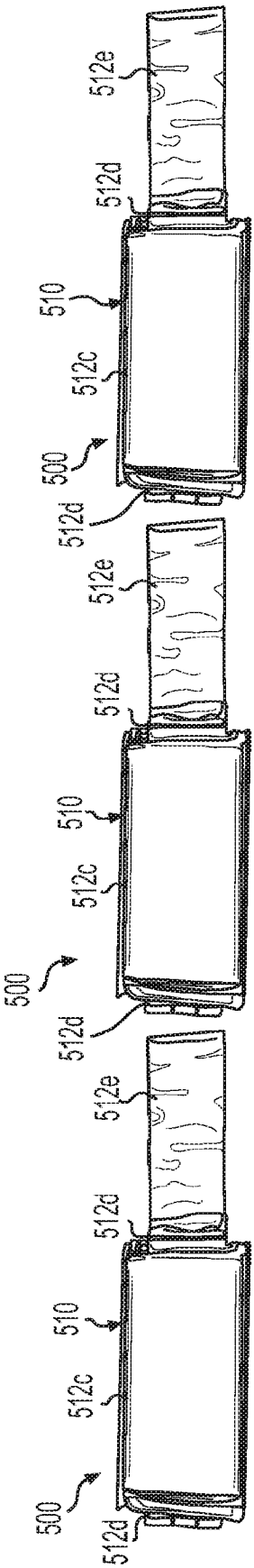
512e
512d
510
512c
500
512d
512e
512d
510
512c
500
512d
512e
512d
510
512c
500
512d

FIG. 31

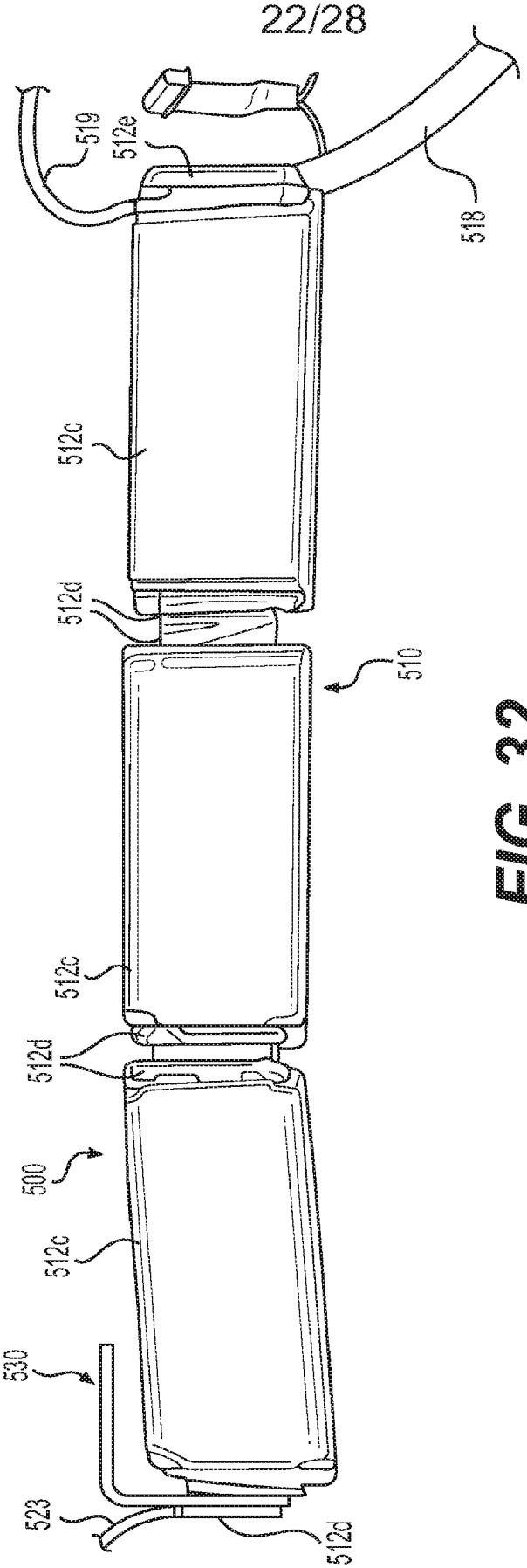

FIG. 32

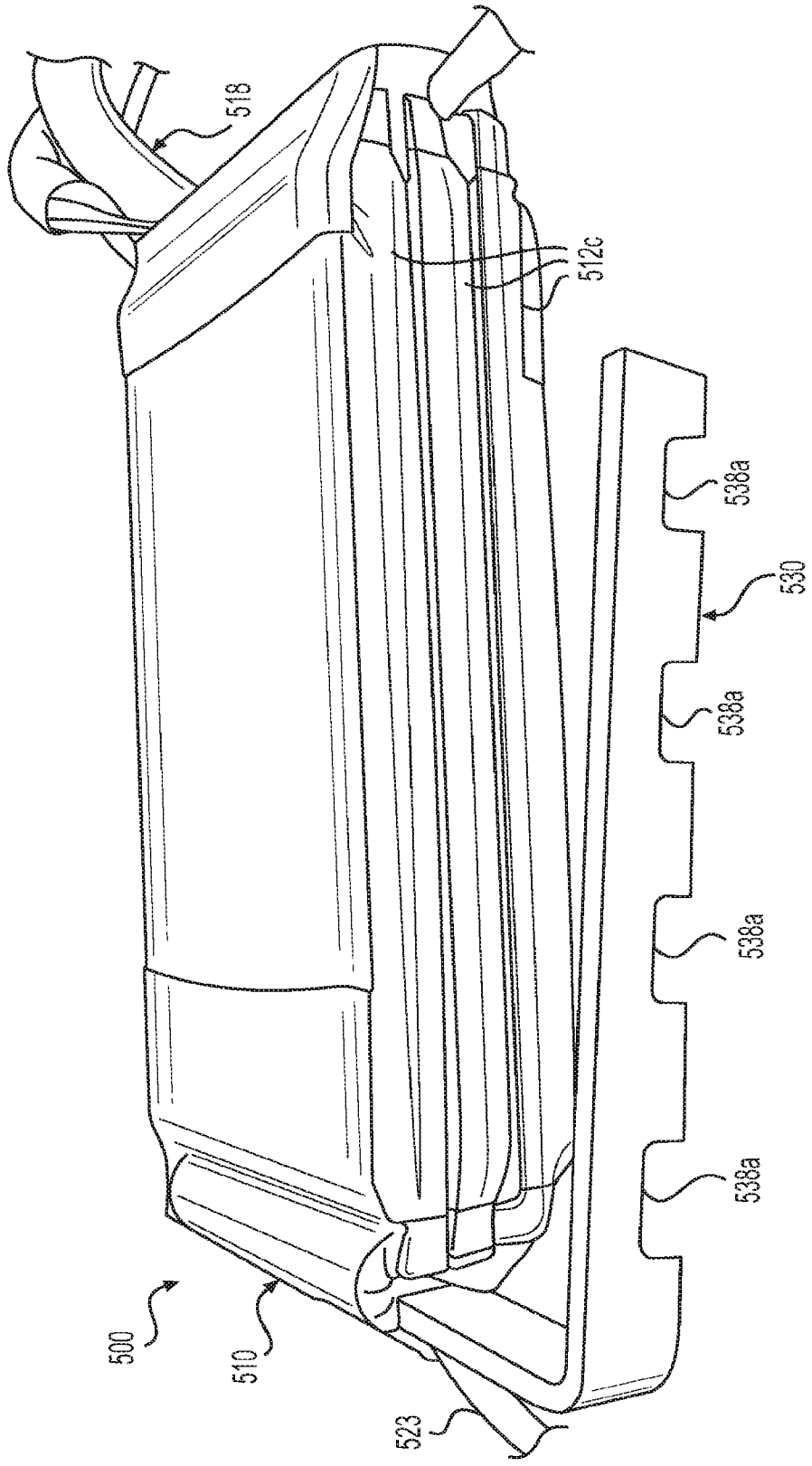

FIG. 33

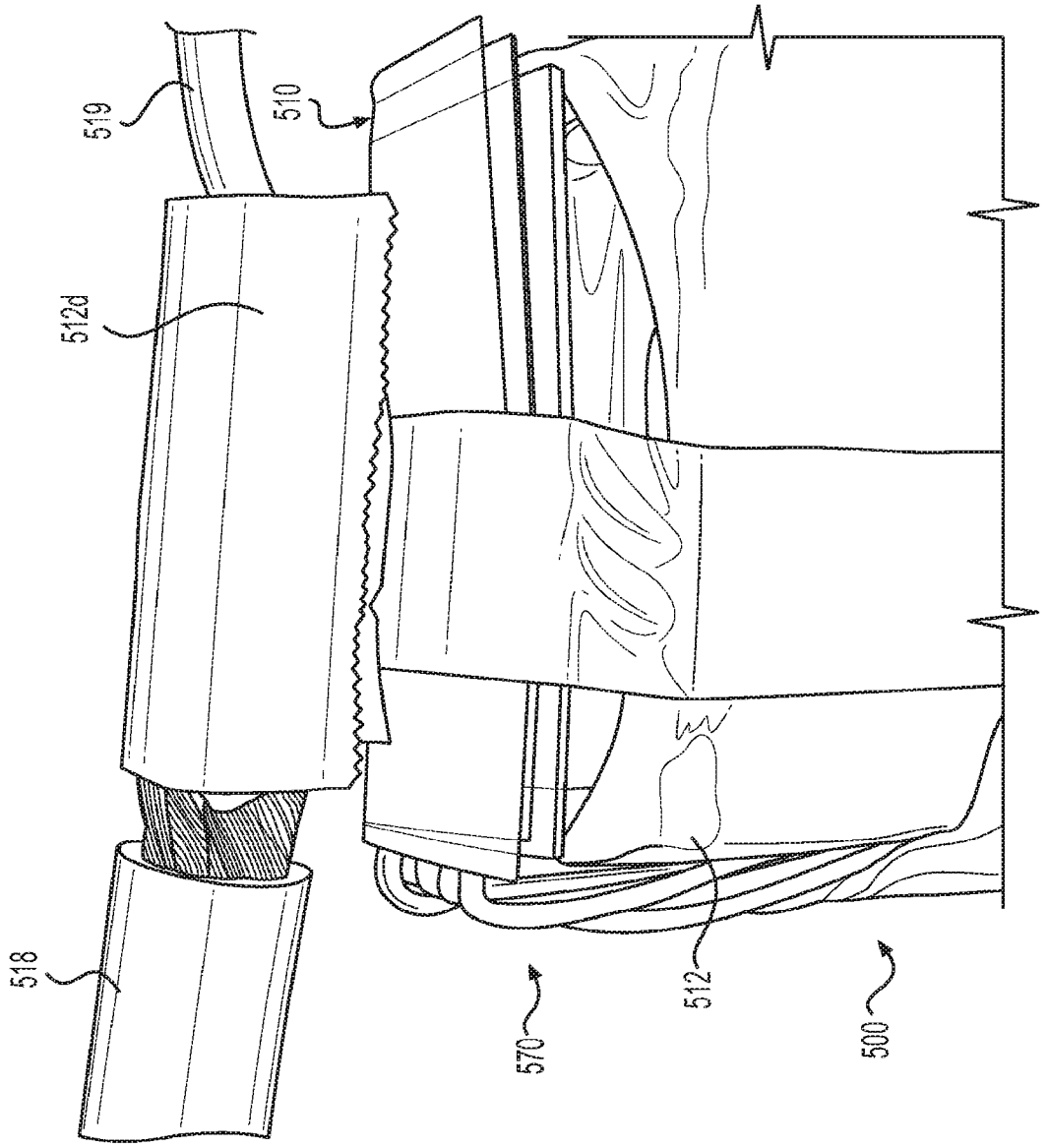

FIG. 34

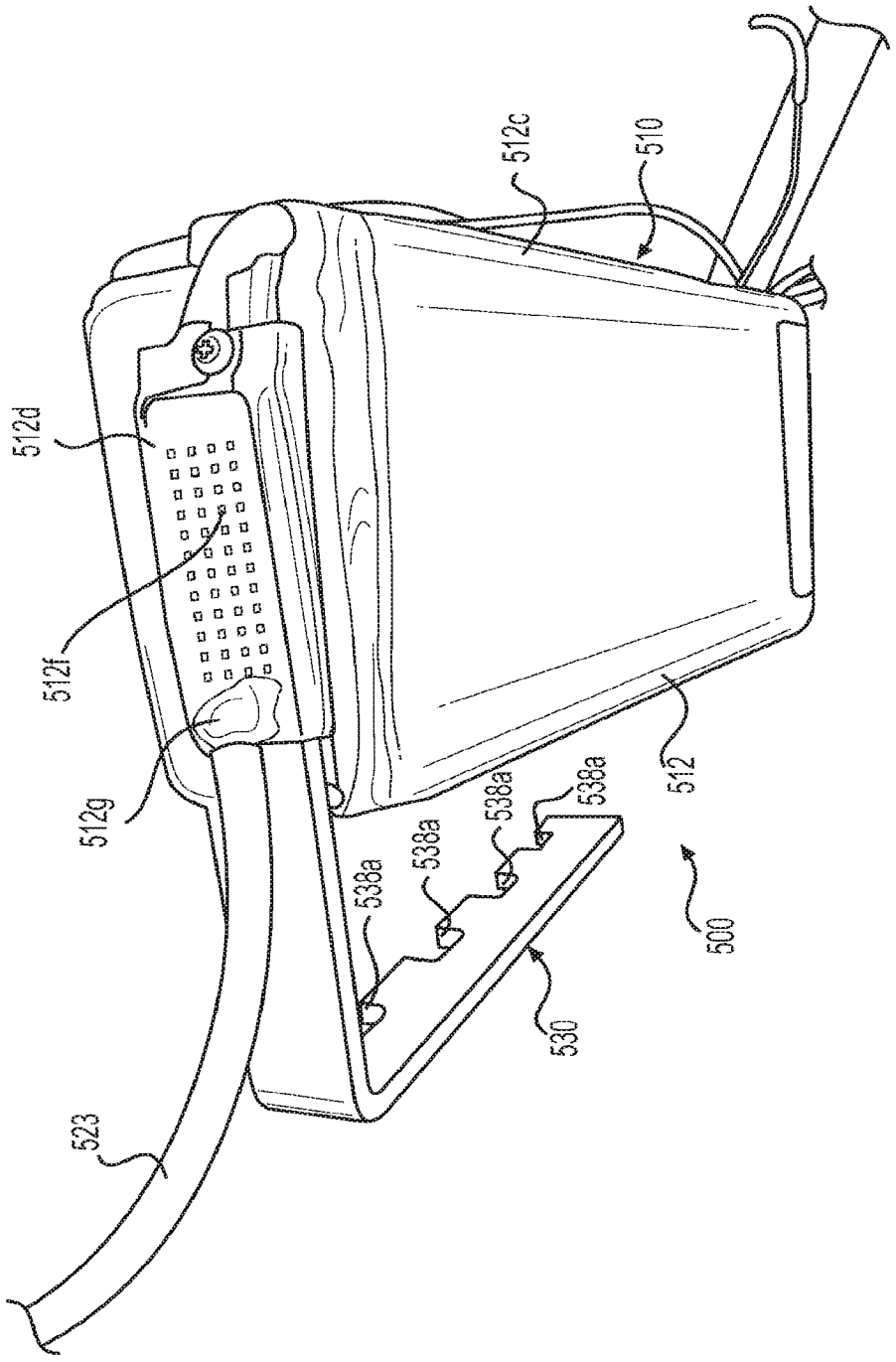

FIG. 35

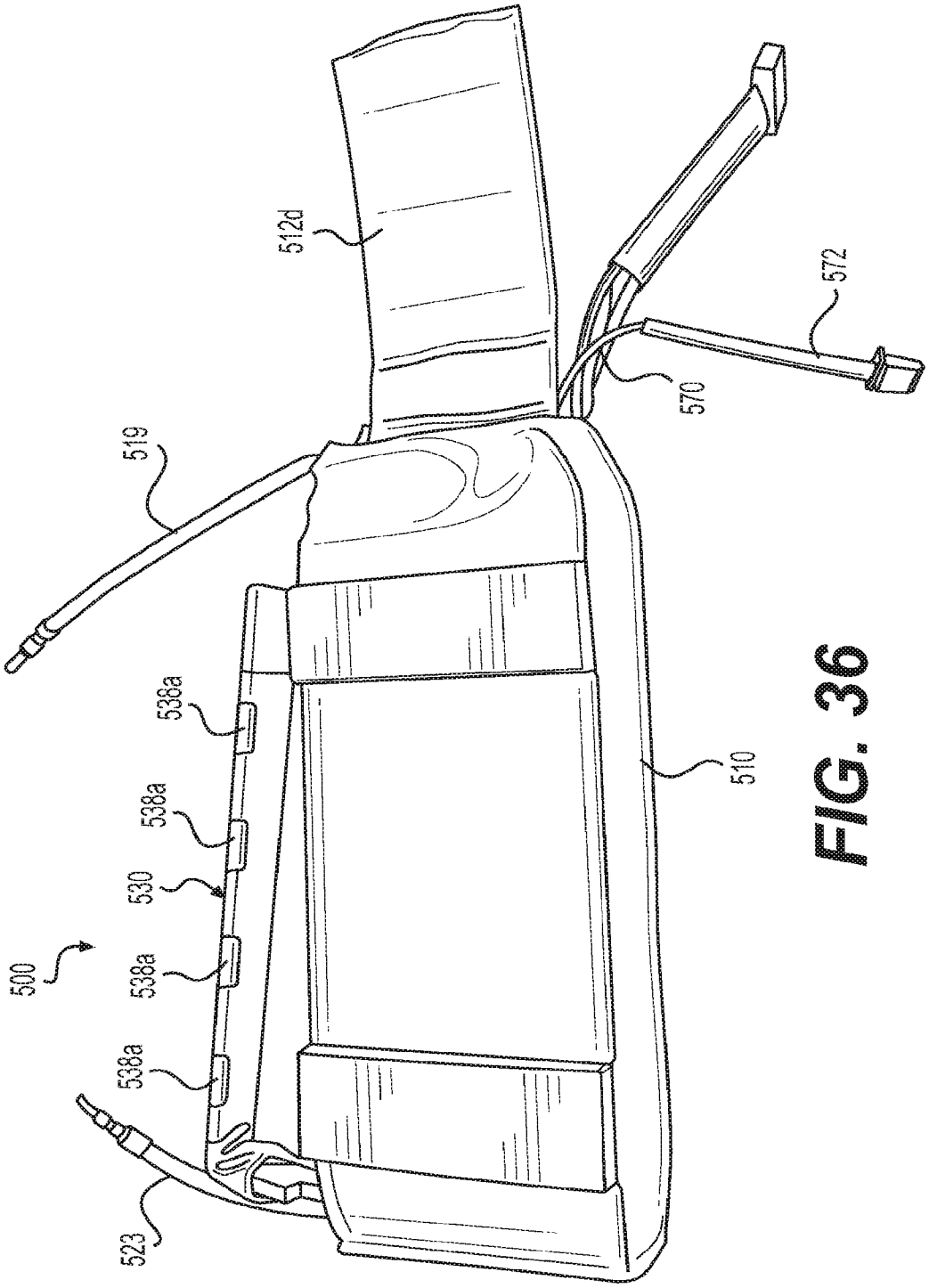

FIG. 36

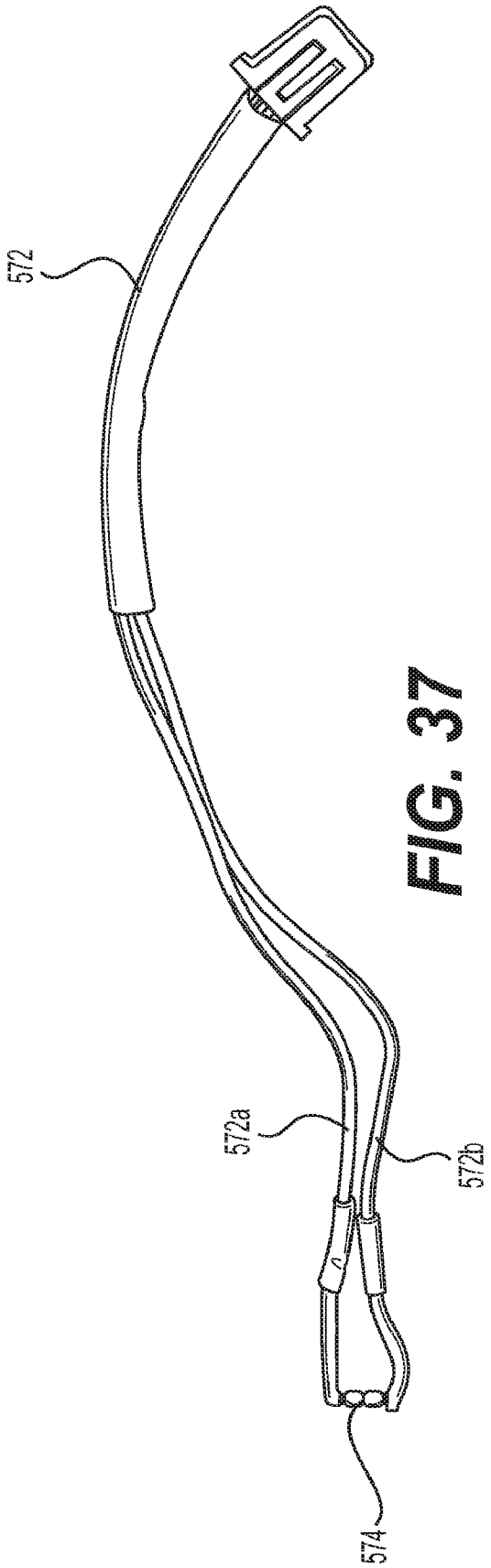

FIG. 37

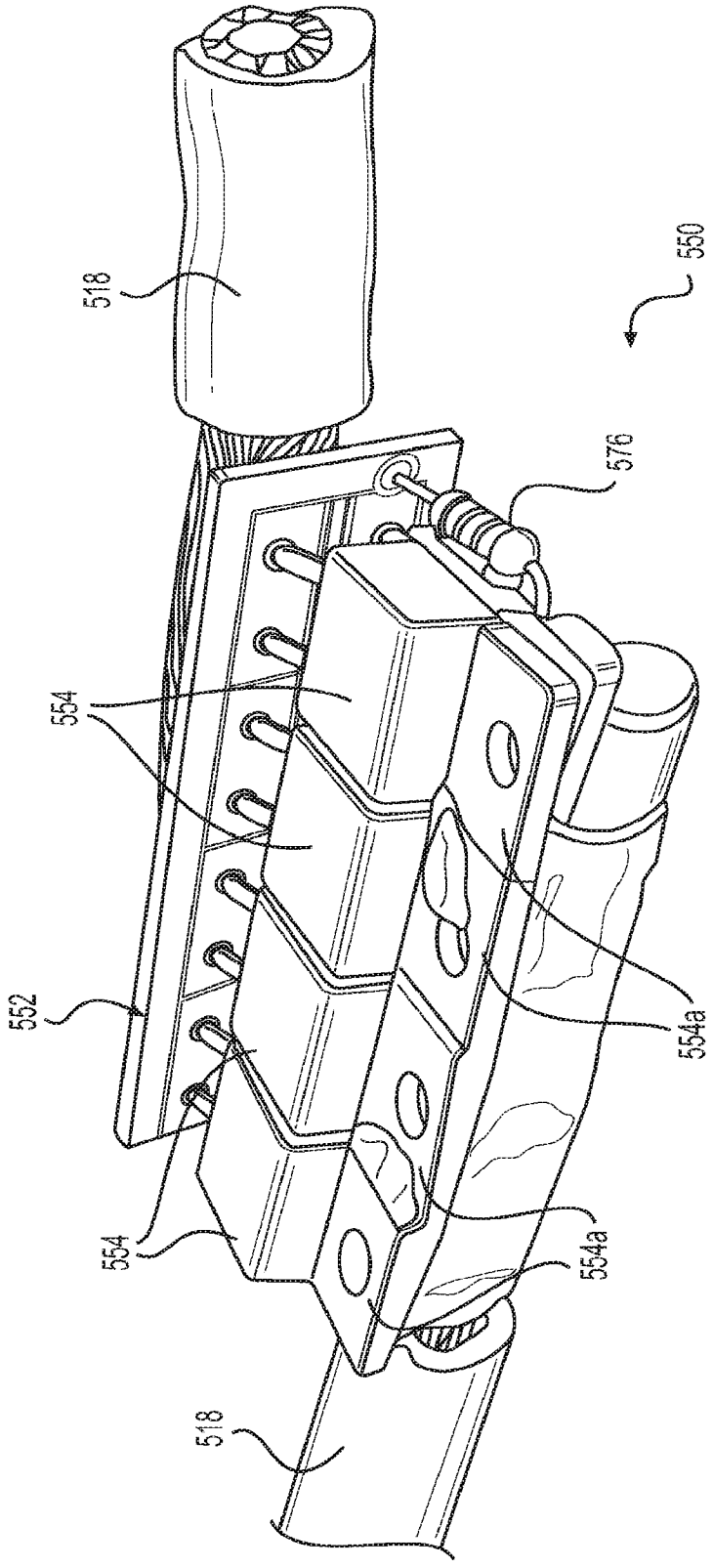

FIG. 38

Espacenet

Bibliographic data: CN107852004 (A) — 2018-03-27

BATTERY ASSEMBLY DEVICE

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Applicant(s): NOCO CO ± (尼科公司)

Classification: - international: ***H02J7/00; H02J7/14***
- cooperative: **H01M2/30 (US); H01R11/24 (US); H02J1/122 (EP); H02J7/14 (EP, GB, US); H02J7/342 (GB);** F02N11/12 (EP); F02N11/14 (EP); H02J1/122 (US)

Application number: CN20168002479 20160329 Global Dossier

Priority number (s): US201662294067P 20160211 ; WO2016US24680 20160329

Also published as: AU2016392707 (A1) AU2016392707 (B2) AU2020200268 (A1) CA2957431 (A1) DE112016002206 (T5) more

Abstract of CN107852004 (A)

The subject matter relates to a battery assembly device for use with an apparatus for jump starting a vehicle, and an apparatus for jump starting a vehicle comprising the battery assembly device. A battery assembly device for a battery jump starting device. The battery assembly is configured to maximize electrical conductivity from a battery pack of the battery jump starting device to a battery tobe recharged.

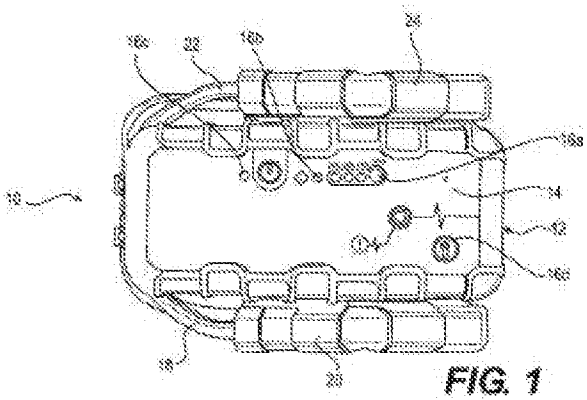

FIG. 1

(19)中华人民共和国国家知识产权局

(12)发明专利申请

(10)申请公布号 CN 107852004 A
(43)申请公布日 2018.03.27

(21)申请号 201680002479.X

(22)申请日 2016.03.29

(30)优先权数据
62/294,067 2016.02.11 US

(85)PCT国际申请进入国家阶段日
2017.02.28

(86)PCT国际申请的申请数据
PCT/US2016/024680 2016.03.29

(87)PCT国际申请的公布数据
WO2017/138963 EN 2017.08.17

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代理人 王达佐 王艳春

(51)Int.Cl.
H02J 7/00(2006.01)
H02J 7/14(2006.01)

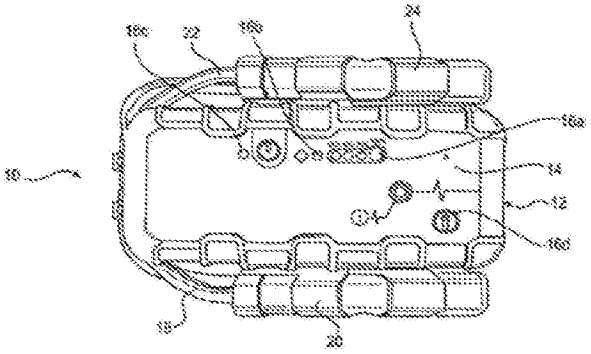
权利要求书2页 说明书5页 附图11页

(54)发明名称

电池组件装置

(57)摘要

本申请的主题涉及一种用于与跳线跨接启动车辆的设备一起使用的电池组件装置，以及包括该电池组件装置的、用于跳线跨接启动车辆的设备。用于电池跳线跨接启动装置的电池组件装置。电池组件配置为使从电池跳线跨接启动装置的电池组至待再充电的电池的导电性最大化。



CN 107852004 A

1.一种用于具有智能开关的电池跳线跨接启动装置的电池组件装置，所述电池组件装置包括：

电池，包括正极端子突片和负极端子突片；

正极端子导体棒，连接至所述电池的所述正极端子突片；

负极端子导体棒，连接至所述电池的所述负极端子突片；

正极电缆，连接至所述正极端子导体棒；以及

智能开关接口，能够连接至所述跳线跨接启动装置的所述智能开关，所述智能开关接口包括电路板，所述电路板具有在所述电路板上彼此间隔开的第一电路板导体棒和第二电路板导体件，所述智能开关接口还包括一个或多个继电器，所述一个或多个继电器连接在所述第一电路板导体棒和所述第二电路板导体棒之间，用于在所述电池的所述负极端子突片与正在跳线跨接的电池之间提供隔离。

2.一种用于具有智能开关的电池跳线跨接启动装置的电池组件装置，所述电池组件装置包括：

矩形电池，包括正极端子突片和负极端子突片；

正极端子导体棒，连接至所述电池的所述正极端子突片；

负极端子导体棒，连接至所述电池的所述负极端子突片；

正极电缆，通过柔性电缆连接器连接至所述正极端子导体棒；以及

智能开关接口，能够连接至所述跳线跨接启动装置的所述智能开关，所述智能开关接口包括电路板，所述电路板具有在所述电路板上彼此间隔开的第一电路板导体棒和第二电路板导体件，所述智能开关接口还包括一个或多个继电器，所述一个或多个继电器连接在所述第一电路板导体棒和所述第二电路板导体棒之间，用于在正在跳线跨接的电池的负极端子突片之间提供隔离。

3.一种用于具有智能开关的电池跳线跨接启动装置的电池组件装置，所述电池组件装置包括：

矩形电池，包括分别位于所述电池的相对端的正极端子突片和负极端子突片；

L形正极端子导体棒，连接至所述电池的所述正极端子突片，所述L形正极端子围绕所述电池的角部弯曲，并且沿所述电池的侧部的至少一部分延伸；

L形负极端子导体棒，连接至所述电池的所述负极端子突片，所述L形负极端子围绕所述电池的角部弯曲，并沿所述电池的侧部的至少一部分延伸；

正极电缆，连接至所述正极端子导体棒；以及

智能开关接口，能够连接至所述跳线跨接启动装置的所述智能开关，所述智能开关接口包括电路板，所述电路板具有在所述电路板上彼此间隔开的第一电路板导体棒和第二电路板导体件，所述智能开关接口还包括一个或多个继电器，所述一个或多个继电器连接在所述第一电路板导体棒和所述第二电路板导体棒之间，用于在正在跳线跨接的电池的负极端子突片之间提供隔离。

4.根据权利要求1所述的装置，其中，所述继电器是多个继电器，所述多个继电器在所述第一电路板导体棒与所述第二电路板导体棒之间并联连接。

5.根据权利要求1所述的装置，其中，所述负端子导体棒将所述电池机械地和电连接至所述智能开关电池接口。

WINPLUS Ex. 1003, p. 621

6.根据权利要求5所述的装置，其中，所述智能开关电池接口通过所述负端子导体棒定位在所述电池上方并邻近所述电池。

7.根据权利要求1所述的装置，其中，所述正极电缆的一端配置成至少部分地缠绕在所述正极电缆的暴露的电缆导体端部周围。

8.根据权利要求1所述的装置，其中，所述正极端子导体棒超声波焊接至所述电池的所述正极端子突片，并且所述负极端子导体棒超声波焊接至所述电池的所述负极端子突片。

9.根据权利要求1所述的装置，其中，所述电池为矩形，并且所述正极端子导体棒和所述负极端子导体棒为L形，并且缠绕所述电池的相应角部。

10.根据权利要求9所述的装置，其中，所述电池突片与所述电池的壳体齐平安装。

11.根据权利要求1所述的装置，其中，所述正极电缆通过柔性电缆连接器连接至所述正极端子导体棒。

12.根据权利要求11所述的装置，其中，所述柔性电缆连接器包括柔性外套筒部分和柔性内套筒部分。

13.根据权利要求12所述的装置，其中，所述柔性外套筒部分包括外凸缘，以及所述柔性内套筒部分包括内凸缘，所述外凸缘和所述内凸缘夹入所述电池跳线跨接启动装置的壳体壁。

14.根据权利要求11所述的装置，其中，所述柔性电缆连接器包括内部蛇形电缆部分。

15.根据权利要求14所述的装置，其中，所述柔性电缆连接器配置为容纳相对于所述电池跳线跨接启动装置的壳体壁成角度定向的正极电缆，以及所述内部蛇形电缆部分配置为适应相对于所述壳体壁的角度与所述内部蛇形电缆部分与正端子导体棒的附接角度之间的不对准。

WINPLUS Ex. 1003, p. 622

电池组件装置

技术领域

[0001] 一种电池组件装置，例如用于电池跳线跨接启动装置。

背景技术

[0002] 现有在Nook等人的第9,007,015号美国专利中所公开的便携式车辆电池跳线跨接启动设备。该设备利用锂离子电池组。在这种类型的设备中，需要使从该设备的电池组至正在进行跳线跨接启动的车辆的车辆电池的电导率最大化。

[0003] 对于成功的汽车跳线跨接起动，有两个主要因素决定结果。第一个因素是由锂离子电池组提供的电量，第二个因素是最大电导率。需要两个因素才有最好的机会来跳线跨接启动大引擎。没有另一因素的一个因素是不够的。

发明内容

[0004] 本申请的主题涉及一种用于与跳线跨接启动车辆的设备一起使用的电池组件装置，以及包括该电池组件装置的、用于跳线跨接启动车辆的设备。

[0005] 本申请的主题涉及以下目的。

[0006] 一种电池组件装置，包括电池或由电池组成，该电池具有连接至电池的端子的至少一个电池导体件。

[0007] 一种电池组件装置，包括电池或由电池组成，该电池具有连接至电池的端子突片的至少一个电池导体部。

[0008] 一种电池组件装置，包括电池或由电池组成，电池具有连接至电池的正极端子接触部的正极电池导体件以及连接至电池的负极端子接触部的负极电池导体件。

[0009] 一种电池组件装置，包括电池或由电池组成，该电池具有连接至电池的正极端子接触部的正极电池导体以及连接至电池的负极端子接触部的负极电池导体，电池导体件焊接至电池的相应端子接触部。

[0010] 一种电池组件装置，包括电池或由电池组成，该电池具有连接至电池的正极端子接触部的正极电池导体件、连接至电池的负极端子接触部的负极电池导体件、以及连接至电池的电池导体件中的一个的继电器。

[0011] 一种电池组件装置，包括电池或由电池组成，该电池具有连接至电池的正极端子接触部的正极电池导体件、连接至电池的负极端子接触部的负极电池导体件、以及连接至负极电池导体件的继电器。

[0012] 一种电池组件装置，包括电池或由电池组成，该电池具有连接至电池的正极端子接触部的正极电池导体件、连接至电池的负极端子接触部的负极电池导体件、以及连接至负极电池导体件的继电器。

[0013] 一种电池组件装置，包括电池或由电池组成，电池具有连接至电池的正极端子接触部的正极电池导体件、连接至电池的负极端子接触部的负极电池导体件、以及连接至负极电池导体件的多个继电器。

WINPLUS Ex. 1003, p. 623

[0014] 一种电池组件装置，包括电池或由电池组成，该电池具有连接至电池的正极端子接触部的正极电池导体件、连接至电池的负极端子接触部的负极电池导体件、以及连接至正极电池导体件的正极电缆。

附图说明

[0015] 图1是未展开夹具的电池跳线跨接启动装置的前视。

[0016] 图2是图1所示的电池跳线跨接启动装置的后视立体图。

[0017] 图3是图1和图2所示的电池跳线跨接启动装置的端部立体图。

[0018] 图4是图1所示的电池跳线跨接启动装置的前视立体图，然而，其中夹具展开。

[0019] 图5是包含于图1所示的电池跳线跨接启动装置中的安装在电池跳线跨接启动装置中的电池组件装置的立体图，然而，其中负极电缆尚未安装。

[0020] 图6是图5所示的电池组件装置的俯视图。

[0021] 图7是图5所示的电池组件装置的主视图。

[0022] 图8是用于正极电缆的弯曲电缆连接器的侧视图。

[0023] 图9是图5所示的电池组件装置的立体图，其中负极电缆连接至电池组件装置。

[0024] 图10是图5所示的电池组件装置的立体图，其中正极电缆上安装有二极管设备。

[0025] 图11是连接至电池跳线跨接启动装置的其他部件或装置的电池组件装置的立体图。

[0026] 图12是包含于图1所示的电池跳线跨接启动装置中的安装在电池跳线跨接启动装置中时的电池组装置的立体图。

具体实施方式

[0027] 图1和图2中示出了电池跳线跨接启动装置10。电池跳线跨接跳线跨接启动装置10包括壳体12，壳体12具有设置有发光二极管16(LED)布置的显示器14。电池跳线跨接启动装置10还包括具有正极夹具20的正极电缆18以及具有负极夹具24的负极电缆22。正极电缆18和负极电缆22穿过壳体12中的开口12a、12b，并且布线至将在下面详细描述的、内部定位的部件(即，电池组件装置)。

[0028] 如图1所示，夹具20、24通过每个均夹紧至在壳体12的相对侧上向外延伸的相应侧柱26而以未展开的模式收起或对接。侧柱26在图2中示出。当电池跳线跨接启动装置10不使用时，夹具20、24对接，并且在使用期间从侧柱26松开。

[0029] 电池跳线跨接启动装置10配置为用于跳线跨接启动车辆电池。例如，电池跳线跨接启动装置10可为在第9,007,015号美国专利中公开的“具有安全保护的便携式车辆跳线跨接启动装置”，该美国专利通过引用全部并入本文，或可为类似装置。

[0030] 电池跳线跨接启动装置10包括位于壳体12内的各种电气部件或零件。例如，电池跳线跨接启动装置10包括图5至图10中所示的电池组件110以及图11中所示的内部电气部件。

[0031] 如图5至图10所示，电池组件110包括电池112。例如，电池112为锂离子可再充电型电池。电池组件110配置为使从电池112至电池跳线跨接启动装置10的电缆18、22和夹具20、24的电导率最大化。电池112包括壳体，例如矩形壳体112a。

WINPLUS Ex. 1003, p. 624

[0032] 电池组件110还包括在一端处连接(例如,焊接)至电池112的正极端子突片(即,接触部)的正极端子导体棒114。正极端子导体棒114的另一端设置有导电环116,导电环116缠绕并连接(例如,卷曲和/或焊接)至用于正极电缆18的电缆导体件的暴露的导体件端18a。

[0033] 如图5和图6所示,例如,正极端子导体棒114可为L形,以便缠绕电池112的矩形壳体112a的方形角部(例如,当在平面图中观察电池112时)。如图6所示,L形正极端子导体棒114沿电池112的端部并沿电池112的侧部的至少一部分延伸。

[0034] 正极端子导体棒114还可以机械地联接和/或粘附至电池壳体112a的外表面,以提供正极端子导体棒114的附加的结构支承和稳定性(例如,在电池跳线跨接启动器装置10意外跌落的情况下承受机械冲击)。例如,正极端子导体棒114可通过粘合剂(例如,硅树脂粘合剂)、双面胶带、双面泡沫胶带、具有卡扣连接的绝缘塑料或陶瓷连接器和/或机械紧固件机械连接至电池壳体112a。

[0035] 正极电缆18包括将正极电缆18连接至正极端子导体棒114的弯曲电缆部分118。弯曲电缆部分118包括过渡至柔性套筒120中的外套筒部分118a。柔性套筒120包括外套筒部分120a和柔性内套筒部分120b,其中,外套筒部分120a相对于电池跳线跨接启动装置10的壳体112位于外部,柔性内套筒部分120b相对于电池跳线跨接启动装置10的壳体112位于内部。

[0036] 柔性套筒120配置成加强正极电缆18与电池跳线跨接启动装置10的壳体12之间的连接,同时保持柔性。例如,柔性套筒120设置有一个或多个凹槽124(图3中示出为三个(3)),从而暴露正极电缆18的外套筒18a。一个或多个凹槽124用作铰链,以便于在柔性外套筒部分120的位置处弯曲正极电缆18。

[0037] 柔性套筒120还包括与内凸缘126间隔开的外凸缘124,内凸缘126与外凸缘124之间限定凹槽125。例如,外凸缘124与外凸缘126间隔开与壳体12的壁厚相等的距离。凸缘124、126配置为将柔性连接器120连同正极电缆18一起锚固至电池跳线跨接启动装置10的壳体12。柔性连接器120的套筒部分128(图6)将外凸缘126和内凸缘128连接在一起。例如,柔性套筒120单独模制并组装至正极电缆18上,或模制到正极电缆18上以形成单个单元。例如,柔性外套筒部分120是插入注射模制的,其中在模制过程期间,将正极电缆18的一部分插入模具内。替代地,柔性外套筒部分120分开制造(例如模制),然后安装或组装至正极电缆18的部分上。例如,正极电缆18包括内导体件(例如,实芯导体或多股金属线导体,例如,由铜,铝制成)和外绝缘套筒18a(例如,模制塑料套筒)。柔性套筒120可施加(例如,模制或安装或组装)至正极电缆18的外套筒18a上,并围绕外套筒18a。

[0038] 电池组件110还包括在一端连接(例如,焊接)至电池112的负极突片(即,接触部)的负极端子导体棒130。负极端子导体棒130的另一端设置有负极端子导体棒连接器部分132,如图5所示。

[0039] 负极端子导体棒130可为L形,以缠绕矩形电池112的角部,如图6所示。L形负极端子导体棒130沿电池112的端部并沿电池112的侧部的至少一部分延伸。

[0040] 负端子导体棒130还可机械地联接和/或粘附至电池壳体112a的外表面,以提供负端子导体棒130的附加支承和稳定性(例如,在电池跳线跨接启动器装置10意外跌落的情况下承受机械冲击)。例如,负极端子导体棒114可通过粘合剂(例如,硅树脂粘合剂)、双面胶带、双面泡沫胶带、具有卡扣连接的绝缘塑料或陶瓷连接器和/或机械紧固件机械连接至电

WINPLUS Ex. 1003, p. 625

池壳体112a。

[0041] 电池组件110还包括智能开关电池接口134，如图1所示。智能开关电池接口134包括电路板136，电路板136具有与第二电路板导体棒140间隔开的第一电路板导体棒138，第一电路板导体棒138和第二电路板导体棒140二者均位于电路板136的一侧上，如图5所示。

[0042] 一对继电器142安装在电路板136的相对侧上。继电器142包括延伸穿过电路板136中的槽136a的中继锚固插脚142a(图5)。继电器142还包括第一中继连接器插脚142b，第一中继连接器插脚142b延伸穿过均位于电路板136中的槽且穿过位于负端子导体棒连接器部分132中的槽132a。继电器142乃至还包括第二电路继电器连接销142c，第二电路继电器连接销142c延伸穿过均位于电路板136、第一电路板导体棒138的窗口138a的槽，并且穿过设置在第一导体棒138中的槽132a。中继锚固插脚136a焊接在适当位置，以将继电器142机械连接至电路板136。中继连接器插脚142b和142c焊接在适当位置以分别将继电器142机械和电气地连接至电路板导体板138、140。

[0043] 电路板136中的槽136a例如为矩形(图5)，并且容纳矩形的中继锚固插脚142a。具体地，中继锚固插脚142a的基部为过渡至方形端的矩形形状。方形端部在尺寸上比基部部分更窄，从而形成定位成与电路板136的外表面齐平的横向边缘。当将焊料施加至中继锚固插脚142a的暴露端时，将焊料连接至方形端的侧部和横向边缘，以将中继锚固插脚142a锚固和锁定至电路板136。

[0044] 槽132a设置在负端子导体棒连接器部分132中，并且第一电路板导体棒138中的槽138a为矩形。第二电路板导体棒140中的槽140a(图5)为T形，以容纳三(3)个水平定向的中继连接器插脚142b。中继连接器插脚142b的端部被示出为与负极端子导体棒连接器部分132的外表面齐平。当将焊料施加至中继连接器插脚142b的暴露端部时，焊料填充在负极端子导体棒连接器部分132中的槽132a中以及第一电路板导体棒138的槽138a，并且使连接器插脚142b的侧部与槽132a和槽138a的内边缘连接，以将继电器142锚固至电路板136和负极端子导体棒连接器部分132。该所施加的焊料使负极端子导体棒连接器部分132电气连接至第一电路板导体棒138。

[0045] 设置在第二电路板导体棒140中的槽140a为T形，以容纳三(3)个竖直定向的第二中继连接插脚142c。第二中继连接器插脚142c从电路板136的外表面向外延伸，从而与负极电缆14的暴露的电缆端14a连接，如图9所示。当将焊料施加至第二中继连接器插脚142c的端部时，焊料填充在T形槽140a(图5)中，并且将第二中继连接器插脚140c电连接至第二电路板导体棒140。负极电缆22的暴露的电缆端22a焊接至第二中继连接器插脚142c(图5)，如图9所示。

[0046] 负端子导体棒130的负端子导体棒连接器部分132连接(例如，通过焊接)至电路板136的第一电路板导体棒138。负极电缆22的暴露的电缆端22a(即，其中汽车绝缘套筒)再次连接(例如，通过焊接)至第二电路板导体棒140，如图9所示。负极电缆22装配有柔性套筒118，如图11所示。

[0047] 作为弯曲电缆连接器118(图5)的布置的替代物，二极管装置150安装至(即，接合至)柔性电缆连接器118，如图10所示。二极管装置150包括电路板152，电路板152设置有位于其一侧上的一组反向充电二极管154以及设置在电路板152的相对侧部上的导体棒156。

[0048] 电池跳线跨接启动装置10包括具有上壳体部分12a和下壳体部分12b的壳体12，如

WINPLUS Ex. 1003, p. 626

图11所示。上壳体部分12a和下壳体部分12b配置成当组装电池跳线跨接启动装置10时连接在一起。

[0049] 电池跳线跨接启动装置10还包括电池组件110和控制器组件210，当组装电池跳线跨接启动装置10时，电池组件110和控制器组件210二者均设置在壳体12内，如图11所示。控制器组件210包括邻近另一电路板214定位的电路板212。

[0050] 电池组件110的正极端子通过正电源线216连接至电路板212，如图11所示。例如，正电源线216焊接至正极导体棒114(图5)。电池组件110的负极端子经由负电源线218连接至电路板214。

[0051] 如图11所示，中继电路板136设置有具有连接器222的线组220。连接器222配置为在电池跳线跨接启动装置10的组装期间与位于控制器组件210的电路板212上的继电器板连接器224连接，如图11所示。

[0052] 电池组件110还包括具有连接器228的线组226，如图11所示。连接器228配置为与位于控制器组件220的电路板212上的电池单元充电/监测连接器230连接。

[0053] 电池组件110还包括具有线组232的电池温度传感器，线组232具有连接器234，如图11所示。连接器234配置为与位于控制器组件220的电路板212上的温度传感器连接器236连接。

[0054] 电路板212设置有充电电力电阻器240和输出继电器242，如图11所示。另外，下壳体部分12a设置有具有连接至电路板214的线组246的主用户输出连接器244以及具有连接至电路板214的线组250的主用户内连接器248。

[0055] 电池组件110连接至电池跳线跨接起动装置10，如图11所示。当组装后，电池连接器装置110安装在电池跳线跨接启动装置10的壳体12内。

WINPLUS Ex. 1003, p. 627

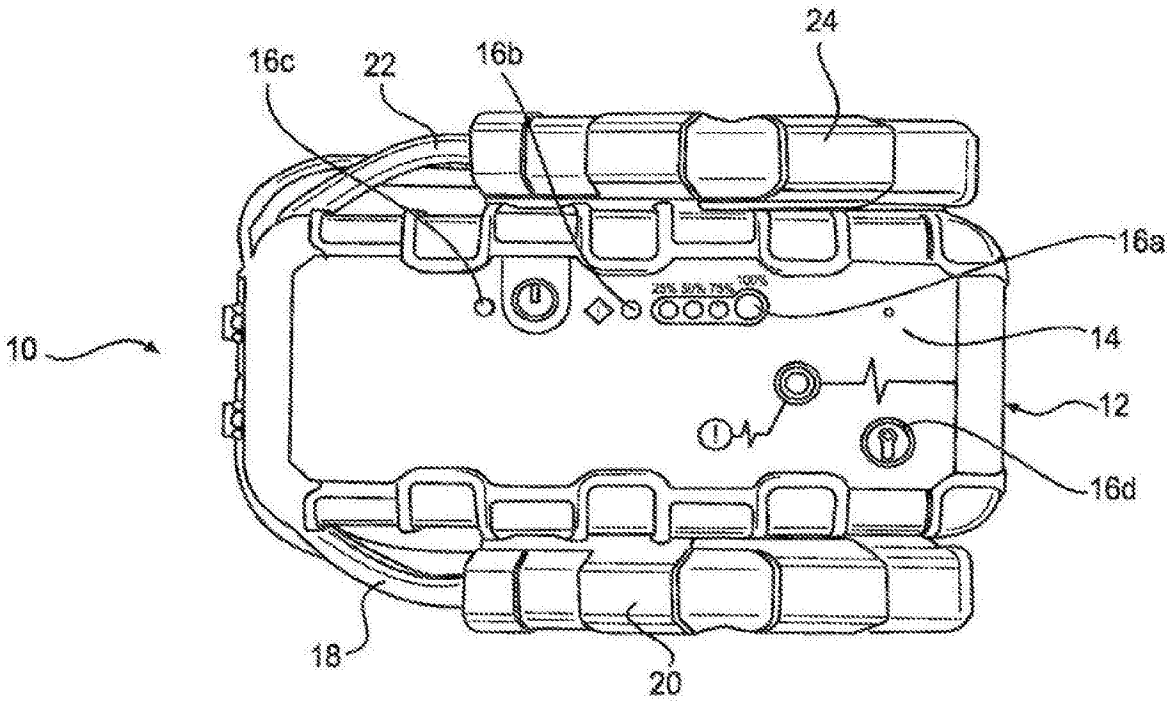


图1

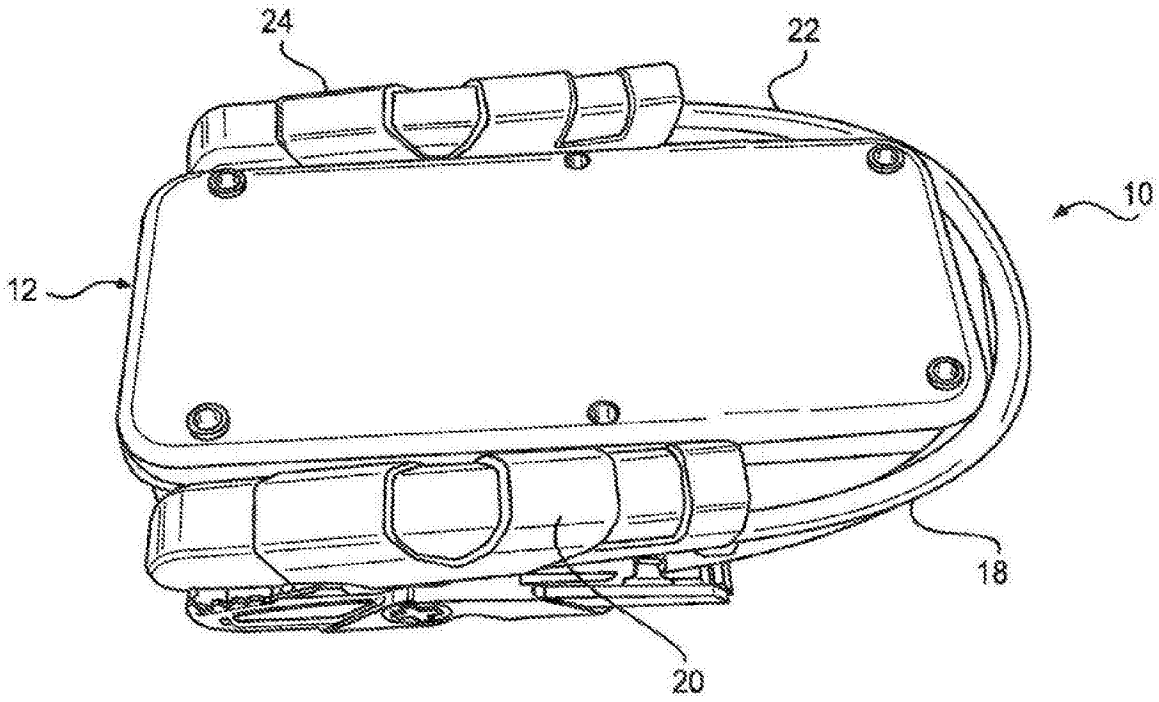


图2

WINPLUS Ex. 1003, p. 628

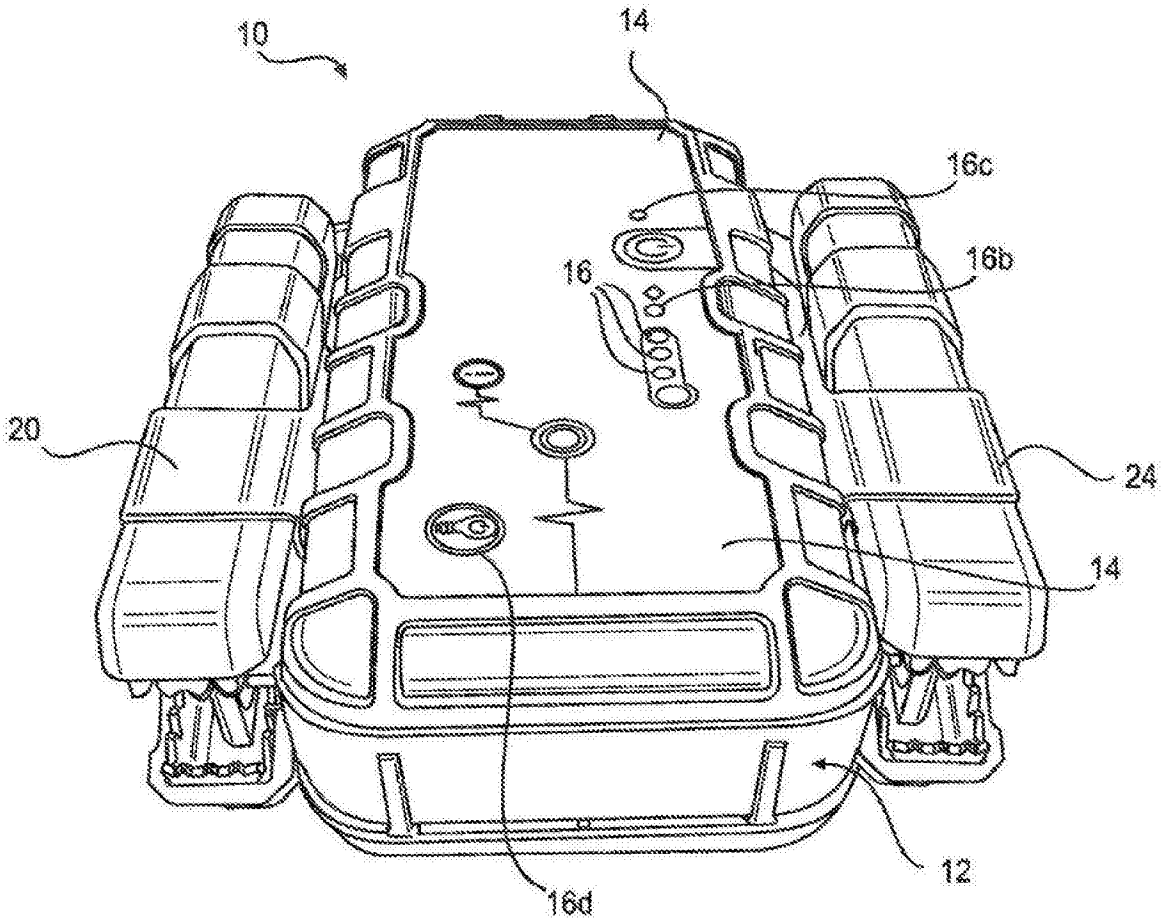


图3

WINPLUS Ex. 1003, p. 629

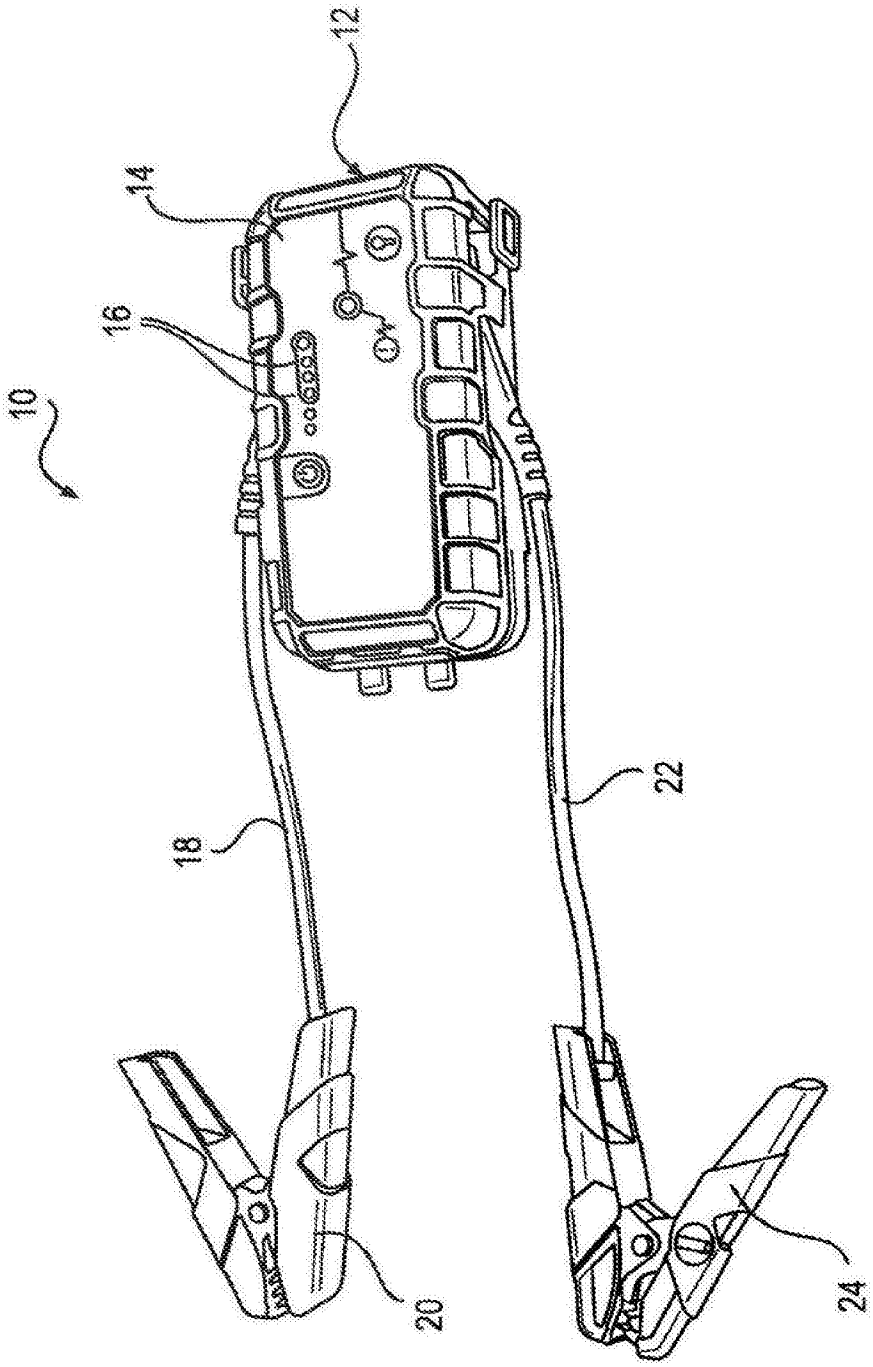


图4

WINPLUS Ex. 1003, p. 630

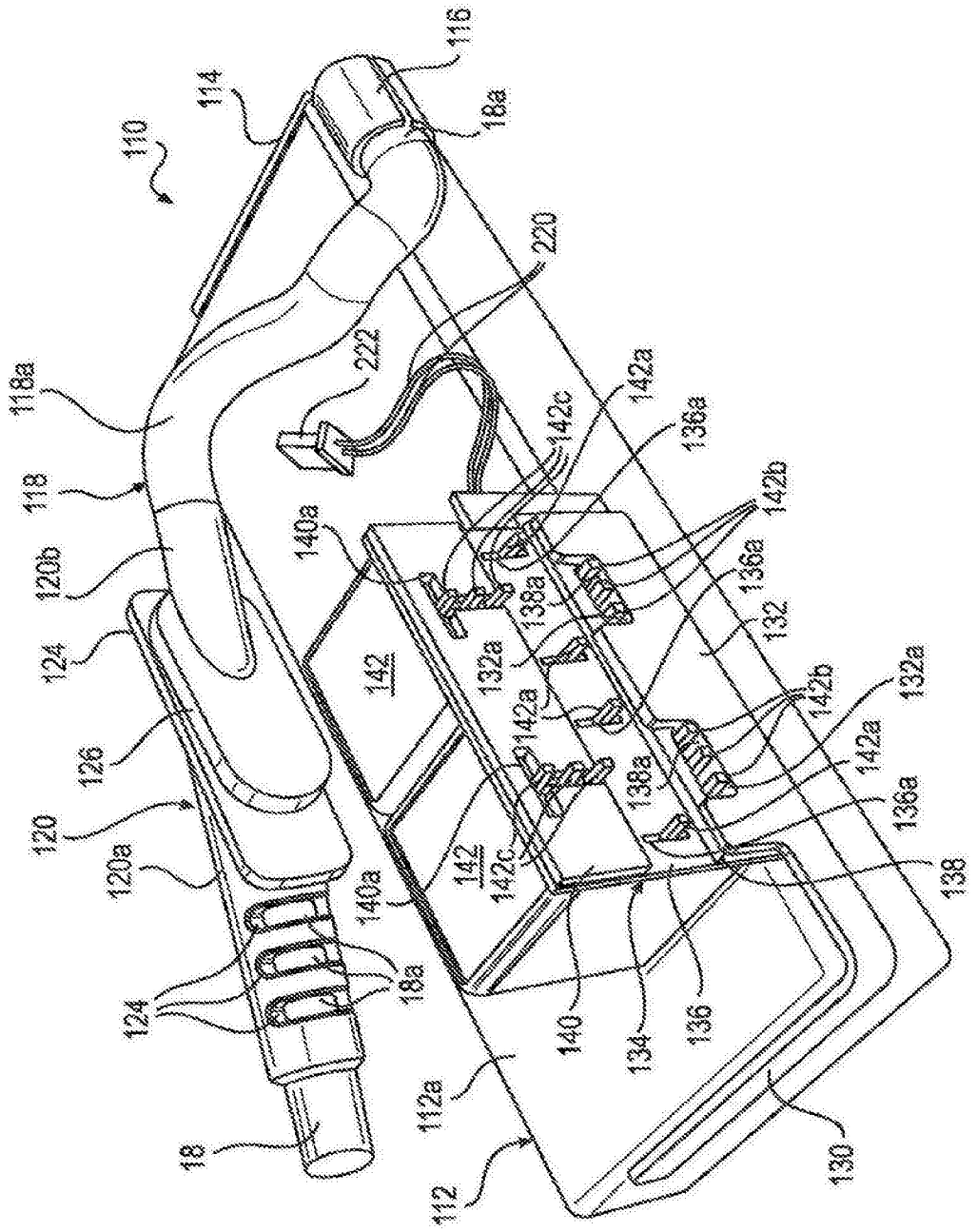


图5

WINPLUS Ex. 1003, p. 631

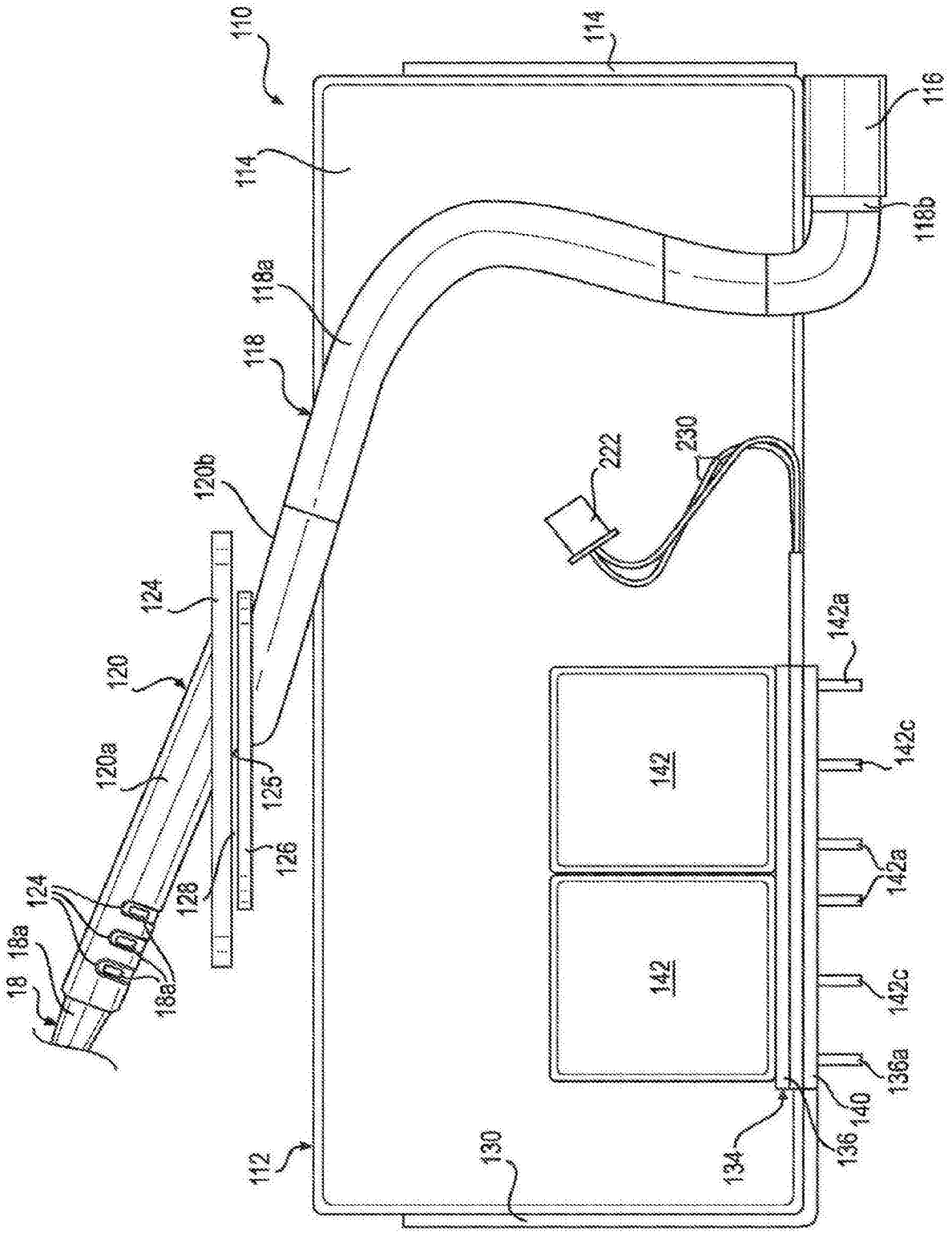


图6

WINPLUS Ex. 1003, p. 632

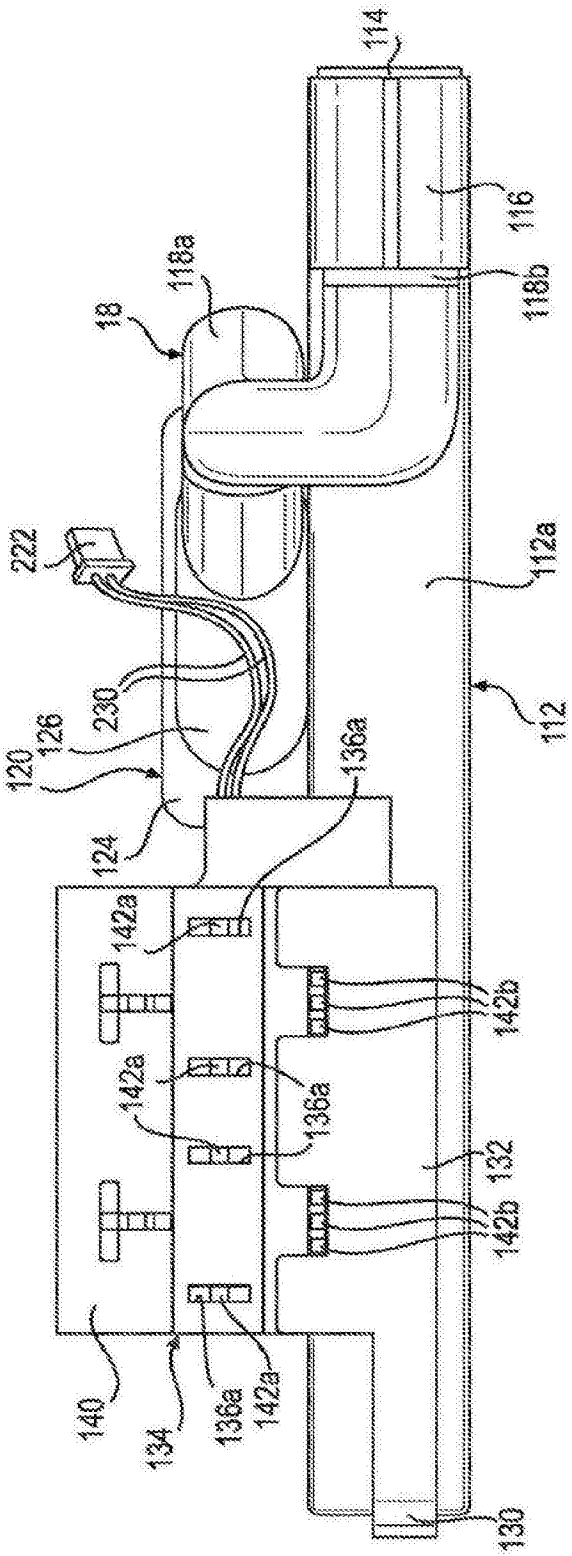


图7

WINPLUS Ex. 1003, p. 633

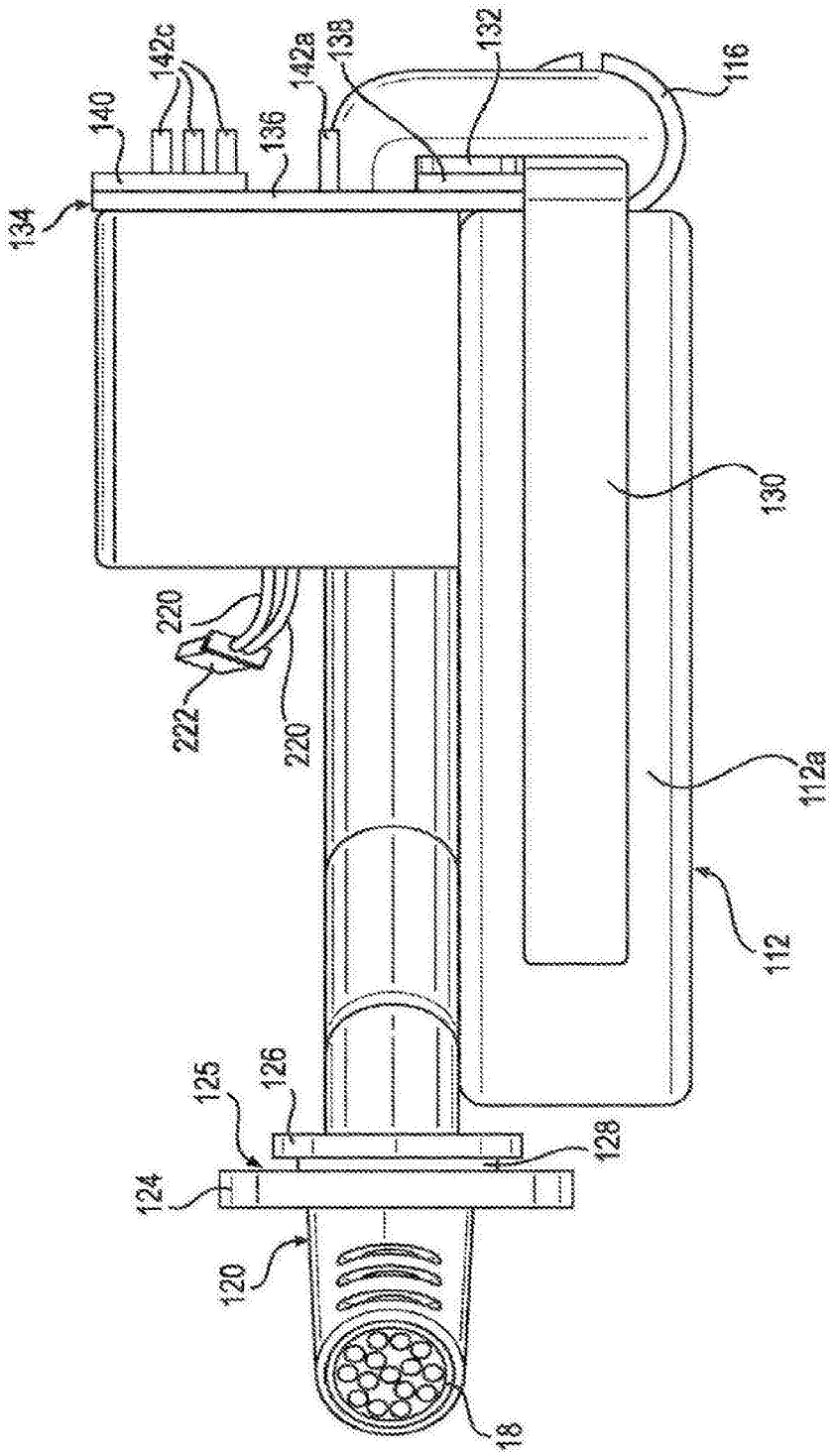


图8

WINPLUS Ex. 1003, p. 634

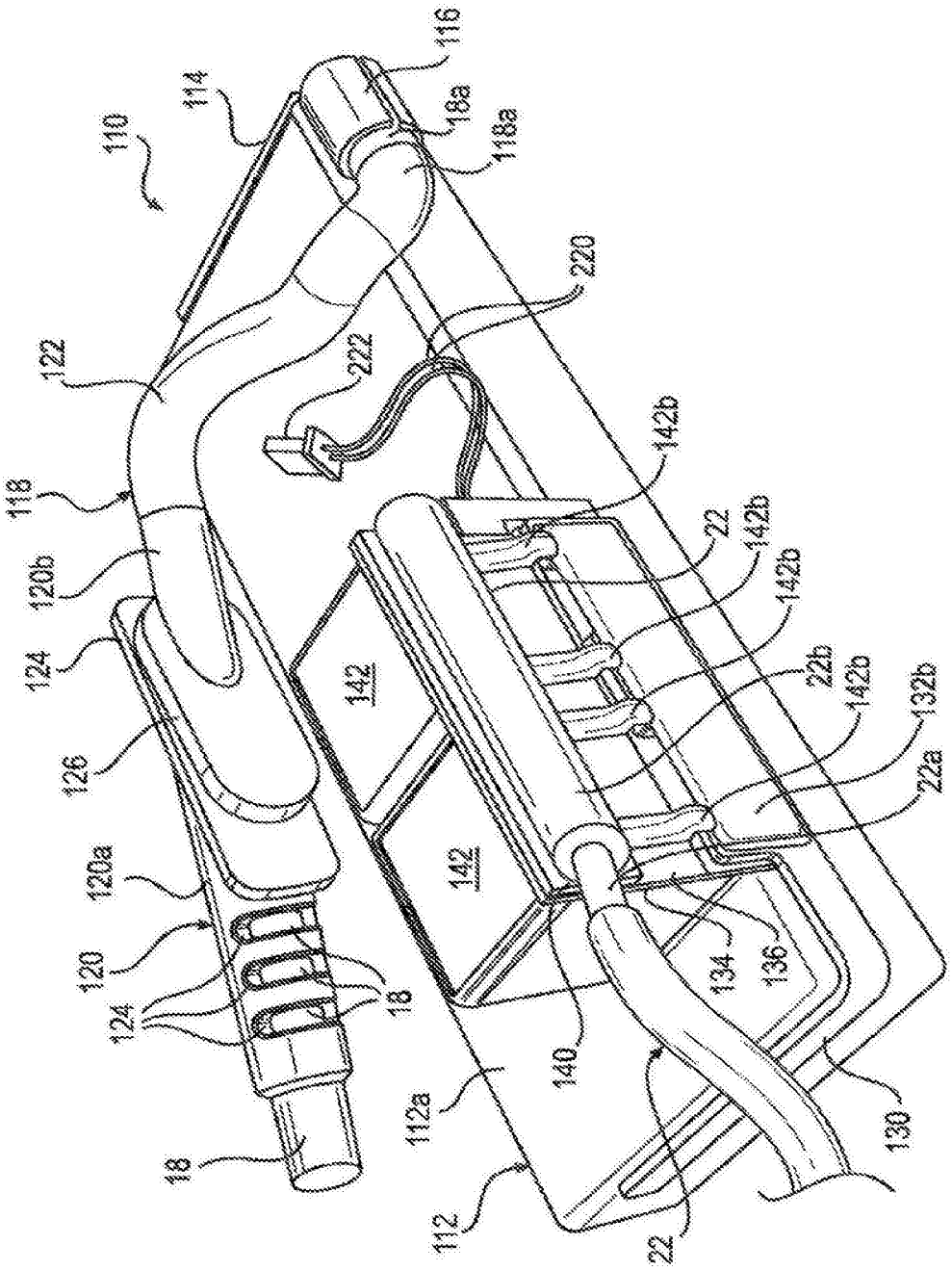


图9

WINPLUS Ex. 1003, p. 635

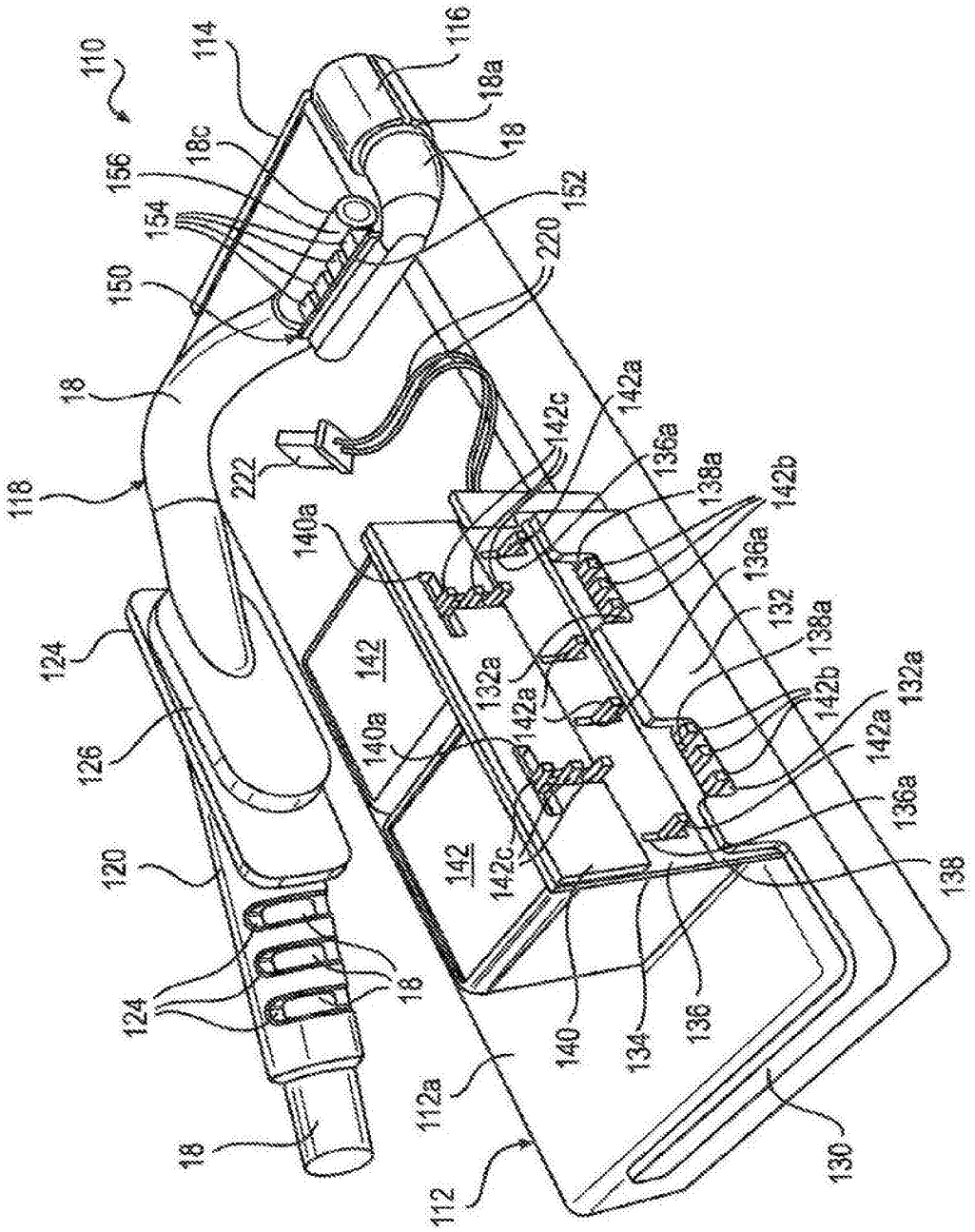


图10

WINPLUS Ex. 1003, p. 636

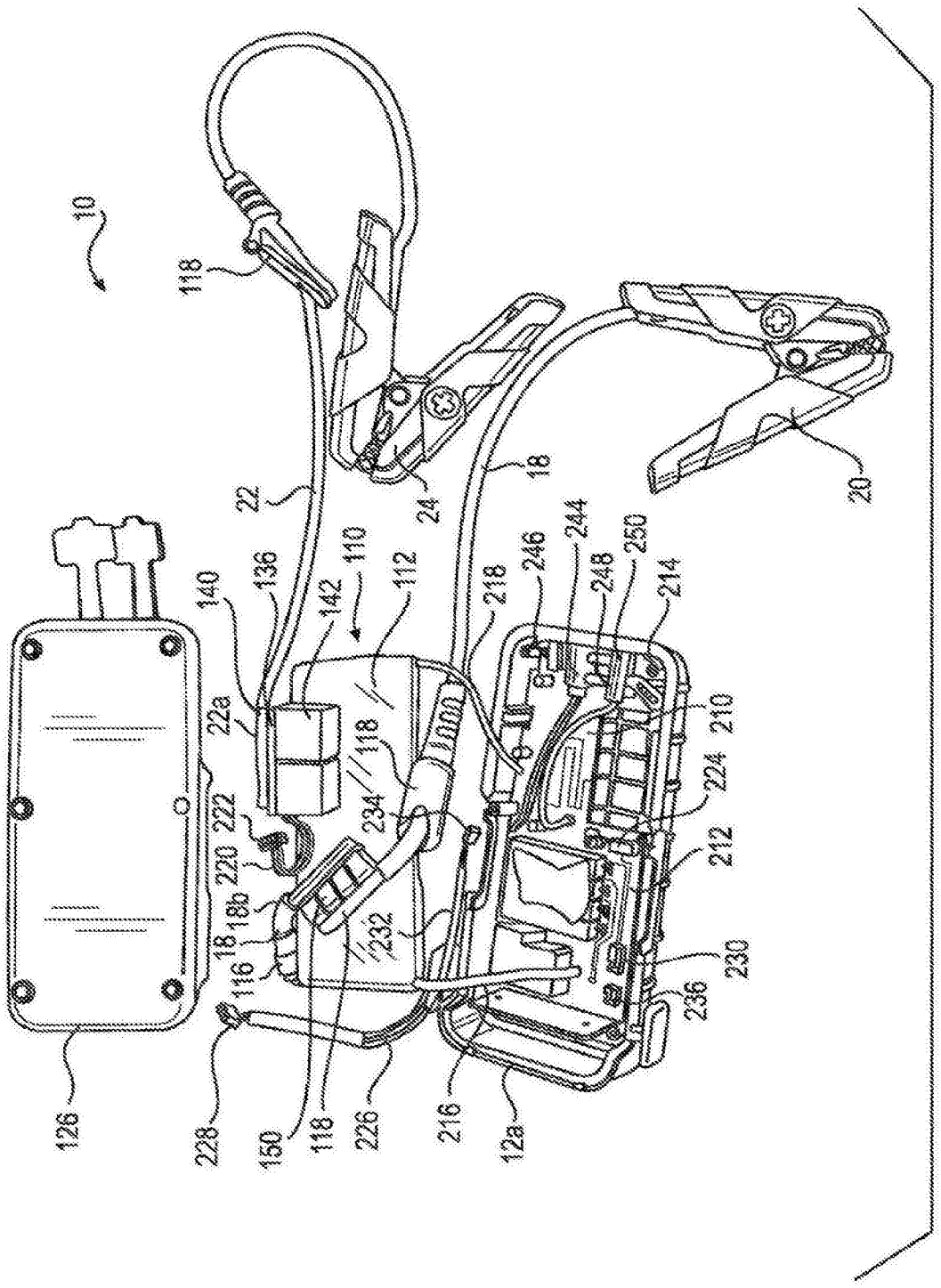


图11

WINPLUS Ex. 1003, p. 637

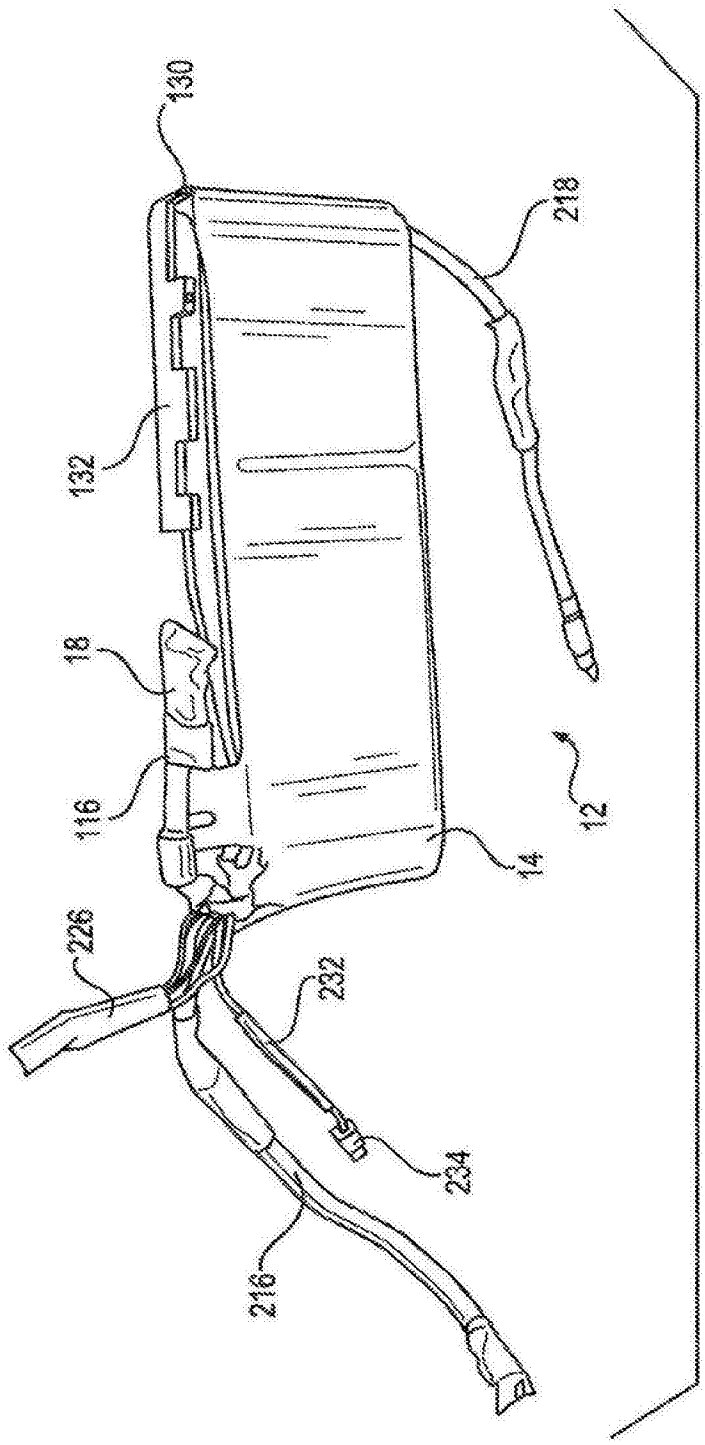


图12

WINPLUS Ex. 1003, p. 638

Espacenet

Bibliographic data: CN107852004 (A) — 2018-03-27

BATTERY ASSEMBLY DEVICE

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Applicant(s): NOCO CO ± (尼科公司)

Classification: - international: ***H02J7/00; H02J7/14***
- cooperative: **H01M2/30 (US); H01R11/24 (US); H02J1/122 (EP); H02J7/14 (EP, GB, US); H02J7/342 (GB);** F02N11/12 (EP); F02N11/14 (EP); H02J1/122 (US)

Application number: CN20168002479 20160329 Global Dossier

Priority number (s): US201662294067P 20160211 ; WO2016US24680 20160329

Also published as: AU2016392707 (A1) AU2016392707 (B2) AU2020200268 (A1) CA2957431 (A1) DE112016002206 (T5) more

Abstract of CN107852004 (A)

The subject matter relates to a battery assembly device for use with an apparatus for jump starting a vehicle, and an apparatus for jump starting a vehicle comprising the battery assembly device. A battery assembly device for a battery jump starting device. The battery assembly is configured to maximize electrical conductivity from a battery pack of the battery jump starting device to a battery tobe recharged.

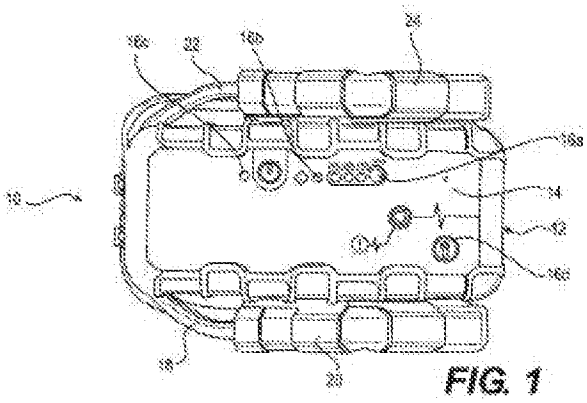

FIG. 1

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DESCRIPTION CN107852004

Abstract The subject of the present application relates to a battery assembly device for use with a device for starting a vehicle by a jumper jumper, and a device for starting a vehicle by a jumper jumper including the battery assembly device. Battery assembly device for battery jumper jump start device. The battery assembly is configured to maximize conductivity from a battery jumper across the battery pack of the starting device to the battery to be recharged.

Battery pack device

Technical field

A battery assembly device, for example, used for a battery jumper jump start device.

Background technique

There is a portable vehicle battery jumper jump start device disclosed in US Patent No. 9,007,015 of Nook et al. The device utilizes a lithium-ion battery pack. In this type of device, it is necessary to maximize the conductivity of the vehicle battery from the battery pack of the device to the vehicle that is performing the jumper jump start.

For a successful car jumper jump start, there are two main factors that determine the result. The first factor is the amount of electricity provided by the lithium-ion battery pack, and the second factor is the maximum conductivity. Two factors are needed to have the best chance to jumper and start the big engine. One factor without another factor is not enough.

Summary of the invention

The subject of the present application relates to a battery assembly device for use with a device for starting a vehicle by a jumper jumper, and a device for starting a vehicle by a jumper jumper including the battery assembly device.

The subject of this application relates to the following purposes.

A battery assembly device includes or consists of a battery having at least one battery conductor connected to a terminal of the battery.

A battery assembly device includes or consists of a battery having at least one battery conductor connected to a terminal tab of the battery.

A battery assembly device includes or consists of a battery having a positive battery conductor connected to a positive terminal contact portion of the battery and a negative battery conductor connected to a negative terminal contact portion of the battery.

A battery assembly device includes or consists of a battery having a positive battery conductor connected to a positive terminal contact portion of the battery and a negative battery conductor connected to a negative terminal contact portion of the battery, the battery conductor piece is welded to the corresponding of the battery Terminal contact.

A battery assembly device includes or consists of a battery having a positive battery conductor connected to a positive terminal contact portion of the battery, a negative battery conductor connected to a negative terminal contact portion of the battery, and a battery connected to the battery Relay of one of the conductor pieces.

A battery assembly device includes or consists of a battery having a positive battery conductor connected to a positive terminal contact portion of the battery, a negative battery conductor connected to a negative terminal contact portion of the battery, and a negative battery conductor Piece of relay.

A battery assembly device includes or consists of a battery having a positive battery conductor connected to a positive terminal contact portion of the battery, a negative battery conductor connected to a negative terminal contact portion of the battery, and a negative battery conductor Piece of relay.

A battery assembly device includes or consists of a battery having a positive battery conductor connected to a positive terminal contact portion of the battery, a negative battery conductor connected to a negative terminal contact portion of the battery, and a negative battery conductor connected to the battery Multiple relays.

A battery assembly device includes or consists of a battery having a positive battery conductor connected to a positive terminal contact portion of the battery, a negative battery conductor connected to a negative terminal contact portion of the battery, and a positive battery conductor The positive cable of the piece.

BRIEF DESCRIPTION

Figure 1 is a front view of a battery jumper jump start device without unfolding the clamp.

FIG. 2 is a rear perspective view of the battery jumper jump start device shown in FIG. 1.

3 is an end perspective view of the battery jumper jump start device shown in FIGS. 1 and 2.

FIG. 4 is a front perspective view of the battery jumper jump start device shown in FIG. 1, however, with the clamp deployed.

FIG. 5 is a perspective view of a battery assembly device installed in the battery jumper jump start device included in the battery jumper jump start device shown in FIG. 1, however, wherein the negative cable has not been installed.

6 is a plan view of the battery module device shown in FIG. 5.

7 is a front view of the battery module device shown in FIG. 5.

Fig. 8 is a side view of a bent cable connector for a positive cable.

9 is a perspective view of the battery assembly device shown in FIG. 5, in which a negative cable is connected to the battery assembly device.

FIG. 10 is a perspective view of the battery module device shown in FIG. 5 in which a diode device is installed on the positive cable.

11 is a perspective view of a battery assembly device connected to other components or devices of a battery jumper jump start device.

12 is a perspective view of the battery pack device included in the battery jumper jump start device shown in FIG. 1 when installed in the battery jumper jump start device.

detailed description

The battery jumper jump start device 10 is shown in FIGS. 1 and 2. The battery jumper jumper jumper jumper starting device 10 includes a housing 12 having a display 14 provided with a light emitting diode 16 (LED) arrangement. The battery jumper jump start device 10 further includes a positive cable 18 having a positive clamp 20 and a negative cable 22 having a negative clamp 24. The positive cable 18 and the negative cable 22 pass through the openings 12a, 12b in the case 12, and are wired to internally positioned components (ie, battery assembly devices) that will be described in detail below.

As shown in FIG. 1, the clamps 20, 24 are retracted or docked in an unexpanded mode by clamping each to a corresponding side post 26 that extends outward on the opposite side of the housing 12. The side post 26 is shown in FIG. 2. When the battery jumper jump start device 10 is not in use, the clamps 20, 24 are docked and released from the side post 26 during use.

The battery jumper jump start device 10 is configured to jump jump start the vehicle battery. For example, the battery jumper jump start device 10 may be the "portable jumper jump start device with safety protection" disclosed in US Pat. Device.

The battery jumper jump start device 10 includes various electrical components or parts located in the housing 12. For example, the battery jumper jump start device 10 includes the battery assembly 110 shown in FIGS. 5 to 10 and the internal electrical components shown in FIG. 11.

As shown in FIGS. 5 to 10, the battery assembly 110 includes a battery 112. For example, the battery 112 is a lithium ion rechargeable battery. The battery assembly 110 is configured to maximize the electrical conductivity of the cables 18, 22 and the clamps 20, 24 across the starting device 10 from the battery 112 to the battery jumper. The battery 112 includes a case, for example, a rectangular case 112a.

The battery assembly 110 also includes a positive terminal conductor bar 114 connected (eg, welded) to the positive terminal tab (ie, contact portion) of the battery 112 at one end. The other end of the positive terminal conductor bar 114 is provided with a conductive ring 116 which is wound and connected (eg, crimped and / or welded) to the exposed conductor member end 18 a of the cable conductor member for the positive cable 18.

As shown in FIGS. 5 and 6, for example, the positive terminal conductor bar 114 may be L-shaped so as to wrap around the square corner of the rectangular case 112 a of the battery 112 (for example, when the battery 112 is viewed in a plan view). As shown in FIG. 6, the L-shaped positive terminal conductor rod 114 extends along the end of the battery 112 and along at least a part of the side of the battery 112.

The positive terminal conductor rod 114 may also be mechanically coupled and / or adhered to the outer surface of the battery case 112a to provide additional structural support and stability of the positive terminal conductor rod 114 (eg, jumper starter is jumpered across the battery jumper The device 10 withstands mechanical shock in case of an accidental drop). For example, the positive terminal conductor bar 114 may be passed through an adhesive (eg, silicone adhesive), double-sided tape, double-sided foam tape, insulating plastic or ceramic connector with snap connection, and / or mechanical fastener machinery Connected to the battery case 112a.

The positive cable 18 includes a bent cable portion 118 that connects the positive cable 18 to the positive terminal conductor bar 114. The bent cable portion 118 includes an outer sleeve portion 118a that transitions into the flexible sleeve 120. The flexible sleeve 120 includes an outer sleeve portion 120a and a flexible inner sleeve portion 120b, wherein the outer sleeve portion 120a is located outside relative to the housing 112 of the battery jumper jumper 10 and the flexible inner sleeve portion 120b is opposite to The housing 112 of the battery jumper jump start device 10 is located inside.

The flexible sleeve 120 is configured to strengthen the connection between the positive cable 18 and the housing 12 of the battery jumper jump start device 10 while maintaining flexibility. For example, the flexible sleeve 120 is provided with one or more grooves 124 (shown as three (3) in FIG. 3) so as to expose the outer sleeve 18 a of the positive cable 18. One or more grooves 124 serve as hinges to facilitate bending the positive cable 18 at the location of the flexible outer sleeve portion 120.

The flexible sleeve 120 also includes an outer flange 124 spaced apart from the inner flange 126, and a groove 125 is defined between the inner flange 126 and the outer flange 124. For example, the outer flange 124 and the outer flange 126 are separated by a distance equal to the wall thickness of the housing 12. The flanges 124, 126 are configured to anchor the flexible connector 120 together with the positive cable 18 to the housing 12 of the battery jumper jump start device 10. The sleeve portion 128 (FIG. 6) of the flexible connector 120 connects the outer flange 126 and the inner flange 128 together. For example, the flexible sleeve 120 is separately molded and assembled onto the positive cable 18, or molded onto the positive cable 18 to form a single unit. For example, the flexible outer sleeve portion 120 is insert injection molded, wherein during the molding process, a portion of the positive cable 18 is inserted into the mold. Alternatively, the flexible outer sleeve portion 120 is manufactured separately (eg, molded) and then installed or assembled onto the portion of the positive cable 18. For example, the positive cable 18 includes an inner conductor member (for example, a solid conductor or a stranded metal wire conductor, for example, made of copper, aluminum) and an outer insulating sleeve 18a (for example, a molded plastic sleeve). The flexible sleeve 120 may be applied (eg, molded or installed or assembled) to the outer sleeve 18a of the positive cable 18 and surround the outer sleeve 18a.

The battery assembly 110 also includes a negative terminal conductor bar 130 connected (eg, welded) to the negative tab (ie, contact) of the battery 112 at one end. The other end of the negative terminal conductor bar 130 is provided with a negative terminal conductor bar connector portion 132 as shown in FIG. 5.

The negative terminal conductor bar 130 may be L-shaped to wrap around the corner of the rectangular battery 112 as shown in FIG. 6. The L-shaped negative terminal conductor bar 130 extends along the end of the battery 112 and along at least a part of the side of the battery 112.

The negative terminal conductor bar 130 may also be mechanically coupled and / or adhered to the outer surface of the battery case 112a to provide additional support and stability of the negative terminal conductor bar 130 (for example, to jumper the starter device 10 across the battery jumper Withstand mechanical shock in case of accidental drop). For example, the negative terminal conductor rod 114 may be passed through an adhesive (for example, silicone adhesive), double-sided tape, double-

sided foam tape, an insulating plastic or ceramic connector with a snap connection, and / or mechanical fastener machinery Connected to the battery case 112a.

The battery assembly 110 also includes an intelligent switch battery interface 134, as shown in FIG. The smart switch battery interface 134 includes a circuit board 136 having a first circuit board conductor bar 138 spaced apart from a second circuit board conductor bar 140, both the first circuit board conductor bar 138 and the second circuit board conductor bar 140 Both are located on one side of the circuit board 136, as shown in FIG.

A pair of relays 142 are installed on opposite sides of the circuit board 136. Relay 142 includes relay anchor pins 142a (FIG. 5) extending through slots 136a in circuit board 136. The relay 142 also includes a first relay connector pin 142b that extends through slots that are both located in the circuit board 136 and through slots 132a that are located in the negative terminal conductor bar connector portion 132. The relay 142 even includes a second circuit relay connection pin 142c, which extends through a slot located in the window 138a of the circuit board 136 and the first circuit board conductor bar 138, and passes through the first conductor The groove 132a in the rod 136. The relay anchor pins 136a are soldered in place to mechanically connect the relay 142 to the circuit board 136. The relay connector pins 142b and 142c are soldered in place to mechanically and electrically connect the relay 142 to the circuit board conductor plates 138, 140, respectively.

The slot 136a in the circuit board 136 is, for example, rectangular (FIG. 5), and receives a rectangular relay anchor pin 142a. Specifically, the base of the relay anchor pin 142a has a rectangular shape that transitions to a square end. The square end portion is narrower in size than the base portion, thereby forming a lateral edge positioned flush with the outer surface of the circuit board 136. When solder is applied to the exposed end of the relay anchor pin 142a, the solder is connected to the side and lateral edges of the square end to anchor and lock the relay anchor pin 142a to the circuit board 136.

The slot 132a is provided in the negative terminal conductor bar connector portion 132, and the slot 138a in the first circuit board conductor bar 138 is rectangular. The slot 140a (FIG. 5) in the second circuit board conductor bar 140 is T-shaped to accommodate three (3) horizontally oriented relay connector pins 142b. The end of the relay connector pin 142b is shown flush with the outer surface of the negative terminal conductor bar connector portion 132. When solder is applied to the exposed end of the relay connector pin 142b, the solder fills the groove 132a in the negative terminal conductor bar connector portion 132 and the groove 138a of the first circuit board conductor bar 136, and makes the connector pin The side of 142b is connected to the inner edges of the groove 132a and the groove 138a to anchor the relay 142 to the circuit board 136 and the negative terminal conductor bar connector portion 132. The applied solder electrically connects the negative terminal conductor bar connector portion 132 to the first circuit board conductor bar 138.

The slot 140a provided in the second circuit board conductor bar 140 is T-shaped to accommodate three (3) vertically oriented second relay connection pins 142c. The second relay connector pin 142c extends outward from the outer surface of the circuit board 136 to be connected to the exposed cable end 14a of the negative cable 14, as shown in FIG. When solder is applied to the end of the second relay connector pin 142c, the solder is filled in the T-slot 140a (FIG. 5), and the second relay connector pin 140c is electrically connected to the second circuit board conductor bar 140. The exposed cable end 22a of the negative cable 22 is soldered to the second relay connector pin 142c (FIG. 5), as shown in FIG.

The negative terminal conductor bar connector portion 132 of the negative terminal conductor bar 130 is connected (for example, by soldering) to the first circuit board conductor bar 138 of the circuit board 136. The exposed cable end 22a of the negative cable 22 (ie, in which the automotive insulating sleeve) is connected (for example, by welding) to the second circuit board conductor bar 140, as shown in FIG. 9. The negative cable 22 is equipped with a flexible sleeve 118, as shown in FIG.

As an alternative to the arrangement of the bent cable connector 118 (FIG. 5), the diode device 150 is mounted (ie, joined) to the flexible cable connector 118 as shown in FIG. 10. The diode device 150 includes a circuit board 152 provided with a set of reverse charging diodes 154 on one side thereof and conductor bars 156 provided on opposite sides of the circuit board 152.

The battery jumper jump start device 10 includes a housing 12 having an upper housing portion 12a and a lower housing portion 12b, as shown in FIG. The upper housing portion 12a and the lower housing portion 12b are configured to be connected together when the battery jumper is assembled across the starter device 10.

The battery jumper jump starting device 10 further includes a battery assembly 110 and a controller assembly 210. When the battery jumper jump starting device 10 is assembled, both the battery assembly 110 and the controller assembly 210 are provided in the housing 12, such as As shown in Figure 11. The controller assembly 210 includes a circuit board 212 positioned adjacent to another circuit board 214.

The positive terminal of the battery assembly 110 is connected to the circuit board 212 through the positive power line 216, as shown in FIG. For example, the positive power line 216 is welded to the positive conductor bar 114 (FIG. 5). The negative terminal of the battery assembly 110 is connected to the circuit board 214 via the negative power line 218.

As shown in FIG. 11, the relay circuit board 136 is provided with a wire group 220 having a connector 222. The connector 222 is configured to connect with the relay board connector 224 located on the circuit board 212 of the controller assembly 210 during the assembly of the battery jumper jump start device 10 as shown in FIG. 11.

The battery assembly 110 also includes a wire set 226 having a connector 228, as shown in FIG. The connector 228 is configured to connect with the battery cell charging / monitoring connector 230 located on the circuit board 212 of the controller assembly 220.

The battery assembly 110 further includes a battery temperature sensor having a wire group 232 having a connector 234, as shown in FIG. The connector 234 is configured to connect with the temperature sensor connector 236 located on the circuit board 212 of the controller assembly 220.

The circuit board 212 is provided with a charging power resistor 240 and an output relay 242, as shown in FIG. In addition, the lower case portion 12 a is provided with a main user output connector 244 having a wire group 246 connected to the circuit board 214 and a main user internal connector 248 having a wire group 250 connected to the circuit board 214.

The battery assembly 110 is connected to the battery jumper jump start device 10, as shown in FIG. When assembled, the battery connector device 110 is installed in the housing 12 of the battery jumper jump start device 10.

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CLAIMS CN107852004

1.

A battery assembly device for a battery jumper jump start device with an intelligent switch, the battery assembly device includes: a battery including a positive terminal tab and a negative terminal tab; a positive terminal conductor bar connected to the battery The positive terminal tab of the negative electrode; the negative terminal conductor bar connected to the negative terminal tab of the battery; the positive cable connected to the positive terminal conductor bar; and the smart switch interface capable of being connected to the jumper The smart switch across the starting device, the smart switch interface includes a circuit board having a first circuit board conductor bar and a second circuit board conductor piece spaced apart from each other on the circuit board, the The intelligent switch interface further includes one or more relays, which are connected between the conductor bar of the first circuit board and the conductor bar of the second circuit board, and are used for the negative electrode of the battery Provides isolation between the terminal tab and the battery being jumpered.

2.

A battery assembly device for a battery jumper jump start device with an intelligent switch, the battery assembly device includes: a rectangular battery including a positive terminal tab and a negative terminal tab; a positive terminal conductor bar connected to the The positive terminal tab of the battery; the negative terminal conductor bar connected to the negative terminal tab of the battery; the positive cable connected to the positive terminal conductor bar through a flexible cable connector; and an intelligent switch interface capable of The smart switch connected to the jumper jump start device, the smart switch interface includes a circuit board having a first circuit board conductor bar and a second circuit spaced apart from each other on the circuit board Board conductor, the intelligent switch interface further includes one or more relays, the one or more relays are connected between the conductor bar of the first circuit board and the conductor bar of the second circuit board The jumper jumpers provide isolation between the negative terminal tabs of the battery.

3.

A battery assembly device for a battery jumper jump start device with an intelligent switch, the battery assembly device comprising: a rectangular battery, including a positive terminal tab and a negative terminal tab located at opposite ends of the battery, respectively; L Shaped positive terminal conductor bar connected to the positive terminal tab of the battery, the L-shaped positive terminal is bent around the corner of the battery and extends along at least a portion of the side of the battery; L-shaped negative electrode A terminal conductor bar connected to the negative terminal tab of the battery, the L-shaped negative terminal is bent around the corner of the battery and extends along at least a part of the side of the battery; a positive cable connected to The positive terminal conductor bar; and an intelligent switch interface that can be connected to the intelligent switch of the jumper jump start device, the intelligent switch interface includes a circuit board, the circuit boards have each other on the circuit board The first circuit board conductor bar and the second circuit board conductor part are spaced apart, and the intelligent switch interface further includes one or more relays, and the one or more relays are connected to the

first circuit board conductor bar and the The conductor bars of the second circuit board are used to provide isolation between the negative terminal tabs of the battery being jumpered.

4.

The device of claim 1, wherein the relay is a plurality of relays, the plurality of relays being connected in parallel between the first circuit board conductor bar and the second circuit board conductor bar.

5.

The device of claim 1, wherein the negative terminal conductor rod mechanically and electrically connects the battery to the smart switch battery interface.

6.

The device of claim 5, wherein the smart switch battery interface is positioned above the battery and adjacent to the battery through the negative terminal conductor rod.

7.

The apparatus of claim 1, wherein one end of the positive cable is configured to be wound at least partially around the exposed cable conductor end of the positive cable.

8.

The apparatus of claim 1, wherein the positive terminal conductor bar is ultrasonically welded to the positive terminal tab of the battery, and the negative terminal conductor bar is ultrasonically welded to the negative terminal protrusion of the battery sheet.

9.

The device according to claim 1, wherein the battery is rectangular, and the positive terminal conductor bar and the negative terminal conductor bar are L-shaped, and are wound around corresponding corners of the battery.

10.

The apparatus according to claim 9, wherein the battery tab is installed flush with the battery case.

11.

The device according to claim 1, wherein the positive cable is connected to the positive terminal conductor bar through a flexible cable connector.

12.

The device of claim 11, wherein the flexible cable connector includes a flexible outer sleeve portion and a flexible inner sleeve portion.

13.

The device of claim 12, wherein the flexible outer sleeve portion includes an outer flange, and the flexible inner sleeve portion includes an inner flange, and the outer flange and the inner flange are clamped into The battery jumper is connected across the housing wall of the starting device.

14.

The device of claim 11, wherein the flexible cable connector includes an inner serpentine cable portion.

15.

The device of claim 14, wherein the flexible cable connector is configured to receive a positive cable oriented at an angle relative to a housing wall of the battery jumper jump start device, and the inner serpentine cable portion It is configured to accommodate misalignment between the angle relative to the housing wall and the attachment angle of the inner serpentine cable portion and the positive terminal conductor rod.

Espacenet

Bibliographic data: CN202309139 (U) — 2012-07-04

Emergency power supply of ferric phosphate lithium battery

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Classification: **- international:** ***H02J7/00***
- cooperative:

Application number: CN201120416114U 20111027

Priority number(s): CN201120416114U 20111027

Abstract of CN202309139 (U)

The utility model relates to an emergency power supply of a ferric phosphate lithium battery. The emergency power supply comprises a ferric phosphate lithium battery group and a battery control circuit which are electrically connected, wherein the battery control circuit comprises a heavy-current output protective control circuit, a USB (universal serial bus) control circuit, a charging control circuit and a battery electric quantity indication control circuit which are successively and electrically connected, as well as an operating panel on-off control circuit which is electrically connected with the USB control circuit and the electric quantity indication control circuit, and an LED (light-emitting diode) lamp control circuit which is electrically connected with the operating panel on-off control circuit. The emergency power supply provided by the utility model fully utilizes the high-rate discharge capability of ferric phosphate lithium, has the advantages of longer service life, smaller volume, lighter weight and environmental friendliness, and has functions of transposition alarm, misconnection alarm, excess temperature alarm and over discharging alarm.

(19)中华人民共和国国家知识产权局

(12)实用新型专利

(10)授权公告号 CN 202309139 U
(45)授权公告日 2012.07.04

(21)申请号 201120416114.6

(22)申请日 2011.10.27

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(51)Int.Cl.
H02J 7/00(2006.01)

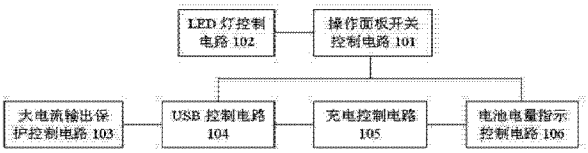
权利要求书 1 页 说明书 4 页 附图 6 页

(54)实用新型名称

磷酸铁锂电池应急电源

(57)摘要

一种磷酸铁锂电池应急电源，该应急电源包含电路连接的磷酸铁锂电池组和电池控制电路，电池控制电路包含依次电路连接的大电流输出保护控制电路、USB控制电路、充电控制电路和电池电量指示控制电路，以及电路连接所述USB控制电路和电池电量指示控制电路的操作面板开关控制电路，以及电路连接所述操作面板开关控制电路的LED灯控制电路。本实用新型充分利用磷酸铁锂的高倍率放电能力，获得更高的使用寿命，体积更小，重量更轻，环保，且具有反接报警、错接报警、过温报警和过放报警功能。



CN 202309139 U

1. 一种磷酸铁锂电池应急电源，其特征在于，该应急电源包含电路连接的磷酸铁锂电池组和电池控制电路。

2. 如权利要求 1 所述的磷酸铁锂电池应急电源，其特征在于，所述的电池控制电路包含依次电路连接的大电流输出保护控制电路（103）、USB 控制电路（104）、充电控制电路（105）和电池电量指示控制电路（106），以及电路连接所述 USB 控制电路（104）和电池电量指示控制电路（106）的操作面板开关控制电路（101），以及电路连接所述操作面板开关控制电路（101）的 LED 灯控制电路（102）。

3. 如权利要求 2 所述的磷酸铁锂电池应急电源，其特征在于，所述的大电流输出保护控制电路（103）包含电路连接的工作控制电路、反接报警关断控制电路、错接报警关断控制电路、过温报警关断控制电路和过放报警关断控制电路。

WINPLUS Ex. 1003, p. 651

磷酸铁锂电池应急电源

技术领域

[0001] 本实用新型涉及一种磷酸铁锂电池应急电源。

背景技术

[0002] 目前，人们对应急电源（Jump Starter）关注的重点是产品维护时间、放电时间等，而忽视了产品内部电池的循环使用次数，对使用环保性的重视也不够，目前，国际上主流的应急电源内置的电池都是铅酸电池，电池的回收过程中容易造成重金属污染和硫酸外泄对大气污染，铅对环境的污染严重，它可以影响人体的神经、造血、消化、泌尿、生殖等各器官，硫酸所形成的二氧化硫，对地球产生酸雨，危害了所有动植物生存的环境。

实用新型内容

[0003] 本实用新型提供的一种磷酸铁锂电池应急电源，可以较好地实现铅酸电池的功能，并可避免污染，增加循环使用次数。

[0004] 为了达到上述目的，本实用新型提供一种磷酸铁锂电池应急电源，一种磷酸铁锂电池应急电源，该应急电源包含电路连接的磷酸铁锂电池组和电池控制电路。

[0005] 所述的电池控制电路包含依次电路连接的大电流输出保护控制电路、USB 控制电路、充电控制电路和电池电量指示控制电路，以及电路连接所述 USB 控制电路和电池电量指示控制电路的操作面板开关控制电路，以及电路连接所述操作面板开关控制电路的 LED 灯控制电路。

[0006] 所述的大电流输出保护控制电路包含电路连接的工作控制电路、反接报警关断控制电路、错接报警关断控制电路、过温报警关断控制电路和过放报警关断控制电路。

[0007] 本实用新型充分利用磷酸铁锂的高倍率放电能力，获得更高的使用寿命，体积更小，重量更轻，环保，且具有反接报警、错接报警、过温报警和过放报警功能。

附图说明

[0008] 图 1 是本实用新型的电路框图；

[0009] 图 2 是本实用新型的电路图；

[0010] 图 3 ～图 6 是图 2 的局部放大图。

具体实施方式

[0011] 以下根据图 1 ～图 6，具体说明本实用新型的较佳实施例。

[0012] 本实用新型提供一种磷酸铁锂电池应急电源，该应急电源包含电路连接的磷酸铁锂电池组和电池控制电路。

[0013] 如图 1 和图 2 所示，所述的电池控制电路包含依次电路连接的大电流输出保护控制电路 103、USB 控制电路 104、充电控制电路 105 和电池电量指示控制电路 106，以及电路连接所述 USB 控制电路 104 和电池电量指示控制电路 106 的操作面板开关控制电路 101，以

WINPLUS Ex. 1003, p. 652

及电路连接所述操作面板开关控制电路 101 的 LED 灯控制电路 102。

[0014] 如图 3 所示，是操作面板开关控制电路 101 和 LED 灯控制电路 102 的电路图，操作面板开关控制电路 101 主要是配合面板复位开关一起工作，使面板上的自复位开关开作时具有锁定和断开的功能；LED 灯控制电路 102 中的 LED 应急照明灯为大功率超高亮 LED 灯，它通过三极管 Q3 和 Q5 进行开关控制。

[0015] 图中，K1、K2 为自复位薄膜开关，并通过引置于应急电源整机的操作面板上；开关 K1 用于控制 USB 控制电路 104 的工作电源及电池电量指示控制电路 106 的工作电源，当第一次按下时，通过 IC1 控制 1 脚锁定输出高电平，使 Q9、Q10 导通，继电器吸合，从而为后面电路提供工作电源；当再按下 K1 复位开关时，IC1 第 1 脚由高电平转为低电平，使 Q9、Q10 同时进入关断状态，同时继电器释放使电源断开。开关 K2 的工作原理与 K1 基本相同，只是 LED 灯的工作控制为负极。即，当 K2 按下时，IC1 第 13 脚输出高电平，Q3 导通，从而使 Q5 导通，LED 点亮。当再按下 K2 复位开关时，IC1 第 13 脚输出低电平，从而使 Q3 和 Q5 关断，LED 息灭。

[0016] 如图 4 所示，是充电控制电路 105 和电池电量指示控制电路 106 的电路图，电池电量指示控制电路 106 用于检测电池实时的剩余电量，通过点亮不同颜色的 LED 灯（红、黄、绿）表示电池处于不同的电量状态；充电控制电路 105 控制充电过程状态，当电池正处于充电状态时（指充电未满）红色 LED3 点亮，当充电结束时，充电指示灯绿色 LED1 点亮。充电控制电路 105 的充电指示用的红色、绿色 LED 与电池电量指示控制电路 106 的电池电量指示红色、绿色 LED 共用。

[0017] 当开关 K1 按下时（如图 2 和图 3 所示），继电器吸合导通（相当于工作电源开关打开），此时 BAT/TEST 点与电池正极接通，电池电量指示控制电路 106 通过从电池两端取电压样与基准电压进行比较、判断，然后通过点亮不同颜色的指示灯来表示电池此时的剩余电量。红色（LED3）表示电池电压小于或等于 12.2VDC，提示用户立即给电池充电；黄色（LED2）表示电池电压在 12.2VDC 至 12.7VDC 之间，表示电池已经处于欠压状态，应尽快给电池充电；绿色（LED1）表示电池状态良好。

[0018] 充电控制电路 105 配合外部开关电源充电器一起使用（外部开关电源充电器提供一个恒压限流的充电电源），充电控制电路 105 通过取样电阻 R58 上产生的压降进行放大，再与基准电压进行比较、判断电池是否已充满，当电池充满时，充电回路电流减小，电阻 R58 上产生的压降低，使 IC4 第 7 脚输出高电压，使 Q2 饱和导通，红色 LED 灯 LED3（R）息火，同时绿色 LED1（G）点亮，表示电池已充满。

[0019] 电路中的 D4、D9 主要用于电源极性反向时保护电路中的 IC 和三极管不被击穿损坏。

[0020] 如图 5 所示，是 USB 控制电路 104 的电路图，USB 控制电路 104 将电池的 12VDC 转换成一个稳定的 5VDC 稳压电源，再通过标准的 USB 输出插座输出，最大输出功率为 10.5W。该电路具有自动稳压、限流等保护功能，同时还自带输入电压过低保护功能，防止电池因过放电而造成永久性损坏。主要用于现代数码产品提供工作电源或电池充电使用。

[0021] 当开关 K1 打开后，USB/VCC 端获取工作电压，经一个自恢复保险丝 RT1 后接至 IC3 和第 2 脚，IC3 的第 3 脚输出，经肖特基二极管 D7、电感 L1 和 C12 组成输出电路接至 USB 输出插座，IC3 第 5 脚为输出取样，并自动控制稳压作用。IC3 第 7 脚为输出控制脚，高电平导

WINPLUS Ex. 1003, p. 653

通，低电平关断。

[0022] 当电池电压过低时，三极管 Q7 导通，使 IC3 第 7 脚由高电平变成低电平，从而关断输出对电池进行保护。

[0023] 如图 6 所示，大电流输出保护控制电路 103 包含电路连接的工作控制电路、反接报警关断控制电路、错接关断控制电路、过温关断控制电路和过放报警关断控制电路。

[0024] 该电路作为大电流输出夹子控制保护电路，主要具备有输出夹子外接电池正确时自动接通、外接电池正、负极性接反时保护、外接电压过高时保护（即接到 24V 的外部电池上时防止反充而保护）、内部电池输出电压过低时关断保护、内部电池温度过高时关断输出保护等功能。

[0025] 首先由红、黑夹子的小齿分别取出信号样送至主要由 IC6、IC7、IC8 组成的识别电路进行判断后，并将判断结果进行隔离转换，当连接正确时，三极管 Q6 导通，直流接触器 JK2 吸合工作，大电流经直流接触器送至夹子端；当极性接反时，IC5-A 比较器输出高电压，实现声、光同时报警，同时三极管 Q4 饱和导通，使三极管 Q6 关断，直流接触器保持在关闭保护状态。当外接电压过高时，IC7 工作，通过 D19 使三极管 Q4 导通，从而也实现相应的保护作用。（直流接触器为常开型开关器件）当电压电压过低时，IC5-B 比较器输出高电平，实现声、光报警功能，同时 Q4 饱和导通，强制关断大电流输出而实现保护功能；当电池温度过高时，RT1 断开，使 IC5-B 出输出高电平，实现关断保护，方法同上；低压报警与过温报警共用 LED3（R）来指示。

[0026] 如图 6 所示，大电流输出保护控制电路 103 的工作原理如下：

[0027] 工作控制电路：正接（正常工作）时，红、黑夹子夹在外部电池的正、负极，通过夹子中的红、黑取样线获得取样信号，通过光电耦合器 IC6 来驱动三极管 Q6 工作在饱和状态，使正常工作指示灯 LED4-G 点亮，同时直流接触器 JK2 吸合工作。

[0028] 反接报警关断控制电路：夹子中的红、黑取样线检测到外部电池接反的情况后，通过二极管 D15 驱动光电耦合器 IC8 工作输出高电平（在正接情况下，由于二极管 D15 的单向导电性，没有电信号提供光电耦合器 IC8，因此使其不工作），通过比较器 IC5-A 输出高电平，使其发出声、光报警（指示灯 LED5-R 点亮，蜂鸣器 B1 报警），同时使三极管 Q4 导通处于饱和状态，将三极管 Q6 的基极电压拉低，使其截止，以致正常工作指示灯 LED4-G 熄灭，同时直流接触器 JK2 断开，起到保护作用；

[0029] 错接关断控制电路：当夹子中的红、黑取样线检测到接错了外部电池时（应该接 12V 电池，却接到了 24V 电池），这时，外部电池的电压远高于内部磷酸铁锂电池的电压，通过稳压二极管 DW3 使三极管 Q3 工作于饱和状态，拉低电平，使光电耦合器 IC6 不再工作，与此同时，取样线通过稳压二极管 DW2 驱动光电耦合器 IC7 工作输出高电平，使三极管 Q4 饱和导通，拉低三极管 Q6 基极的电平，使其工作在截止状态，以致正常工作指示灯 LED4-G 熄灭，同时直流接触器 JK2 关断，起到保护作用；

[0030] 过温关断控制电路：选用的温度传感器 RT 是常闭型的。此温度传感器 RT 的检测范围在 60±5℃。将此温度传感器 RT 设置在磷酸铁锂电池的表面，温度低于检测范围时，线路按照上述的类型工作，一旦温度超过检测范围时，传感器 RT 将由常闭转换成常开，相当于开关的断开，此时 IC5-B 比较器的反向输入端由正常的高电位转为低电位，使比较器输出由低电平转为高电平，从而实现强制关断输出及相应的报警提示功能，起到了对磷酸铁

WINPLUS Ex. 1003, p. 654

锂电池的保护作用。

[0031] 过放报警关断控制电路：以磷酸铁锂电池工作在检测温度范围内为前提条件下，在电路中，设计了一个电池电压比较器 IC5-B，用它来一直监测磷酸铁锂电池两端的电压。在比较器 IC5-B 的同相输入端，选用了一个稳压二极管 DW5（6C2）使其电压稳定在 6V 作为比较器的基准电压，反相端的电压是根据实际的情况在变化的。当磷酸铁锂电池开始放电（启动汽车、其它功能的使用以及电池自身自耗电）时，一旦反相端的电压低于同相端电压，比较起输出高电平，驱动指示灯 LED3-R 和蜂鸣器 B1 工作，与此同时，三极管 Q4 饱和导通将三极管 Q6 基极拉为低电平，使其截止，正常工作指示灯 LED4-G 熄灭，同时直流接触器 JK2 关断不工作，起到保护电池免受损伤。

[0032] 本实施例中，电路中主要元器件型号：

[0033] IC1 为：集成块 TC4013B；IC2 为：集成块 LM324；IC3 为：集成块 ACT4070YH；IC4、IC5 均为：集成块 LM358；IC6、IC7、IC8 均为：集成块 817B；RT 为：常闭型温度控制器；RT1 为：自恢复保险丝；JK1 为：12V/3A 继电器；JK2 为：大电流开关控制直流按触器。

[0034] 本使用新型应用了磷酸铁锂电池，较传统铅酸电池产品的使用寿命提升 4 倍，2000 次充放电后能达到初始设计容量的 82%；磷酸锂铁电池大部份的物质为铁，少部份的锂、金、银、铜、锡，因此在环境污染来说，是非常低，也因为如此，磷酸锂铁是属于一个环保性的产品；磷酸铁锂电池的放电能力强，锂电池 1C 放电，（1C=1 小时率额定容量（A.H）；如：8AH 的电池 1C=8A），可 100% 放出设计容量；相同放电能力，锂电池体积更小，重量更轻，充电速度更快。

[0035] 尽管本实用新型的内容已经通过上述优选实施例作了详细介绍，但应当认识到上述的描述不应被认为是对本实用新型的限制。在本领域技术人员阅读了上述内容后，对于本实用新型的多种修改和替代都将是显而易见的。因此，本实用新型的保护范围应由所附的权利要求来限定。

WINPLUS Ex. 1003, p. 655

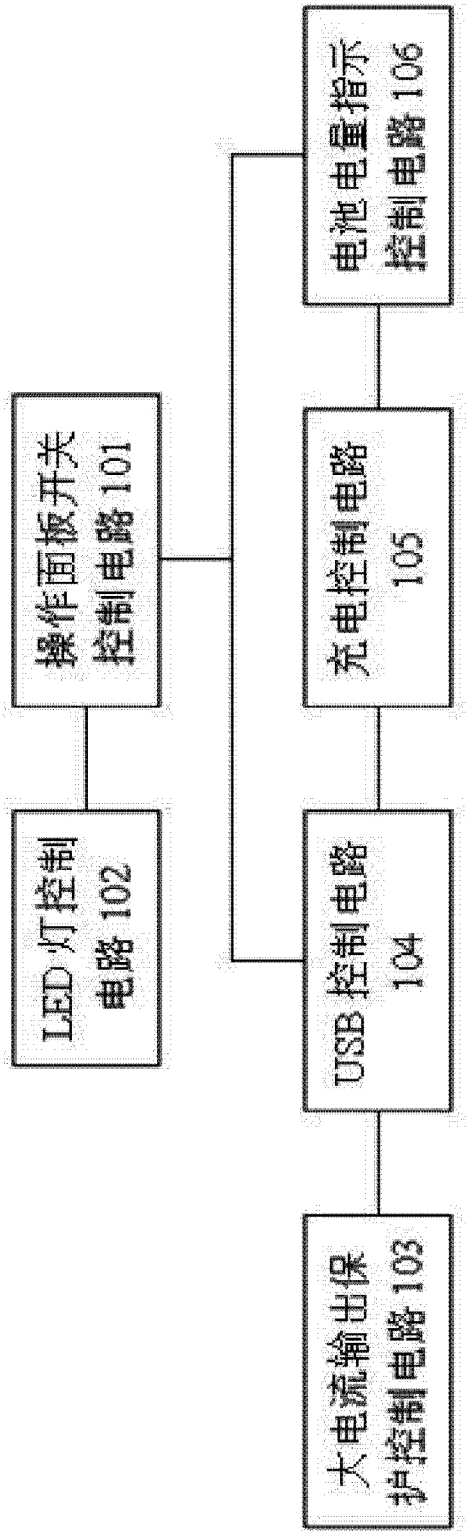


图 1

WINPLUS Ex. 1003, p. 656

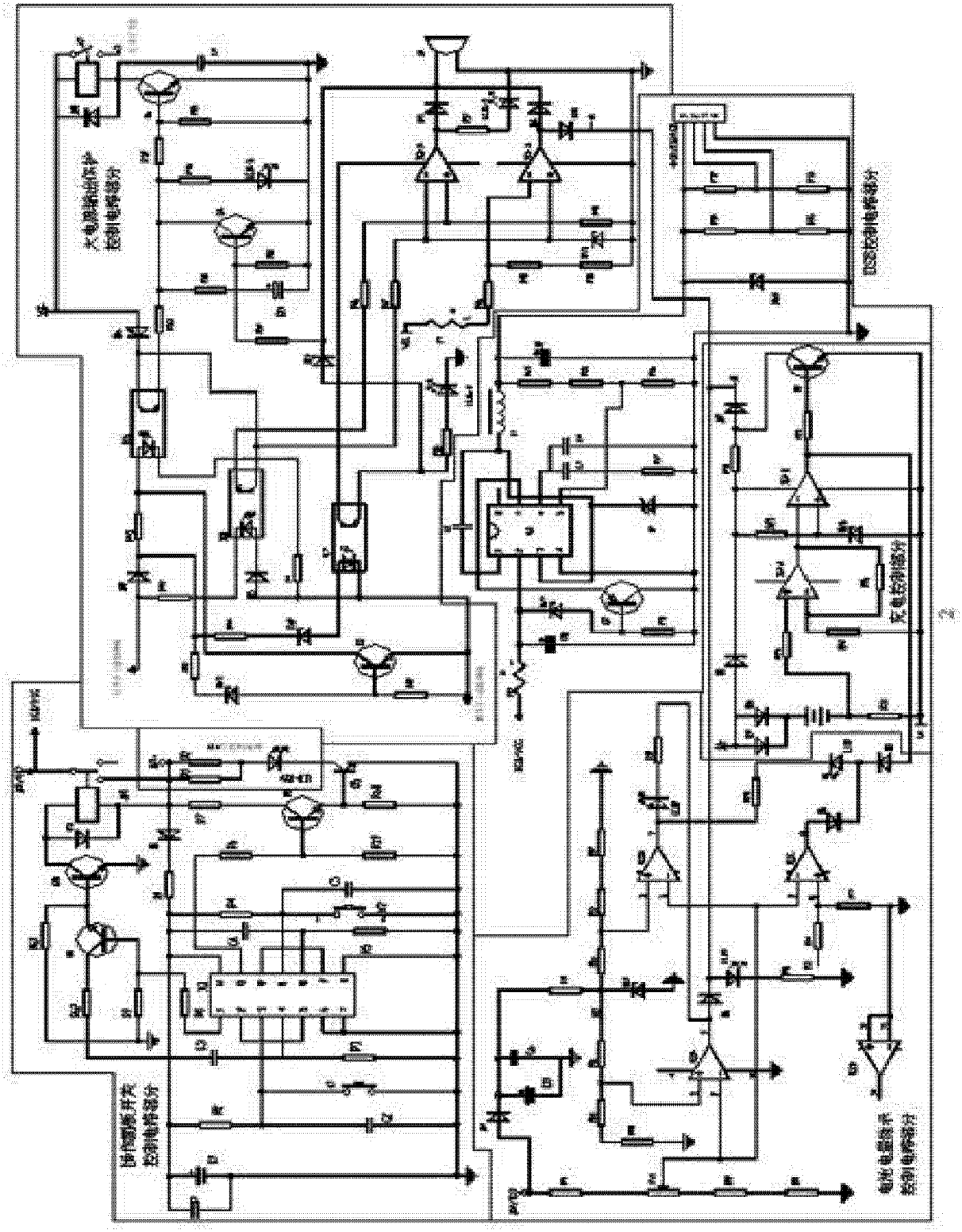


图 2

WINPLUS Ex. 1003, p. 657

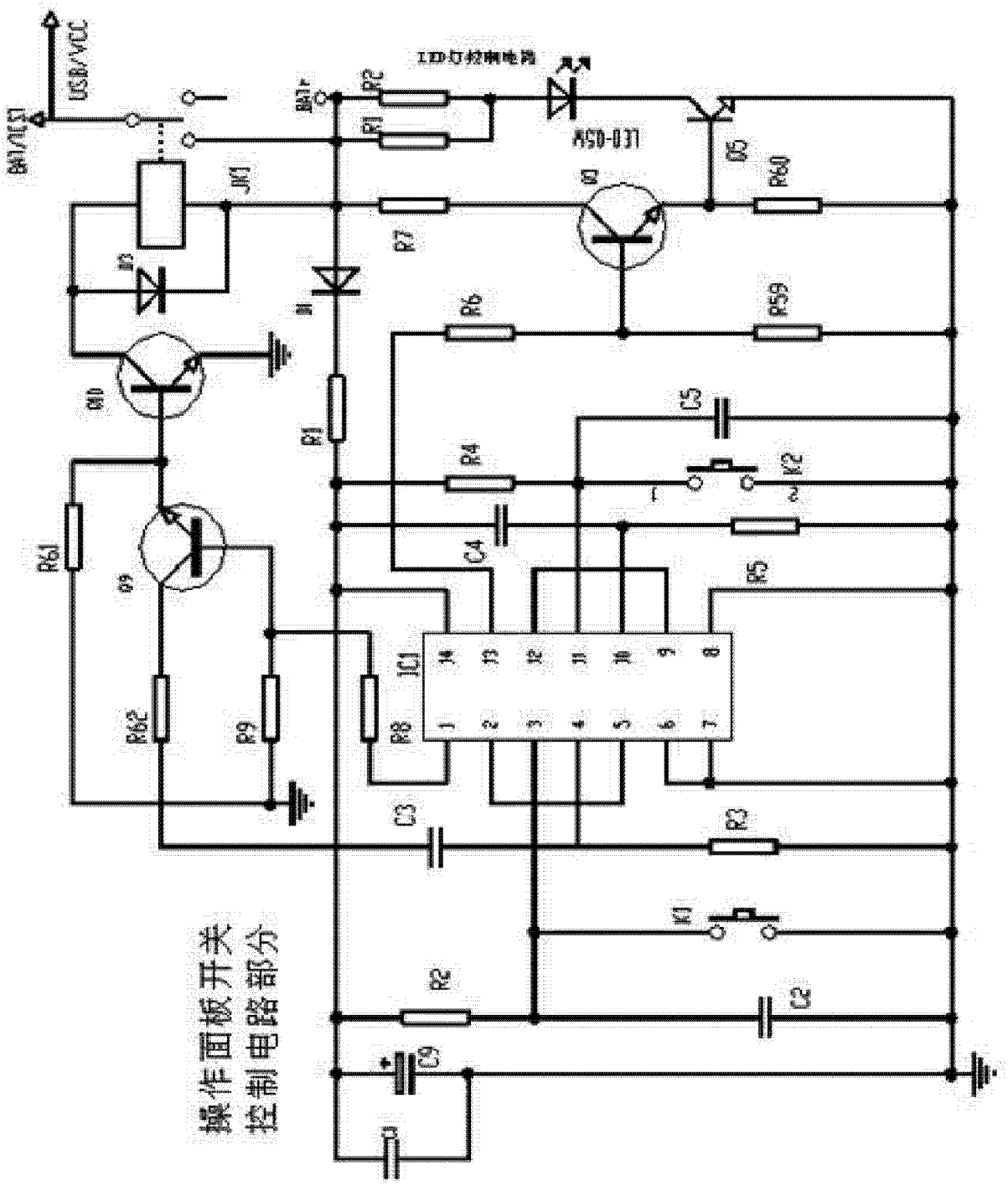


图 3

WINPLUS Ex. 1003, p. 658

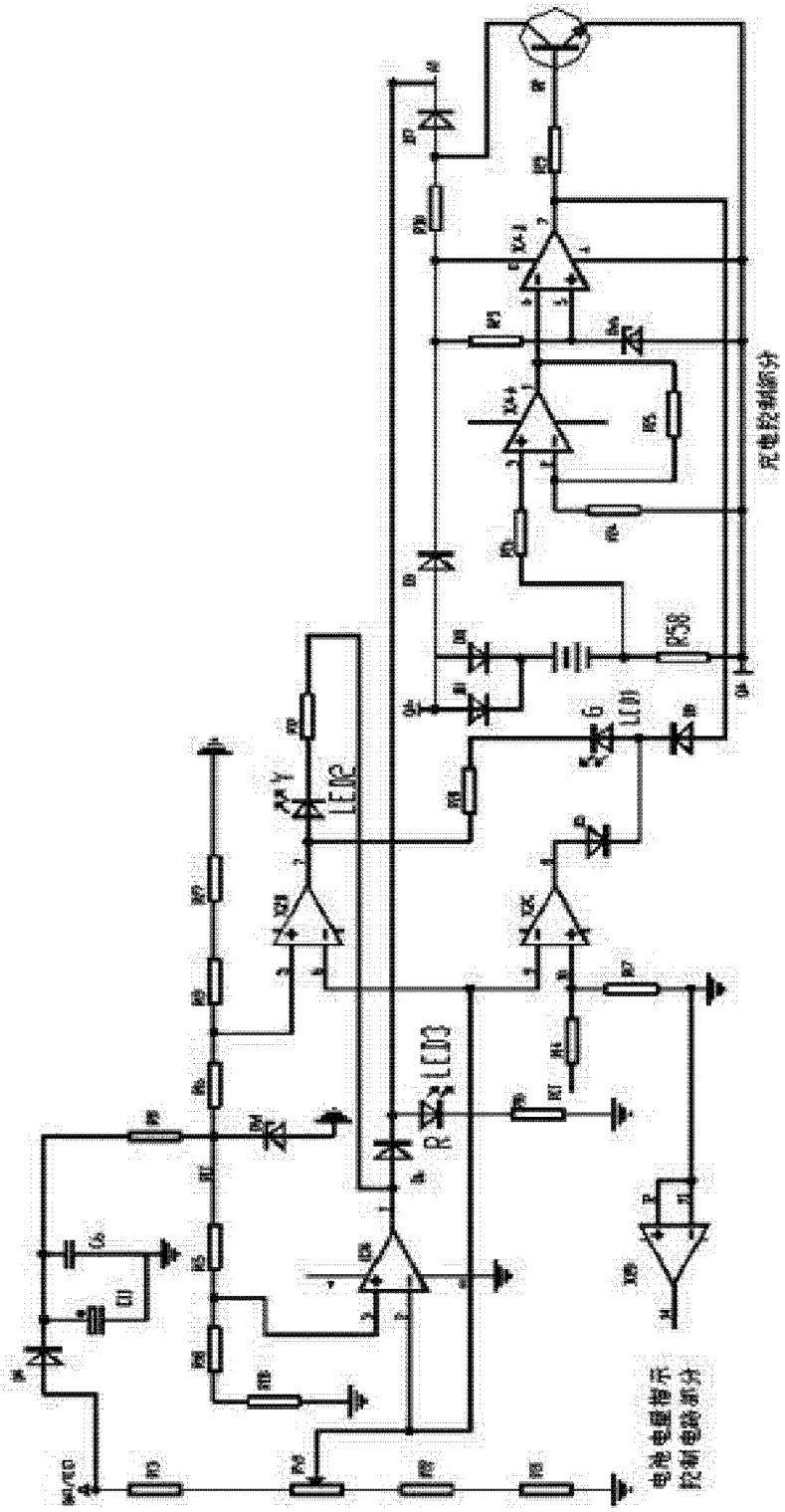


图 4

WINPLUS Ex. 1003, p. 659

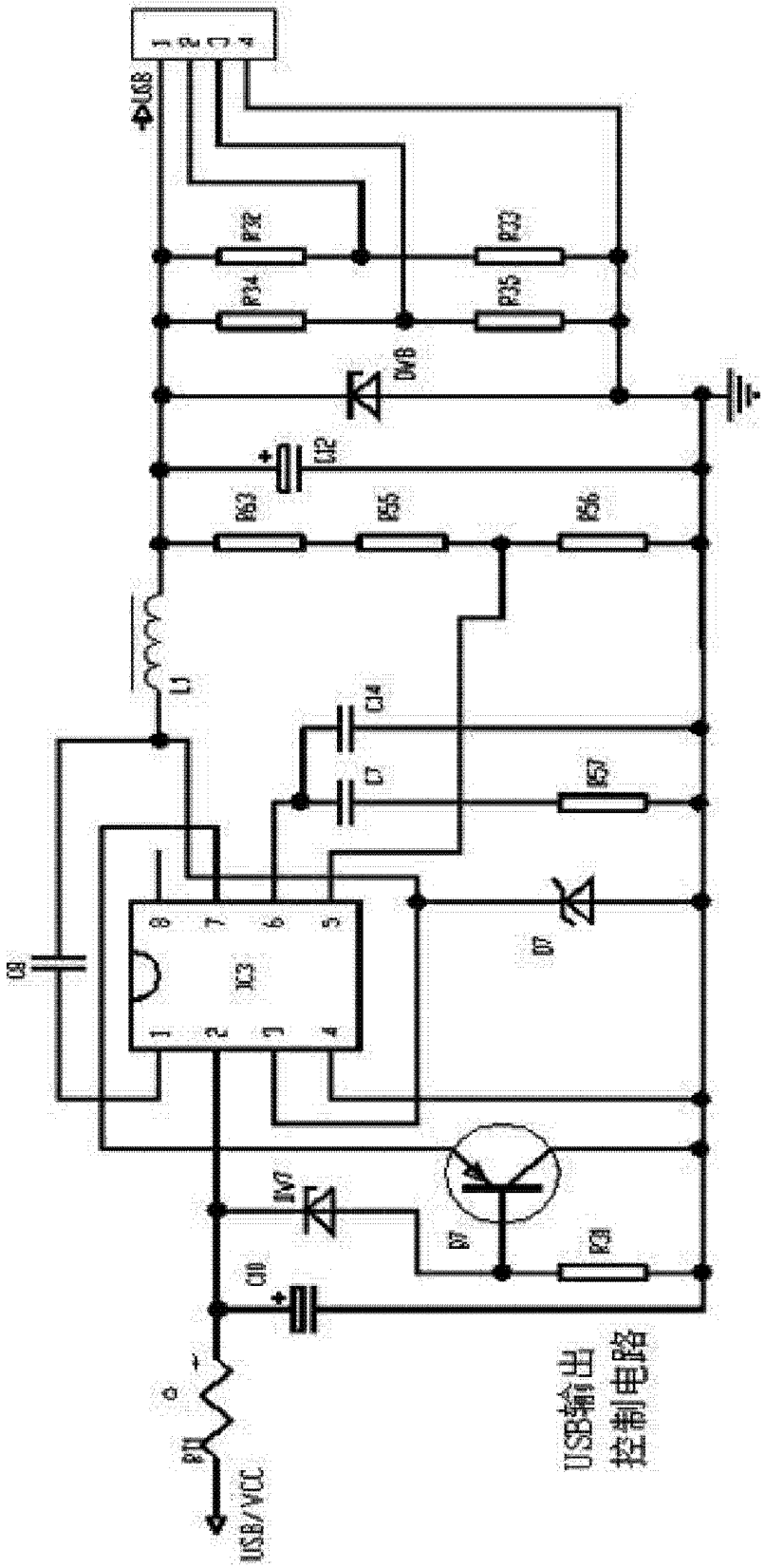


图 5

WINPLUS Ex. 1003, p. 660

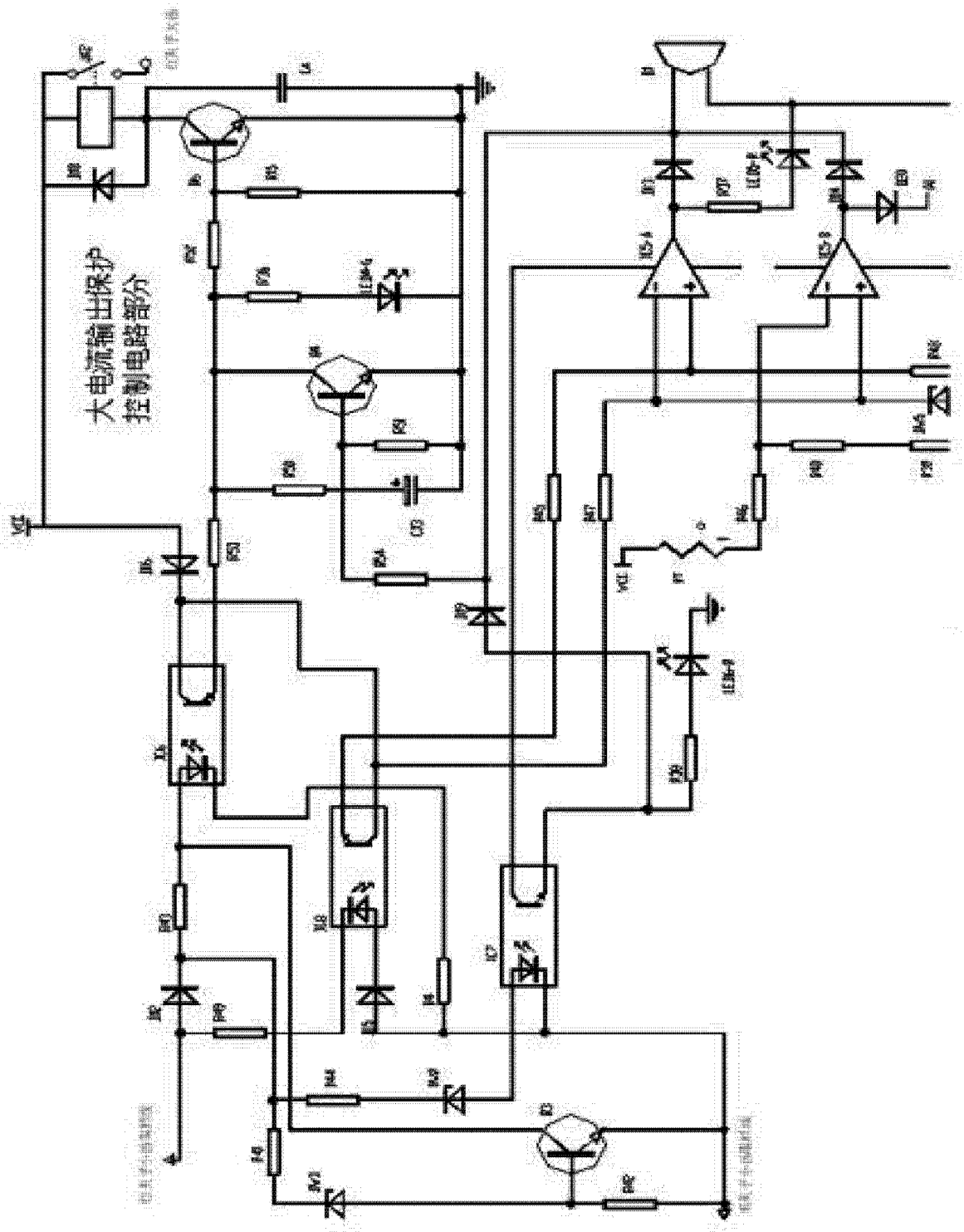


图 6

WINPLUS Ex. 1003, p. 661

Espacenet

Bibliographic data: CN202309139 (U) — 2012-07-04

Emergency power supply of ferric phosphate lithium battery

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Classification: **- international:** ***H02J7/00***
- cooperative:

Application number: CN201120416114U 20111027

Priority number(s): CN201120416114U 20111027

Abstract of CN202309139 (U)

The utility model relates to an emergency power supply of a ferric phosphate lithium battery. The emergency power supply comprises a ferric phosphate lithium battery group and a battery control circuit which are electrically connected, wherein the battery control circuit comprises a heavy-current output protective control circuit, a USB (universal serial bus) control circuit, a charging control circuit and a battery electric quantity indication control circuit which are successively and electrically connected, as well as an operating panel on-off control circuit which is electrically connected with the USB control circuit and the electric quantity indication control circuit, and an LED (light-emitting diode) lamp control circuit which is electrically connected with the operating panel on-off control circuit. The emergency power supply provided by the utility model fully utilizes the high-rate discharge capability of ferric phosphate lithium, has the advantages of longer service life, smaller volume, lighter weight and environmental friendliness, and has functions of transposition alarm, misconnection alarm, excess temperature alarm and over discharging alarm.

WINPLUS Ex. 1003, p. 662

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DESCRIPTION CN202309139

An emergency power supply for a lithium iron phosphate battery. The emergency power supply includes a circuit-connected lithium iron phosphate battery pack and a battery control circuit. The battery control circuit includes a circuit-connected large current output protection control circuit, a USB control circuit, a charging control circuit, and a battery. A power indication control circuit, an operation panel switch control circuit connected to the USB control circuit and the battery power indication control circuit, and an LED lamp control circuit connected to the operation panel switch control circuit. The utility model fully utilizes the high-rate discharge capacity of lithium iron phosphate to obtain a longer service life, smaller volume, lighter weight, environmental protection, and has functions of reverse connection alarm, wrong connection alarm, over temperature alarm and over discharge alarm.

Lithium iron phosphate battery emergency power supply

Technical field

The utility model relates to an emergency power supply of a lithium iron phosphate battery.

Background technique

At present, people's focus on emergency power supply (Jump Starter) is product maintenance time, discharge time, etc., and ignore the number of internal battery recycling of the product, and pay little attention to the use of environmental protection. At present, the international mainstream emergency power supply The built-in batteries are all lead-acid batteries. During the battery recycling process, heavy metal pollution and sulfuric acid leakage can easily cause air pollution. Lead can cause serious environmental pollution. It can affect the body 's nerves, hematopoiesis, digestion, urination, and reproduction. The sulfur dioxide formed by sulfuric acid produces acid rain on the earth and harms the environment in which all animals and plants live.

Utility model content

The utility model provides an emergency power supply for a lithium iron phosphate battery, which can better realize the function of a lead-acid battery, and can avoid pollution and increase the number of cycles.

In order to achieve the above object, the utility model provides a lithium iron phosphate battery emergency power supply and a lithium iron phosphate battery emergency power supply. The emergency power supply includes a circuit connected lithium iron phosphate battery pack and a battery control circuit.

The battery control circuit includes a high-current output protection control circuit, a USB control circuit, a charging control circuit and a battery power indication control circuit connected in sequence, and an operation panel switch connected to the USB control circuit and the battery power indication control circuit A control circuit, and an LED lamp control circuit whose circuit is connected to the operation panel switch control circuit.

The high-current output protection control circuit includes a circuit-connected work control circuit, a reverse connection alarm shutdown control circuit, a wrong connection alarm shutdown control circuit, an over-temperature alarm shutdown control circuit, and an over-discharge alarm shutdown control circuit.

The utility model fully utilizes the high-rate discharge capacity of lithium iron phosphate to obtain a longer service life, smaller volume, lighter weight, environmental protection, and has functions of reverse connection alarm, wrong connection alarm, over temperature alarm and over discharge alarm.

BRIEF DESCRIPTION

Figure 1 is a circuit block diagram of the utility model;

Figure 2 is a circuit diagram of the utility model;

3 to 6 are partially enlarged views of FIG. 2.

detailed description

The preferred embodiments of the present invention will be specifically described below based on FIGS. 1 to 6.

The utility model provides an emergency power supply of a lithium iron phosphate battery. The emergency power supply includes a circuit connected lithium iron phosphate battery pack and a battery control circuit.

As shown in FIGS. 1 and 2, the battery control circuit includes a large current output protection control circuit 103, a USB control circuit 104, a charge control circuit 105, and a battery power indication control circuit 106 that are sequentially connected to the circuit, and the circuit is connected to the The operation panel switch control circuit 101 of the USB control circuit 104 and the battery power indication control circuit 106, and the LED lamp control circuit 102 whose circuits are connected to the operation panel switch control circuit 101.

As shown in FIG. 3, it is a circuit diagram of the operation panel switch control circuit 101 and the LED lamp control circuit 102. The operation panel switch control circuit 101 mainly works together with the panel reset switch, so that the self-reset switch on the panel is locked and The function of disconnection; the LED emergency lighting lamp in the LED lamp control circuit 102 is a high-power ultra-bright LED lamp, which is controlled by the transistors Q3 and Q5.

In the figure, K1 and K2 are self-resetting membrane switches and are placed on the operation panel of the emergency power supply machine; the switch K1 is used to control the working power of the USB control circuit 104 and the working power of the battery power indication control circuit 106. When it is pressed for the first time, IC1 controls pin 1 to lock the output high level, making Q9 and Q10 turn on, and the relay pulls in to provide working power for the following circuit; when the K1 reset switch is pressed again, IC1 pin 1 Turning from high level to low level makes Q9 and Q10 enter the shutdown state at the same time, and the relay is released to disconnect the power supply. The working principle of switch K2 is basically the same as that of K1, except that the working control of the LED lamp is negative. That is, when K2 is pressed, IC13 pin 13 outputs a high level, Q3 is turned on, so that Q5 is turned on, and the LED lights. When the K2 reset switch is pressed again, pin 13 of IC1 outputs a low level, thereby turning off Q3 and Q5, and the LED turns off.

As shown in FIG. 4, it is a circuit diagram of the charging control circuit 105 and the battery power indication control circuit 106. The battery power indication control circuit 106 is used to detect the real-time remaining power of the battery by lighting LED lights of different colors (red, yellow, green) Indicates that the battery is in a different state of charge; the charging control circuit 105 controls the state of the charging process. When the battery is in the charging state (meaning the charge is not full), the red LED3 lights up, and when the charging is completed, the charging indicator green LED1 lights up. The red and green LEDs for charging instructions of the charging control circuit 105 are shared with the red and green LEDs of the battery power instruction control circuit 106.

When the switch K1 is pressed (as shown in Figures 2 and 3), the relay draws in and conducts (equivalent to the working power switch is turned on), at this time the BAT / TEST point is connected to the positive electrode of the battery, and the battery power indication control circuit 106 passes Take voltage samples from both ends of the battery and compare with the reference voltage to judge, and then indicate the remaining power of the battery at this time by lighting the indicator lights of different colors. Red (LED3) indicates that the battery voltage is less than or equal to 12.2VDC, prompting the user to charge the battery immediately; yellow (LED2) indicates that the battery voltage is between 12.2VDC and 12.7VDC, indicating that the battery is already under voltage, and the battery should be charged as soon as possible; Green (LED1) indicates that the battery is in good condition.

The charging control circuit 105 is used in conjunction with an external switching power supply charger (the external switching power supply charger provides a constant-voltage current-limiting charging power supply). The charging control circuit 105 amplifies the voltage drop generated by the sampling resistor R58 and then performs it with the reference voltage Compare and judge whether the battery is fully charged. When the battery is fully charged, the charging circuit current decreases, the voltage

generated on the resistor R58 decreases, the IC4 pin 7 outputs a high voltage, and Q2 is saturated and turned on, the red LED light LED3 (R) Off, and the green LED1 (G) lights up, indicating that the battery is fully charged.

D4 and D9 in the circuit are mainly used to protect the IC and transistor in the circuit from being damaged by breakdown when the polarity of the power supply is reversed.

As shown in FIG. 5, it is a circuit diagram of the USB control circuit 104. The USB control circuit 104 converts the 12VDC of the battery into a stable 5VDC regulated power supply, and then outputs it through a standard USB output socket, with a maximum output power of 10.5W. The circuit has protection functions such as automatic voltage stabilization and current limiting. It also has a low input voltage protection function to prevent permanent damage to the battery due to over-discharge. Mainly used for modern digital products to provide working power or battery charging.

When the switch K1 is turned on, the USB / VCC terminal obtains the operating voltage, and is connected to IC3 and the second pin through a self-recovery fuse RT1. The output of the third pin of IC3 is composed of the output circuit through the Schottky diode D7, the inductors L1 and C12 Connected to the USB output socket, IC5 pin 5 is the output sampling, and automatically controls the voltage stabilization function. Pin 7 of IC3 is the output control pin. The high level is turned on and the low level is turned off.

When the battery voltage is too low, the transistor Q7 turns on, making the 7th pin of IC3 change from high level to low level, thus shutting down the output to protect the battery.

As shown in FIG. 6, the high-current output protection control circuit 103 includes a circuit-connected work control circuit, a reverse connection alarm shutdown control circuit, a wrong connection shutdown control circuit, an over-temperature shutdown control circuit, and an over-discharge alarm shutdown control circuit .

This circuit is used as a high-current output clip control and protection circuit. It is mainly equipped with automatic connection when the external battery of the output clip is correct, protection when the positive and negative polarity of the external battery is reversed, and protection when the external voltage is too high (that is, it is connected to a 24V external battery When the battery is too low, the output protection is turned off when the internal battery output voltage is too low, and the output protection is turned off when the internal battery temperature is too high.

First, the small teeth of the red and black clips take out the signal samples and send them to the identification circuit mainly composed of IC6, IC7, IC8 for judgment, and the judgment results are isolated and converted. When the connection is correct, the transistor Q6 is turned on and the DC contact The device JK2 attracts and closes, and a large current is sent to the clip end through the DC contactor; when the polarity is reversed, the IC5-A comparator outputs a high voltage to achieve simultaneous sound and light alarm, and the transistor Q4 is saturated and turned on, so that the transistor Q6 Turn off, the DC contactor remains in the closed protection state. When the external voltage is too high, IC7 works, and the transistor Q4 is turned on through D19, so that the corresponding protection effect is also achieved. (The DC contactor is a normally open switching device.) When the voltage is too low, the IC5-B comparator outputs a high level to achieve audible and visual alarm functions. At the same time, Q4 is saturated and turned on, forcing off the large current output to achieve protection Function: When the battery temperature is too high, RT1 is disconnected, so that IC5-B outputs high level to achieve shutdown protection, the method is the same as above; low voltage alarm and over temperature alarm share LED3 (R) to indicate.

As shown in FIG. 6, the working principle of the high-current output protection control circuit 103 is as follows:

Working control circuit: when connected (normal operation), the red and black clips are clamped between the positive and negative poles of the external battery, the sampling signal is obtained through the red and black sampling lines in the clip, and the transistor Q6 is driven to work in a saturated state through the photocoupler IC6 , So that the normal working indicator LED4-G is lit, and the DC contactor JK2 works at the same time.

Reverse connection alarm shutdown control circuit: after detecting the reverse connection of the external battery in the red and black sampling lines in the clip, the photocoupler IC8 is driven through diode D15 to output high level (in the case of positive connection, due to the single To the conductivity, no electrical signal is provided to the photocoupler IC8, so it does not work), output high level through the comparator IC5-A, make it sound and light alarm (indicator LED5-R lights, buzzer B1 alarm), at the same time make the transistor Q4 turned on in a saturated state, the base voltage of the transistor Q6 is pulled down to make it cut off, so that the normal working indicator LED4-G goes out, and the DC contactor JK2 is opened for protection ;

Misconnected shutdown control circuit: when the red and black sampling lines in the clip detect that the wrong external battery is connected (12V battery should be connected, but 24V battery), then the voltage of the external battery is much higher than the internal iron phosphate The voltage of the lithium battery makes the transistor Q3 work in saturation state through the Zener diode DW3, pulls the low level, so that the optocoupler IC6 no longer works, and at the same time, the sampling line drives the

optocoupler IC7 working output through the Zener diode DW2 High level makes the transistor Q4 saturated and conducts, and lowers the level of the transistor Q6 base to make it work in the cut-off state, so that the normal working indicator LED4-G goes out, and the DC contactor JK2 is turned off for protection. ;

Over-temperature shutdown control circuit: The selected temperature sensor RT is normally closed. The detection range of this temperature sensor RT is 60 ± 5 ° C. Set the temperature sensor RT on the surface of the lithium iron phosphate battery. When the temperature is lower than the detection range, the circuit works according to the above type. Once the temperature exceeds the detection range, the sensor RT will change from normally closed to normally open, which is equivalent to the switch off On, at this time, the inverting input terminal of the IC5-B comparator changes from the normal high potential to the low potential, so that the output of the comparator changes from low level to high level, thereby realizing the forced shutdown output and the corresponding alarm prompt function , Played a protective role in lithium iron phosphate batteries.

Over-discharge alarm shutdown control circuit: Under the premise that the lithium iron phosphate battery operates within the detection temperature range, a battery voltage comparator IC5-B is designed in the circuit to use it to continuously monitor the two ends of the lithium iron phosphate battery Voltage. At the non-inverting input end of the comparator IC5-B, a voltage stabilizing diode DW5 (6C2) is used to stabilize its voltage at 6V as the reference voltage of the comparator, and the voltage at the inverting end changes according to the actual situation. When the lithium iron phosphate battery starts to discharge (starting the car, using other functions, and the battery's own power consumption), once the voltage at the inverting terminal is lower than the voltage at the non-inverting terminal, the output is high compared to the drive indicator LED3-R and the bee The buzzer B1 works, and at the same time, the transistor Q4 is turned on saturated to pull the base of the transistor Q6 to a low level to make it cut off, the normal working indicator LED4-G goes out, and the DC contactor JK2 is turned off and does not work. Protect the battery from damage.

In this embodiment, the main component models in the circuit:

IC1 is: integrated block TC4013B; IC2 is: integrated block LM324; IC3 is: integrated block ACT4070YH; IC4, IC5 are: integrated block LM358; IC6, IC7, IC8 are: integrated block 817B; RT is: normally closed temperature Controller; RT1 is: self-recovery fuse; JK1 is: 12V / 3A relay; JK2 is: high current switch to control the DC contactor.

This new application uses a lithium iron phosphate battery, which is 4 times longer than traditional lead-acid battery products. After 2000 charges and discharges, it can reach 82% of the original design capacity; most of the lithium iron phosphate battery is iron, less Part of lithium, gold, silver, copper, tin, so in terms of environmental pollution, is very low, and because of this, lithium iron phosphate is an environmentally friendly product; lithium iron phosphate batteries have a strong discharge capacity, lithium batteries 1C discharge, (1C = 1 hour rate rated capacity (AH); For example: 8AH battery 1C = 8A), can release 100% of the designed capacity; the same discharge capacity, the lithium battery is smaller, lighter in weight and faster in charging speed .

Although the content of the present invention has been described in detail through the above preferred embodiments, it should be recognized that the above description should not be considered as a limitation of the present invention. After a person skilled in the art reads the above, various modifications and substitutions to the present invention will be apparent. Therefore, the protection scope of the present invention should be defined by the appended claims.

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CLAIMS CN202309139

1.

An emergency power supply for a lithium iron phosphate battery is characterized in that the emergency power supply includes a circuit connected lithium iron phosphate battery pack and a battery control circuit.

2.

The emergency power supply for a lithium iron phosphate battery according to claim 1, wherein the battery control circuit includes a high-current output protection control circuit (103), a USB control circuit (104), and a charging control circuit connected in sequence (105) and a battery power indication control circuit (106), an operation panel switch control circuit (101) connected to the USB control circuit (104) and the battery power indication control circuit (106), and a circuit connected to the operation panel switch The LED lamp control circuit (102) of the control circuit (101).

3.

The emergency power supply for a lithium iron phosphate battery according to claim 2, wherein the high-current output protection control circuit (103) includes a circuit-connected work control circuit, a reverse connection alarm shutdown control circuit, and a wrong connection alarm shutdown Break control circuit, over temperature alarm shutdown control circuit and over discharge alarm shutdown control circuit.

(19)中华人民共和国国家知识产权局

(12)实用新型专利

(10)授权公告号 CN 203933073 U
(45)授权公告日 2014.11.05

(21)申请号 201420212173.5

(22)申请日 2014.04.28

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(51)Int.Cl.
H02J 7/00(2006.01)

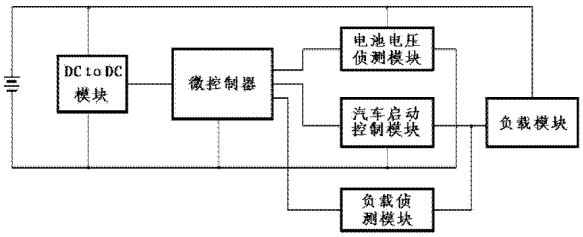
权利要求书1页 说明书3页 附图2页

(54)实用新型名称

一种新型汽车充电器

(57)摘要

本实用新型公开了一种新型汽车充电器，包括直流电压，直流电压正极同时连接为DCtoDC模块的一端、电池电压侦测模块的一端和负载模块的一端，电池负极同时连接DCtoDC模块的另一端、微控制器的一端、汽车启动控制模块的一端和电池电压侦测模块的另一端，所述DCtoDC模块的第三端连接微控制器的另一端，所述微控制器的其他三端分别连接电池电压侦测模块的第三端、汽车启动控制模块的另一端和负载侦测模块的一端，所述负载侦测模块的另一端同时连接汽车启动控制模块的第三端和负载模块的另一端。本实用新型通过微处理器模块经由负载侦测线路判断汽车电瓶是否接上，检测直流电压是否低压，保护电路，功能齐全，值得推广。



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1. 一种新型汽车充电器，包括直流电源，其特征在于，直流电源正极同时连接为 DC to DC 模块的一端、电池电压侦测模块的一端和负载模块的一端，直流电压负极同时连接 DC to DC 模块的另一端、微控制器的一端、汽车启动控制模块的一端和电池电压侦测模块的另一端，所述 DC to DC 模块的第三端连接微控制器的另一端，所述微控制器的其他三端分别连接电池电压侦测模块的第三端、汽车启动控制模块的另一端和负载侦测模块的一端，所述负载侦测模块的另一端同时连接汽车启动控制模块的第三端和负载模块的另一端；所述负载模块位于汽车的一端，所述负载模块包括汽车电瓶和汽车发动机。

2. 根据权利要求 1 所述的一种新型汽车充电器，其特征在于，所述 DC to DC 模块包括二极管 D1、电阻 R1、电容 C1、HT7530 稳压管、电容 C2 和电容 C3，所述二极管 D1 的正极与电池的正极连接，二极管 D1 的负极通过电阻 R1 同时连接电容 C1 的一端和 HT7530 稳压管 IN 端口，所述 HT7530 稳压管的 OUT 端口同时连接电容 C2 的一端、电容 C3 的一端和微控制器 U2 的 VDD 端口，所述电容 C1 的另一端、电容 C2 的另一端、电容 C3 的另一端和 HT7530 稳压管的 GND 端口同时接地和电池负极；所述微控制器 U2 的 R1 端口通过串联的发光二极管 L1 和电阻 R12 连接电池负极，微控制器 U2 的 B1 端口连接汽车启动控制模块的 EN 端口，微控制器 U2 的 VO 端通过并联的电容 C4 和电阻 R7 连接电池负极，VO 端还通过滑动变阻器 RT 连接 VDD 端口，微控制器 U2 的 V1 端口通过并联电阻 10、电容 C6 和电阻 R13 也连接电池负极，V1 端口通过电阻 R2 连接电池正极，V1 端口还通过电阻 R9 同时连接汽车电瓶负极和汽车发动机，所述汽车电瓶两端还并联有电容 C7，电阻 R9、电阻 10、电容 C6 和电阻 R13 一起组成负载侦测模块，微控制器 U2 的 V4 端口通过电容 C5 接地，微控制器 U2 的 VSS 端口与电容 C4 的一端同时接地，所述电容 C4 的另一端连接微控制器 U2 的 VDD 端口，所述电阻 R2、电容 C6 和电阻 R13 一起组成电池电压侦测模块，所述汽车启动控制模块的 Drive 端口同时连接汽车发动机和电阻 R14 的一端，电阻 R14 的另一端接地。

3. 根据权利要求 1 所述的一种新型汽车充电器，其特征在于，所述 DC to DC 模块为微控制器提供稳定电压，所述微控制器采集相关数据进行对应控制，所述电池电压侦测模块进行电池电压的量测，所述汽车启动控制模块经由微控制器对负载模块进行供电或断电，所述负载侦测模块检测负载模块是否正确接上。

4. 根据权利要求 1 所述的一种新型汽车充电器，其特征在于，所述电池电压侦测模块为供电电池提供保护。

5. 根据权利要求 1 所述的一种新型汽车充电器，其特征在于，在待机状态下，直流电源的电压低于可供电状态时，微控制器关闭所有输出，直流电源的电压高于可供电状态时恢复工作。

6. 根据权利要求 1 所述的一种新型汽车充电器，其特征在于，所述汽车启动控制模块为电子开关。

WINPLUS Ex. 1003, p. 670

一种新型汽车充电器

技术领域

[0001] 本实用新型汽车充电装置，具体是一种新型安全电源快速充电的汽车充电器。

背景技术

[0002] 汽车充电给是驾车出行爱车人士和商务人士一项大事，其技术的成熟度是制约汽车充电器推广应用的关键因素之一，但现在的汽车充电器普遍存在无法自动侦测是否已接负载，侦测电极与汽车电瓶是否接反，侦测汽车发电机或电瓶是否有逆电流，侦测电池状态是否适合做大电流发电等问题，因此，本实用新型提供了一种新型安全电源快速充电的汽车充电器以解决上述问题，使汽车充电安全快速成熟且可推广。

发明内容

[0003] 本实用新型的目的在于提供一种新型安全电源快速充电的汽车充电器，以解决上述背景技术中提出的问题。

[0004] 为实现上述目的，本实用新型提供如下技术方案：一种新型汽车充电器，包括直流电源，直流电源正极同时连接为DC to DC模块的一端、电池电压侦测模块的一端和负载模块的一端，直流电压负极同时连接 DC to DC 模块的另一端、微控制器的一端、汽车启动控制模块的一端和电池电压侦测模块的另一端，所述 DC to DC 模块的第三端连接微控制器的另一端，所述微控制器的其他三端分别连接电池电压侦测模块的第三端、汽车启动控制模块的另一端和负载侦测模块的一端，所述负载侦测模块的另一端同时连接汽车启动控制模块的第三端和负载模块的另一端；所述负载模块位于汽车的一端，所述负载模块包括汽车电瓶和汽车发动机。

[0005] 作为本实用新型进一步的方案：所述 DC to DC 模块为微控制器提供稳定电压，所述微控制器采集相关数据进行对应控制，所述电池电压侦测模块进行电池电压的量测，所述汽车启动控制模块经由微控制器对负载模块进行供电或断电，所述负载侦测模块检测负载模块是否正确接上，所述负载模块包括汽车电瓶或是汽车发电机。

[0006] 作为本实用新型进一步的方案：电路对负载模块供电采用电子开关，可以对产品做更多的保护或缩小产品尺寸和降低材料成本。

[0007] 作为本实用新型进一步的方案：所述电池电压侦测模块为供电电池提供保护，防止直流电源放电造成毁损。

[0008] 作为本实用新型进一步的方案：所述负载侦测模块防止使用者不当操作。

[0009] 作为本实用新型进一步的方案：在待机状态下，直流电源的电压低于可供电状态时，微控制器关闭所有输出，直流电源的电压高于可供电状态时恢复工作。

[0010] 作为本实用新型进一步的方案：汽车启动控制模块为电子开关。

[0011] 与现有技术相比，本实用新型的有益效果是：

[0012] 1. 本实用新型的负载供电采用电子开关控制，这部分可以对产品做更多的保护以及缩小产品尺寸跟降低材料成本。

WINPLUS Ex. 1003, p. 671

[0013] 2. 本实用新型的电池侦测可做低电压保护，防止电池过放电造成损坏。

[0014] 3. 本实用新型的负载侦测，可以防止使用者不正当操作，如极性接反，造成汽车或直流电源损坏。

[0015] 4. 本实用新型采用负载异常电压回流保护，当侦测异常电压时，关闭汽车启动线路，以保护电池。

[0016] 5. 本实用新型具有快速充电功能，且可根据人们使用需要进行固定安装或便携式移动。

[0017] 6. 本实用新型的自动侦测模块可自动检测是否已经接上负载，侦测电极与汽车电瓶是否接反，侦测汽车发电机是否有逆充电流，侦测电池状态是否适合做大电流放电，保护负载和电路，功能齐全。

附图说明

[0018] 图 1 为安全智能汽车应急电源的原理框图；

[0019] 图 2 为安全智能汽车应急电源的电路图。

[0020] 图中：1-DC to DC 模块、2- 微控制器、3- 电池电压侦测模块、4- 汽车启动控制模块、5- 负载侦测模块、6- 负载模块、7- 直流电源。

具体实施方式

[0021] 下面将结合本实用新型实施例中的附图，对本实用新型实施例中的技术方案进行清楚、完整地描述，显然，所描述的实施例仅仅是本实用新型一部分实施例，而不是全部的实施例。基于本实用新型中的实施例，本领域普通技术人员在没有做出创造性劳动前提下所获得的所有其他实施例，都属于本实用新型保护的范围。

[0022] 请参阅图 1，一种新型汽车充电器，包括直流电源，直流电源正极同时连接为 DC to DC 模块的一端、电池电压侦测模块的一端和负载模块的一端，直流电压负极同时连接 DC to DC 模块的另一端、微控制器的一端、汽车启动控制模块的一端和电池电压侦测模块的另一端，所述 DC to DC 模块的第三端连接微控制器的另一端，所述微控制器的其他三端分别连接电池电压侦测模块的第三端、汽车启动控制模块的另一端和负载侦测模块的一端，所述负载侦测模块的另一端同时连接汽车启动控制模块的第三端和负载模块的另一端；所述负载模块位于汽车的一端，所述负载模块包括汽车电瓶和汽车发动机。

[0023] 请参阅图 2，所述 DC to DC 模块包括二极管 D1、电阻 R1、电容 C1、HT7530 稳压管、电容 C2 和电容 C3，所述二极管 D1 的正极与电池的正极连接，二极管 D1 的负极通过电阻 R1 同时连接电容 C1 的一端和 HT7530 稳压管 IN 端口，所述 HT7530 稳压管的 OUT 端口同时连接电容 C2 的一端、电容 C3 的一端和微控制器 U2 的 VDD 端口，所述电容 C1 的另一端、电容 C2 的另一端、电容 C3 的另一端和 HT7530 稳压管的 GND 端口同时接地和电池负极；所述微控制器 U2 的 R1 端口通过串联的发光二极管 L1 和电阻 R12 连接电池负极，微控制器 U2 的 B1 端口连接汽车启动控制模块的 EN 端口，微控制器 U2 的 VO 端通过并联的电容 C4 和电阻 R7 连接电池负极，VO 端还通过滑动变阻器 RT 连接 VDD 端口，微控制器 U2 的 V1 端口通过并联电阻 10、电容 C6 和电阻 R13 也连接电池负极，V1 端口通过电阻 R2 连接电池正极，V1 端口还通过电阻 R9 同时连接汽车电瓶负极和汽车发动机，所述汽车电瓶两端还并联有电容 C7，

WINPLUS Ex. 1003, p. 672

电阻 R9、电阻 10、电容 C6 和电阻 R13 一起组成负载侦测模块，微控制器 U2 的 V4 端口通过电容 C5 接地，微控制器 U2 的 VSS 端口与电容 C4 的一端同时接地，所述电容 C4 的另一端连接微控制器 U2 的 VDD 端口，所述电阻 R2、电容 C6 和电阻 R13 一起组成电池电压侦测模块，所述汽车启动控制模块的 Drive 端口同时连接汽车发动机和电阻 R14 的一端，电阻 R14 的另一端接地。

[0024] 本实用新型中所述 DC to DC 模块为微控制器提供稳定电压，所述微控制器采集相关数据进行对应控制，所述电池电压侦测模块进行电池电压的量测，所述汽车启动控制模块经由微控制器对负载模块进行供电或断电，所述负载侦测模块检测负载模块是否正确接上。

[0025] 本实用新型中微控制器经负载侦测模块判断汽车电瓶和汽车发动机是否接上，当负载接对后，汽车启动控制模块会自动开启，电池开始对负载模块供电；假设负载没接上或是正负极性接反，汽车启动控制模块会自动关闭，电池停止对负载模块供电。在待机状态，当电池电压低于 9V 时，微控制器关闭所有输出，只有电池电压高于 10V 才会恢复正常工作；汽车启动后，汽车发动机会产生正常电压对电池进行回充，当回充电压大于电池启动供电前的电压，立即关闭汽车启动控制模块，以免电池受到正常电压充电造成损害；汽车启动控制模块为电子开关，可以防止负载接反和正常电压回充，进而对电池进行保护以及延长寿命。

[0026] 汽车启动后，汽车发动机会产生异常电压对直流电源进行回充，当回充电压大于直流电源启动供电前的电压，立即关闭汽车启动控制模块，以避免直流电源受到异常电压充电造成损坏。

[0027] 对于本领域技术人员而言，显然本实用新型不限于上述示范性实施例的细节，而且在不背离本实用新型的精神或基本特征的情况下，能够以其他的具体形式实现本实用新型。因此，无论从哪一点来看，均应将实施例看作是示范性的，而且是非限制性的，本实用新型的范围由所附权利要求而不是上述说明限定，因此旨在将落在权利要求的等同要件的含义和范围内的所有变化囊括在本实用新型内。不应将权利要求中的任何附图标记视为限制所涉及的权利要求。

[0028] 此外，应当理解，虽然本说明书按照实施方式加以描述，但并非每个实施方式仅包含一个独立的技术方案，说明书的这种叙述方式仅仅是为清楚起见，本领域技术人员应当将说明书作为一个整体，各实施例中的技术方案也可以经适当组合，形成本领域技术人员可以理解的其他实施方式。

WINPLUS Ex. 1003, p. 673

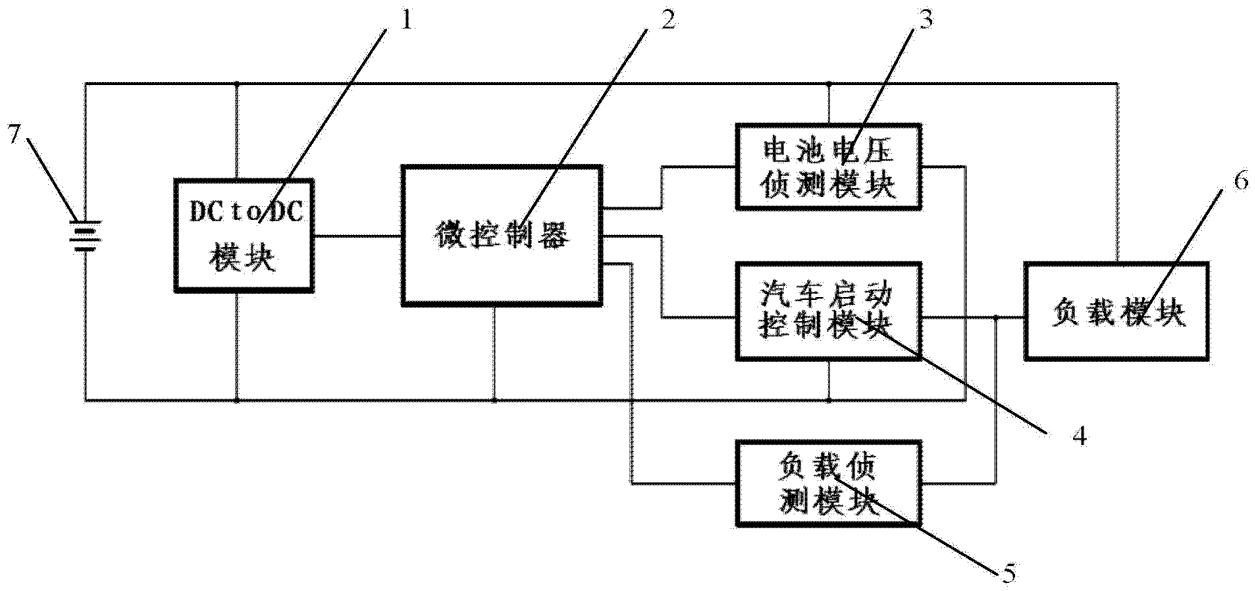

图 1

WINPLUS Ex. 1003, p. 674

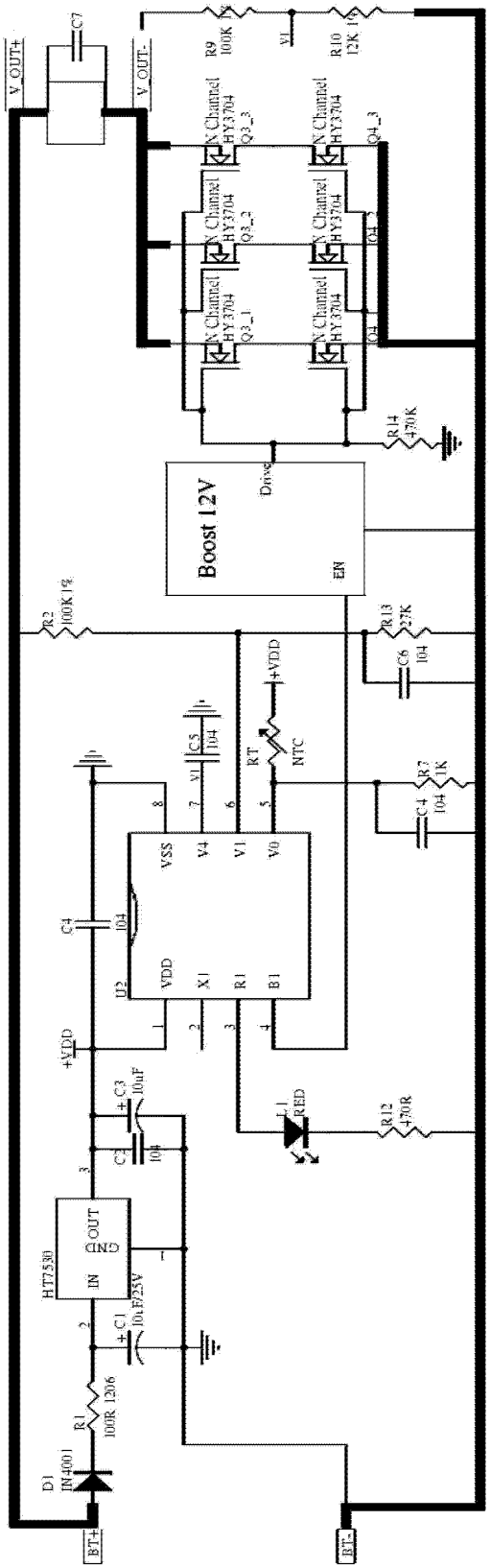

图 2

WINPLUS Ex. 1003, p. 675

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CERTIFICATION

This is to certify that annexed is a true copy from the records of this office of the patent application as originally filed which is identified hereunder:

Application No.: 201420212173.5
Application type: Utility model patent
Title of the Invention: Novel automobile charger
Filing Date: April 28, 2014
Applicant: WANG, Xining
Inventors or designers: WANG, Xining

Commissioner: [signature: SHEN Changyu]
SHEN Changyu

June 24, 2015

1. A novel automobile charger, comprising a direct current (DC) power supply, characterized in that a positive electrode of the DC power supply is simultaneously connected to one end of a DC to DC module, one end of a battery voltage detection module, and one end of a load module, a DC voltage negative electrode is simultaneously connected to another end of the DC to DC module, one end of a microcontroller, one end of an automobile start control module, and another end of the battery voltage detection module, a third end of the DC to DC module is connected to another end of the microcontroller, other three ends of the microcontroller are respectively connected to a third end of the battery voltage detection module, another end of the automobile start control module and one end of a load detection module, another end of the load detection module is simultaneously connected to a third end of the automobile start control module and another end of the load module; the load module is located at one end of an automobile, and the load module comprises an automobile storage battery and an automobile engine.

2. The novel automobile charger according to claim 1, characterized in that the DC to DC module comprises a diode D1, a resistor R1, a capacitor C1, an HT7530 voltage stabilizing tube, a capacitor C2 and a capacitor C3, a positive electrode of the diode D1 is connected to a positive electrode of a battery, a negative electrode of the diode D1 is simultaneously connected to one end of the capacitor C1 and an IN port of the HT7530 voltage stabilizing tube via the resistor R1, an OUT port of the HT7530 voltage stabilizing tube is simultaneously connected to one end of the capacitor C2, one end of the capacitor C3 and a VDD port of the microcontroller U2, another end of the capacitor C1, another end of the capacitor C2, another end of the capacitor C3 and a GND port of the HT7530 voltage stabilizing tube are grounded and connected to a negative electrode of the battery at the same time; an R1 port of the microcontroller U2 is connected to the negative electrode of the battery via a light-emitting diode L1 and a resistor R12 connected in series, a B1 port of the microcontroller U2 is connected to an EN port of the automobile start control module, a VO end of the microcontroller U2 is connected to the negative electrode of the battery via a capacitor C4 and a resistor R7 connected in parallel, the VO end is further connected to a VDD port via a slide rheostat RT, a V1 port of the microcontroller U2 is also connected to the negative electrode of the battery by means of connecting a resistor 10, a

capacitor C6 and a resistor R13 in parallel, the Vl port is connected to the positive electrode of the battery via a resistor R2, the Vl port is further connected to the negative electrode of the automobile storage battery and the automobile engine via a resistor R9, two ends of the automobile storage battery are also connected with a capacitor C7 in parallel, the resistor R9, a resistor 10, the capacitor C6 and a resistor R13 together form the load detection module, a V4 port of the microcontroller U2 is grounded via a capacitor C5, a VSS port of the microcontroller U2 and one end of the capacitor C4 are grounded at the same time, another end of the capacitor C4 is connected to a VDD port of the microcontroller U2, the resistor R2, the capacitor C6 and the resistor R13 form the battery voltage detection module, a Drive port of the automobile start control module is simultaneously connected to the automobile engine and one end of a resistor R14, and another end of the resistor R14 is grounded.

3. The novel automobile charger according to claim 1, characterized in that the DC to DC module provides a stable voltage for the microcontroller, the microcontroller collects relevant data for corresponding control, the battery voltage detection module measures battery voltages, the automobile start control module power on or power off the load module via the microcontroller, and the load detection module detects whether the load module is correctly connected.

4. The novel automobile charger according to claim 1, characterized in that the battery voltage detection module provides protection for a power supply battery.

5. The novel automobile charger according to claim 1, characterized in that in a standby state, when a voltage of the DC power supply is lower than that in a power supply state, the microcontroller turns off all outputs, and resumes work when the voltage of the DC power supply is higher than that in the power supply state.

6. The novel automobile charger according to claim 1, characterized in that the automobile start control module is an electronic switch.

NOVEL AUTOMOBILE CHARGER

Technical Field

[0001] The present utility model is related to an automobile charging device, in particular to a novel safe automobile charger for quick charging a power supply.

Background Art

[0002] Automobile charging is a big issue of traveling by automobile for those automobile fans and businessmen, the maturity of the technology thereof is one of the critical factors restricting the application of automobile chargers. However, current automobile chargers have common problems of not able to automatically detect whether a load is connected, whether an electrode is connected with an automobile storage battery reversely, whether an automobile engine or a storage battery has a reverse current, whether the battery state is suitable for heavy current power generation, and so on. Accordingly, the present utility model provides a novel safe automobile charger for quick charging a power supply, so as to solve the problems mentioned above, thus making the automobile charging safe, quick, mature and propagable.

Summary of the Utility Model

[0003] One object of the present utility model is to provide a novel safe automobile charger for quick charging a power supply in order to solve the technical problems mentioned in the background art.

[0004] To achieve the above object, the present utility model provides the following technical solution: a novel automobile charger comprises a direct current (DC) power supply, a positive electrode of the DC power supply is simultaneously connected to one end of a DC to DC module, one end of a battery voltage detection module, and one end of a load module, a DC voltage negative electrode is simultaneously connected to another end of the DC to DC module, one end of a microcontroller, one end of an automobile start control module, and another end of the battery voltage detection module, a third end of the DC to DC module is connected to another end of the microcontroller, other three ends of the microcontroller are respectively connected to a third end of the battery voltage detection module, another end of the automobile start control module and one end of a load detection module, another end of the load detection module is simultaneously connected to a third end of the automobile start control module and another end

of the load module; the load module is located at one end of an automobile, and the load module comprises an automobile storage battery and an automobile engine.

[0005] As a further solution of the present utility model, the DC to DC module provides a stable voltage for the microcontroller, the microcontroller collects relevant data for corresponding control, the battery voltage detection module measures battery voltages, the automobile start control module power on or power off the load module via the microcontroller, and the load detection module detects whether the load module is correctly connected, and the load module comprises an automobile storage battery and an automobile engine.

[0006] As a further solution of the present utility model, an electronic switch is used by the circuit to supply power to the load module, which can provide more protection to the product or reduce product size and material cost.

[0007] As a further solution of the present utility model, the battery voltage detection module provides protection for the power supply battery to prevent damages caused by the discharge of the DC power supply.

[0008] As a further solution of the present utility model, the load detection module prevents improper operation by a user.

[0009] As a further solution of the present utility model, in a standby state, when a voltage of the DC power supply is lower than that in a power supply state, the microcontroller turns off all outputs, and resumes work when the voltage of the DC power supply is higher than that in the power supply state.

[0010] As a further solution of the present utility model, the automobile start control module is an electronic switch.

[0011] Compared with the existing technologies, the present utility model has the following beneficial effects:

1. The present utility model employs an electronic switch to control the supply power for the load, this part can offer more protection for the product, and reduce the product size and the material cost.

[0012] 2. The battery detection of the present utility model can provide low voltage protection to prevent damages caused by the over-discharging of the battery.

[0013] 3. The load detection of the present utility model can prevent improper operations by a user, such as connections with reversed polarity, which may cause damages to the automobile or the DC power supply.

[0014] 4. The present utility model employs the voltage backflow protection for abnormal load; in the case where an abnormal voltage is detected, the automobile start line can be shut down to protect the battery.

[0015] 5. The present utility model has a fast charging function, and can be installed fixedly or moved portably according to the use requirements of people.

[0016] 6. The automatic detection module of the present utility model can automatically detects whether the load is connected, whether the electrodes are connected to an automobile storage battery reversely, whether an automobile engine has a reverse current, whether the battery state is suitable for heavy current power generation, and the like, thereby protecting the load and the circuit. Hence, it has full functions.

Brief Description of the Drawings

[0017] Fig. 1 is a block diagram for the principle of a safe and intelligent emergency power supply for an automobile.

Fig. 2 is a circuit diagram for the safe and intelligent emergency power supply for an automobile.

[0018] In the figures: 1- DC to DC module, 2- microcontroller, 3- battery voltage detection module, 4- automobile start control module, 5- load detection module, 6- load module, 7- direct current (DC) power supply.

Description of the Embodiments

[0019] The technical solutions of the present utility model will be described more clearly and fully in conjunction with drawings in the embodiments of the present utility model. Apparently, the described embodiments are merely a part of the embodiments of the present utility model, not all the embodiments of the present utility model. Based on these embodiments of the present utility model, all other embodiments obtained by a person of ordinary skill in the art without creative efforts fall within the scope of protection of the present utility model.

[0020] With reference to Fig. 1, a novel automobile charger comprises a direct current (DC) power supply, a positive electrode of the DC power supply is simultaneously connected to

one end of a DC to DC module, one end of a battery voltage detection module, and one end of a load module, a DC voltage negative electrode is simultaneously connected to another end of the DC to DC module, one end of a microcontroller, one end of an automobile start control module, and another end of the battery voltage detection module, a third end of the DC to DC module is connected to another end of the microcontroller, other three ends of the microcontroller are respectively connected to a third end of the battery voltage detection module, another end of the automobile start control module and one end of a load detection module, another end of the load detection module is simultaneously connected to a third end of the automobile start control module and another end of the load module; the load module is located at one end of an automobile, and the load module comprises an automobile storage battery and an automobile engine.

[0021] With reference to Fig. 2, the DC to DC module comprises a diode D1, a resistor R1, a capacitor C1, an HT7530 voltage stabilizing tube, a capacitor C2 and a capacitor C3, a positive electrode of the diode D1 is connected to a positive electrode of a battery, a negative electrode of the diode D1 is simultaneously connected to one end of the capacitor C1 and an IN port of the HT7530 voltage stabilizing tube via the resistor R1, an OUT port of the HT7530 voltage stabilizing tube is simultaneously connected to one end of the capacitor C2, one end of the capacitor C3 and a VDD port of the microcontroller U2, another end of the capacitor C1, another end of the capacitor C2, another end of the capacitor C3 and a GND port of the HT7530 voltage stabilizing tube are grounded and connected to a negative electrode of the battery at the same time; an R1 port of the microcontroller U2 is connected to the negative electrode of the battery via a light-emitting diode L1 and a resistor R12 connected in series, a B1 port of the microcontroller U2 is connected to an EN port of the automobile start control module, a VO end of the microcontroller U2 is connected to the negative electrode of the battery via a capacitor C4 and a resistor R7 connected in parallel, the VO end is further connected to a VDD port via a slide rheostat RT, a V1 port of the microcontroller U2 is also connected to the negative electrode of the battery by means of connecting a resistor 10, a capacitor C6 and a resistor R13 in parallel, the Vl port is connected to the positive electrode of the battery via a resistor R2, the Vl port is further connected to the negative electrode of the automobile storage battery and the automobile engine via a resistor R9, two ends of the automobile storage battery are also connected with a capacitor

C7 in parallel, the resistor R9, a resistor 10, the capacitor C6 and a resistor R13 together form the load detection module, a V4 port of the microcontroller U2 is grounded via a capacitor C5, a VSS port of the microcontroller U2 and one end of the capacitor C4 are grounded at the same time, another end of the capacitor C4 is connected to a VDD port of the microcontroller U2, the resistor R2, the capacitor C6 and the resistor R13 form the battery voltage detection module, a Drive port of the automobile start control module is simultaneously connected to the automobile engine and one end of a resistor R14, and another end of the resistor R14 is grounded.

[0022] In the present utility model, the DC to DC module provides a stable voltage for the microcontroller, the microcontroller collects relevant data for corresponding control, the battery voltage detection module measures battery voltages, the automobile start control module power on or power off the load module via the microcontroller, and the load detection module detects whether the load module is correctly connected.

[0023] In the present utility model, the microcontroller determines whether the automobile storage battery is connected to the automobile engine through the load detection module. The automobile start control model can be automatically activated and the battery starts to supply power to the load module when the load is correctly connected. The automobile start control model can be automatically deactivated and the battery stops supplying power to the load module when the load is not connected or the positive and negative electrodes are reversely connected. In the standby state, the microcontroller shuts down all outputs when the battery voltage is lower than 9 V, and resumes the normal operation only when the battery voltage is higher than 10 V. The automobile engine can generate a normal voltage to back-charge the battery after the automobile starts. When the back-charging voltage is higher than the voltage before the battery starts the power supply, the automobile start control module is deactivated immediately to protect the battery from damages caused by charging with the normal voltage. The automobile start control module is an electronic switch, which can prevent the load from being reversely connected and back-charging with the normal voltage, thereby protecting the battery and prolonging the service life thereof.

[0024] The automobile engine can generate abnormal voltage to back-charge the direct current power supply after the automobile starts. The automobile start control module is deactivated immediately when the back-charging voltage is higher than the voltage before the

direct current power supply starts the power supply, so as to protect the direct current power supply from damages caused by charging with an abnormal voltage.

[0024] It would be obvious to a person skilled people in the art that the present utility model is not merely limited to the details of the above exemplary embodiments, and the present utility model can be implemented in other specific forms without departing from the sprits or basic features of the present utility model. Thus, no matter to consider from which point of view, the embodiments should be considered as exemplary and non-limiting. The scope of the present utility model is defined by the appended claims rather than the above descriptions. Therefore it is intended that all the changes within the meanings and scope of the equivalent elements of the claims are covered by the present utility model. Any drawing reference in the claims should not be regarded as limiting the related claims.

[0025] Moreover, it should be understood that although the description is provided based on the embodiments, not every embodiment includes only an independent technical solution. This manner of description of the present utility model is only for clarity, therefore a person skilled in the art should take the description as a whole, and the technical solutions in various embodiments can be combined appropriately to form other implementations that can be understood by a person skilled in the art.

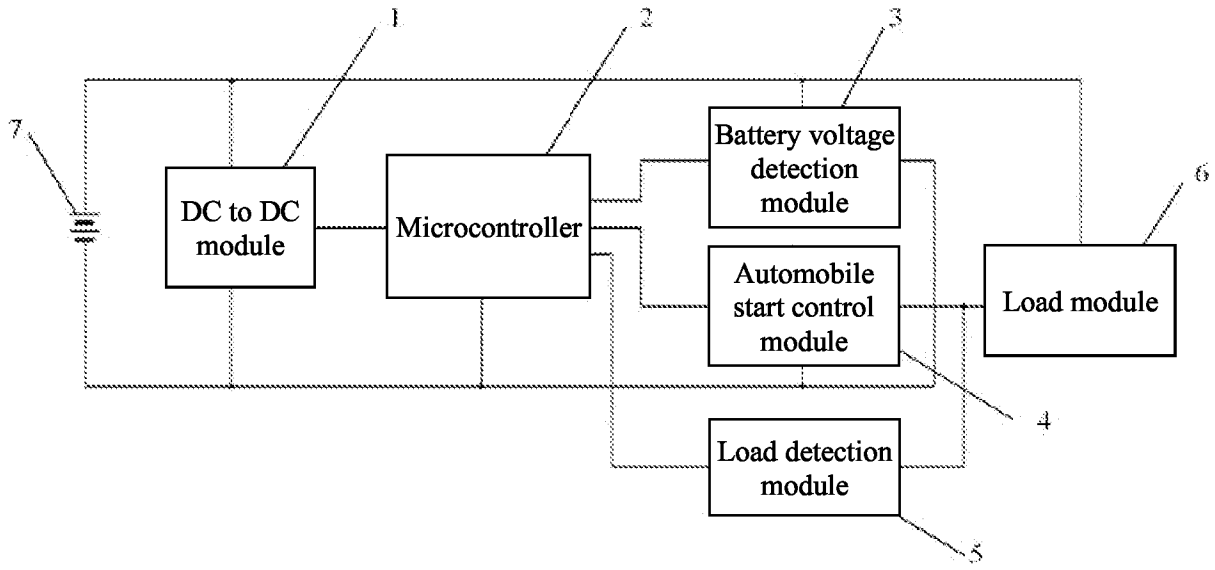
1
2
3
7
DC to DC module
Microcontroller
Battery voltage detection module
Automobile start control module
Load module
6
4
Load detection module
5

Fig. 1

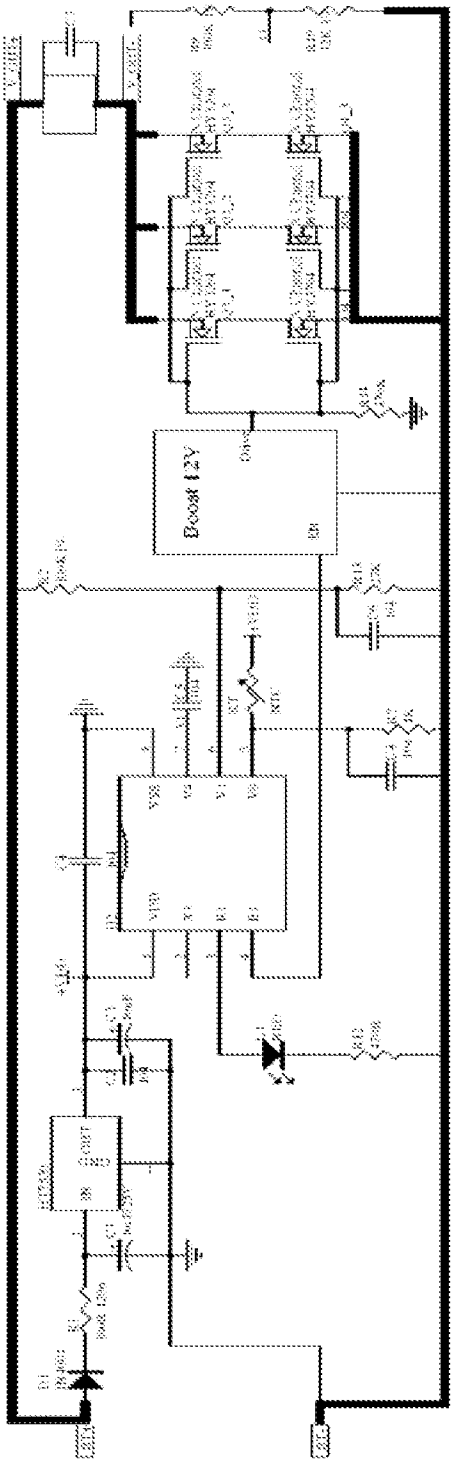

Fig. 2

(19)中华人民共和国国家知识产权局

(12)实用新型专利

(10)授权公告号 CN 202696190 U
(45)授权公告日 2013.01.23

(21)申请号 201220235980.X

(22)申请日 2012.05.23

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(51)Int.Cl.
H02J 7/00(2006.01)
G01R 19/165(2006.01)
G01R 31/02(2006.01)

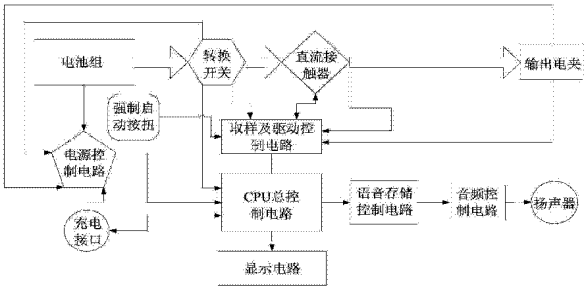
权利要求书 1 页 说明书 7 页 附图 4 页

(54)实用新型名称

一种自带语音提示功能的智能型应急启动电源

(57)摘要

本实用新型公开一种自带语音提示功能的智能型应急启动电源，包括有电池组，电池组的供电端连接有转换开关，转换开关通过直流接触器连接至输出电夹，还包括有 CPU 总控制电路，该 CPU 总控制电路的输出端连接有音频播放系统；CPU 总控制电路的输入端连接有取样及驱动控制电路，该取样及驱动控制电路与转换开关、直流接触器及输出电夹相连；电池组通过电源控制电路与充电接口相连，电源控制电路与充电接口连接至 CPU 总控制电路；输出电夹及转换开关分别与电源控制电路相连；CPU 总控制电路的输出端还连接有显示电路；取样及驱动控制电路连接有强制启动按钮。该应急启动电源在不同的使用环境下，都能够及时准确地向用户传递相关操作信息。



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1. 一种自带语音提示功能的智能型应急启动电源，包括有电池组，该电池组的供电端连接有转换开关，转换开关通过直流接触器连接至输出电夹，其特征在于，

还包括有 CPU 总控制电路，该 CPU 总控制电路的输出端连接有音频播放系统；

所述 CPU 总控制电路的输入端连接有取样及驱动控制电路，该取样及驱动控制电路与转换开关、直流接触器及输出电夹相连；

所述电池组通过电源控制电路与充电接口相连，电源控制电路与充电接口连接至 CPU 总控制电路；

所述输出电夹及转换开关分别与电源控制电路相连；

所述 CPU 总控制电路的输出端还连接有显示电路；

所述取样及驱动控制电路连接有强制启动按钮。

2. 根据权利要求 1 所述的一种自带语音提示功能的智能型应急启动电源，其特征在于，所述音频播放系统包括语音存储控制电路，该语音存储控制电路的输入端连接于 CPU 总控制电路，其输出端连接于音频控制电路，音频控制电路与扬声器相连。

3. 根据权利要求 1 所述的一种自带语音提示功能的智能型应急启动电源，其特征在于，所述显示电路包括 LED 数码管显示器和不同颜色的 LED 指示灯。

WINPLUS Ex. 1003, p. 688

一种自带语音提示功能的智能型应急启动电源

技术领域

[0001] 本实用新型涉及应急启动电源，尤其涉及一种自带语音提示功能的智能型应急启动电源。

背景技术

[0002] 12V/24V 转换应急启动电源在不同的使用环境下，单靠人为控制操作难以做到百分之百正确。在没有任何保护和提示的前提下，任何出现一次误操作都将可能给产品带来永久损坏，严重时甚致可导致电池爆炸，危及到用户的人身财产安全。虽然现有的部分产品设有操作指导说明和一些简单的声光报警功能，但由于简单的蜂鸣器报警和使用的磨损导致操作提示内容的缺损或模糊，使应急启动电源缺少必要的安全指示，同时也给用户操作出现问题后却无法及时找到原因而困惑。如果在用户每一项操上同时增加必要的语音提示和光电指示，这样既能减少不同环境给用户带来的影响，同时也能及时地直接告知用户实时的操作状况，更能有效地预防失误的产生，让用户操作更直接、更清楚。因此，有必要对现有应急启动电源的结构进行优化。

实用新型内容

[0003] 本实用新型的目的是提供一种自带语音提示功能的智能型应急启动电源，用语音对用户的当前操作给予提示，以减少误操作，使应急启动电源在操作时得到安全防护，延长其使用寿命。

[0004] 本实用新型为解决其技术问题所采用的技术方案是，

[0005] 一种自带语音提示功能的智能型应急启动电源，包括有电池组，该电池组的供电端连接有转换开关，转换开关通过直流接触器连接至输出电夹，还包括有 CPU 总控制电路，该 CPU 总控制电路的输出端连接有音频播放系统，该音频播放系统包括有语音存储控制电路，语音存储控制电路的输入端连接于 CPU 总控制电路，其输出端连接于音频控制电路，音频控制电路与扬声器相连；

[0006] 所述 CPU 总控制电路的输入端连接有取样及驱动控制电路，该取样及驱动控制电路与转换开关、直流接触器及输出电夹相连；所述电池组通过电源控制电路与充电接口相连，电源控制电路与充电接口连接至 CPU 总控制电路；所述输出电夹及转换开关分别与电源控制电路相连；所述 CPU 总控制电路的输出端还连接有显示电路，该显示电路包括 LED 数码管显示器和不同颜色的 LED 指示灯；所述取样及驱动控制电路连接有强制启动按钮。

[0007] 本实用新型的优点在于，该应急启动电源可对档位选择、正确连接、错误连接和电压过低或电压过高等进行安全保护，同时在充电档位选择、电池低压预警、输出过流保护、电夹输出短路保护以及人为强制启动安全提示等方面都加入相应的语音提示和光电提示；在不同的使用环境下，都能够及时准确地向用户传递相关操作信息，使用户通过声、光等不同类型的提示方式获取操作信息，使用户更加直观地了解实时的操作情况及使用错误的原因，便于更好地进行下一步操作或及时有效地纠正措施，确保使用者的人身安全，使整个产

WINPLUS Ex. 1003, p. 689

品更具人性化、智能化。

附图说明

[0008] 图 1 是本实用新型提出的应急启动电源的电气原理图；

[0009] 图 2 是电源控制电路图；

[0010] 图 3 是是 CPU 总控制电路及 LED 数码管显示器电路图；

[0011] 图 4 是语音存储及音频控制电路图；

[0012] 图 5 是取样及驱动控制电路图。

具体实施方式

[0013] 为了使本实用新型实现的技术手段、创作特征、达成目的与功效易于明白了解，下面结合图示与具体实施例，进一步阐述本实用新型。

[0014] 如图 1 所示，本实用新型提出的自带语音提示功能的智能型应急启动电源包括有电池组，该电池组的供电端连接有转换开关，转换开关通过直流接触器连接至输出电夹，还包括有 CPU 总控制电路，该 CPU 总控制电路的输出端连接有音频播放系统，该音频播放系统包括有语音存储控制电路，语音存储控制电 路的输入端连接于 CPU 总控制电路，其输出端连接于音频控制电路，音频控制电路与扬声器相连；

[0015] 所述 CPU 总控制电路的输入端连接有取样及驱动控制电路，该取样及驱动控制电路与转换开关、直流接触器及输出电夹相连；所述电池组通过电源控制电路与充电接口相连，电源控制电路与充电接口连接至 CPU 总控制电路；所述输出电夹及转换开关分别与电源控制电路相连；所述 CPU 总控制电路的输出端还连接有显示电路，该显示电路包括 LED 数码管显示器和不同颜色的 LED 指示灯；所述取样及驱动控制电路连接有强制启动按钮。

[0016] 目前汽车电池主要分为 12V 和 24V 两种，在电路设计中以 0VDC ～ 15.5VDC 以内默认为是 12VDC 电池；以 15.5 ～ 30.0VDC 内默认为是 24VDC 电池。转换开关将两个电池实现并联或串联两种方式，使之能够实现一机两个电压输出的功能。同时在转换开关上镶入两个联动小开关，联动开关与 12V 档和 24V 档保持同步，即转换开关在 12V 或 24V 档时，联动开也同步闭合，在 OFF 档时，联动开关也自动断开，用于实现外部连接信号的输入或断开等判断。

[0017] 该应急启动电源利用大功率直流接触器作为自动控制电子开关，通过电路进行控制其通和断两种状态，同时电路在吸合后判断直流接触器两端电压降，作为判断输出电夹是否出现短接的条件之一。

[0018] 应急启动电源分别从电池组两端、电夹小齿、转换开关输出端、直流接触器两端、充电接口、内部电压测试复位开关、强制启动按扭等关键点分别取样送至 CPU 总控制电路处理、判断，从而得知用户的操作信息后，将对应的脉冲信号发到语音存储控制电路，调取预先保存好的语音内容，再经过音频控制电路功率放大后，由场声器发出相应的语音信息。该应急启动电源可对档位选择、正确连接、错误连接和电压过低或过高等进行安全保护，同时在充电档位选择、电池低压预警、输出过流保护、电夹输出短路保护以及人为强制启动安全提示等方面都加入相应的语音提示和光电提示。语音清晰、响亮，发音标准，在 40dB 噪声环境下，声音有效传输距离在 5 米以上。语音种类除了标准的英语提示外还预备另外两个

WINPLUS Ex. 1003, p. 690

语种，即法语和西班牙语，用户可直接通过简单的按键任意切换，提高产品的通用性。

[0019] 在一个实施例中，该应急启动电源的电路构成如图2、图3、图4、图5所 示。本实施例中，该应急启动电源采用的主要关键器件有：IC1-7805 三端集成稳压器、IC2-MC96F32Q 单片机、IC3-BLA4208 语音存储集成芯片、IC4-TDA2822 集成音频功放、LS1- 全频段扬声器 2W/8 欧、LED-LG5631AH 七段数码管显示器、IC5（IC6）-PC817 光耦、IC7-LM358 集成运放、大功直流接触器、大电流转换开关（12/24V 档切换用）、联动开关、强制启动按钮、输出正、负极电夹。

[0020] 本实施例中，该应急启动电源可实现的主要功能有：

[0021] 1、应急启动电源转换开关操作时 12V/24V 档位自动识别提示，对应的档位语音提示及 LED3/LED4 点亮指示；

[0022] 2、应急启动电源电池低压自动报警提示，当电池电压低于 8.0 ≤ U ＜ 10.0V 时，语音自动报警提示；

[0023] 3、应急启动电源电池电压过低自动关断保护及提示，当电池电压持续低于 8V 时，应急启动电源自动关断电夹输出回路，同时发出低压关断保护语音提示；

[0024] 4、输出电夹正确连接导通提示，正确连接时自动吸合导通，并带语音提示及 LED4 灯点亮提示；

[0025] 5、输出电夹连接极性反向错误关断保护和提示，输出电夹极性接反时，直流接触器产关断保护，同时发出相应的语音信息提示及反接指示 LED7 灯点亮提示，同时数码管闪烁显示错误代码“Er1”信息；

[0026] 6、输出电夹连接电压错误关断保护和提示，即，内外连接的电池电压不匹配，一般指 12V 与 24V 电池对接错误或 24V 接外部电压高于 30.0V 的电池，应急启动电源自动发出错误连接语音信息提示和错接指示 LED6 灯点亮提示，同时数码管闪烁显示错误代码“Er2”信息；

[0027] 7、输出电夹过载关断保护和提示，当输出电夹出现电流过大时，自动关断而保护，应急启动电源发出相应的语音信息提示及数码管闪烁显示过载保护代码“P1”信息；

[0028] 8、输出电夹短路自动关断保护和提示，在吸合导通下，当输出电夹再次出现短接时，自动关断输出而保护，同时发出相应的语音信息提示及数码管闪烁显示短路保护代码“P2”信息；

[0029] 9、充电档位提示及充电状态指示，转换款应急启动电源充电仅现于 12V 档充电，即要把两电池并联后再一起充电，以确保两电池的充电电压平衡，即， 插入充电器后，如转换开关不在 12V 档位时，应急启动电源自动发出语音信息提示，同时充电指示灯也不会点亮，直到档位选择正确为止，正在充电指示灯 LED2 点亮、充电结束时 LED1 点亮；

[0030] 10、强制启动输出功能，当外部没有电池电压输入或输入电压信号过低，应急启动电源无法正常自动识别时，通过人为判断并正确可靠连接后，按下强制启动按扭，使应急启动电源强制吸合导通。当按下强制启动按开关后，应急启动电源自动发出安全预警信息语音和数码管同步显示“10—9—8—.....0”倒数时间计数提示信息给用户，提醒用户注意外接负载的极性和安全工作电压，需要持续按下 10s 后，应急启动电源才自动吸合，确保用户有足够的时间再对连接进行安全确认。

[0031] 本实施例中，语音存储控制电路中存储的语音内容如下（以英文版为例）：

WINPLUS Ex. 1003, p. 691

[0032] A. 12V

[0033] B. 24V

[0034] C. Low voltage, recharging recommended

[0035] D. Power is connected

[0036] E. Wrong Voltage

[0037] F. Wrong Polarity

[0038] G. Recharging ON, Turn the switch at back to 12V

[0039] H. charge immediately

[0040] I. Overload

[0041] J. Short Circuit

[0042] 其具体工作过程如下：

[0043] 1、当转换开关由 OFF 档转入 12V 或 24V 档位时，转换开关将电池组并联或串联后的电压送至直流接触器的输入端，同时“OUT+”端有高电平（OUT+ 取样点实际连接于直流接触器的输入端，“BAT/ 外部”连接于直流接触器的输出端），并通过二极管 D1、限流电阻 R1 和稳压二极管 DW1 限压后，由电阻 R2 驱动开关管 Q1，使继电器 JK1 吸合导通；电池 BAT+ 电压经过二极管 D4 加入三稳集成稳压器 7805 的输入端，使 3 脚输出一个稳定的 5VDC 电压给 CPU 及其他电路供电；

[0044] 当外部电夹正确连接且电压大于 1.5V 时，“BAT/ 外部”端电压经过二极管 D6 后，同样也加到开关管 Q1 的基极使继电器吸合导通，从而使 7805 进入正常工作状态；同理，当充电接口“CH+”接入电源时，7805 也进入正常工作状态。

[0045] 2、单片机上电工作后，首先检测转换开关是否打开，当“OUT+”端检测到电压 < 15.5VDC 时再与单电池正极“BAT1+”端取到的电压进行对比，当两个参考点的电压基本相同时，CPU 默认此时转换开关已置于 12V 档位；反之，当该点电压≥ 15.5V 且与“BAT1+”端的电压值相差较大时，CPU 默认转换开关已置于 24V 档；确定好档位后，单片机由 P52 端口或 P53 端口输出高电平，驱动对应的档位指示灯 LED3 或 LED4 点亮；同时由 P21 端口或 P23 端口输出一个脉冲信号驱动语音芯片，提取对应的语音信息经功放、扬声器等器件将对应的档位信息报告给用户；

[0046] 当单片机检测到“OUT+”的电压过低时，12V 档电压低于 10.0VDC（24V 档电压低于 20.0VDC）时，应急启动电源自动默认为电池已经溃电，不宜再使用，应及时补充电量；单片机 P16 脚将自动循环输出脉冲信号给语音存储芯片，提取低压报警提示语音，并通过扬声器及时地把低压信息报告给用户；同时将自动关断所有负载，即关闭点烟器和直流接触器的输出；

[0047] 当单片机检测到“UOT+”的电压为 0V，同时在“OUT+/ 外部”端检测到一定的正电压时，则表示应急启动电源的转换开关没有开，只是用户将输出电夹与外部电池已正确连接上；时此，应急启动电源默认用户想通过 JS 的数显电压表去测试外部电池电压，即单片机自动将从“OUT+/ 外部”端读到的实际电压值通过数码管显示出来；

[0048] 当单片机检测到“UOT+”的电压为 0V，同时在“CH+”端检测到充电器有接入电压时，表示此时转换开关没有开，只是充电器已接入，此时单片机自动将输出一个脉冲信号给语音存储芯片，提取充电档位置限制提示语音，告诉用户充电时请将转换开关置于 12V 档，

WINPLUS Ex. 1003, p. 692

如转换开关在其他档位时，单片机将自动循环输出触发信号，直到用户将转换开关转到正确的12V档位为止；当应急启动电源进入正常充电后，单片机通过检测取样电阻R31上的压降进行判断，当充电电流小于300mA时该电阻上的压降为0.03V，表示充电结束，反之则表示正在充电，当LED2点亮表示正在充电，当LED1点亮时表示充电结束。

[0049] 3、启动，其工作原理如下：

[0050] 3.1、12V档正确连接导通和提示：转换开产置于12V档，单片机检测到“OUT+”点和“BAT1+”点的电压均在12V档范围内时，应急启动电源自动报12V档位提示语音；同时外部12V电池两端电压分两路取样，一路接入直流接触器的输端，使单片机在“BAT+/外部”点检到12V档范围内的有效电压值；另一路通过电夹小齿取样、电夹线内部导线接至控制板的“J1”端口，使正接信号通过R5、D8和IC5进行转换后，将外部正接信号“RIGHT-Ctrl”送至单片机的P13端口，单片机判断应急启动电源已转到12V档，同时电夹已经正确可靠连接，此时单片机再向直流接触器控制电路输出高电平使其吸合导通，并向语音芯片发送一个脉冲信号提取正确连接及导通提示语音，将正确连接接信息及时地告诉用户；其他指示：12V档位指示灯点亮；对应的正确连接指示灯点亮提示；数码管自动显示内、外池电并联后的综合电压值。

[0051] 3.2、12V档极性反向连接保护和提示：转换开关转到12V档，相应的档位检测和提示内容同上；同时外部12V（或24V）电池两端电压通过电夹小齿取样、电夹线内部导线接至控制板的“J1”端口，使反接信号通过D9、IC6和R5进行转换后，将外部反接信号“Reverse-Ctrl”送至单片机的P12端口，单片机判断应急启动电源已转到12V档，同时检测到外部电池极性接反，此时直流接触器将保持断开状态，并向语音芯片连续发送脉冲信号提取反接提示语音信息，并将反接信息及时地告诉用户；其他指示：12V档位指示灯点亮；反接报警指示灯LED7点亮；数码管显示反接错误代码“Er1”闪烁。

[0052] 3.3、12V档外接电压过高错误保护和提示：转换开关转到12V档，相应的检测和提示内容同上；同时电夹从外部电池两端电压接入直流接触器的输端，使单片机在“BAT+/外部”点检到此时连接的电池电压已超出“12V”的安全范围内时，单片机直接默认外接电池电压与应急启动电源所选择的档位不匹配，直流接触器保持关闭保护；并向语音芯片连续发送脉冲信号提取电压错误连接提示语音信息，并将错接信息及时地告诉用户；其他指示：12V档位指示灯点亮；电压错误连接报警指示灯LED6点亮；数码管显示反接错误代码“Er2”闪烁。

[0053] 3.4、24V档正确连接导通和提示：转换开产置于24V档，单片机检测到“OUT+”点和“BAT1+”点的电压相关较大，应属于24V档位。应急启动电源自动报24V档位提示语音；同时外部24V电池两端电压分两路取样，一路接入直流接触器的输端，使单片机在“BAT+/外部”点检到24档范围内的有效电压值；中一路通过电夹小齿取样、电夹线内部导线后接至控制板的“J1”端口，使正接信号通过R5、D8和IC5进行转换后，将外部正接信号“RIGHT-Ctrl”送至单片机的P13端口，单片机判断应急启动电源已转到24V档，同时电夹已经正确可靠连接，此时单片机再向直流接触器控制电路输出高电平使其吸合导通，并向语音芯片发送一个脉冲信号提取正确连接及导通提示语音，将正确连接接信息及时地告诉用户；其他指示：24V档位指示灯点亮；对应的正确连接指示灯点亮提示；数码管自动显示内、外池电并联后的综合电压值。

WINPLUS Ex. 1003, p. 693

[0054] 3.5、24V 档极性反向连接保护和提示：转换开关转到 24V 档，相应的档位检测和提示内容同上；同时外部 24V（或 12V）电池两端电压通过电夹小齿取样、电夹线内部导线后接至控制板的“J1”端口，使反接信号通过 D9、IC6 和 R5 进行转换后，将外部反接信号“Reverse-Ctrl”送至单片机的 P12 端口，单片机判断应急启动电源已转到 24V 档，同时检测到外部电池极性接反，此时直流接触器将保持断开状态，并向语音芯片连续发送脉冲信号提取反接提示语音信息，并将反接信息及时地告诉用户；其他指示：24V 档位指示灯点亮；反接报警指示灯 LED7 点亮；数码管显示反接错误代码“Er1”闪烁。

[0055] 3.6、24V 档外接电压过低（或过高，超过 30.0V 时）错误保护和提示：转换开关转到 24V 档，相应的档位检测和提示内容同上；同时电夹从外部电池两端电压接入直流接触器的输端，使单片机在“BAT+/ 外部”点检到此时连接的电池电压已超出“24V”的安全范围内时，如外部电压低于 15.5V 或高于 30.0V 时，单片机直接默认外接电池电压与应急启动电源所选的档位不匹配，直流接触器保持关闭保护。并向语音芯片连续发送脉冲信号提取电压错误连接提示语音信息，并将错接信息及时地告诉用户；其他指示：24V 档位指示灯点亮；电压错误连接报警指示灯 LED6 点亮；数码管显示反接错误代码“Er2”闪烁。

[0056] 4、启动过载自动关断保护：当应急启动电源在启动的瞬间，整过启动系统中产生很大电流，应急启动电源通过从黑电夹小齿上取样，读取黑电夹的大齿到内部电池负极之间的压降，通过黑电夹小齿、内部信号线送到“J1”端口，再 经过 D0、IC7 等电路放大后，将过流信号“OVERLOAE-TEST”送到单片机的 P11 端口，当该电压值在一定时间内持续高于某一设定值（预先测试出黑电夹大齿到电池负极端子之间的电阻，参考应急启动电源电池最大放电能力计算出过流保护的参考电压值）时，应急启动电源就默认外部连接负载过重，已超出整个系统最大承受范围时，单片机切断直流接触器控制信号，使直流接触器强制关断输出；单片机同时向语音存片提取对应的过流保护提示语音信息，并将信息及时告知用户；其他指示：数码管显示过流保护代码“P1”闪烁。

[0057] 5、电夹输出短路自动关断保护：当应急启动电源在吸合导通后电夹出现短路时，整过启动系统中产生很大电流，应急启动电源同样通过从黑电夹小齿上取样，读取黑电夹的大齿到内部电池负极之间的压降，通过黑电夹小齿、内部信号线送到“J1”端口，再经过 D0、IC7 等电路放大后，将过流信号“OVERLOAE-TEST”送到单片机的 P11 端口；同时单片机判断直流接触器两端“OUT+”和“BAT/ 部外”两点之间压差，当这两个电压值在一定时间内持续高于某一设定值时，应急启动电源就默认外部电夹连接出现短路故障；单片机将立即切断直流接触器控制信号，使直流接触器强制关断输出；单片机同时向语音存片提取对应的短路保护提示语音信息，并将信息及时告知用户；其他指示：数码管显示过流保护代码“P2”闪烁。

[0058] 6、强制启动输出：当外部电池电压过低或没有电池时，用户可以先将转换开关打开到所需的电压档位（此时相应的档位检测和提示内容同上），再将正、负极电夹分别接到负载的输入电源正、负极上，注意电夹的大小齿同时可靠连接，并确认负载所需电源与应急启动电源转换开关选择的电压档位一致后；按持续按下强制启开关，强制启动开关将“J3”端口短接，使内部 5V 电源通过电阻 R15、R16 分压取样后，送至单片机的第 P25 端口，单片机将自动开始计时，并向语音芯片提取强制启动语音安全提示，持续按下 10S 后，单片机将自动发出接通指令，使直流接触器强制吸合导通；当应急启动电源在动自吸合之前（10S 内）

WINPLUS Ex. 1003, p. 694

出现连接异常(如、反接、高压错接)时,单片机将自动判断强制启动操作无效,需要排除故障后恢复;确保用户的操作安全;其他提示:按下此开关后,在 10s 内数码管显示“10s 倒数计时器”闪烁,吸合导通后,应急启动电源将发出正确导通语音提示,同时正确连接提示灯 LED5 点亮。

[0059] 7、语音控制电路工作原理:首先把所有的功能语音以 PCM 压缩模式存入语音存储芯片中,语音芯片选用 BLA 系列的 BLA4208 芯片,该芯片总共支持语音长度为 42s,最多可存储 30 段不同的语音内容;语音的读取是通过 S1-S8 共 8 个单独触发引脚控制,同时还支持不同引脚以不同的组合方式进行触发,使其能够支持 30 段语音触发的需要;再通过 CPU 控制任意提取每一段语音内容,通过第 8 脚输出语音信号,经过音频功放 IC4 放大后,直接驱动扬声器 SL1 发音;语音触发信号为高电平有效,单片机每发出一个脉冲触发信号,语音芯片将自动提取一次相应的语音内容进行播报;当触发为持续高电平时,芯片将自动循环播报相同语音内容。

[0060] 8、取样电路及控制电路工作原理:如图 5 所示,J1 为正、负极电夹小齿取样信号输入端,当外部正接时,电压通过电阻 R5、D8 及 IC5 进行转换后,将 AD 信号送入单机的第 P31 端口,作为判断外部电夹是否正接或断开的依据;当外接电池电压极性反向时,单片机无法直接读取“BAT/ 外部”端的负压,而通过 J1、D9、IC6、R5 进行转换后,将反接信号送入单片机的第 P12 端口,作为判断外部电夹连接极性反向依据;当输出电夹线出现负载电流过大时,大电流将会在负极电夹线上产生一定压降,这个电压将通过负极电夹的小齿取出送至 D0、R11 和 IC7 放大后送入单片机的第 P11 脚进行判断,当检测到该电压在 1s 内持续大于某一设定值时,单片机就默认为外接负载过重,立即关断直流接触器进行保护;同理,当检测到该电压值在瞬间内高于另一设定值,同时又分别从直流接触器两端检测到的压降也大于某一设定值时,应急启动电源就自动默认为输出电夹存在短路现象,立即关断直流接触器而保护;

[0061] J5 为充电电源接入端;J6 为内输出电压检测和外部电压检测输入端,同时也是直流接触器两端压降的取样点;J7 为直流接触器控制线圈接口;其中由主要元件 R25、R26、Q2、JK2、RT1 组成点烟器输出控制电路;由主要元件 R29、R30、Q3 组成蜂鸣器报警控制电路;由主要元件 R27、R28、Q3 组成直流接触器控制电路;由主要元 R17、R18、R31、C25、C21 组成充电电源取样及充电电流取样电路,用于判断充电器的接入以及充电状态的检测;由主要元件 R19、R20、R21、R22、R23、R24、C22、C23、C20 组成了内、外电池电压取样电路及转换开关档位判断取样电路;由主要元件 LED、Q5、Q6、Q7 等组成数码显 示控制电路。

[0062] 以上显示和描述了本实用新型的基本原理、主要特征和本实用新型的优点。本行业的技术人员应该了解,本实用新型不受上述实施例的限制,上述实施例和说明书中描述的只是说明本实用新型的原理,在不脱离本实用新型精神和范围的前提下本实用新型还会有各种变化和改进,这些变化和改进都落入要求保护的本实用新型范围内。本实用新型要求保护范围由所附的权利要求书及其等同物界定。

WINPLUS Ex. 1003, p. 695

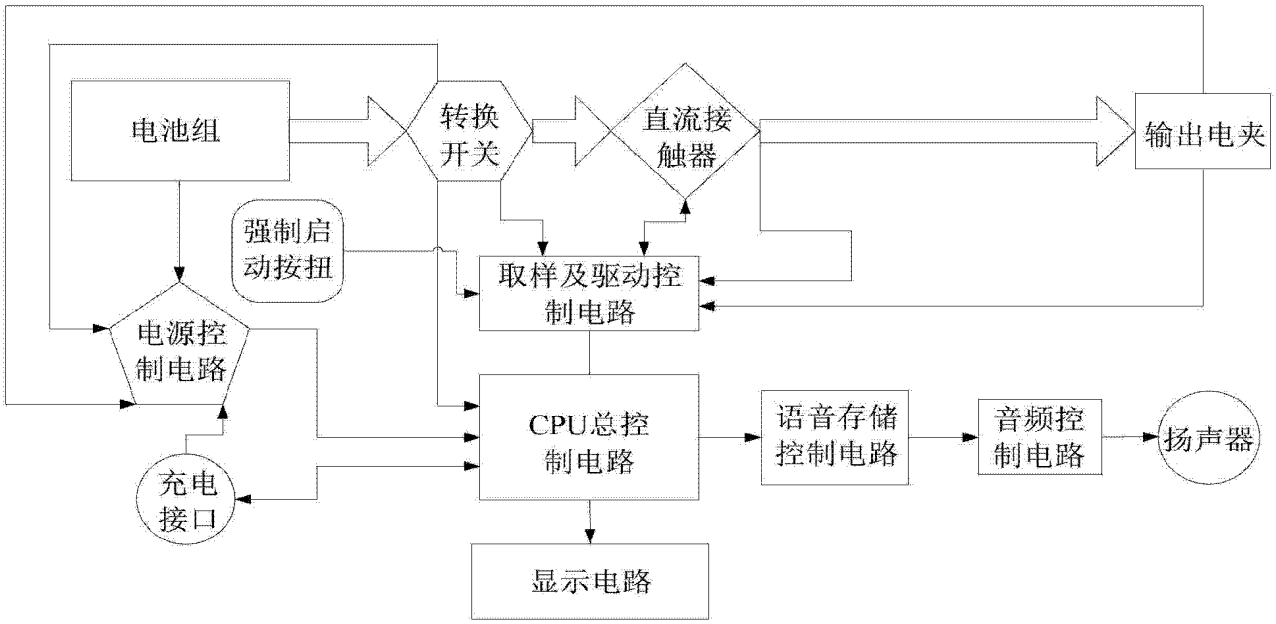

图 1

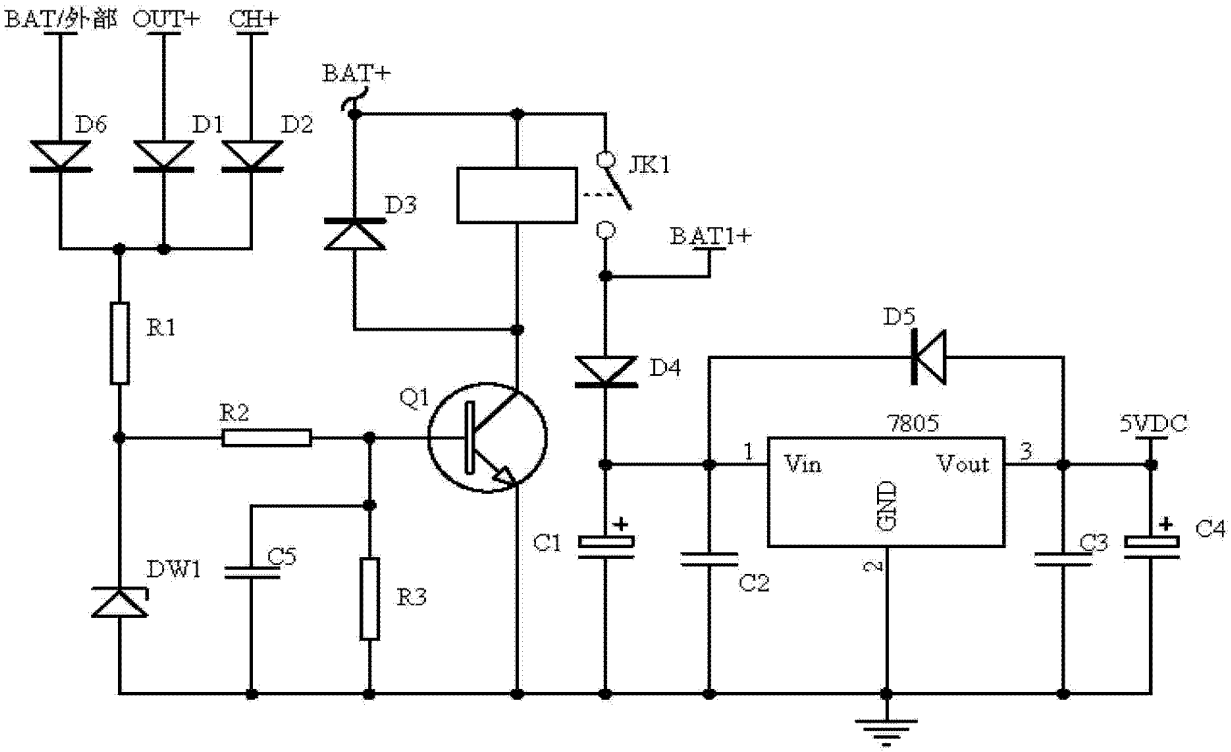

图 2

WINPLUS Ex. 1003, p. 696

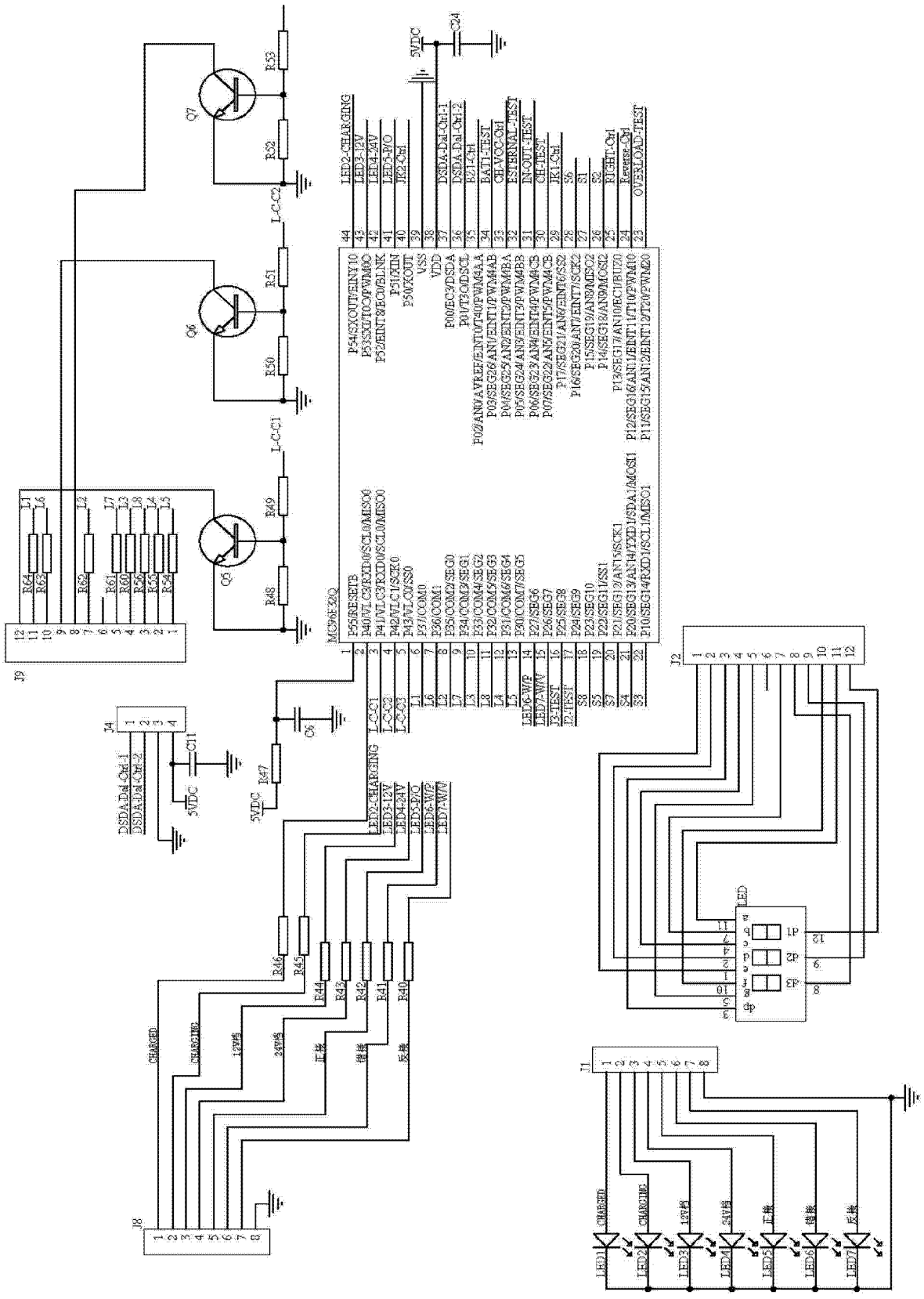

图 3

WINPLUS Ex. 1003, p. 697

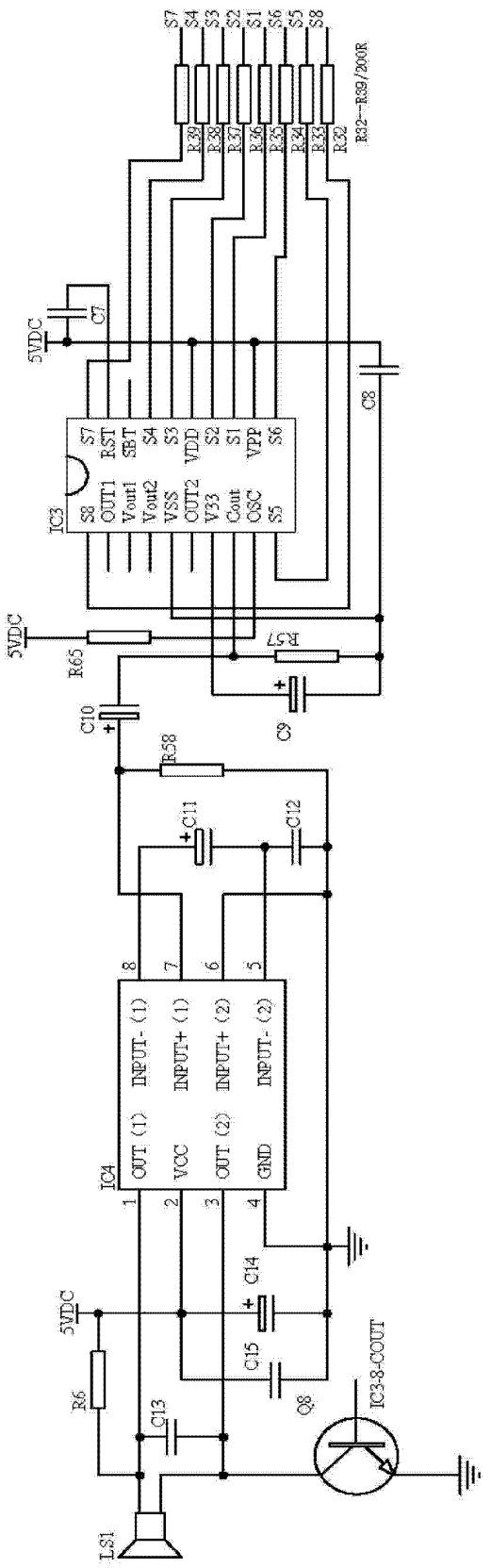

图 4

WINPLUS Ex. 1003, p. 698

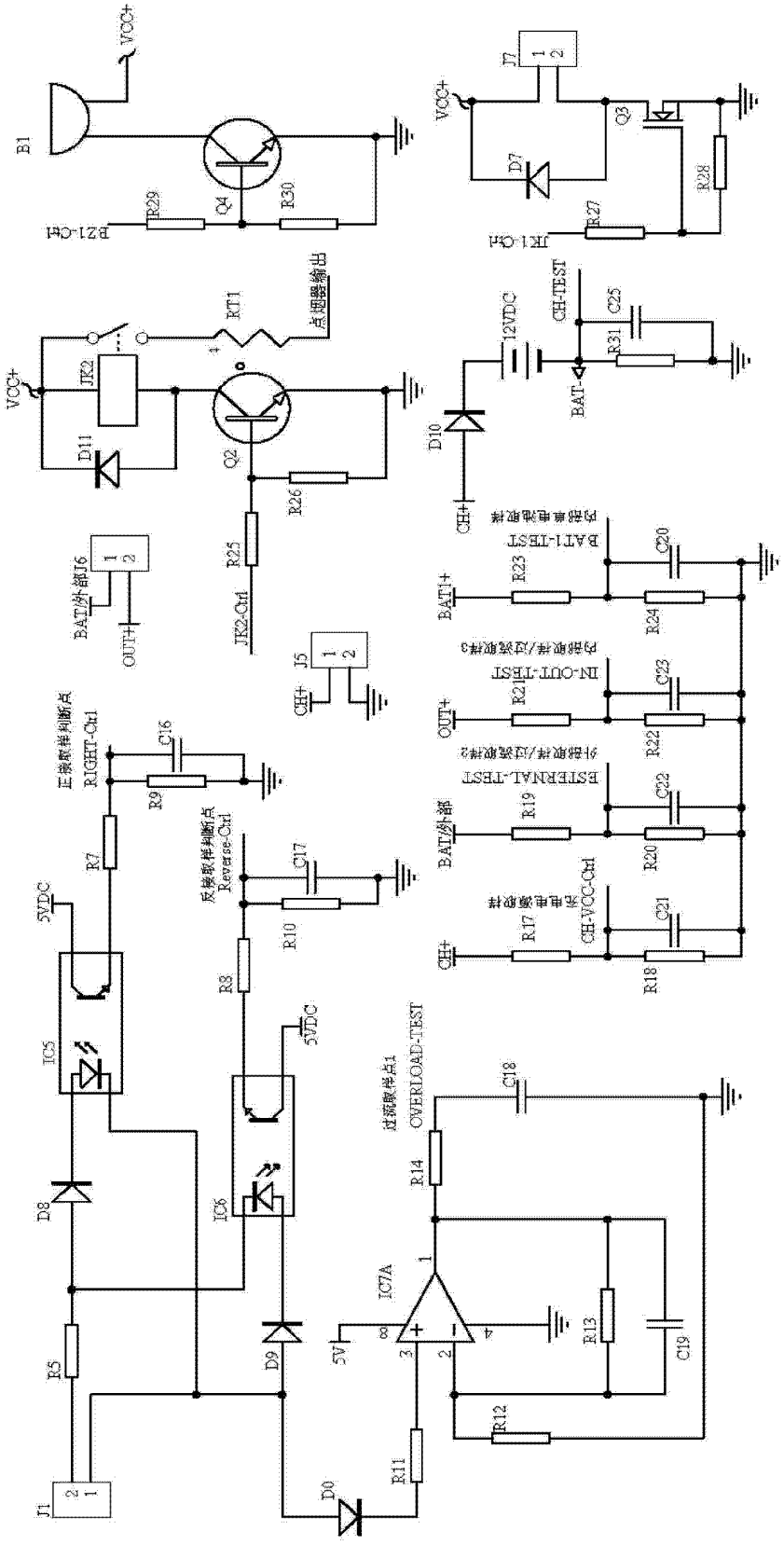

图 5

WINPLUS Ex. 1003, p. 699

Google Patents

Intelligent emergent start power source with self-equipped voice prompt function

Abstract

The utility model discloses an intelligent emergent start power source with a self-equipped voice prompt function. The intelligent emergent start power source comprises a battery pack, wherein the power supply end of the battery pack is connected with an alternation switch which is connected with an output electric clip through a direct current (DC) contactor. The intelligent emergent start power source further comprises a central processing unit (CPU) main control circuit, wherein an output end of the CPU main control circuit is connected with an audio broadcast system. An input end of the CPU main control circuit is connected with a sampling and driving control circuit which is connected with the alternation switch, the DC contactor and the output electric clip. The battery pack is connected with a charge port through a power source control circuit, and the power source control circuit and the charge port are connected with the CPU main control circuit. The output electric clip and the alternation switch are respectively connected with the power source control circuit. The output end of the CPU main control circuit also is connected with a display circuit, and the sampling and driving control circuit is connected with a force started button. The emergent start power source can timely and accurately send relative operation information to users under different environments.

CN202696190U
China

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Other languages: Chinese

Inventor: [redacted]

Worldwide applications

2012 · ~~CN~~

Application CN 201220235980 events

2012-05-23 ◦ Application filed by SHANGHAI GUANGWEITUOPU ELECTRIC POWER CO Ltd, SHANGHAI GUANGWEI ELECTRIC CO Ltd, Shanghai Guangwei Electric and Tools Co Ltd

2012-05-23 ◦ Priority to CN 201220235980

2013-01-23 ◦ Application granted

2013-01-23 ◦ Publication of CN202696190U

2022-05-23 ◦ Anticipated expiration

Status ◦ Expired - Lifetime

Info: Cited by (3), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

Claims (3)

Hide Dependent

1. an intelligent emergency starting power supply that carries sound prompt function includes battery pack, and the feeder ear of this battery pack is connected with change over switch, and change over switch is connected to output electricity folder by D.C. contactor, it is characterized in that,

Also include the CPU total control circuit, the output of this CPU total control circuit is connected with audio frequency broadcast system;

The input of described CPU total control circuit is connected with sampling and Drive and Control Circuit, and this sampling and Drive and Control Circuit link to each other with change over switch, D.C. contactor and output electricity folder;

Described battery pack links to each other with charging inlet by power control circuit, and power control circuit and charging inlet are connected to the CPU total control circuit;

Described output electricity folder and change over switch link to each other with power control circuit respectively;

The output of described CPU total control circuit also is connected with display circuit;

Described sampling and Drive and Control Circuit are connected with the force start button.

2. a kind of intelligent emergency starting power supply that carries sound prompt function according to claim 1, it is characterized in that, described audio frequency broadcast system comprises the voice storage control circuit, the input of this voice storage control circuit is connected in the CPU total control circuit, its output is connected in audio control circuit, and audio control circuit links to each other with loud speaker.

3. a kind of intelligent emergency starting power supply that carries sound prompt function according to claim 1 is characterized in that described display circuit comprises the LED light of LED character display and different colours.

Description

A kind of intelligent emergency starting power supply that carries sound prompt function

Technical field

The utility model relates to the emergency starting power supply, relates in particular to a kind of intelligent emergency starting power supply that carries sound prompt function.

Background technology

12V/24V conversion emergency starting power supply is depended merely on the manual control operation and is difficult to accomplish absolutely correct under different environments for use.Under the prerequisite without any protection and prompting, a misoperation of any appearance all may bring permanent damages to product, very cause when serious to cause battery explosion, injure user's personal safety as well as the property safety.Although existing portioned product is provided with Operating Guideline explanation and some simple sound and light of alarm, but because the wearing and tearing of simple buzzer warning and use cause the damaged or fuzzy of operation indicating content, make the emergency starting power supply lack the safety indication of necessity, but can't in time find former thereby puzzlement after also going wrong to user's operation simultaneously.If on each behaviour of user, increase simultaneously the indication of necessary voice suggestion and photoelectricity, can reduce the impact that varying environment is brought to the user like this, simultaneously also can directly inform in time the operating conditions that the user is real-time, more can effectively prevent the generation of slipping up, it is more direct, clearer to allow the user operate.Therefore, be necessary the structure of existing emergency starting power supply is optimized.

The utility model content

The purpose of this utility model provides a kind of intelligent emergency starting power supply that carries sound prompt function, with voice user's current operation is pointed out, and to reduce misoperation, makes the emergency starting power supply obtain security protection when operation, prolongs its useful life.

The utility model is that the technical scheme that its technical problem of solution adopts is,

A kind of intelligent emergency starting power supply that carries sound prompt function, include battery pack, the feeder ear of this battery pack is connected with change over switch, change over switch is connected to output electricity folder by D.C. contactor, also include the CPU total control circuit, the output of this CPU total control circuit is connected with audio frequency broadcast system, this audio frequency broadcast system includes the voice storage control circuit, the input of voice storage control circuit is connected in the CPU total control circuit, its output is connected in audio control circuit, and audio control circuit links to each other with loud speaker;

The input of described CPU total control circuit is connected with sampling and Drive and Control Circuit, and this sampling and Drive and Control Circuit link to each other with change over switch, D.C. contactor and output electricity folder; Described battery pack links to each other with charging inlet by power control circuit, and power control circuit and charging inlet are connected to the CPU total control circuit; Described output electricity folder and change over switch link to each other with power control circuit respectively; The output of described CPU total control circuit also is connected with display circuit, and this display circuit comprises the LED light of LED charactron display and different colours; Described sampling and Drive and Control Circuit are connected with the force start button.

The utility model has the advantage of, this emergency starting power supply can carry out safeguard protection to gear selection, exact connect ion, incorrect link and brownout or overtension etc., all adds corresponding voice suggestion and photoelectricity prompting the selection of charging gear, the early warning of battery low pressure, output overcurrent protection, electricity folder output short circuit protection and people for aspects such as force start safety instructions simultaneously; Under different environments for use, can both transmit associative operation information to the user timely and accurately, make the user obtain operation information by dissimilar prompting modes such as sound, light, make the user understand more intuitively the reason of real-time operational circumstances and mistake in using, be convenient to carry out better next step operation or timely and effectively corrective action, guarantee user's personal safety, make whole product have more hommization, intellectuality.

Description of drawings

Fig. 1 is the electrical schematic diagram of the emergency starting power supply that the utility model proposes;

Fig. 2 is power control circuit figure;

Fig. 3 is CPU total control circuit and LED charactron display circuit;

Fig. 4 is voice storage and audio control circuit figure;

Fig. 5 is sampling and Drive and Control Circuit figure.

Embodiment

For technological means, creation characteristic that the utility model is realized, reach purpose with effect is easy to understand, below in conjunction with illustrating and specific embodiment, further set forth the utility model.

As shown in Figure 1, the intelligent emergency starting power supply that carries sound prompt function that the utility model proposes includes battery pack, the feeder ear of this battery pack is connected with change over switch, change over switch is connected to output electricity folder by D.C. contactor, also include the CPU total control circuit, the output of this CPU total control circuit is connected with audio frequency broadcast system, this audio frequency broadcast system includes the voice storage control circuit, the input of voice storage control circuit is connected in the CPU total control circuit, its output is connected in audio control circuit, and audio control circuit links to each other with loud speaker;

The input of described CPU total control circuit is connected with sampling and Drive and Control Circuit, and this sampling and Drive and Control Circuit link to each other with change over switch, D.C. contactor and output electricity folder; Described battery pack links to each other with charging inlet by power control circuit, and power control circuit and charging inlet are connected to the CPU total control circuit; Described output electricity folder and change over switch link to each other with power control circuit respectively; The output of described CPU total control circuit also is connected with display circuit, and this display circuit comprises the LED light of LED charactron display and different colours; Described sampling and Drive and Control Circuit are connected with the force start button

At present automobile batteries mainly is divided into two kinds of 12V and 24V, is the 12VDC battery with 0VDC ~ 15.5VDC with interior being defaulted as in circuit design; The 24VDC battery to be defaulted as in 15.5 ~ 30.0VDC.Change over switch is realized two batteries in parallel or the series connection dual mode, enables to realize the function of two voltage-outputs of a machine.Be bumped into two interlock P cocks at change over switch simultaneously, linked switch and 12V shelves and 24V shelves keep synchronously, and namely change over switch is when 12V or 24V shelves, also synchronizing close is opened in interlock, when the OFF shelves, linked switch is automatic disconnection also, for judgements such as the input that realizes outside connection signal or disconnections.

This emergency starting power utilization high-power direct current contactor is as automatic control electronic switch, control its logical and disconnected two states by circuit, simultaneously circuit judges that after adhesive the D.C. contactor both end voltage falls, as judging that the output electricity presss from both sides one of the condition of short circuit that whether occurs.

The emergency starting power supply respectively from the battery pack two ends, the key points such as the little tooth of electricity folder, change over switch output, D.C. contactor two ends, charging inlet, builtin voltage test reset switch, force start knob take a sample respectively and deliver to the CPU total control circuit and

WINPLUS Ex. 1003, p. 701

process, judge, thereby after learning user's operation information, the pulse signal of correspondence is dealt into the voice storage control circuit, transfer the good voice content of pre-save, after passing through again the audio control circuit power amplification, send corresponding voice messaging by speaker.This emergency starting power supply can carry out safeguard protection to gear selection, exact connect ion, incorrect link and too low or too high for voltage etc., simultaneously at selections of charging gear, the early warning of battery low pressure, output overcurrent protection, electricity folder output short circuit protection and the people adds corresponding voice suggestion for aspects such as force start safety instructions and photoelectricity is pointed out.Lamprophonia, loud, pronunciation standard, under the 40dB noise circumstance, the sound effective propagation path is more than 5 meters.Speech category is also prepared two other languages except the English prompts of standard, i e. French and Spanish, and the user can directly be switched arbitrarily by simple button, improves the versatility of product.

in one embodiment, the circuit of this emergency starting power supply consists of such as Fig. 2, Fig. 3, Fig. 4, shown in Figure 5.In the present embodiment, the main Primary Component that this emergency starting power acquisition is used has: IC1-7805 three terminal integrated voltage stabilizer, IC2-MC96F320 single-chip microcomputer, IC3-BLA4208 voice storage integrated chip, IC4-TDA2822 integrated audio power amplifier, LS1-full frequency band loud speaker 2W/8 Europe, LED-LG5631AH seven segment numerical tube display, IC5(IC6)-PC817 optocoupler, IC7-LM358 integrated transporting discharging, large merit D.C. contactor, large current convertor switch (12/24V shelves switch with), linked switch, force start button, output positive and negative electrode electricity folder.

In the present embodiment, the attainable major function of this emergency starting power supply has.

12V/24V gear automatic identification warning when 1, the emergency starting transfer switch operates, corresponding gear voice suggestion and LED3/LED4 light indication;

2, emergency starting power-supply battery low pressure automatic alarm prompting, when cell voltage is lower than 8.0≤U < 10.0V, the prompting of voice automatic alarm;

3, emergency starting power-supply battery brownout automatically shuts down protection and prompting, and when cell voltage continued to be lower than 8V, the emergency starting power supply automatically shut down electricity folder output loop, sends simultaneously the voice suggestion of low pressure turn-off protection;

4, output electricity folder exact connect ion conducting prompting, automatic pick conducting during exact connect ion, and be with voice suggestion and LED4 lamp to light prompting;

5, output electricity folder connects pole reversal mistake turn-off protection and prompting, during output electricity folder reverse polarity connection, D.C. contactor produces turn-off protection, sends simultaneously corresponding voice messaging prompting and reversal connection indication LED 7 lamps and lights prompting, simultaneously charactron flickering display error code " Er1 " information;

6, output electricity folder connects voltage mistake turn-off protection and prompting, namely, the inside and outside cell voltage that connects does not mate, refer generally to that 12V docks mistake with the 24V battery or 24V connects the battery that external voltage is higher than 30.0V, the emergency starting power supply sends the prompting of incorrect link voice messaging automatically and misconnection indication LED 6 lamps are lighted prompting, simultaneously charactron flickering display error code " Er2 " information;

7, output electricity folder overload turn-off protection and prompting when output electricity folder electric current occurs when excessive, automatically shut down and protect, and the emergency starting power supply sends corresponding voice messaging prompting and charactron flickering display overload protection code " P1 " information;

8, the short circuit of output electricity folder automatically shuts down protection and prompting, under the adhesive conducting, when output electricity folder short circuit occurs again, automatically shuts down output and protects, and sends simultaneously corresponding voice messaging prompting and charactron flickering display short-circuit protection code " P2 " information;

9, the prompting of charging gear and charged state indication, conversion money emergency starting power source charges is only existing charges in the 12V shelves, namely will be more together charging behind two cell parallels, to guarantee the balance of charging voltage of two batteries, namely, after inserting charger, not when the 12V gear, the emergency starting power supply sends the voice messaging prompting automatically such as change over switch, and charging indicator light can not lighted yet simultaneously, until gear is selected correctly, just LED1 lights when charging indicator light LED2 lights, charges end;

10, force start output function, when the outside does not have cell voltage input or input voltage signal excessively low, when the emergency starting power supply can't normally be identified automatically, by artificial judgement and after correct reliable the connection, press the force start knob, make the emergency starting power supply force the adhesive conducting.When press force start by switch after, the emergency starting power supply automatically send safe early warning information speech and charactron simultaneous display " 10-9-8-... 0 " zero count counting information is to the user, the polarity of call user's attention external load and trouble free service voltage, after need to continuing to press 10s, the emergency starting power supply is automatic pick, guarantees that the user has time enough again safety verification to be carried out in connection.

in the present embodiment, the voice content of storing in the voice storage control circuit following (take English edition as example):

A.12V

B.24V

C.Low?voltage,recharging?recommended

D.Power?is?connected

E.Wrong?Voltage

F.Wrong?Polarity

G.Recharging?ON,Turn?the?switch?at?back?to?12V

H.charge?immediately

I.Overload

J.Short?Circuit

Its specific works process is as follows:

1, when change over switch changes 12V or 24V gear over to by the OFF shelves, change over switch with battery pack the voltage after the in parallel or series connection deliver to the input of D.C. contactor, " OUT+ " end has high level (the actual input that is connected in D.C. contactor of OUT+ sampling point simultaneously, " BAT/ is outside " is connected in the output of D.C. contactor), and by after diode D1, current-limiting resistance R1 and the voltage stabilizing didce DW1 pressure limiting, by resistance R 2 driving switch pipe Q1, make relay J K1 adhesive conducting; Battery BAT+ voltage makes stable 5VDC voltage of 3 pin output to CPU and other circuit supplies through the input that diode D4 adds three steady integrated regulators 7805;

When outside electricity folder exact connect ion and voltage during greater than 1.5V, " BAT/ is outside " terminal voltage through diode D6 after, the base stage that equally also is added to switching tube Q1 makes relay adhesive conducting, thereby makes 7805 to enter normal operating conditions; In like manner, when charging inlet " CH+ " access power supply, 7805 also enter normal operating conditions.

2, after single-chip microcomputer works on power, whether at first detect change over switch opens, the voltage of getting with monocell anodal " BAT1+ " end again when " OUT+ " end detects voltage < 15.5VDC compares, when the voltage of two reference points was basic identical, CPU acquiescence change over switch this moment had placed the 12V gear; Otherwise, when this point voltage 〉 =15.5V and with the magnitude of voltage of " BAT1+ " end when differing larger, CPU acquiescence change over switch has placed the 24V shelves; After determining gear, single-chip microcomputer is driven corresponding gear indicator light LED3 or LED4 and is lighted by P52 port or P53 port output high level; Simultaneously drive speech chip by P21 port or pulse signal of P23 port output, extract corresponding voice messaging and through devices such as power amplifier, loud speakers the gear information of correspondence is reported to the user;

When single-chip microcomputer detected the brownout of " OUT+ ", 12V shelves voltage was lower than 10.0VDC(24V shelves voltage and is lower than 20.0VDC) time, the emergency starting power supply is defaulted as routed electricity of battery automatically, should not re-use, and should in time replenish electric weight; Single-chip microcomputer P16 pin to the voice storage chip, extracts the low pressure alarming suggestion voice with the automatic cycle output pulse signal, and by loud speaker in time the low pressure information reporting to the user; To automatically shut down all loads simultaneously, namely close the output of cigar lighter and D.C. contactor;

The voltage that detects " UOT+ " when single-chip microcomputer is 0V, simultaneously when " OUT+/outside " end detects certain positive voltage, represents that then the change over switch of emergency starting power supply is not opened, and just the user will export electricity folder and external cell on the exact connect ion; The time this, emergency starting power supply default user is want to go to test external battery voltage by the digital display voltmeter of JS, namely single-chip microcomputer will show by charactron from the actual voltage value read of " OUT+/outside " end automatically;

The voltage that detects " UOT+ " when single-chip microcomputer is 0V, simultaneously when " CH+ " end detects charger access voltage is arranged, expression change over switch this moment is not opened, just charger accesses, single-chip microcomputer will be exported a pulse signal automatically to the voice storage chip this moment, extract charging shift position limitation suggestion voice, tell and please change over switch is placed the 12V shelves when user charges, such as change over switch when other gears, single-chip microcomputer is exported triggering signal with automatic cycle, until the user forwards change over switch to correct 12V gear; When the emergency starting power supply enter charge normal after, single-chip microcomputer is judged by the pressure drop that detects on the sample resistance R31, when charging current during less than 300mA this ohmically pressure drop be 0.03V, the expression charging finishes, otherwise then expression is charged, charge when LED2 lights expression, represent that when LED1 lights charging finishes.

3, start, its operation principle is as follows:

3.1, the exact connect ion conducting of 12V shelves and prompting: conversion is opened and is produced the voltage all in 12V shelves scope time that places 12V shelves, single-chip microcomputer to detect " OUT+ " point and " BAT1+ " point, and the emergency starting power supply is reported 12V gear suggestion voice automatically; Simultaneously outside 12V battery both end voltage is divided the two-way sampling, and the defeated end of one tunnel access D.C. contactor makes single-chip microcomputer at the effective voltage value of " BAT+/outside " spot check in the 12V shelves scope; Another road is by the little tooth sampling of electricity folder, electricity clamp inner lead is connected to " J1 " port of control board, make and just connect signal and pass through R5, after D8 and IC5 change, the outside is just being connect the P13 port that signal " RIGHT-Ctrl " is delivered to single-chip microcomputer, single-chip microcomputer judges that the emergency starting power supply has forwarded the 12V shelves to, the electricity folder correctly reliably connects simultaneously, this moment, single-chip microcomputer made its adhesive conducting to D.C. contactor control circuit output high level again, and to pulse signal extraction exact connect ion of speech chip transmission and conducting suggestion voice, exact connect ion is connect information tell in time the user; Other indications: 12V gear indicator light is lighted; Corresponding exact connect ion indicator light is lighted prompting; Charactron shows the integrated voltage value after the electricity parallel connection of inside and outside pond automatically.

3.2, the 12V shelves pole reversal connects protection and prompting: change over switch forwards the 12V shelves to, corresponding gear detect and suggestion content the same; Simultaneously outside 12V(or 24V) the battery both end voltage presss from both sides " J1 " port that little tooth sampling, electric clamp inner lead are connected to control board by electricity, after the reversal connection signal is changed by D9, IC6 and R5, outside reversal connection signal " Reverse-Ctrl " is delivered to the P12 port of single-chip microcomputer, single-chip microcomputer judges that the emergency starting power supply has forwarded the 12V shelves to, detect simultaneously the external cell reverse polarity connection, D.C. contactor will remain open state this moment, and to the continuous transmitted signal extraction of speech chip reversal connection suggestion voice information, and tell in time the user with reversal connection information; Other indications: 12V gear indicator light is lighted; Reversal connection alarm lamp LED7 lights; Charactron shows reversal connection error code " Er1 " flicker.

3.3, the too high error protection of 12V shelves external voltage and prompting: change over switch forwards the 12V shelves to, corresponding detect and suggestion content the same; The electricity folder is from the defeated end of external cell both end voltage access D.C. contactor simultaneously, make single-chip microcomputer when " BAT+/outside " spot check exceeds in the safe range of " 12V " to the cell voltage that connects this moment, external connection battery voltage directly given tacit consent to by single-chip microcomputer and the selected gear of emergency starting power supply does not mate, and D.C. contactor keeps cutting out protection; And to the continuous transmitted signal extraction of speech chip voltage incorrect link suggestion voice information, and tell in time the user with misconnection information; Other indications: 12V gear indicator light is lighted; Voltage incorrect link alarm lamp LED6 lights; Charactron shows reversal connection error code " Er2 " flicker.

3.4, the exact connect ion conducting of 24V shelves and prompting: conversion is opened and is produced that to place 24V shelves, single-chip microcomputer to detect the voltage that " OUT+ " point and " BAT1+ " put relevant larger, should belong to the 24V gear.The emergency starting power supply is reported 24V gear suggestion voice automatically; Outside 24V battery both end voltage is divided the two-way sampling simultaneously, and the defeated end of one tunnel access D.C. contactor makes the effective voltage value of single-chip microcomputer in " BAT+/outside " spot check to 24 grade scope; In lead up to the little tooth sampling of electricity folder, be connected to " J1 " port of control board behind the electricity clamp inner lead, make and just connect signal and pass through R5, after D8 and IC5 change, the outside is just being connect the P13 port that signal " RIGHT-Ctrl " is delivered to single-chip microcomputer, single-chip microcomputer judges that the emergency starting power supply has forwarded the 24V shelves to, the electricity folder correctly reliably connects simultaneously, this moment, single-chip microcomputer made its adhesive conducting to D.C. contactor control circuit output high level again, and to pulse signal extraction exact connect ion of speech chip transmission and conducting suggestion voice, exact connect ion is connect information tell in time the user; Other indications: 24V gear indicator light is lighted; Corresponding exact connect ion indicator light is lighted prompting; Charactron shows the integrated voltage value after the electricity parallel connection of inside and outside pond automatically.

3.5, the 24V shelves pole reversal connects protection and prompting: change over switch forwards the 24V shelves to, corresponding gear detect and suggestion content the same; Simultaneously outside 24V(or 12V) the battery both end voltage presss from both sides " J1 " port that is connected to control board behind little tooth sampling, the electric clamp inner lead by electricity, after the reversal connection signal is changed by D9, IC6 and R5, outside reversal connection signal " Reverse-Ctrl " is delivered to the P12 port of single-chip microcomputer, single-chip microcomputer judges that the emergency starting power supply has forwarded the 24V shelves to, detect simultaneously the external cell reverse polarity connection, D.C. contactor will remain open state this moment, and to the continuous transmitted signal extraction of speech chip reversal connection suggestion voice information, and tell in time the user with reversal connection information; Other indications: 24V gear indicator light is lighted, Reversal connection alarm lamp LED7 lights; Charactron shows reversal connection error code " Er1 " flicker.

3.6,24V shelves external voltage excessively low (or too high, when surpassing 30.0V) error protection and prompting: change over switch forwards the 24V shelves to, corresponding gear detect and suggestion content the same; The electricity folder is from the defeated end of external cell both end voltage access D.C. contactor simultaneously, make single-chip microcomputer when " BAT+/outside " spot check exceeds in the safe range of " 24V " to the cell voltage that connects this moment; when being lower than 15.5V or being higher than 30.0V such as external voltage; external connection battery voltage directly given tacit consent to by single-chip microcomputer and the selected gear of emergency starting power supply does not mate, and D.C. contactor keeps cutting out protection.And to the continuous transmitted signal extraction of speech chip voltage incorrect link suggestion voice information, and tell in time the user with misconnection information; Other indications: 24V gear indicator light is lighted; Voltage incorrect link alarm lamp LED6 lights; Charactron shows reversal connection error code " Er2 " flicker.

4, start overload and automatically shut down protection: when the moment that the emergency starting power supply is starting, have suffered and produce very large electric current in the start-up system, the emergency starting power supply is taken a sample by press from both sides little tooth from black appliances, read the canine tooth of black appliances folder to the pressure drop between the internal cell negative pole, press from both sides little tooth by black appliances, internal signal wire is delivered to " J1 " port, pass through again D0, after the circuit such as IC7 amplify, over-current signal " OVERLOAE-TEST " is delivered to the P11 port of single-chip microcomputer, when continuing to be higher than a certain set point within a certain period of time, this magnitude of voltage (tests out in advance black appliances folder canine tooth to the resistance between the battery cathode terminal, calculate the reference voltage level of overcurrent protection with reference to the maximum discharge capability of emergency starting power-supply battery) time, the emergency starting power supply just outside connection of acquiescence load is overweight, when having exceeded the maximum tolerance range of whole system, single-chip microcomputer cuts off the D.C. contactor control signal, makes D.C. contactor force to turn-off output; Single-chip microcomputer is deposited sheet to voice simultaneously and is extracted corresponding overcurrent protection suggestion voice information, and information is in time informed the user; Other indications: charactron shows overcurrent protection code " P1 " flicker.

5, electricity folder output short-circuit automatically shuts down protection: when emergency starting power supply when short circuit appears in the electricity folder after the adhesive conducting, have suffered and produce very large electric current in the start-up system, the emergency starting power supply is taken a sample by press from both sides little tooth from black appliances equally, read the canine tooth of black appliances folder to the pressure drop between the internal cell negative pole, by black appliances press from both sides little tooth, internal signal wire is delivered to " J1 " port, after amplifying through circuit such as D0, IC7 again, over-current signal " OVERLOAE-TEST " is delivered to the P11 port of single-chip microcomputer; Simultaneously single-chip microcomputer is judged pressure reduction between D.C. contactor two ends " OUT+ " and " the BAT/ section outside " at 2, and when these two magnitudes of voltage continued to be higher than a certain set point within a certain period of time, the emergency starting power supply just outside electricity of acquiescence pressed from both sides connection and short trouble occurs; Single-chip microcomputer will cut off the D.C. contactor control signal immediately, make D.C. contactor force to turn-off output; Single-chip microcomputer is deposited sheet to voice simultaneously and is extracted corresponding short-circuit protection suggestion voice information, and information is in time informed the user; Other indications: charactron shows overcurrent protection code " P2 " flicker.

6, force start output: when external battery voltage is crossed low or do not had battery, the user can be opened to change over switch first required voltage gear (this moment, corresponding gear detection and suggestion content were the same), again positive and negative electrode electricity folder is received respectively on the input power positive and negative electrode of load, the big or small tooth of noting the electricity folder is reliable the connection simultaneously, and after confirming the required power supply of load and the voltage gear of emergency starting transfer switch selection being consistent; Force breakdown to close by continuing to press, the force start switch is with " J3 " port short circuit, after making inner 5V power supply by resistance R 15, the sampling of R16 dividing potential drop, deliver to the P25 port of single-chip microcomputer, single-chip microcomputer will begin timing automatically, and extract the safety instruction of force start voice to speech chip, after continuing to press 10S, single-chip microcomputer will automatically send and go code, and make D.C. contactor force the adhesive conducting; When the emergency starting power supply moving when unusual (such as, reversal connection, high pressure misconnection) appears connecting in (10S in) before adhesive, it is invalid that single-chip microcomputer operates the automatic decision force start, the rear recovery of need to fixing a breakdown, Guarantee user's handling safety; Other promptings: after pressing this switch, charactron shows " 10s count down timer " flicker in 10s, and after the adhesive conducting, the emergency starting power supply will send correct conducting voice suggestion, and exact connect ion warning light LED5 lights simultaneously

7, voice control circuit operation principle, at first all function voice are deposited in the voice storage chip with the PCM compact model, speech chip is selected the BLA4208 chip of BLA series, this chip altogether support voice length is 42s, can store at most 30 sections different voice contents; Reading of voice is by S1-S8 totally 8 separately triggering pin controls, supports also that simultaneously different pins trigger with different compound modes, can support the needs of 30 sections speech trigger; Extract arbitrarily each section voice content by CPU control again, by the 8th pin output voice signal, after process audio frequency power amplifier IC4 amplifies, directly drive loud speaker SL1 pronunciation; The speech trigger signal is that high level is effective, and single-chip microcomputer whenever sends a pulse triggering signal, and speech chip will automatically extract once corresponding voice content and report; When triggering as lasting high level, chip is reported the same voice content with automatic cycle.

8, sample circuit and control circuit operation principle: as shown in Figure 5, J1 is the little tooth sampled signal input of positive and negative electrode electricity folder, when the outside just connects, after voltage is changed by resistance R 5, D8 and IC5, the AD signal is sent into the P31 port of unit, as the foundation of judging whether outside electricity folder is just connecing or disconnecting; When the external connection battery polarity of voltage is reverse, single-chip microcomputer can't directly read the negative pressure of " BAT/ is outside " end, and after changing by J1, D9, IC6, R5, the reversal connection signal is sent into the P12 port of single-chip microcomputer, as judging that outside electricity folder connects pole reversal foundation; When the electric clamp of output load current occurs when excessive, large electric current will produce a constant pressure drop at the negative electricity clamp, this voltage will take out by the little tooth of negative electricity folder to be delivered to the P11 pin of sending into single-chip microcomputer after D0, R11 and IC7 amplify and judges, when detecting this voltage and in 1s, continue greater than a certain set point, it is overweight that single-chip microcomputer just is defaulted as external load, turn-offs immediately D.C. contactor protection; In like manner, within moment, be higher than another set point when detecting this magnitude of voltage, the pressure drop that detects from the D.C. contactor two ends respectively again simultaneously is during also greater than a certain set point, and the emergency starting power supply just automatically is defaulted as output electricity folder and has short circuit phenomenon, turn-offs D.C contactor immediately and protects;

J5 is the charge power supply incoming end; J6 is that interior output voltage detects and the external voltage detection input, also is the sampling point of D.C. contactor two ends pressure drop simultaneously; J7 is D.C. contactor control coil interface; Wherein form the cigar lighter output control circuit by main element R25, R26, Q2, JK2, RT1; Form the buzzer warning control circuit by main element R29, R30, Q3, Form the D.C. contactor control circuit by main element R27, R28, Q3, Form charge power supply sampling and charging current sample circuit by main first R17, R18, R31, C25, C21, be used for judging the access of charger and the detection of charged state;

inside and outside cell voltage sample circuit and change over switch gear judgement sample circuit have been formed by main element R19, R20, R21, R22, R23, R24, C22, C23, C20; Form digital display control circuit by main element LED, Q5, Q6, Q7 etc.

More than show and described basic principle of the present utility model, principal character and advantage of the present utility model.The technical staff of the industry should understand; the utility model is not restricted to the described embodiments; that describes in above-described embodiment and the specification just illustrates principle of the present utility model; the utility model also has various changes and modifications under the prerequisite that does not break away from the utility model spirit and scope, and these changes and improvements all fall in claimed the utility model scope.The claimed scope of the utility model is defined by appending claims and equivalent thereof.

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Publication number	Priority date	Publication date	Assignee	Title
CN105914439A *	2015-12-31	2016-05-18	深圳市华思旭科技有限公司	Intelligent wire-connection control device
CN109655653A *	2019-01-25	2019-04-19	李毅乐	A kind of device and method measuring electric current
US11104236B2	2014-04-28	2021-08-31	Pilot Inc.	Automobile charger
Family To Family Citations				

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
CN102709958B	2015-08-12	A kind of serial lithium battery group baffle based on battery protection chip
CN201119053Y	2008-09-17	Intelligent control device for solar luminescent street lamp
CN202633998U	2012-12-26	Intelligent management monitoring system of lithium battery pack
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CN215817560U	2022-02-11	Intelligent charger based on singlechip

Priority And Related Applications

Priority Applications (1)

Application	Priority date	Filing date	Title
CN 201220235980	2012-05-23	2012-05-23	Intelligent emergent start power source with self-equipped voice prompt function

Applications Claiming Priority (1)

Application	Filing date	Title
CN 201220235980	2012-05-23	Intelligent emergent start power source with self-equipped voice prompt function

Legal Events

Date	Code	Title	Description
2013-01-23	C14	Grant of patent or utility model	
2013-01-23	GR01	Patent grant	
2015-06-03	ASS	Succession or assignment of patent right	**Free format text**: FORMER OWNER: SHANGHAI GUANGWEI ELECTRIC + TOOLS CO., LTD. SHANGHAI GUANGWEITUOPU ELECTRIC POWER CO., LTD. **Effective date**: 20150515
2015-06-03	C41	Transfer of patent application or patent right or utility model	
2015-06-03	TR01	Transfer of patent right	**Effective date of registration**: 20150515 **Address after**: 200241 No. 4916, Lane 18, Hongmei South Road, Shanghai, Minhang District **Patentee after**: Shanghai Guangwei Electric Co., Ltd. **Address before**: 200241 No. 4916, Lane 18, Hongmei South Road, Shanghai, Minhang District **Patentee before**: Shanghai Guangwei Electric Co., Ltd. **Patentee before**: Shanghai Guangwei Electric & Tools Co., Ltd. **Patentee before**: Shanghai Guangweituopu Electric Power Co., Ltd.
2022-06-10	CX01	Expiry of patent term	**Granted publication date**: 20130123
2022-06-10	CX01	Expiry of patent term	

Concepts

machine-extracted

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Name	Image	Sections	Count	Query match
sampling		claims,abstract,description	23	0.000
electricity		claims,description	49	0.000
colorant		claims,description	3	0.000

Show all concepts from the description section

(19)中华人民共和国国家知识产权局

(12)实用新型专利

(10)授权公告号 CN 203211234 U
(45)授权公告日 2013.09.25

(21)申请号 201320217854.6

(22)申请日 2013.04.26

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(51)Int.Cl.
B60R 16/033(2006.01)

(ESM)同样的发明创造已同日申请发明专利

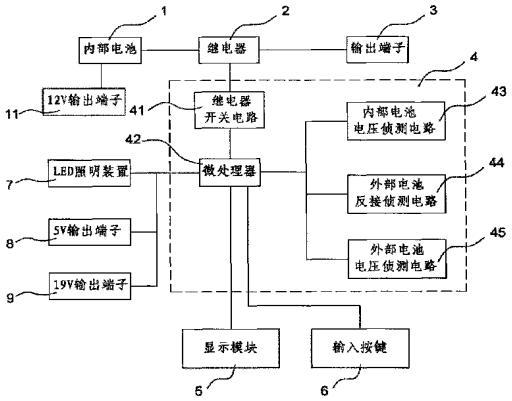
权利要求书1页 说明书3页 附图6页

(54)实用新型名称

一种汽车应急启动装置

(57)摘要

本实用新型涉及一种汽车启动装置，具体涉及一种汽车应急启动装置。本实用新型包括内部电池，充电输入接口，显示模块，控制模块，继电器，输入按键和输出端子，其中所述继电器主触点分别与内部电池和输出端子连接；控制模块中包含微处理器，所述微处理器通过继电器开关电路控制继电器开合用以控制内部电池向输出端子输出电流；还包括用于提供外部电池接线正误信号的外部电池反接侦测电路。本装置内部电池与外部电池通过继电器接入，在通常情况和汽车启动成功后继电器处于关断状态，使本装置在接入与取下时不产生火花。同时输出端子与外部电池相连接的极性接错时，微处理器控制继电器不吸合，可防止极性接错而产生的大电流。



CN 203211234 U

1. 一种汽车应急启动装置，包括内部电池 (1)，充电输入 (10) 接口，显示模块 (5)，控制模块 (4)，继电器 (2)，输入按键 (6) 和输出端子 (3)，其特征是所述继电器 (2) 主触点分别与内部电池 (1) 和输出端子 (3) 连接；控制模块 (4) 中包含微处理器 (42)，所述微处理器 (42) 通过继电器开关电路 (41) 控制继电器 (2) 开合用以控制内部电池 (1) 向输出端子 (3) 输出电流；控制模块 (4) 中还包括用于提供外部电池接线正误信号的外部电池反接侦测电路 (44)。

2. 根据权利要求 1 所述的汽车应急启动装置，其特征是控制模块 (4) 中还包括内部电池电压侦测电路 (43)，所述内部电池电压侦测电路 (43) 与微处理器 (42) 信号连接。

3. 根据权利要求 1 所述的汽车应急启动装置，其特征是控制模块 (4) 中还包括外部电池电压侦测电路 (45)，所述外部电池电压侦测电路 (45) 与微处理器 (42) 信号连接。

4. 根据权利要求 1 所述的汽车应急启动装置，其特征是所述装置内还包括 LED 照明装置 (7) 和 LED 照明驱动电路。

5. 根据权利要求 1 到 4 任一所述的汽车应急启动装置，其特征是所述装置内还包括 5V 电压输出电路和 19V 电压输出电路；5V 输出电路与 5V 输出端子 (8) 相连接，19V 输出电路与 19V 输出端子 (9) 相连接。

6. 根据权利要求 1 到 4 任一所述的汽车应急启动装置，其特征是所述装置内还包括 12V 输出端子 (11)，所述 12V 输出端了与内部电池 (1) 连接。

WINPLUS Ex. 1003, p. 708

一种汽车应急启动装置

技术领域

[0001] 本实用新型一种汽车启动装置，具体涉及一种汽车应急启动装置。

背景技术

[0002] 汽车是社会生产中不可缺少的一种交通运输工具。目前的燃油汽车都在汽车内部设置蓄电池，汽车发动机在运转过程中通过发电机对蓄电池进行充电，当汽车发动机停止运转时，可以由蓄电池提供电力供应汽车使用或使发动机启动。汽车内部所设置的蓄电池一般为铅酸电池。铅酸电池在经过一定次数的充放电循环后会电池容量越变越低。经过长期使用还可能使电池直接报废。当汽车在使用过程中，可能会由于电池过放电或电池失效而使汽车无法启动。常见的方法是用一个单独的蓄电池替换汽车蓄电池，使汽车启动，常见的这种汽车应急启动电源是铅酸电池代替原汽车蓄电池。在使用的时候，由于铅酸电池自身比较笨重，体积庞大，同时也没有极性检测功能，当接入的应急启动电源极性和原汽车蓄电池极性相反时可能会产生很大的电流使蓄电池损坏，严重时甚至会发生爆炸。同时这样的单独铅酸电池作为汽车启动应急电源，在接入的时候也没有防火花设计，可以在接入或断开应急电源瞬间产生火花，存在不安全因素。

实用新型内容

[0003] 本实用新型针对上述不足之处而提供的一种汽车应急启动电源。本实用新型的汽车应急启动电源，当应急启动电源接入汽车电路中电源极性接反时不与通电。同时本实用新型的汽车应急启动电源接入或断开与汽车连接时可有效防止电火花产生，提高了安全性。

[0004] 本实用新型是这样实现的，一种汽车应急启动装置，包括内部电池，充电输入接口，显示模块，控制模块，继电器，输入按键和输出端子，其中所述继电器主触点分别与内部电池和输出端子连接；控制模块中包含微处理器，所述微处理器通过继电器开关电路控制继电器开合用以控制内部电池向输出端子输出电流；控制模块中还包括用于提供外部电池接线正误信号的外部电池反接侦测电路。本实用新型的汽车应急启动装置内还包括 12V 输出端子，所述 12V 输出端子与内部电池连接。

[0005] 为使显示模块可以显示内部电池电压，其特征是控制模块中还包括内部电池电压侦测电路，所述内部电池电压侦测电路与微处理器信号连接。

[0006] 为使显示模块可以显示外部电池电压，控制模块中还包括外部电池电压侦测电路，所述外部电池电压侦测电路与微处理器信号连接。

[0007] 本实用新型的汽车应急启动装置，还包括 LED 照明装置和 LED 照明驱动电路。

[0008] 为方便使用，本实用新型的汽车应急启动装置内还包括 5V 电压输出电路和 19V 电压输出电路；5V 输出电路与 5V 输出端子相连接，19V 输出电路与 19V 输出端子相连接。

[0009] 本实用新型的汽车应急启动装置，采用内置电池方案，同时内部电池与外部电池通过继电器接入，通常情况下继电器处于关断状态，当本装置与外部汽车电池相连接时，本

WINPLUS Ex. 1003, p. 709

装置将侦测到外部电池电压，同时会将此电压显示在 LCD 上，此时，按动输入按键中的 JUMP 按键可以控制继电器的通断，使本汽车应急启动装置在接入时不产生火花。应用本装置成功启动汽车后，本装置将在 2 秒钟之内关断续电器，使外部电池与内部电池断开连接，使本汽车应急启动装置在移开时也不会产生火花，同时也不会产生汽车发电机给本装置反向充电之情形。同时本装置内部设置有外部电池反接侦测电路，当本实用新型的汽车应急启动装置输出端子与外部电池相连接的极性接错时，微处理器控制继电器不吸合，可有效防止极性接错而产生的大电流。

附图说明

[0010] 图 1 为本实用新型系统结构示意图。

[0011] 图 2 为本实用新型控制模块电路原理图。

[0012] 图 3 为本实用新型 LED 照明装置电路原理图。

[0013] 图 4 为本实用新型 5V 输出电路原理图。

[0014] 图 5 为本实用新型 19V 输出电路原理图。

[0015] 图 6 为本实用新型的主视示意图。

[0016] 图 7 为本实用新型的仰视示意图。

[0017] 图 8 为本实用新型的右视示意图。

[0018] 图 9 为本实用新型的左视示意图。

[0019] 附图中 :1- 内部电池，2- 继电器，3- 输出端子，4- 控制模块，5- 显示模块，6- 输入按键，7-LED 照明装置，8-5V 输出端子，9-19V 输出端子，10- 充电输入，11-12V 输出端子。

具体实施方式

[0020] 下面结合附图和具体实施例对本实用新型作进一步详细说明，但本实用新型并不限于下述实施方式，任何在本实施例原理上所做的改变或替代方案，均落入本实用新型要求保护的范围之中。

[0021] 结合附图 1 到图 9，一种汽车应急启动装置，包括内部电池 1，充电输入 10 接口，显示模块 5，控制模块 4，继电器 2，输入按键 6 和输出端子 3，其中所述继电器 2 主触点触头分别与内部电池 1 和输出端子 3 连接 ；控制模块 4 中包含微处理器 42，所述微处理器 42 通过继电器开关电路 41 控制继电器 2 开合用以控制内部电池 1 向输出端子 3 输出电流 ；控制模块 4 中还包括用于提供外部电池接线正误信号的外部电池反接侦测电路 44。

[0022] 为使显示模块 5 可以显示内部电池 1 电压，其特征是控制模块 4 中还包括内部电池电压侦测电路 43，所述内部电池电压侦测电路 43 与微处理器 42 信号连接。

[0023] 为使显示模块 5 可以显示外部电池电压，控制模块 4 中还包括外部电池电压侦测电路 45，所述外部电池电压侦测电路 45 与微处理器 42 信号连接。

[0024] 本实用新型的汽车应急启动装置，还包括 LED 照明装置 7 和 LED 照明驱动电路。

[0025] 为方便使用，本实用新型的汽车应急启动装置内还包括 5V 电压输出电路和 19V 电压输出电路 ；5V 输出电路与 5V 输出端子 8 相连接，19V 输出电路与 19V 输出端子 9 相连接。本实用新型的汽车应急启动装置内还包括 12V 输出端子 11，所述 12V 输出端子 11 与内部电池 1 连接。

WINPLUS Ex. 1003, p. 710

[0026] 当汽车由于汽车自带电池原因不能启动时，把本实用新型的汽车应急启动装置输出端子 3 与外部电池即待启动汽车自带电池相连接。通常情况下继电器处于关断状态，如果输出端子 3 与外部电池连接时极性有误，通过外部电池反接侦测电路 44 提供信号到微处理器 42，使微处理器 42 控制继电器 2 不能吸合从而可以避免因极性接错而产生的大电流。如果输出端子 3 与外部电池极性正确，外部电池电压侦测电路 45 工作，微处理器 42 会检测出外部电池电压，同时会将此电压显示在 LCD 上，如果外部电池电压在正常范围，则可以按动输入按键 6 中的 JUMP 按键使继电器 2 吸合，以便内部电池 1 通过输出端子 3 向待启动汽车输出电流。当汽车启动 2 秒后，微处理器 42 会控制继电器 2 断开，以便取下输出端子 3 接线。由于继电器 2 断开后输出端子 3 中没有电流，所以在取下时不会产生火花。当汽车已启动且取下输出端子 3 接线后，本实用新型的汽车应急启动装置工作完成。

[0027] 通过内部电池电压侦测电路 43 提供给微处理器 42 信号，可以在显示模块 5 上显示出内部电池 1 电压，以方便对电池使用状态进行监控。通过外部电池电压侦测电路 45 提供给微处理器 42 信号，可以在显示模块 5 上显示出外部电池电压，以方便了解外部电池情况。

[0028] 为了让内部电池 1 可以充电，在本装置上设置有充电输入 10 接口。同时本装置上还设置有 LED 照明装置 7，以方便光线强度不够时用作照明。本装置上还设置了 5V 输出端子 8 和 19V 输出端子 9 以及 12V 输出端子 11，在平时可以当一般电源供其它用电设备使用。

WINPLUS Ex. 1003, p. 711

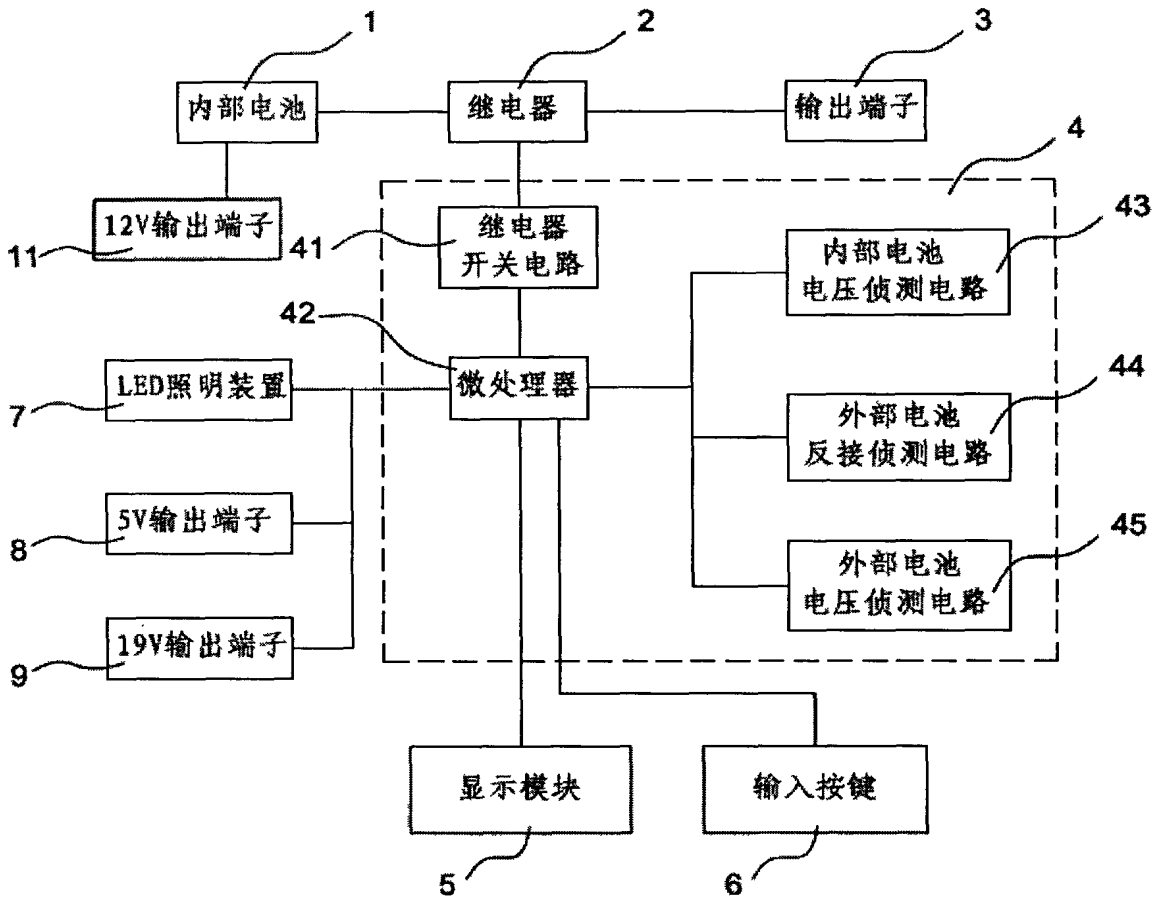


图 1

WINPLUS Ex. 1003, p. 712

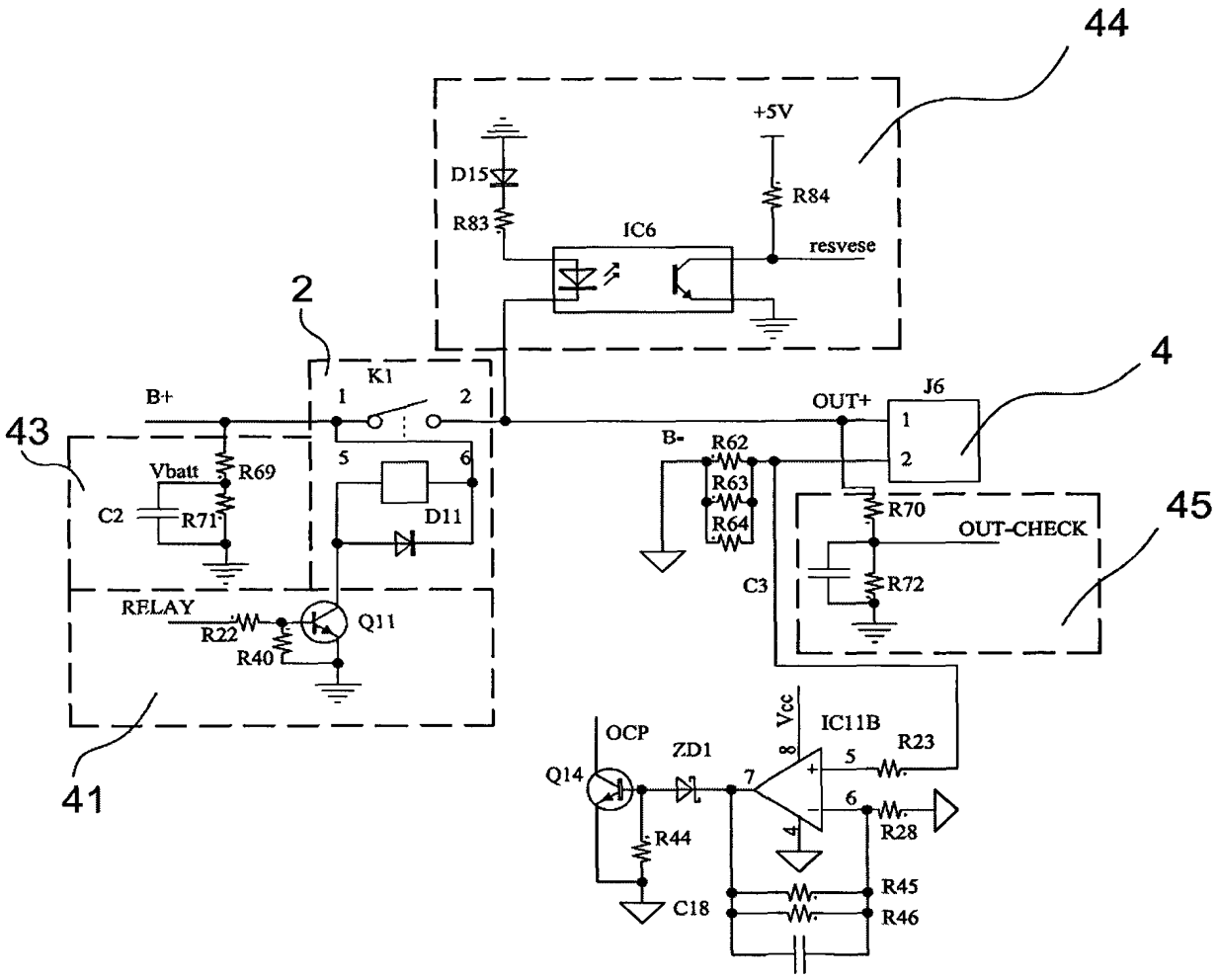


图 2

WINPLUS Ex. 1003, p. 713

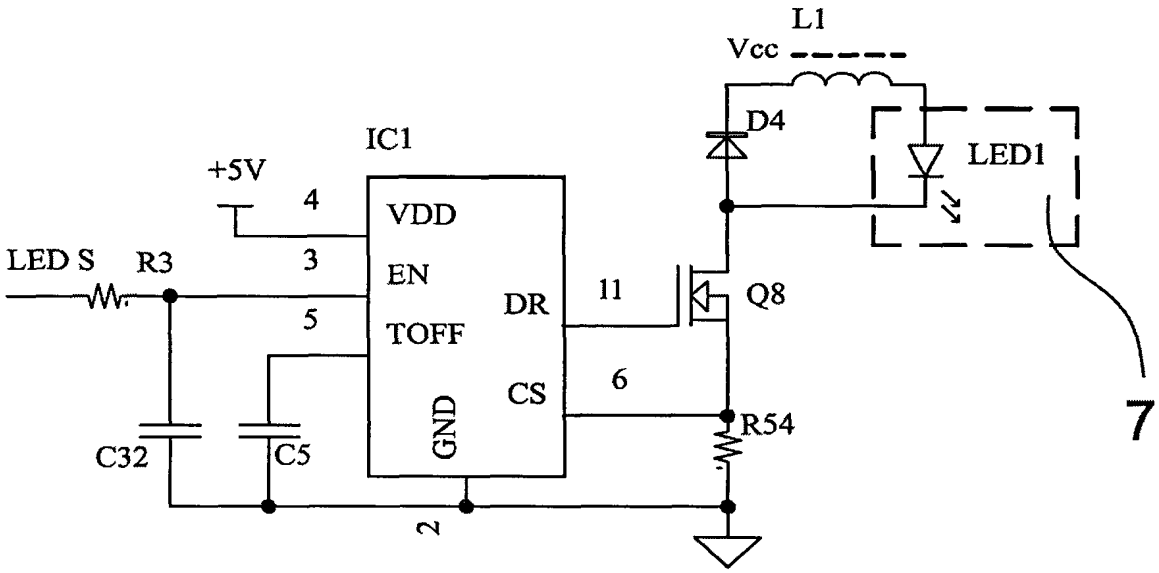


图 3

WINPLUS Ex. 1003, p. 714

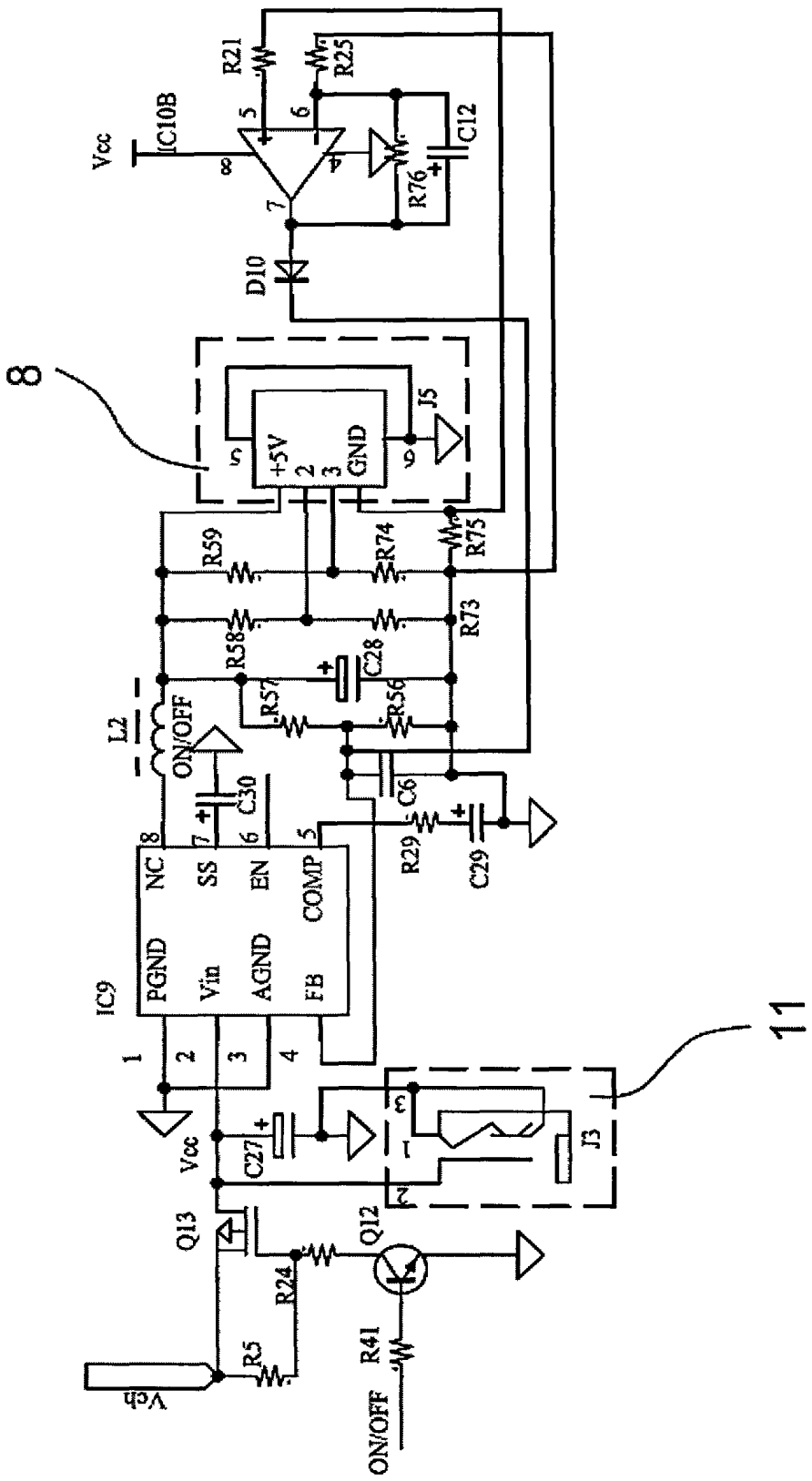


图 4

WINPLUS Ex. 1003, p. 715

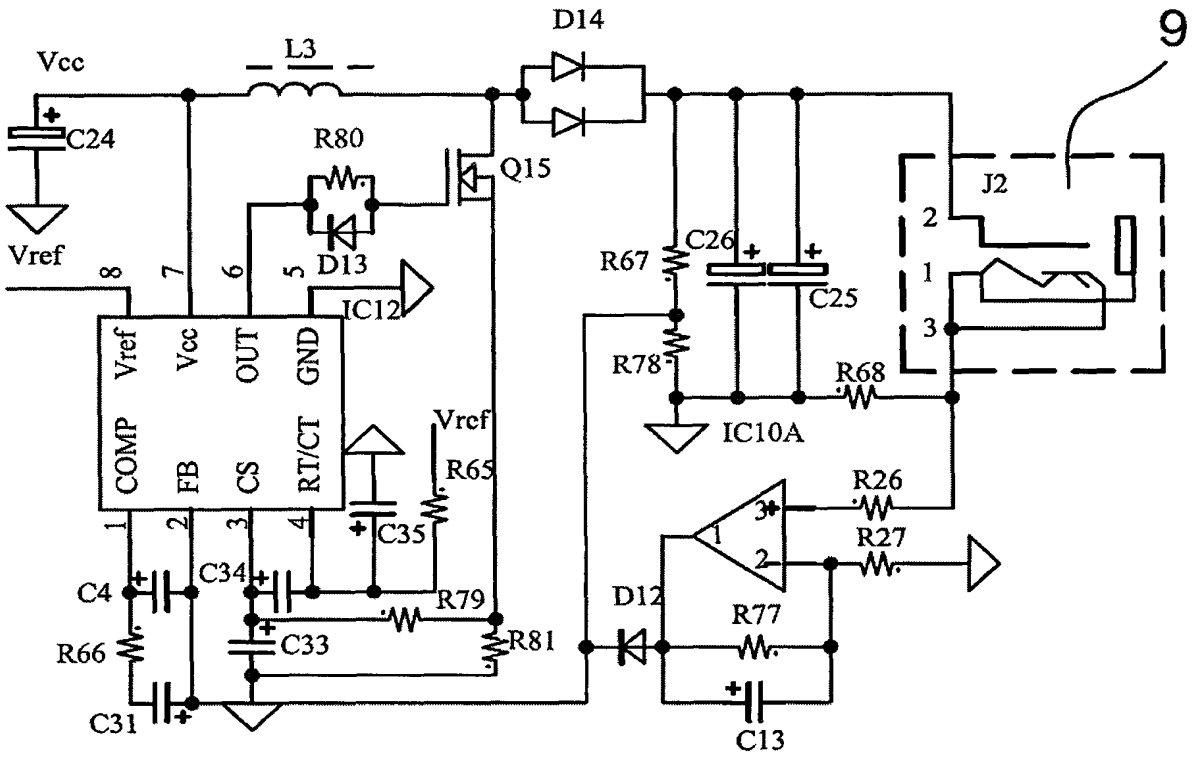


图 5

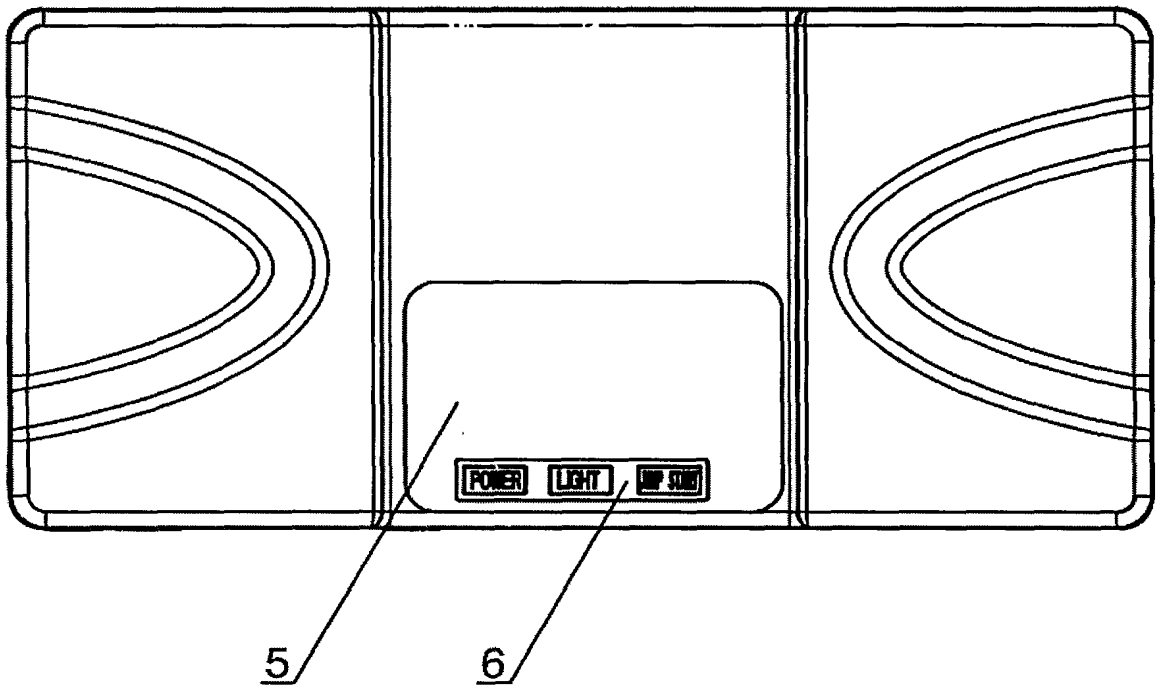


图 6

WINPLUS Ex. 1003, p. 716

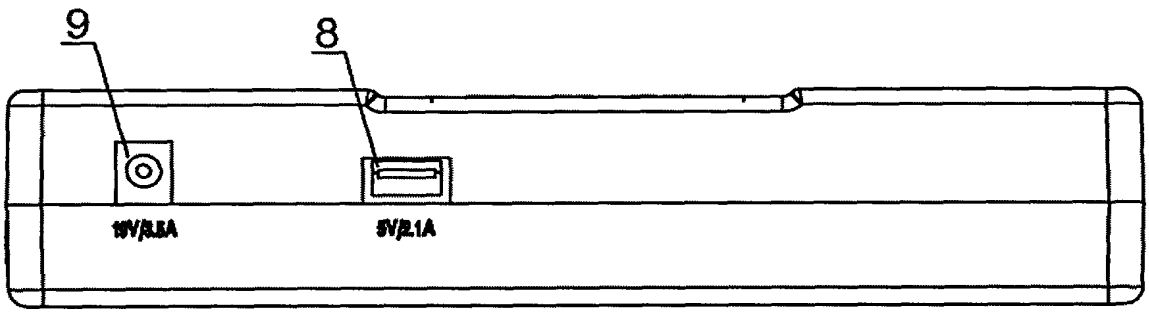


图 7

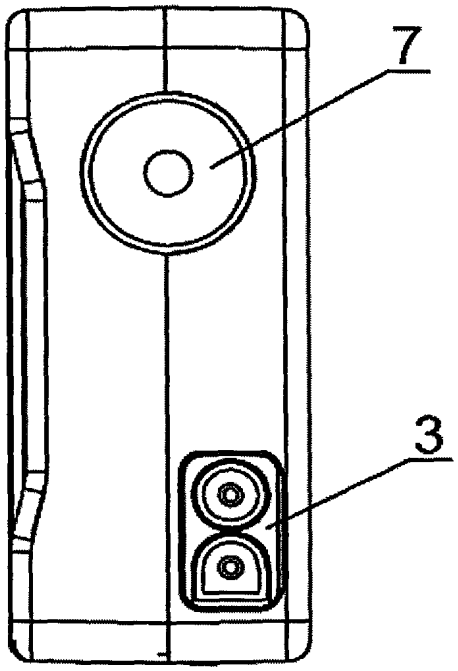


图 8

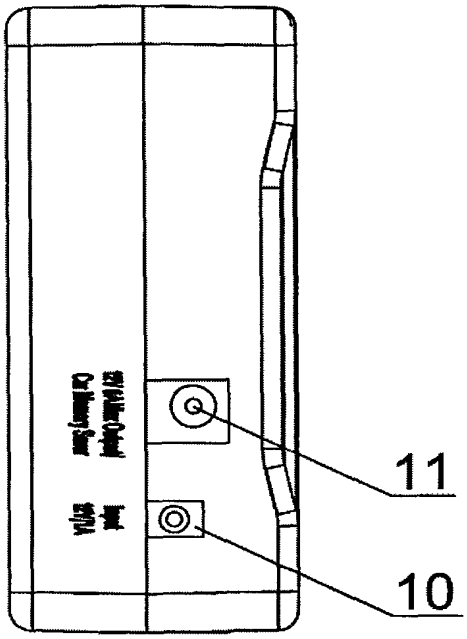


图 9

WINPLUS Ex. 1003, p. 717

Google Patents

Emergency starting device of automobile

Abstract

The utility model relates to a starting device of an automobile, in particular to an emergency starting device of an automobile. The emergency starting device comprises an internal battery, a charge input interface, a display module, a control module, a relay, an input key and output terminals. A main contact of the relay is connected with the internal battery and the output terminals respectively, the control module comprises a microprocessor and an external battery reverse connection detection circuit, and the microprocessor controls on and off of the relay via a relay switching circuit so as to control the internal battery to output currents to the output terminals; the external battery reverse connection detection circuit is used for providing correct or erroneous external battery connection signals. The emergency starting device has the advantages that the internal battery is connected with an external battery by the relay, and the relay is in an off state under conventional conditions or after the automobile is successfully started, so that sparks are prevented when the emergency starting device is connected to the automobile or is disconnected from the automobile; the relay is prevented from being actuated under the control of the microprocessor when the output terminals and the external battery are in wrong polarity connection, so that high currents caused by the wrong polarity connection can be prevented.

CN203211234U

Grant

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Other languages: Chinese

Inventor: [redacted]

Current Assignee : [redacted]

Worldwide applications

2013 · CN

Application CN 201320217854 events

2013-04-26 · Application filed by Huizhou Huayifong Technology Co ltd

2013-04-26 · Priority to CN 201320217854

2013-09-25 · Application granted

2013-09-25 · Publication of CN203211234U

Status · Active

2023-04-26 · Anticipated expiration

Info: Cited by (5), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

Claims (6)

Hide Dependent

1. car emergency starter gear, comprise internal cell (1), charging input (10) interface, display module (5), control module (4), relay (2), input button (6) and lead-out terminal (3) is characterized in that described relay (2) main contact is connected with lead-out terminal (3) with internal cell (1) respectively; Comprise microprocessor (42) in the control module (4), described microprocessor (42) by relay switching circuit (41) control relay (2) folding in order to control internal cell (1) to lead-out terminal (3) outgoing current; Also comprise in the control module (4) be used to the external cell reversal connection circuit for detecting (44) that the positive error signal of external cell wiring is provided.

2. car emergency starter gear according to claim 1 is characterized in that also comprising in the control module (4) internal cell voltage detection circuit (43), and described internal cell voltage detection circuit (43) is connected with microprocessor (42) signal.

3. car emergency starter gear according to claim 1 is characterized in that also comprising in the control module (4) external battery voltage circuit for detecting (45), and described external battery voltage circuit for detecting (45) is connected with microprocessor (42) signal.

4. car emergency starter gear according to claim 1 is characterized in that also comprising in the described device LED illumination equipment (7) and LED illumination driving circuit.

5. according to the arbitrary described car emergency starter gear of claim 1 to 4, it is characterized in that also comprising in the described device 5V voltage follower circuit and 19V voltage follower circuit, The 5V output circuit is connected with 5V lead-out terminal (8), and the 19V output circuit is connected with 19V lead-out terminal (9).

6. according to the arbitrary described car emergency starter gear of claim 1 to 4, it is characterized in that also comprising in the described device 12V lead-out terminal (11), described 12V mouth be connected with internal cell (1).

Description

A kind of car emergency starter gear

Technical field

A kind of automobile initiating means of the utility model is specifically related to a kind of car emergency starter gear.

Background technology

Automobile is indispensable a kind of transport facility in the social production.Present fuel-engined vehicle all arranges storage battery at automotive interior, and automotive engine charges to storage battery by electrical generator in operation process, when automotive engine shuts down, can provide the electric power supply automobile to use or make engine starting by storage battery.The set storage battery of automotive interior is generally lead-acid battery.Lead-acid battery become lower and lower through meeting capacity of cell after the charge and discharge cycles of certain number of times.Through long-term use battery is directly scrapped.When automobile in use, may automobile can't be started owing to battery over-discharge or battery failure.Common method is to replace automotive battery with an independent storage battery, makes automobile starting, and it is that lead-acid battery replaces former automotive battery that common this car emergency starts power supply.When in use, because lead-acid battery self is relatively heavier, bulky, does not also have the polarity measuring ability simultaneously, when the emergency starting electric power polarity that inserts is opposite with former automotive battery polarity, may produce very big electric current and make battery damage, when serious even can blast.Simultaneously so independent lead-acid battery does not have the sparkproof design as the automobile starting emergency source of electrical power yet when inserting, can produce spark inserting or disconnect emergency source of electrical power moment, have safety hazard.

The utility model content

A kind of car emergency that the utility model provides at above-mentioned weak point starts power supply.Car emergency of the present utility model starts power supply, when the emergency starting power supply insert in the automobile circuit electric power polarity connect inverse time not with energising.Car emergency startup power supply access simultaneously of the present utility model or disconnection can prevent effectively that electro spark from producing, and improved safety when being connected with automobile.

The utility model is achieved in that a kind of car emergency starter gear, comprises internal cell, charging input interface, display module, control module, relay, input button and lead-out terminal, wherein said relay main contact is connected with lead-out terminal with internal cell respectively; Comprise microprocessor in the control module, described microprocessor by the folding of relay switching circuit control relay in order to control internal cell to the lead-out terminal outgoing current; Also comprise in the control module be used to the external cell reversal connection circuit for detecting that the positive error signal of external cell wiring is provided.Also comprise the 12V lead-out terminal in the car emergency starter gear of the present utility model, described 12V lead-out terminal is connected with internal cell.

For making display module can show internal cell voltage, it is characterized in that also comprising in the control module internal cell voltage detection circuit, described internal cell voltage detection circuit is connected with microprocessor signals.

For making display module can show external battery voltage, also comprise the external battery voltage circuit for detecting in the control module, described external battery voltage circuit for detecting is connected with microprocessor signals.

Car emergency starter gear of the present utility model also comprises LED illumination equipment and LED illumination driving circuit.

Use for convenient, also comprise 5V voltage follower circuit and 19V voltage follower circuit in the car emergency starter gear of the present utility model; The 5V output circuit is connected with the 5V lead-out terminal, and the 19V output circuit is connected with the 19V lead-out terminal.

Car emergency starter gear of the present utility model, adopt the internal battery scheme, internal cell and external cell insert by relay simultaneously, generally relay is in off state, and when this device is connected with outside automobile batteries, this device will detect external battery voltage, this voltage can be presented on the LCD simultaneously, at this moment, press the break-make that the JUMP button of input in the button can control relay, make this car emergency starter gear when inserting, not produce spark.After using this device and successfully starting automobile, this device will turn-off condenser within 2 seconds, external cell is disconnected with internal cell be connected, make this car emergency starter gear when removing, also can not produce spark, also can not produce automobile current generator to the situation of this device reverse charging simultaneously.This device inside is provided with external cell reversal connection circuit for detecting simultaneously, when polarity wrong that car emergency starter gear lead-out terminal of the present utility model is connected with external cell, the not adhesive of microprocessor control relay can effectively be prevented the stop polarity wrong and the big electric current that produces.

Description of drawings

Fig. 1 is the utility model system architecture scheme drawing.

Fig. 2 is the utility model control module schematic circuit diagram.

Fig. 3 is the utility model LED illumination equipment schematic circuit diagram.

Fig. 4 is the utility model 5V output circuit schematic diagram.

Fig. 5 is the utility model 19V output circuit schematic diagram.

Fig. 6 looks scheme drawing for master of the present utility model.

Fig. 7 is elevational schematic view of the present utility model.

Fig. 8 looks scheme drawing for the right side of the present utility model.

Fig. 9 looks scheme drawing for a left side of the present utility model.

In the accompanying drawing, the 1-internal cell, the 2-relay, the 3-lead-out terminal, the 4-control module, the 5-display module, 6-imports button, the input of charging of 7-LED illumination equipment, 8-5V lead-out terminal, 9-19V lead-out terminal, 10-, 11-12V lead-out terminal.

The specific embodiment

Below in conjunction with the drawings and specific embodiments the utility model is described in further detail, but the utility model is not limited to following embodiment; any change of making on the present embodiment principle or replacement scheme all fall among the claimed scope of the utility model.

1 arrive Fig. 9 by reference to the accompanying drawings, a kind of car emergency starter gear comprises internal cell 1, charging input 10 interfaces, display module 5, control module 4, relay 2, input button 6 and lead-out terminal 3, wherein said relay 2 main contact contacts are connected with lead-out terminal 3 with internal cell 1 respectively; Comprise microprocessor 42 in the control module 4, described microprocessor 42 by 2 foldings of relay switching circuit 41 control relays in order to control internal cell 1 to lead-out terminal 3 outgoing currents; Also comprise in the control module 4 be used to the external cell reversal connection circuit for detecting 44 that the positive error signal of external cell wiring is provided

For making display module 5 can show internal cell 1 voltage, it is characterized in that also comprising in the control module 4 internal cell voltage detection circuit 43, described internal cell voltage detection circuit 43 is connected with microprocessor 42 signals.

For making display module 5 can show external battery voltage, also comprise external battery voltage circuit for detecting 45 in the control module 4, described external battery voltage circuit for detecting 45 is connected with microprocessor 42 signals

Car emergency starter gear of the present utility model also comprises LED illumination equipment 7 and LED illumination driving circuit.

Use for convenient, also comprise 5V voltage follower circuit and 19V voltage follower circuit in the car emergency starter gear of the present utility model; The 5V output circuit is connected with 5V lead-out terminal 8, and the 19V output circuit is connected with 19V lead-out terminal 9.Also comprise 12V lead-out terminal 11 in the car emergency starter gear of the present utility model, described 12V lead-out terminal 11 is connected with internal cell 1.

When automobile owing to automobile when the charged pool reason can not start, car emergency starter gear lead-out terminal 3 of the present utility model and external cell are waited that namely starting automobile is connected from charged pool.Generally relay is in off state, if polarity was wrong when lead-out terminal 3 was connected with external cell, provide a signal to microprocessor 42 by external cell reversal connection circuit for detecting 44, thereby make microprocessor 42 control relays 2 can not adhesive can avoid the big electric current that produces because of the polarity wrong.If lead-out terminal 3 is correct with external cell polarity, 45 work of external battery voltage circuit for detecting, microprocessor 42 can detect external battery voltage, this voltage can be presented on the LCD simultaneously, if external battery voltage is in normal range, then can press the JUMP button of input in the button 6 and make relay 2 adhesives, so as internal cell 1 by lead-out terminal 3 to waiting to start the automobile outgoing current.When automobile starting after 2 seconds, microprocessor 42 can disconnect by control relays 2, in order to take off lead-out terminal 3 wiring.Because disconnecting in the lead-out terminal 3 of back, relay 2 do not have electric current, so taking off Shi Buhui generation spark.After the own startup of automobile and taking off lead-out terminal 3 wiring, car emergency starter gear of the present utility model work is finished.

Offer microprocessor 42 signals by internal cell voltage detection circuit 43, can demonstrate internal cell 1 voltage at display module 5, with convenient battery use state is monitored.Offer microprocessor 42 signals by external battery voltage circuit for detecting 45, can demonstrate external battery voltage at display module 5, with convenient understanding external cell situation.

For internal cell 1 can be charged, this device is provided with charging input 10 interfaces.Simultaneously also be provided with LED illumination equipment 7 on this device, when making things convenient for light intensity not enough as throwing light on.Also be provided with 5V lead-out terminal 8 and 19V lead-out terminal 9 and 12V lead-out terminal 11 on this device, can working as general power supply for other consumer use at ordinary times.

Cited By (5)

Publication number	Priority date	Publication date	Assignee	Title
CN104118374A *	2013-04-26	2014-10-29	惠州市华易通科技有限公司	Automobile emergency start device
US10135271B2	2014-09-09	2018-11-20	Halo International SEZC Ltd.	Multi-functional portable power charger
US10250056B2	2014-09-09	2019-04-02	Halo International SEZC Ltd.	Multi-function external attachment and safety circuit for a portable power charger
US10340716B2	2014-09-09	2020-11-17	Halo International SEZC Ltd.	Safety circuit for multi-function portable power charger
US11124077B2	2014-04-28	2021-09-21	Pilot Inc.	Automobile charger
Family To Family Citations				

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
CN203211234U	2013-09-25	Emergency starting device of automobile
CN104118374A	2014-10-29	Automobile emergency start device
CN104709104B	2017-02-01	Method and system for rapidly switching battery packs of electric vehicle
CN105416069B	2017-09-26	A kind of power supply for electric car
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CN204271634U	2015-04-15	The startup battery pack that a kind of novel height ensures
CN104044588A	2014-09-17	Electricity loss prevention device and electricity loss prevention method of low-voltage storage battery
CN103618346A	2014-03-05	Automobile double-set storage battery charging and discharging automatic switching controller
CN102602295B	2015-01-28	Awakening electric shock prevention device for electric vehicle
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CN107745689A	2018-03-02	Vehicle-mounted emergency electric system and motor vehicle
US9667059B2	2017-05-30	Battery protection device and battery device

Priority And Related Applications

Priority Applications (1)

Application	Priority date	Filing date	Title
CN 201320217854	2013-04-26	2013-04-26	Emergency starting device of automobile

Applications Claiming Priority (1)

Application	Filing date	Title
CN 201320217854	2013-04-26	Emergency starting device of automobile

Legal Events

Date	Code	Title	Description
2013-09-25	C14	Grant of patent or utility model	
2013-09-25	GR01	Patent grant	
2014-10-08	ASS	Succession or assignment of patent right	**Owner name:** DONGGUAN ZHONGKANG TECHNOLOGY ELECTRONICS CO., LTD **Free format text:** FORMER OWNER: HUIZHOU HUAYITONG TECHNOLOGY CO., LTD. **Effective date:** 20140915
2014-10-08	C41	Transfer of patent application or patent right or utility model	
2014-10-08	COR	Change of bibliographic data	**Free format text:** CORRECT: ADDRESS; FROM: 516000 HUIZHOU, GUANGDONG PROVINCE TO: 523000 DONGGUAN, GUANGDONG PROVINCE
2014-10-08	TR01	Transfer of patent right	**Effective date of registration.** 20140915 **Address after:** 523000 Guangdong province Dongguan city Tangxia town Tian Xinyan Road No. 12 **Patentee after:** Dongguan Zhongkang Technology Electronics Co., Ltd. **Address before:** 516000 Guangdong city of Huizhou province Medina kapok pit gold wheat hill F type A layer 701 rooms **Patentee before:** HUIZHOU HUAYITONG TECHNOLOGY CO., LTD.

Concepts

machine-extracted

Download Filter table

Name	Image	Sections	Count	Query match
detection method		claims,abstract,description	9	0.000

starting material	claims,description	22	0.000
illumination	claims,description	9	0.000
reversible	claims,description	5	0.000

Show all concepts from the description section

(19)中华人民共和国国家知识产权局

(12)实用新型专利

(10)授权公告号 CN 203504235 U
(45)授权公告日 2014.03.26

(21)申请号 201320627258.5

(22)申请日 2013.10.11

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(51)Int.Cl.
H02J 7/00(2006.01)

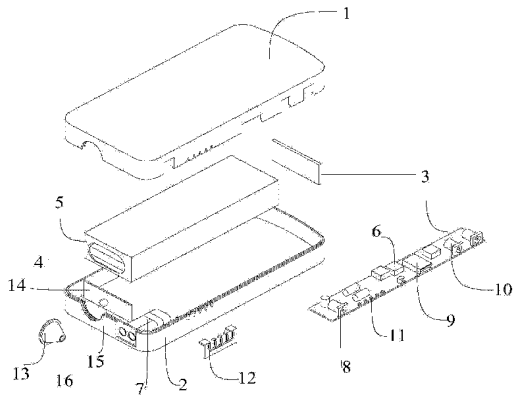
权利要求书1页 说明书2页 附图1页

(54)实用新型名称

一种多功能汽车应急启动电源

(57)摘要

本实用新型涉及移动电源技术领域，尤其是一种多功能汽车应急启动电源。它包括由上盖和下壳形成的壳体，壳体内设置有电池组和主控板，电池组连接有汽车启动连接件；电池组包括若干个电池，若干个电池上下叠置后通过隔热胶条包覆；主控板包括若干个线圈，线圈上罩设有防护壳。本实用新型通过耐高温的隔热胶条将若干个高倍放电的锂电聚合物电池板进行包覆从而形成整体式的电池组，有利于电池组的防水防尘以及防膨胀处理；同时，利用防护壳可防止线圈积灰，保证了线圈的工作性能；主控板则连接了丰富的充电接口，可为手机、平板电脑、笔记本电脑、车载冰箱等设备充电，并形成了应急输出功能以作为汽车的启动电源使用；其结构简单，具有很强的实用性。



CN 203504235 U

1. 一种多功能汽车应急启动电源，它包括由上盖和下壳形成的壳体，所述壳体内设置有电池组和主控板，所述电池组连接主控板，其特征在于：所述电池组连接有受控于主控板的汽车启动连接件；所述电池组包括若干个电池，若干个所述电池上下叠置后通过隔热胶条包覆；所述主控板包括若干个线圈，所述线圈上罩设有防护壳。

2. 如权利要求 1 所述的一种多功能汽车应急启动电源，其特征在于：所述电池为锂电聚合物电池板。

3. 如权利要求 2 所述的一种多功能汽车应急启动电源，其特征在于：所述主控板连接并控制有 19V/3.5A 充电口、5V/2A 充电口、12V/2A 充电口和若干个电量指示灯，所述 19V/3.5A 充电口、5V/2A 充电口和 12V/2A 充电口均设置在壳体的一侧面上，所述壳体的下壳上对应于电量指示灯的位置设置有灯槽，所述灯槽内设置有第一灯罩。

4. 如权利要求 3 所述的一种多功能汽车应急启动电源，其特征在于：所述主控板还连接有照明灯组件，所述照明灯组件包括透镜灯罩和与主控板电连的灯控板，所述灯控板上设置有灯珠，所述透镜灯罩上设置有用于容置灯珠的凹槽。

WINPLUS Ex. 1003, p. 724

一种多功能汽车应急启动电源

技术领域

[0001] 本实用新型涉及移动电源技术领域，尤其是一种多功能汽车应急启动电源。

背景技术

[0002] 随着科学技术的不断发展，各式各样的电子产品很受欢迎，比如手机、平板电脑、数码相机等，极大的改善了人们的生活水平，市场上出现了各种专用的移动电源为电子产品充电，使用十分方便；同时，也针对汽车以及其他电子设备的启动或充电需求对移动电源进行了功能融合，形成了汽车应急启动电源。

[0003] 然而，随着移动电源应用范围的扩大，其使用环境及使用条件也出现了多样的变化，由于现有的移动电源或汽车应急启动电源仍然存在功能相对单一、结构设计不合理等问题，进而导致其使用不便、防水防尘效果差；因此有必要对现有的移动电源或汽车应急启动电源进行结构及功能改进，以满足人们现实的需求。

实用新型内容

[0004] 针对上述现有技术中存在的不足，本实用新型的目的在于提供一种结构简单、防水防尘效果显著、功能丰富、使用方便的多功能汽车应急启动电源。

[0005] 为了实现上述目的，本实用新型采用如下技术方案：

[0006] 一种多功能汽车应急启动电源，它包括由上盖和下壳形成的壳体，所述壳体内设置有电池组和主控板，所述电池组连接主控板，所述电池组连接有受控于主控板的汽车启动连接件；所述电池组包括若干个电池，若干个所述电池上下叠置后通过隔热胶条包覆；所述主控板包括若干个线圈，所述线圈上罩设有防护壳。

[0007] 优选地，所述电池为锂电聚合物电池板。

[0008] 优选地，所述主控板连接并控制有 19V/3.5A 充电口、5V/2A 充电口、12V/2A 充电口和若干个电量指示灯，所述 19V/3.5A 充电口、5V/2A 充电口和 12V/2A 充电口均设置在壳体的一侧面上，所述壳体的下壳上对应于电量指示灯的位置设置有灯槽，所述灯槽内设置有第一灯罩。

[0009] 优选地，所述主控板还连接有照明灯组件，所述照明灯组件包括透镜灯罩和与主控板电连的灯控板，所述灯控板上设置有灯珠，所述透镜灯罩上设置有用于容置灯珠的凹槽。

[0010] 由于采用了上述方案，本实用新型通过耐高温的隔热胶条将若干个高倍放电的锂电聚合物电池板进行包覆从而形成整体式的电池组，有利于电池组的防水防尘以及防膨胀处理；同时，利用防护壳罩设主控板上的线圈，防止线圈积灰，保证了线圈的工作性能；另外，主控板连接了丰富的充电接口，可为手机、平板电脑、笔记本电脑、车载冰箱等设备充电，并形成了应急输出功能以作为汽车的启动电源使用；其结构简单、实用性强。

附图说明

WINPLUS Ex. 1003, p. 725

[0011] 图 1 为本实用新型实施例的分解结构示意图。

具体实施方式

[0012] 以下结合附图对本实用新型的实施例进行详细说明，但是本实用新型可以由权利要求限定和覆盖的多种不同方式实施。

[0013] 如图 1 所示，本实用新型提供的一种多功能汽车应急启动电源，它包括由上盖 1 和下壳 2 组装形成的壳体，在壳体内设置有电池组和主控板 3，电池组连接主控板 3；其中，电池组包括若干个电池 4，本实施例的电池 4 采用由高倍放电的锂电聚合物电池板以代替传统移动电源内的圆柱电芯，若干个电池 4 上下叠置后通过隔热胶条 5 包覆，以此形成整体式电池组，利于电池组的更换、拆装以及电池的防尘、防水和防膨胀处理；由于主控板 3 包括若干个容易积灰的线圈（图中未示出），故为保证线圈的工作性能同时防止线圈积灰、触水，在线圈上罩设有防护壳 6；而电池组还连接有受控于主控板 3 的汽车启动连接件 7，以此实现移动电源的应急输出功能，使其能够作为汽车启动电源使用并完成多次启动。

[0014] 为丰富移动电源的功能，拓宽适用范围，主控板 3 连接并控制有用于为笔记本电脑等电子产品进行充电的 19V/3.5A 充电口 8、用于为手机、数码相机、PSP、平板电脑和汽车导航等设备进行充电的 5V/2A 充电口 9、用于为车载冰箱等设备进行充电的 12V/2A 充电口 10 和若干个并排设置的电量指示灯 11；其中，19V/3.5A 充电口 8、5V/2A 充电口 9 和 12V/2A 充电口 10 均设置在壳体的一侧面上，在壳体的下壳 2 上对应于电量指示灯 11 的位置设置有灯槽（图中未示出），在灯槽内设置有第一灯罩 12，以利用第一灯罩 12 实现电量指示灯 11 的连续性变化而不是单个点的显示。

[0015] 另外，主控板 3 还连接有照明灯组件，以使移动电源可以提供长时间、高亮度的照明，照明灯组件包括透镜灯罩 13 和与主控板 3 电连的灯控板 14，在灯控板 14 上设置有灯珠 15，在透镜灯罩 13 上设置有用于容置灯珠 15 的凹槽 16，而透镜灯罩 13 则嵌合在壳体侧面的对应插槽内。

[0016] 本实施例的移动电源极大的丰富了传统移动电源的功能，可为众多电子设备以及汽车提供电源，鉴于移动电源使用环境及使用条件的多变性，在保证其高效工作性能的基础上，通过结构的细化设置，实现移动电源的防水、防尘等效果，其结构简单、具有很强的实用性和市场推广价值。

[0017] 以上所述仅为本实用新型的优选实施例，并非因此限制本实用新型的专利范围，凡是利用本实用新型说明书及附图内容所作的等效结构或等效流程变换，或直接或间接运用在其他相关的技术领域，均同理包括在本实用新型的专利保护范围内。

WINPLUS Ex. 1003, p. 726

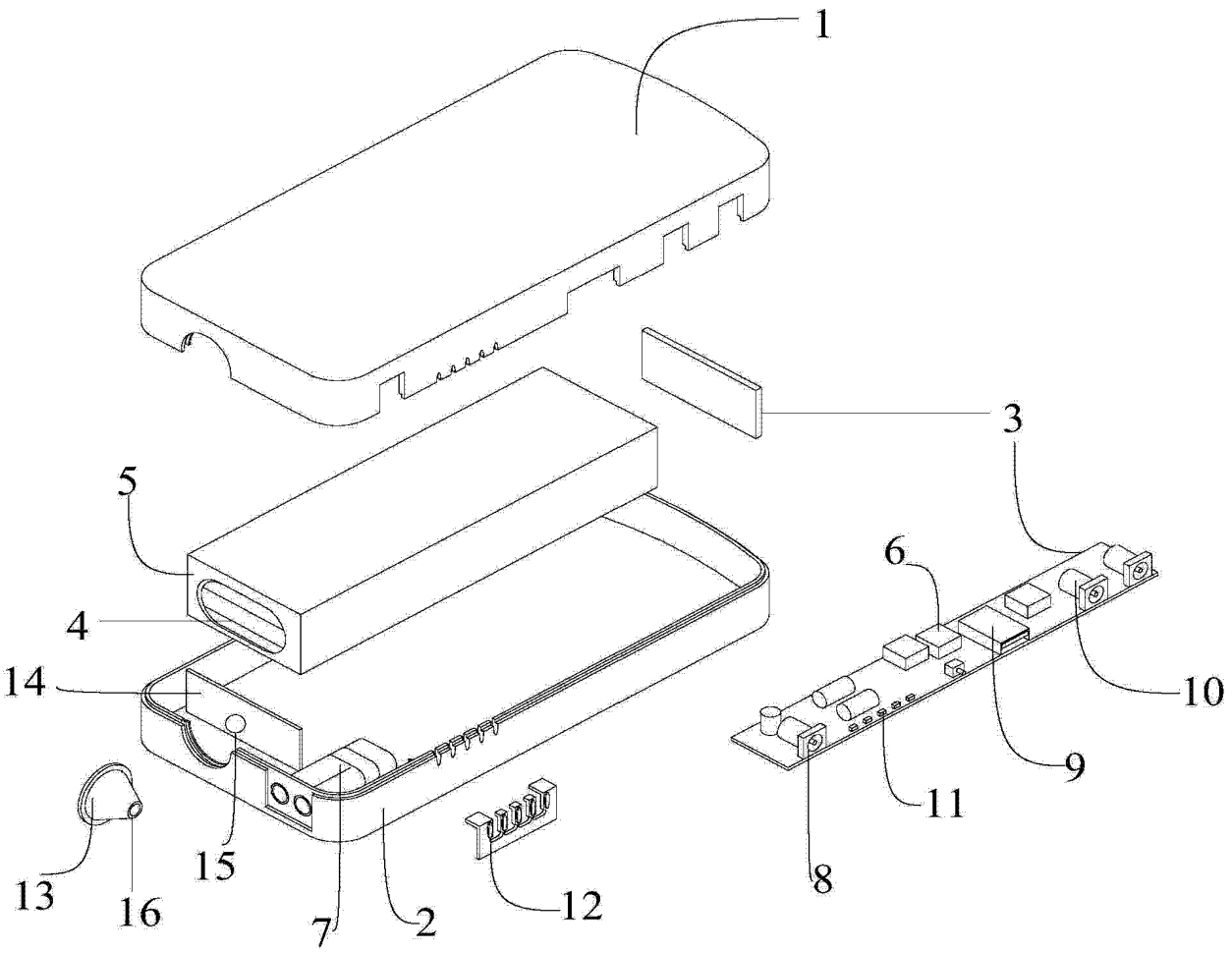


图 1

WINPLUS Ex. 1003, p. 727

Multifunctional emergency starting power supply for car

Abstract

The utility model relates to the technical field of mobile power supplies, and particularly relates to a multifunctional emergency starting power supply for a car. The multifunctional emergency starting power supply for a car comprises a shell formed by an upper cover and a lower shell; the shell is internally provided with a battery pack and a main control board; the battery pack is connected with a car starting connector; the battery pack comprises a plurality of batteries, and the batteries are stacked vertically and coated by a heat insulation tape; and the main control board comprises a plurality of coils, and a protection shell covers the coils. According to the multifunctional emergency starting power supply for the car, a plurality of high-power discharge lithium polymer battery plates are coated via the high temperature-resisting heat insulation tape to form an integral battery pack, thereby facilitating water-proof, dust-proof and expansion-proof treatment on the battery pack; dust can be prevented from gathering on the coils due to the protection shell, thereby ensuring operation performances of the coil; as the main control board is connected with rich charging interfaces, equipment such as a cell phone, a tablet personal computer, a notebook computer and a car-mounted refrigerator can be charged, and an emergency output function is formed to serve as the starting power supply for the car; and the structure is simple and practicability is strong.

article: 那个 translated from English

CN203504235U

Grant

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Other languages: Chinese

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Worldwide applications

2013 · CN

Application CN201320627258.5U events

2013-10-11 ◦ Application filed by [redacted]

2013-10-11 ◦ Priority to CN201320627258.5U

2014-03-26 ◦ Application granted

2014-03-26 ◦ Publication of CN203504235U

Status ◦ Expired - Fee Related

2023-10-11 ◦ Anticipated expiration

Info: Cited by (1), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

Claims (4)

Hide Dependent

1. a multi-purpose vehicle(MPV) emergency starting power supply, it comprises the housing being formed by upper cover and lower casing, in described housing, be provided with battery pack and master control borad, described battery pack connects master control borad, it is characterized in that: described battery pack is connected with the automobile starting connector that is controlled by master control borad; Described battery pack comprises several batteries, and described in several, battery is upper and lower is coated by insulated rubber strip after stacked; Described master control borad comprises several coils, on described coil, is covered with protecting crust.

2. a kind of multi-purpose vehicle(MPV) emergency starting power supply as claimed in claim 1, is characterized in that: described battery is lithium electric polymer cell panel.

3. a kind of multi-purpose vehicle(MPV) emergency starting power supply as claimed in claim 2, it is characterized in that: described master control borad connects and controlled 19V/3.5A charge port, 5V/2A charge port, 12V/2A charge port and several battery capacity indication lamps, described 19V/3.5A charge port, 5V/2A charge port and 12V/2A charge port are all arranged on a side of housing, position corresponding to battery capacity indication lamp on the lower casing of described housing is provided with light trough, is provided with the first lampshade in described light trough.

4. a kind of multi-purpose vehicle(MPV) emergency starting power supply as claimed in claim 3, it is characterized in that: described master control borad is also connected with lamp assembly, described lamp assembly comprises lens lampshade and the lamp control plate being electrically connected with master control borad, on described lamp control plate, be provided with lamp pearl, on described lens lampshade, be provided with the groove for accommodating lamp pearl.

Description

A kind of multi-purpose vehicle(MPV) emergency starting power supply

Technical field

The utility model relates to portable power source technical field, especially a kind of multi-purpose vehicle(MPV) emergency starting power supply.

Background technology

Along with scientific and technical development, electronic product miscellaneous is popular, and such as mobile phone, panel computer, digital camera etc., has improved greatly people's living standard, the portable power source that has occurred various special uses on market is electronic product charging, uses very convenient; Meanwhile, also for startup or the charging demand of automobile and other electronic equipments, portable power source has been carried out to function fusion, formed car emergency and started power supply.

Yet, expansion along with portable power source range of application, also there is various variation in its environment for use and service condition, because existing portable power source or car emergency start power supply, still there is the problems such as function is relatively single, structural design is unreasonable, and then cause it to use inconvenience, water proof and dust proof weak effect; Therefore be necessary existing portable power source or car emergency startup power supply to carry out structure and revising of the functions, to meet the demand of people's reality.

Utility model content

For above-mentioned the deficiencies in the prior art, the purpose of this utility model be to provide a kind of simple in structure, water proof and dust proof effect significantly, feature richness, multi-purpose vehicle(MPV) emergency starting power supply easy to use.

To achieve these goals, the utility model adopts following technical scheme:

A multi-purpose vehicle(MPV) emergency starting power supply, it comprises the housing being formed by upper cover and lower casing, is provided with battery pack and master control borad in described housing, and described battery pack connects master control borad, and described battery pack is connected with the automobile starting connector that is controlled by master control borad; Described battery pack **article**: 那个 ries, and described in several, battery is upper and lower is coated by insulated rubber strip after stacked; Described master control borad comp scribed coil, is covered with protecting crust.

translated from English

Preferably, described battery is lithium electric polymer cell panel.

Preferably, described master control borad connects and has controlled 19V/3.5A charge port, 5V/2A charge port, 12V/2A charge port and several battery capacity indication lamps, described 19V/3.5A charge port, 5V/2A charge port and 12V/2A charge port are all arranged on a side of housing, position corresponding to battery capacity indication lamp on the lower casing of described housing is provided with light trough, is provided with the first lampshade in described light trough.

Preferably, described master control borad is also connected with lamp assembly, and described lamp assembly comprises lens lampshade and the lamp control plate being electrically connected with master control borad, on described lamp control plate, is provided with lamp pearl, on described lens lampshade, is provided with the groove for accommodating lamp pearl.

Owing to having adopted such scheme, thereby the utility model is coated the lithium electric polymer cell panel of several high power electric discharges to form all-in-one-piece battery pack by thermostable heat insulation adhesive tape, is conducive to water proof and dust proof and the anti-expansion process of battery pack; Meanwhile, utilize protection clamshell to establish the coil on master control borad, prevent coil dust stratification, guaranteed the service behaviour of coil; In addition, master control borad has connected abundant charging inlet, can be the equipment charges such as mobile phone, panel computer, notebook computer, car refrigerator, and has formed emergent output function and using and use as the startup power supply of automobile; It is simple in structure, practical.

Accompanying drawing explanation

Fig. 1 is the decomposition texture schematic diagram of the utility model embodiment.

Embodiment

Below in conjunction with accompanying drawing, embodiment of the present utility model is elaborated, but the multitude of different ways that the utility model can be defined by the claims and cover is implemented.

As shown in Figure 1, a kind of multi-purpose vehicle(MPV) emergency starting power supply that the utility model provides, it comprises the housing being formed by upper cover 1 and lower casing 2 assemblings, is provided with battery pack and master control borad 3 in housing, battery pack connects master control borad 3, Wherein, battery pack comprises several batteries 4, the battery 4 of the present embodiment adopts the lithium electric polymer cell panel being discharged by high power to replace the cylindrical electrical core in traditional portable power source, it is coated by insulated rubber strip 5 after several batteries are stacked Shang Xia 4, with this, form integral type battery group, be beneficial to dustproof, waterproof and the anti-expansion process of replacing, dismounting and the battery of battery pack; Because master control borad 3 comprises the coil (not shown) of several easy dust stratifications, therefore for the service behaviour of assurance coil prevents coil dust stratification, touches water simultaneously, be provided with protecting crust 6 in coil upper cover, And battery pack is also connected with the automobile starting connector 7 that is controlled by master control borad 3, with this, realize the emergent output function of portable power source, can use and complete repeatedly as automobile starting power supply to start.

The function of horn of plenty portable power source, widen the scope of application, master control borad 3 connects and controls and is useful on the 19V/3.5A charge port 8 of charging for electronic products such as notebook computers, is used to the 5V/2A charge port 9 that the equipment such as mobile phone, digital camera, PSP, panel computer and auto navigation charge, 12V/2A charge port 10 and several the battery capacity indication lamps 11 being arranged side by side that is used to the equipment such as car refrigerator to charge; Wherein, 19V/3.5A charge port 8,5V/2A charge port 9 and 12V/2A charge port 10 are all arranged on a side of housing, position corresponding to battery capacity indication lamp 11 on the lower casing 2 of housing is provided with light trough (not shown), in light trough, be provided with the first lampshade 12, to utilize the first lampshade 12 to realize the continuity variation of battery capacity indication lamp 11 rather than the demonstration of a single point.

In addition, master control borad 3 is also connected with lamp assembly, so that portable power source can provide for a long time, the illumination of high brightness, lamp assembly comprises lens lampshade 13 and the lamp control plate 14 being electrically connected with master control borad 3, on lamp control plate 14, be provided with lamp pearl 15, on lens lampshade 13, be provided with the groove 16 for accommodating lamp pearl 15, lens lampshade 13 is entrenched in the corresponding slot of housing side.

The portable power source of the present embodiment has enriched the function of traditional portable power source greatly, can be numerous electronic equipments and automobile power supply is provided, polytropy in view of portable power source environment for use and service condition, guaranteeing on the basis of its efficient operation performance, refinement by structure arranges, realize the waterproof and dustproof texts of portable power source, it is simple in structure, have very strong practicality and market popularization value.

The foregoing is only preferred embodiment of the present utility model; not thereby limit the scope of the claims of the present utility model; every equivalent structure or conversion of equivalent flow process that utilizes the utility model specification and accompanying drawing content to do; or be directly or indirectly used in other relevant technical fields, be all in like manner included in scope of patent protection of the present utility model.

Cited By (1)

Publication number	Priority date	Publication date	Assignee	Title
CN105029876A *	2015-08-14	2015-11-11	李喜良	Portable bag with portable power sources
Family To Family Citations				

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

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CN203312856U	2013-11-27	Multifunctional port[illegible]wer supply
CN203522279U	2014-04-02	Multifunctional mob[illegible]
CN202772625U	2013-03-06	Multifunctional mobile power supply
CN202957680U	2013-05-29	Multifunctional charging box
CN203504235U	2014-03-26	Multifunctional emergency starting power supply for car
CN202663159U	2013-01-09	Mobile power supply
CN201430551Y	2010-03-24	Solar energy power supply
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CN104821616A	2015-08-05	Solar charging device
CN204633426U	2015-09-09	Be applicable to the portable power source of electrical equipment
CN206575183U	2017-10-20	Multifunctional portable power source
CN205092810U	2016-03-16	Solar mobile power supply system
CN201845561U	2011-05-25	Solar multifunctional music player
CN204012780U	2014-12-10	Adjustable battery
CN205835959U	2016-06-22	Multifunctional solar mobile power supply
CN203553971U	2014-04-16	Multi-output emergency power supply
CN103683411B	2016-03-30	A kind of portable power source with solar cell
CN203261075U	2013-10-30	Portable mobile power supply
CN211359623U	2020-11-03	Utilize carrying device of photovoltaic rechargeable lithium cell accumulate

Priority And Related Applications

Priority Applications (1)

Application	Priority date	Filing date	Title
CN201320627258.5U	2013-10-11	2013-10-11	Multifunctional emergency starting power supply for car

Applications Claiming Priority (1)

Application	Filing date	Title
CN201320627258.5U	2013-10-11	Multifunctional emergency starting power supply for car

Legal Events

Date	Code	Title	Description
2014-03-26	GR01	Patent grant	
2014-03-26	GR01	Patent grant	
2016-11-09	C41	Transfer of patent application or patent right or utility model	
2016-11-09	TR01	Transfer of patent right	**Effective date of registration:** 20161021 **Address after:** 518000 Guangdong province Shenzhen city Longhua District Guanlan ty Yuelu No. 334 concave back Guangxi with rich industrial park A1 **Patentee after:** SHENZHEN BENRONG TECHNOLOGY CO., LTD. **Address before:** 516100 Guangdong city of Huizhou province Boluo county Luo Yang Zhen Guan Park Yuelong Lane No. 6 **Patentee before:** Luo Wuqiang
2019-10-08	CF01	Termination of patent right due to non-payment of annual fee	**Granted publication date:** 20140326 **Termination date:** 20181011
2019-10-08	CF01	Termination of patent right due to non-payment of annual fee	

article: 部件
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Concepts

machine-extracted

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Name	Image	Sections	Count	Query match
lithium	Li	claims,abstract,description	5	0.000
lithium		claims,abstract,description	5	0.000
polymer		claims,abstract,description	5	0.000
Moroccan pepper virus		claims,description	9	0.000
corresponding		claims,description	4	0.000
dust		abstract,description	7	0.000
insulation		abstract,description	3	0.000

Show all concepts from the description section

Espacenet

Bibliographic data: CN103560555 (A) — 2014-02-05

Automobile emergency starting power circuit capable of automatically judging normal output

Inventor(s): LAI YANAN ± (LAI YANAN)

Applicant(s): HANGZHOU SUNLIGHT TOOLS CO LTD ± (HANGZHOU SUNLIGHT TOOLS CO., LTD)

Classification: **- international:** ***H02J7/00***
- cooperative:

Application number: CN201310528846 20131030 Global Dossier

Priority number (s): CN201310528846 20131030

Also published as: CN103560555 (B)

Abstract of CN103560555 (A)

The embodiment of the invention discloses an automobile emergency starting power circuit capable of automatically judging normal output. The automobile emergency starting power circuit capable of automatically judging normal output comprises a rechargeable battery, a first sampling circuit, a switch circuit, a second sampling circuit, an amplifying circuit, a control circuit, an output clip positive pole and an output clip negative pole. The voltage of the rechargeable battery ranges from 12.7V to 14.3V, and therefore whether a good automobile storage battery is clipped or not can be judged. When the voltage of a second sampling end is equal to the difference of the voltage of a first sampling end and the voltage of the automobile storage battery and smaller than 10.16V, output is conducted on the switch circuit, whether an output clip normally clips the automobile storage battery or not is judged, and meanwhile a high-low level signal lower than 100Hz is output to the switch circuit. In the process, the voltage of the second sampling end is monitored all the time, the voltage of the second sampling end can rise to 10.16V to 11.44V in a short time, the control circuit judges that the clip is taken down at this time, and the switch circuit is disconnected. According to the circuit, a short circuit of the automobile emergency starting power circuit is avoided and the automobile emergency starting power circuit is prevented from being burnt out.

(19)中华人民共和国国家知识产权局

(12)发明专利申请

(10)申请公布号 CN 103560555 A
(43)申请公布日 2014.02.05

(21)申请号 201310528846.8

(22)申请日 2013.10.30

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(51)Int.Cl.
H02J 7/00(2006.01)

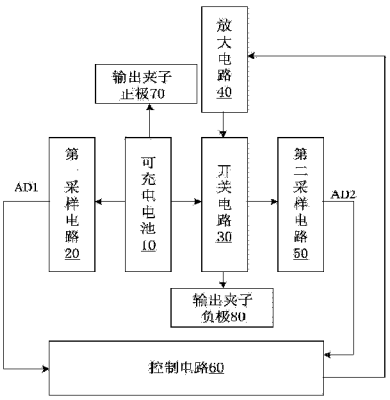
权利要求书2页 说明书4页 附图2页

(54)发明名称

一种自判定是否正常输出的汽车应急启动电源电路

(57)摘要

本发明实施例公开了一种自判定是否正常输出的汽车应急启动电源电路，包括可充电电池，第一采样电路，开关电路，第二采样电路，放大电路，控制电路，输出夹子正极以及输出夹子负极，其中可充电电池的电压范围为 12.7 ～ 14.3V，通过以下判定是否夹上好的汽车电瓶，第二采样端的电压等于第一采样端电压与汽车电瓶电压之差且小于 10.16V 时，此时开关电路有输出，判断输出夹子正常夹上汽车电瓶，同时给开关电路输出 100Hz 以下的高低电平信号，此过程一直监控第二采样端电压，第二采样端电压短时间会上升到 10.16 ～ 11.44V，此时控制电路判断夹子已取下，将开关电路关闭。通过以上电路可避免汽车应急启动电源电路短路烧坏。



CN 103560555 A

1. 一种自判定是否正常输出的汽车应急启动电源电路，包括可充电电池（10），其特征在于，进一步包括第一采样电路（20），开关电路（30），第二采样电路（50），放大电路（40），控制电路（60），输出夹子正极（70）以及输出夹子负极（80），

所述可充电电池（10）与第一采样电路（20）并联，可充电电池（10）的正极与输出夹子正极相连，第一采样电路（20）的输出端作为第一采样端与控制电路（60）的第一输入端连接；可充电电池（10）的负极与开关电路（30）的第一输入端连接，开关电路（30）的输出端作为第二采样电路（50）的一输入端，第二采样电路（50）的输出端作为第二采样端与控制电路（60）的第二输入端连接，所述控制电路（60）比较第一采样端以及第二采样端的电压以控制输出信号至放大电路的第二输入端，放大电路输出放大信号至开关电路（30）以控制开关电路（30）的导通与断开，同时开关电路的输出连接输出夹子负极，输出夹子正极以及输出夹子负极作为输出端分别连接汽车电瓶的正负极；

其中可充电电池的电压范围为 12.7 ～ 14.3V，通过以下判定是否夹上好的汽车电瓶，第二采样端的电压范围为 10.16 ～ 11.44V 时，此时开关电路断开无输出，判断输出夹子未夹上电瓶；第二采样端的电压大于 12.7V，此时开关电路断开无输出，判断输出夹子夹反；第二采样端的电压与第一采样端的电压相等，且电压范围为 12.7 ～ 14.3V 时，此时开关电路断开无输出，判断输出夹子短路；第二采样端的电压等于第一采样端电压与汽车电瓶电压之差且小于 10.16V 时，此时开关电路有输出，判断输出夹子正常夹上汽车电瓶，同时给开关电路输出 100Hz 以下的高低电平信号，此过程一直监控第二采样端电压，第二采样端电压短时间会上升到 10.16 ～ 11.44V，此时控制电路判断夹子已取下，将开关电路关闭。

2. 根据权利要求 1 所述的自判定是否正常输出的汽车应急启动电源电路，其特征在于，所述可充电电池（10）为锂离子电池或磷酸铁锂电池。

3. 根据权利要求 1 所述的自判定是否正常输出的汽车应急启动电源电路，其特征在于，所述开关电路（30）为 6 个 MOS 管并联，用的是过大电流 MOS 管，其中源极作为开关电路（30）的第一输入端，栅极作为开关电路（30）的第二输入端，漏极作为开关电路（30）的输出端。

4. 根据权利要求 1 所述的自判定是否正常输出的汽车应急启动电源电路，其特征在于，所述放大电路（40）包括第一三极管，第二三极管，第六电阻，第七电阻，第八电阻，第九电阻以及第十五电阻，所述第一三极管为 PNP 三极管，所述 PNP 三极管的发射极与第七电阻一端连接并连接至可充电电池的正极，所述 PNP 三极管的基极与第七电阻的另一端以及第八电阻的一端连接，所述 PNP 三极管集电极与第六电阻串联且其串联端作为输出端输入至开关电路的第二输入端，所述第二三极管为 NPN 三极管，控制电路的输出端连接第九电阻的一端，第九电阻的另一端与第十五电阻一端连接并与 NPN 三极管的基极连接，NPN 三极管的发射极连接第十五电阻的另一端并接地，NPN 三极管的集电极与第八电阻的另一端连接。

5. 根据权利要求 1 所述的自判定是否正常输出的汽车应急启动电源电路，其特征在于，所述第一采样电路（20）包括串联的第一电阻和第二电阻，第一电阻和第二电阻的串联端作为第一采样电路输出端。

6. 根据权利要求 1 所述的自判定是否正常输出的汽车应急启动电源电路，其特征在于，所述第二采样电阻（50）包括依次串联的第三电阻，第四电阻和第五电阻，第三电阻和第四电阻的串联端作为输入端连接开关电路的输出端，第四电阻和第五电阻的串联端作为

WINPLUS Ex. 1003, p. 735

输出端连接至控制电路的第二输入端。

7. 根据权利要求 1 至 6 任一所述的自判定是否正常输出的汽车应急启动电源电路，其特征在于，所述控制电路为单片机 EM78P260，其管脚 P52 作为控制电路的第一输入端，其管脚 P51 作为控制电路的第二输入端，其管脚 P57 作为控制电路的输出端。

WINPLUS Ex. 1003, p. 736

一种自判定是否正常输出的汽车应急启动电源电路

技术领域

[0001] 本发明属于电源技术领域，特别地涉及一种自判定是否正常输出的汽车应急启动电源电路。

背景技术

[0002] 汽车应急启动电源是用于汽车亏电或者其他原因无法启动汽车的时候能启动汽车，其包括一个可充电电路，当汽车电瓶电量耗尽导致汽车无法启动时，可将汽车应急启动电源与汽车电瓶连接，为其提供启动电源。现有的汽车应急启动电源存在一个问题，即当汽车应急启动电源的正负极夹子正常夹上好电瓶以后，当夹子拿掉时，输出电路继续保持输出状态，即夹子两端仍有输出，无法及时判定夹子是否取下，此时若输出端正负夹子相连接，将导致输出短路，烧坏汽车应急启动电源的情况发生。

[0003] 故，针对目前现有技术中存在的上述缺陷，实有必要进行研究，以提供一种方案，解决现有技术中存在的缺陷，避免造成汽车应急启动电源烧坏。

发明内容

[0004] 为解决上述问题，本发明的目的在于提供一种自判定是否正常输出的汽车应急启动电源电路，用于采用控制电路实时采样输出正负极夹子两端的输出电压，并比较判断正负极输出夹子的输出状态，在输出正负极夹子正常输出的情况下输出脉冲信号至第二采样电路，并监测采样输出端的电压，及时判断输出夹子是否取下，从而避免汽车应急启动电源误接烧坏。

[0005] 为实现上述目的，本发明的技术方案为：

[0006] 一种自判定是否正常输出的汽车应急启动电源电路，包括可充电电池，进一步包括第一采样电路，开关电路，第二采样电路，放大电路，控制电路，输出夹子正极以及输出夹子负极，

[0007] 所述可充电电池与第一采样电路并联，可充电电池的正极与输出夹子正极相连，第一采样电路的输出端作为第一采样端与控制电路的第一输入端连接；可充电电池的负极与开关电路的第一输入端连接，开关电路的输出端作为第二采样电路的一输入端，第二采样电路的输出端作为第二采样端与控制电路的第二输入端连接，所述控制电路比较第一采样端以及第二采样端的电压以控制输出信号至放大电路的第二输入端，放大电路输出放大信号至开关电路以控制开关电路的导通与断开，同时开关电路的输出连接输出夹子负极，输出夹子正极以及输出夹子负极作为输出端分别连接汽车电瓶的正负极；

[0008] 其中可充电电池的电压范围为 12.7 ～ 14.3V，通过以下判定是否夹上好的汽车电瓶，第二采样端的电压范围为 10.16 ～ 11.44V 时，此时开关电路断开无输出，判断输出夹子未夹上电瓶；第二采样端的电压大于 12.7V，此时开关电路断开无输出，判断输出夹子夹反；第二采样端的电压与第一采样端的电压相等，且电压范围为 12.7 ～ 14.3V 时，此时开关电路断开无输出，判断输出夹子短路；第二采样端的电压等于第一采样端电压与汽车电瓶

WINPLUS Ex. 1003, p. 737

电压之差且小于 10.16V 时，此时开关电路有输出，判断输出夹子正常夹上汽车电瓶，同时给开关电路输出 100Hz 以下的高低电平信号，此过程一直监控第二采样端电压，第二采样端电压短时间会上升到 10.16 ～ 11.44V，此时控制电路判断夹子已取下，将开关电路关闭。

[0009] 优选地，所述可充电电池为锂离子电池或磷酸铁锂电池。

[0010] 优选地，所述开关电路为 6 个 MOS 管并联，用的是过大电流 MOS 管，其中源极作为开关电路的第一输入端，栅极作为开关电路的第二输入端，漏极作为开关电路的输出端。

[0011] 优选地，所述放大电路包括第一三极管，第二三极管，第六电阻，第七电阻，第八电阻，第九电阻以及第十五电阻，所述第一三极管为 PNP 三极管，所述 PNP 三极管的发射极与第七电阻一端连接并连接至可充电电池的正极，所述 PNP 三极管的基极与第七电阻的另一端以及第八电阻的一端连接，所述 PNP 三极管集电极与第六电阻串联且其串联端作为输出端输入至开关电路的第二输入端，所述第二三极管为 NPN 三极管，控制电路的输出端连接第九电阻的一端，第九电阻的另一端与第十五电阻一端连接并与 NPN 三极管的基极连接，NPN 三极管的发射极连接第十五电阻的另一端并接地，NPN 三极管的集电极与第八电阻的另一端连接。

[0012] 优选地，所述第一采样电路包括串联的第一电阻和第二电阻，第一电阻和第二电阻的串联端作为第一采样电路输出端。

[0013] 优选地，所述第二采样电阻包括依次串联的第三电阻，第四电阻和第五电阻，第三电阻和第四电阻的串联端作为输入端连接开关电路的输出端，第四电阻和第五电阻的串联端作为输出端连接至控制电路的第二输入端。

[0014] 优选地，所述控制电路为单片机 EM78P260，其管脚 P52 作为控制电路的第一输入端，其管脚 P51 作为控制电路的第二输入端，其管脚 P57 作为控制电路的输出端。

[0015] 与现有技术相比，本发明的有益效果如下：

[0016] (1) 通过采用控制电路实时采样输出正负极夹子两端的输出电压，并比较判断正负极输出夹子的输出状态，在输出正负极夹子正常输出的情况下输出脉冲信号至第二采样电路，并监测采样输出端的电压，及时判断输出夹子是否取下，从而避免汽车应急启动电源误接烧坏；

[0017] (2) 电路结构简单，稳定性好。

附图说明

[0018] 图 1 为本发明实施例的自判定是否正常输出的汽车应急启动电源电路的结构框图；

[0019] 图 2 为本发明实施例的自判定是否正常输出的汽车应急启动电源电路的电路原理图。

具体实施方式

[0020] 为了使本发明的目的、技术方案及优点更加清楚明白，以下结合附图及实施例，对本发明进行进一步详细说明。应当理解，此处所描述的具体实施例仅仅用以解释本发明，并不用于限定本发明。

[0021] 相反，本发明涵盖任何由权利要求定义的在本发明的精髓和范围上做的替代、修

WINPLUS Ex. 1003, p. 738

改、等效方法以及方案。进一步，为了使公众对本发明有更好的了解，在下文对本发明的细节描述中，详尽描述了一些特定的细节部分。对本领域技术人员来说没有这些细节部分的描述也可以完全理解本发明。

[0022] 参见图 1，所示为本发明实施例的一种自判定是否正常输出的汽车应急启动电源电路的结构框图，其包括可充电电池 10，第一采样电路 20，开关电路 30，第二采样电路 50，放大电路 40，控制电路 60，输出夹子正极 70 以及输出夹子负极 80，其连接方式如下：可充电电池 10 与第一采样电路 20 并联，可充电电池 10 的正极与输出夹子正极相连，第一采样电路 20 的输出端作为第一采样端与控制电路 60 的第一输入端连接；可充电电池 10 的负极与开关电路 30 的第一输入端连接，开关电路 30 的输出端作为第二采样电路 50 的一输入端，第二采样电路 50 的输出端作为第二采样端与控制电路 60 的第二输入端连接，控制电路 60 比较第一采样端以及第二采样端的电压以控制输出信号至放大电路的第二输入端，放大电路输出放大信号至开关电路 30 以控制开关电路 30 的导通与断开，同时开关电路的输出连接输出夹子负极，输出夹子正极以及输出夹子负极作为输出端分别连接汽车电瓶的正负极；其中可充电电池的电压范围为 12.7 ～ 14.3V，通过以下判定是否夹上好的汽车电瓶，第二采样端的电压范围为 10.16 ～ 11.44V 时，此时开关电路断开无输出，判断输出夹子未夹上电瓶；第二采样端的电压大于 12.7V，此时开关电路断开无输出，判断输出夹子夹反；第二采样端的电压与第一采样端的电压相等，且电压范围为 12.7 ～ 14.3V 时，此时开关电路断开无输出，判断输出夹子短路；第二采样端的电压等于第一采样端电压与汽车电瓶电压之差且小于 10.16V 时，此时开关电路有输出，判断输出夹子正常夹上汽车电瓶，同时给开关电路输出 100Hz 以下的高低电平信号，此过程一直监控第二采样端电压，第二采样端电压短时间会上升到 10.16 ～ 11.44V，此时控制电路判断夹子已取下，将开关电路关闭。

[0023] 通过以上设置，使得控制电路实时采样输出正负极夹子两端的输出电压，并比较判断正负极输出夹子的输出状态，在输出正负极夹子正常输出的情况下输出脉冲信号至第二采样电路，并监测采样输出端的电压，及时判断输出夹子是否取下，从而避免汽车应急启动电源误接烧坏。

[0024] 参见图 2，所示为一具体应用实例中各模块的电路结构图，可充电电池 10 为锂离子电池或磷酸铁锂电池。开关电路 30 为 MOS（金属氧化物半导体，Metal Oxide Semiconductor）管开关 Q1，为 6 个 MOS 管并联（在图中仅示出一个），用的是过大电流 MOS 管，其中源极作为开关电路 30 的第一输入端，栅极作为开关电路 30 的第二输入端，漏极作为开关电路 30 的输出端。MOS 管作为开关线路的好处是成本低空间小。放大电路 40 包括第一三极管 Q2，第二三极管 Q3，第六电阻 R6，第七电阻 R7，第八电阻 R8，第九电阻 R9 以及第十五电阻 R15，第一三极管 Q2 为 PNP 三极管，PNP 三极管的发射极与第七电阻 R7 一端连接并连接至可充电电池的正极，PNP 三极管的基极与第七电阻 R7 的另一端以及第八电阻 R8 的一端连接，PNP 三极管集电极与第六电阻串联 R6 且其串联端作为输出端输入至开关电路 30 的第二输入端，第二三极管 Q3 为 NPN 三极管，控制电路 60 的输出端连接第九电阻 R9 的一端，第九电阻 R9 的另一端与第十五电阻 R15 一端连接并与 NPN 三极管的基极连接，NPN 三极管的发射极连接第十五电阻的另一端并接地，NPN 三极管的集电极与第八电阻的另一端连接。第一采样电路 20 包括串联的第一电阻 R1 和第二电阻 R2，第一电阻 R1 和第二电阻 R2 的串联端作为第一采样电路输出端。第二采样电阻 50 包括依次串联的第三电阻 R3，

WINPLUS Ex. 1003, p. 739

第四电阻 R4 和第五电阻 R5，第三电阻 R3 和第四电阻 R4 的串联端作为输入端连接开关电路的输出端，第四电阻 R4 和第五电阻 R5 的串联端作为输出端连接至控制电路的第二输入端。控制电路为单片机 EM78P260，其管脚 P52 作为控制电路的第一输入端，其管脚 P51 作为控制电路的第二输入端，其管脚 P57 作为控制电路的输出端。通过以上实施例实现的自判定是否正常输出的汽车应急启动电源电路，结构简单，稳定性好。

[0025] 以上所述仅为本发明的较佳实施例而已，并不用以限制本发明，凡在本发明的精神和原则之内所作的任何修改、等同替换和改进等，均应包含在本发明的保护范围之内。

WINPLUS Ex. 1003, p. 740

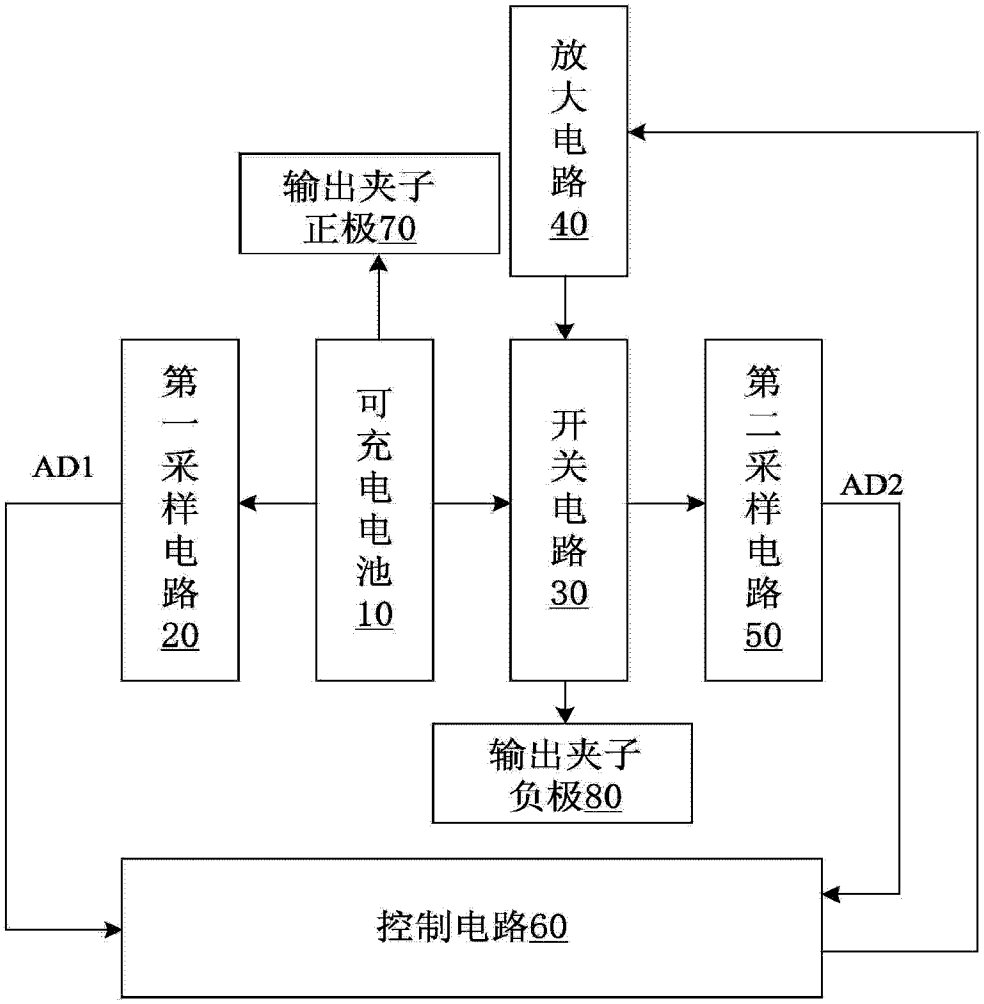


图 1

WINPLUS Ex. 1003, p. 741

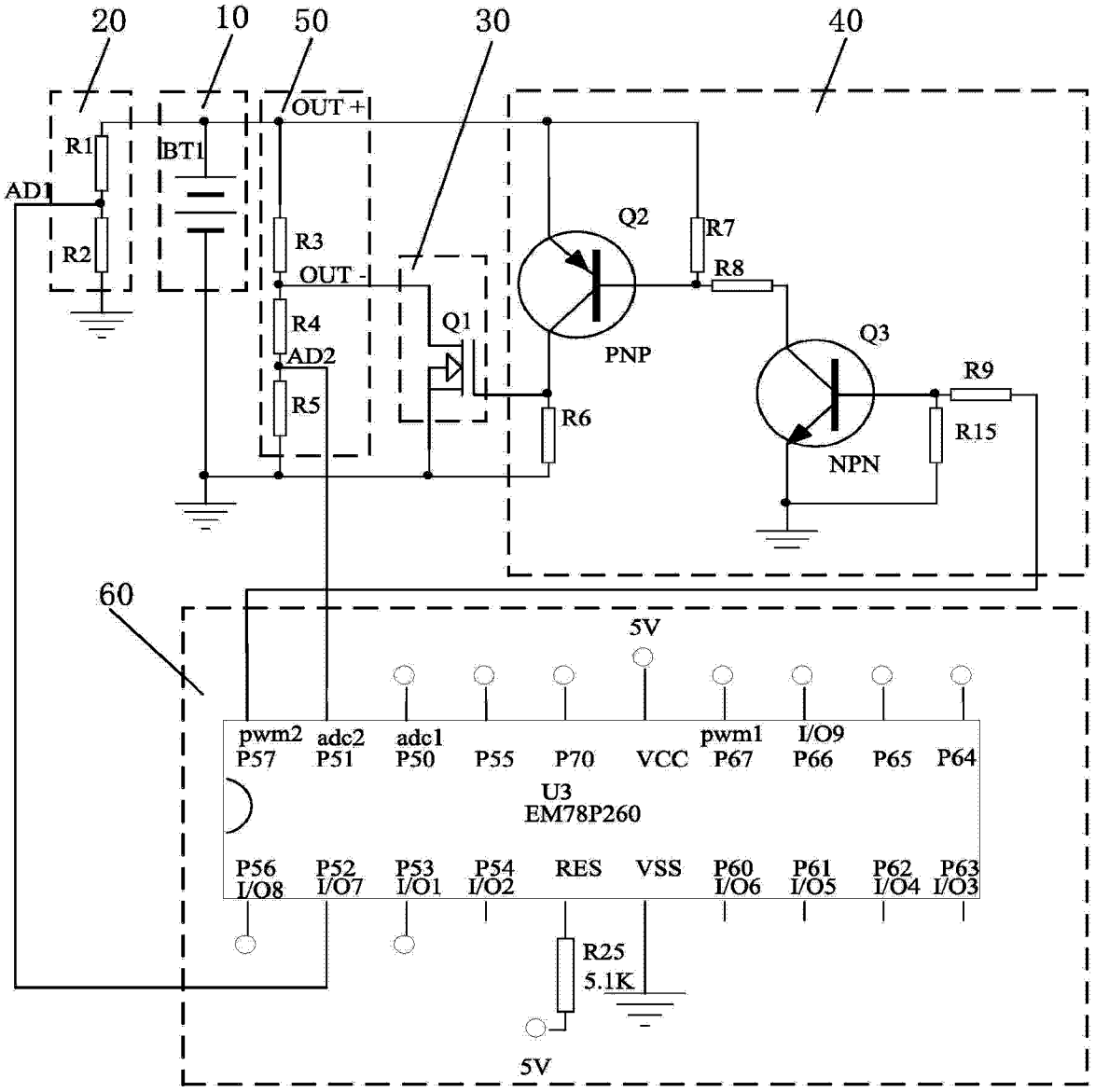


图 2

WINPLUS Ex. 1003, p. 742

Espacenet

Bibliographic data: CN103560555 (A) — 2014-02-05

Automobile emergency starting power circuit capable of automatically judging normal output

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Classification: **- international:** ***H02J7/00***
- cooperative:

Application number: CN201310528846 20131030 Global Dossier

Priority number (s): CN201310528846 20131030

Also published as: CN103560555 (B)

Abstract of CN103560555 (A)

The embodiment of the invention discloses an automobile emergency starting power circuit capable of automatically judging normal output. The automobile emergency starting power circuit capable of automatically judging normal output comprises a rechargeable battery, a first sampling circuit, a switch circuit, a second sampling circuit, an amplifying circuit, a control circuit, an output clip positive pole and an output clip negative pole. The voltage of the rechargeable battery ranges from 12.7V to 14.3V, and therefore whether a good automobile storage battery is clipped or not can be judged. When the voltage of a second sampling end is equal to the difference of the voltage of a first sampling end and the voltage of the automobile storage battery and smaller than 10.16V, output is conducted on the switch circuit, whether an output clip normally clips the automobile storage battery or not is judged, and meanwhile a high-low level signal lower than 100Hz is output to the switch circuit. In the process, the voltage of the second sampling end is monitored all the time, the voltage of the second sampling end can rise to 10.16V to 11.44V in a short time, the control circuit judges that the clip is taken down at this time, and the switch circuit is disconnected. According to the circuit, a short circuit of the automobile emergency starting power circuit is avoided and the automobile emergency starting power circuit is prevented from being burnt out.

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DESCRIPTION CN103560555

The embodiment of the present invention discloses a self-determining normal output power supply circuit for an automobile emergency, which includes a rechargeable battery, a first sampling circuit, a switching circuit, a second sampling circuit, an amplifying circuit, a control circuit, an output clip anode and an output clip Negative electrode, where the voltage range of the rechargeable battery is 12.7 to 14.3V. Determine whether a good car battery is clipped by the following. The voltage at the second sampling terminal is equal to the difference between the voltage at the first sampling terminal and the car battery voltage and is less than 10.16V. When the switch circuit has output, it is judged that the output clip is normally clamped on the car battery, and the high and low level signals below 100Hz are output to the switch circuit. This process has been monitoring the voltage of the second sampling terminal, and the voltage of the second sampling terminal will rise to 10.16 in a short time 11.44V, at this time, the control circuit judges that the clip has been removed, and closes the switch circuit. Through the above circuit, the short circuit of the emergency power supply circuit of the automobile can be prevented from being burnt out.

Automobile emergency start power circuit capable of self-judging whether it is normally output

Technical field

The invention belongs to the technical field of power supply, and in particular relates to a vehicle emergency start power supply circuit that determines whether it outputs normally.

Background technique

The car emergency start power supply is used to start the car when the car loses power or cannot be started for other reasons. It includes a rechargeable circuit. When the car battery is exhausted and the car cannot start, the car emergency start power supply and the car battery can be used. Connect to provide start-up power. There is a problem with the existing automobile emergency start power supply, that is, when the positive and negative clips of the automobile emergency start power supply normally clamp the battery, when the clip is removed, the output circuit continues to maintain the output state, that is, there is still output at both ends of the clip. It is impossible to determine whether the clip is removed in time. At this time, if the positive and negative clips of the output end are connected, it will cause a short circuit in the output and burn out the emergency power supply of the car.

Therefore, in view of the above-mentioned defects in the current existing technology, it is necessary to conduct research to provide a solution to solve the defects in the existing technology and avoid causing the emergency power supply of the automobile to burn out.

Summary of the invention

In order to solve the above problems, the object of the present invention is to provide a self-determining normal output power supply circuit for automobile emergency start, which is used to sample and output the output voltage at both ends of the positive and negative clips in real time by the control circuit and compare and judge the positive and negative output clips in the output state of the output, the pulse signal is output to the second sampling circuit when the positive and negative clips are output normally, and the voltage of the sampling output terminal is monitored to determine whether the output clip is removed in time, so as to avoid accidental burning of the emergency power supply of the car.

To achieve the above objectives, the technical solutions of the present invention are:

A self-judging power supply circuit for automobile emergency start, which includes a rechargeable battery, further includes a first sampling circuit, a switching circuit, a second sampling circuit, an amplifying circuit, a control circuit, a positive output clip and a negative output clip,

The rechargeable battery is connected in parallel with the first sampling circuit, the positive electrode of the rechargeable battery is connected to the positive electrode of the output clip, the output terminal of the first sampling circuit is connected to the first input terminal of the control circuit as the first sampling terminal; the negative electrode of the rechargeable battery It is connected to the first input terminal of the switch circuit. The output terminal of the switch circuit serves as an input terminal of the second sampling circuit. The output terminal of the second sampling circuit serves as the second sampling terminal and is connected to the second input terminal of the control circuit. The circuit compares the voltages of the first sampling terminal and the second sampling terminal to control the output signal to the second input terminal of the amplifier circuit. The amplifier circuit outputs the amplified signal to the switching circuit to control the switching circuit on and off, and the output of the switching circuit is connected The negative pole of the output clip, the positive pole of the output clip and the negative pole of the output clip are respectively connected to the positive and negative poles of the car battery;

The voltage range of the rechargeable battery is 12.7 ~ 14.3V, and the following determines whether a good car battery is clipped. When the voltage range of the second sampling terminal is 10.16 ~ 11.44V, the switch circuit is disconnected and there is no output. Clamp the battery; the voltage at the second sampling end is greater than 12.7V, at this time the switch circuit is disconnected and there is no output, it is judged that the output clamp is reversed; the voltage at the second sampling end is equal to the voltage at the first sampling end, and the voltage range is 12.7 ~ 14.3V At this time, the switch circuit is disconnected and there is no output, and the output clip is judged to be short-circuited; when the voltage of the second sampling terminal is equal to the difference between the voltage of the first sampling terminal and the car battery voltage and is less than 10.16V, the switch circuit has an output at this time, and the output clip is judged to be normal Get on the car battery and simultaneously output high and low level signals below 100Hz to the switch circuit. This process has been monitoring the voltage of the second sampling terminal. The voltage of the second sampling terminal will rise to 10.16 ~ 11.44V in a short time. At this time, the control circuit judges that the clip has been taken. Next, turn off the switch circuit.

Preferably, the rechargeable battery is a lithium ion battery or a lithium iron phosphate battery.

Preferably, the switch circuit is 6 MOS transistors connected in parallel, using an over-current MOS transistor, wherein the source electrode is used as the first input terminal of the switch circuit, the gate electrode is used as the second input terminal of the switch circuit, and the drain electrode is used as the switch The output of the circuit.

Preferably, the amplifier circuit includes a first transistor, a second transistor, a sixth resistor, a seventh resistor, an eighth resistor, a ninth resistor, and a fifteenth resistor, the first transistor is a PNP A transistor, an emitter of the PNP transistor is connected to one end of the seventh resistor and connected to the positive electrode of the rechargeable battery, a base of the PNP transistor is connected to the other end of the seventh resistor and one end of the eighth resistor, and the PNP transistor The collector is connected in series with the sixth resistor and its series terminal is input as the output terminal to the second input terminal of the switching circuit. The second transistor is an NPN transistor. The output terminal of the control circuit is connected to the end of the ninth resistor. The ninth resistor The other end is connected to one end of the fifteenth resistor and to the base of the NPN transistor, the emitter of the NPN transistor is connected to the other end of the fifteenth resistor and grounded, and the collector of the NPN transistor is connected to the other end of the eighth resistor.

Preferably, the first sampling circuit includes a first resistor and a second resistor connected in series, and a series terminal of the first resistor and the second resistor serves as an output terminal of the first sampling circuit.

Preferably, the second sampling resistor includes a third resistor, a fourth resistor and a fifth resistor connected in series in series. The series terminal of the third resistor and the fourth resistor is used as an input terminal to connect to the output terminal of the switching circuit, and the fourth resistor and the first resistor The series terminal of the five resistors is connected as an output terminal to the second input terminal of the control circuit.

Preferably, the control circuit is a single chip microcomputer EM78P260, its pin P52 is used as the first input terminal of the control circuit, its pin P51 is used as the second input terminal of the control circuit, and its pin P57 is used as the output terminal of the control circuit.

Compared with the prior art, the beneficial effects of the present invention are as follows:

(1)

By using the control circuit to sample and output the output voltage at both ends of the positive and negative clips in real time, and compare and judge the output state of the positive and negative output clips, the pulse signal is output to the second sampling circuit when the positive and negative clips are output normally. And monitor the voltage of the sampling output terminal, judge whether the output clip is removed in time, so as to avoid the accidental burning of the emergency power supply of the car;

(2)

The circuit structure is simple and the stability is good.

BRIEF DESCRIPTION

FIG. 1 is a structural block diagram of a vehicle emergency start power supply circuit for self-determination whether it is normally output according to an embodiment of the present invention;

FIG. 2 is a circuit schematic diagram of an auto emergency start power supply circuit for self-determination whether it is normally output according to an embodiment of the present invention.

detailed description

In order to make the objectives, technical solutions and advantages of the present invention clearer, the present invention will be further described in detail below with reference to the accompanying drawings and embodiments.

It should be understood that the specific embodiments described herein are only used to explain the present invention, and are not intended to limit the present invention.

On the contrary, the present invention covers any substitutions, modifications, equivalent methods, and solutions defined by the claims in the spirit and scope of the present invention.

Further, in order to make the public have a better understanding of the present invention, in the following detailed description of the present invention, some specific details are described in detail. Those skilled in the art can fully understand the present invention without the description of these details.

Referring to FIG. 1, it is a structural block diagram of a self-determining whether the vehicle emergency start power supply circuit of the embodiment of the present invention includes a rechargeable battery 10, a first sampling circuit 20, a switching circuit 30, and a second sampling circuit 50, the amplifying circuit 40, the control circuit 60, the output clip positive electrode 70 and the output clip negative electrode 80, the connection method is as follows: the rechargeable battery 10 is connected in parallel with the first sampling circuit 20, the positive electrode of the rechargeable battery 10 is connected to the output clip positive electrode, the first The output terminal of a sampling circuit 20 is connected to the first input terminal of the control circuit 60 as the first sampling terminal; the negative electrode of the rechargeable battery 10 is connected to the first input terminal of the switch circuit 30, and the output terminal of the switch circuit 30 is used as the second sampling terminal An input terminal of the circuit 50, the output terminal of the second sampling circuit 50 is connected to the second input terminal of the control circuit 60 as the second sampling terminal, the control circuit 60 compares the voltages of the first sampling terminal and the second sampling terminal to control the output signal to The second input terminal of the amplifier circuit, the amplifier circuit outputs an amplified signal to the switch circuit 30 to control the switching circuit 30 on and off, and the output of the switch circuit is connected to the output clip negative electrode, the output clip positive electrode and the output clip negative electrode as output terminals Connect the positive and negative poles of the car battery; the voltage range of the rechargeable battery is 12.7 to 14.3V. Determine whether a good car battery is clipped by the following. When the voltage range of the second sampling terminal is 10.16 to 11.44V, the switch circuit is off When there is no output, it is judged that the output clip is not clamped on the battery; the voltage at the second sampling end is greater than 12.7V. At this time, the switch circuit is disconnected and there is no output, and the output clamp is judged to be reversed; When the voltage range is 12.7 ~ 14.3V, the switch circuit is disconnected and there is no output, and the output clip is judged to be short-circuited; when the voltage of the second sampling terminal is equal to the difference between the voltage of the first sampling terminal and the car battery voltage and is less than 10.16V, the switch circuit If there is output, it is judged that the output clip is normally clamped on the car battery, and at the same time, the high and low level signals below 100Hz are output to the switch circuit. This process has been monitoring the voltage of the second sampling terminal. The voltage of the second sampling terminal will rise to 10.16 ~ 11.44V in a short time. At this time, the control circuit judges that the clip has been removed, and closes the switch circuit.

Through the above settings, the control circuit samples and outputs the output voltage at both ends of the positive and negative clips in real time, and compares and judges the output state of the positive and negative output clips, and outputs a pulse signal to the second sampling circuit when the positive and negative clips are output normally , And monitor the voltage of the

sampling output terminal, and judge whether the output clip is removed in time, so as to avoid the accidental burning of the emergency power supply of the car.

Referring to FIG. 2, a circuit structure diagram of each module in a specific application example is shown. The rechargeable battery 10 is a lithium ion battery or a lithium iron phosphate battery. The switch circuit 30 is a MOS (Metal Oxide Semiconductor, Metal Oxide Semiconductor) tube switch Q1, which is 6 MOS tubes connected in parallel (only one is shown in the figure), using an overcurrent MOS tube, in which the source is used as a switch circuit At the first input terminal of 30, the gate serves as the second input terminal of the switching circuit 30, and the drain serves as the output terminal of the switching circuit 30. The advantage of MOS tube as a switching circuit is low cost and small space. The amplifier circuit 40 includes a first transistor Q2, a second transistor Q3, a sixth resistor R6, a seventh resistor R7, an eighth resistor R8, a ninth resistor R9 and a fifteenth resistor R15, and a first transistor Q2 It is a PNP transistor. The emitter of the PNP transistor is connected to one end of the seventh resistor R7 and connected to the positive electrode of the rechargeable battery. The base of the PNP transistor is connected to the other end of the seventh resistor R7 and one end of the eighth resistor R8. The PNP transistor The electrode and the sixth resistor are connected in series R6 and the series terminal is used as the output terminal to input to the second input terminal of the switching circuit 30. The second transistor Q3 is an NPN transistor. The output terminal of the control circuit 60 is connected to one end of the ninth resistor R9. The other end of the nine resistor R9 is connected to one end of the fifteenth resistor R15 and to the base of the NPN transistor. The emitter of the NPN transistor is connected to the other end of the fifteenth resistor and grounded. The collector of the NPN transistor is connected to the other of the eighth resistor Connect at one end. The first sampling circuit 20 includes a first resistor R1 and a second resistor R2 connected in series, and a series terminal of the first resistor R1 and the second resistor R2 serves as an output terminal of the first sampling circuit. The second sampling resistor 50 includes a third resistor R3, a fourth resistor R4 and a fifth resistor R5 serially connected in series, and a series terminal of the third resistor R3 and the fourth resistor R4 is used as an input terminal connected to the output terminal of the switching circuit, and a fourth resistor R4 The series terminal with the fifth resistor R5 is connected as an output terminal to the second input terminal of the control circuit. The control circuit is a singlechip EM78P260, its pin P52 is used as the first input terminal of the control circuit, its pin P51 is used as the second input terminal of the control circuit, and its pin P57 is used as the output terminal of the control circuit. The auto emergency power supply circuit for self-determination whether it is normally output by the above embodiment has a simple structure and good stability.

The above are only the preferred embodiments of the present invention and are not intended to limit the present invention. Any modification, equivalent replacement and improvement made within the spirit and principle of the present invention should be included in the protection of the present invention Within range.

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CLAIMS CN103560555

1.

A car emergency start power supply circuit with self-determination whether it outputs normally, including a rechargeable battery (10), characterized in that it further includes a first sampling circuit (20), a switching circuit (30), and a second sampling circuit (50), Amplifier circuit (40), control circuit (60), output clip positive electrode (70) and output clip negative electrode (80),

The rechargeable battery (10) is connected in parallel with the first sampling circuit (20), the positive electrode of the rechargeable battery (10) is connected to the positive electrode of the output clip, and the output terminal of the first sampling circuit (20) serves as the first sampling terminal and the control circuit (60) The first input terminal is connected; the negative electrode of the rechargeable battery (10) is connected to the first input terminal of the switch circuit (30), and the output terminal of the switch circuit (30) is used as an input of the second sampling circuit (50) Terminal, the output terminal of the second sampling circuit (50) is used as the second sampling terminal and connected to the second input terminal of the control circuit (60), the control circuit (60) compares the voltages of the first sampling terminal and the second sampling terminal to control Output signal to the second input terminal of the amplifier circuit, the amplifier circuit outputs the amplified signal to the switch circuit (30) to control the switch circuit (30) on and off, and the output of the switch circuit is connected to the negative output clip, the positive output clip and The negative pole of the output clip is used as the output terminal to connect the positive and negative poles of the car battery respectively;

The voltage range of the rechargeable battery is 12.7 ~ 14.3V, and the following determines whether a good car battery is clipped. When the voltage range of the second sampling terminal is 10.16 ~ 11.44V, the switch circuit is disconnected and there is no output. Clamp the battery; the voltage at the second sampling end is greater than 12.7V, at this time the switch circuit is disconnected and there is no output, it is judged that the output clamp is reversed; the voltage at the second sampling end is equal to the voltage at the first sampling end, and the voltage range is 12.7 ~ 14.3V At this time, the switch circuit is disconnected and there is no output, and the output clip is judged to be short-circuited; when the voltage of the second sampling terminal is equal to the difference between the voltage of the first sampling terminal and the car battery voltage and is less than 10.16V, the switch circuit has an output at this time, and the output clip is judged to be normal Get on the car battery and simultaneously output high and low level signals below 100Hz to the switch circuit. This process has been monitoring the voltage of the second sampling terminal. The voltage of the second sampling terminal will rise to 10.16 ~ 11.44V in a short time. At this time, the control circuit judges that the clip has been taken. Next, turn off the switch circuit.

2.

The auto emergency start power supply circuit according to claim 1, wherein the rechargeable battery (10) is a lithium ion battery or a lithium iron phosphate battery.

3.

The auto emergency start power supply circuit according to claim 1, wherein the switch circuit (30) is 6 MOS transistors connected in parallel, an overcurrent MOS transistor is used, and the source is used as The first input terminal of the switch circuit (30), the gate serves as the second input terminal of the switch circuit (30), and the drain serves as the output terminal of the switch circuit (30).

4.

The auto emergency start power supply circuit according to claim 1, wherein the amplifier circuit (40) includes a first transistor, a second transistor, a sixth resistor, and a seventh resistor , An eighth resistor, a ninth resistor and a fifteenth resistor, the first transistor is a PNP transistor, the emitter of the PNP transistor is connected to one end of the seventh resistor and connected to the positive electrode of the rechargeable battery, the PNP The base of the transistor is connected to the other end of the seventh resistor and one end of the eighth resistor. The collector of the PNP transistor is connected in series with the sixth resistor and the series terminal is input as an output to the second input of the switching circuit. The second transistor is an NPN transistor, the output of the control circuit is connected to one end of the ninth resistor, the other end of the ninth resistor is connected to the end of the fifteenth resistor and connected to the base of the NPN transistor, and the emitter of the NPN transistor is connected to the tenth The other end of the fifth resistor is connected to ground, and the collector of the NPN transistor is connected to the other end of the eighth resistor.

5.

The auto emergency start power supply circuit according to claim 1, wherein the first sampling circuit (20) includes a first resistor and a second resistor connected in series, the first resistor and the second resistor The serial terminal of is used as the output terminal of the first sampling circuit.

6.

The auto emergency start power supply circuit according to claim 1, wherein the second sampling resistor (50) includes a third resistor, a fourth resistor and a fifth resistor connected in series The series terminal of the resistor and the fourth resistor is connected as the input terminal to the output terminal of the switching circuit, and the series terminal of the fourth resistor and the fifth resistor is connected as the output terminal to the second input terminal of the control circuit.

7.

According to any one of claims 1 to 6, the auto-start power supply circuit for self-determination of normal output is characterized in that the control circuit is a single-chip microcomputer EM78P260, and its pin P52 is used as the first input terminal of the control circuit. Pin P51 serves as the second input terminal of the control circuit, and pin P57 serves as the output terminal of the control circuit.

Espacenet

Bibliographic data: CN108884801 (A) — 2018-11-23

BATTERY CONNECTOR DEVICE FOR A BATTERY JUMP STARTING DEVICE

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Classification: - international: ***F02N11/12; F02N11/14; F02N19/00; H02J7/00; H02J7/32***

- cooperative: **F02N11/12 (EP, GB); F02N11/14 (GB); F02N19/00 (GB); H01M2/30 (EP); H02J1/122 (EP); H02J7/00 (GB); H02J7/0032 (GB);** F02N11/087 (EP); F02N11/14 (EP)

Application number: CN20178010937 20170210 Global Dossier

Priority number (s): US201662294067P 20160211 ; WO2016US24680 20160329 ; US201615137626 20160329 ; US201662424297P 20161118 ; WO2017US17289 20170210

Also published as: AU2017217661 (A1) AU2017217661 (B2) AU2019201081 (A1) CA3005971 (A1) EP3286429 (A1) more

Abstract of CN108884801 (A)

An enhanced conductivity battery connector device for use in a battery jump starting device. The enhance conductivity battery connector providing enhanced conductivity from the battery to a battery being recharged by the battery jump starting device.

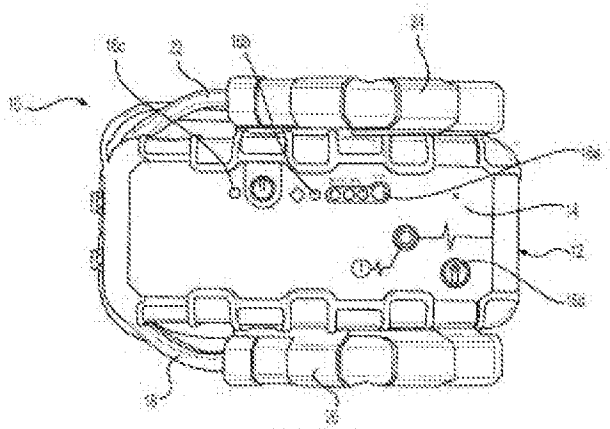

FIG. 1

(19)中华人民共和国国家知识产权局

(12)发明专利申请

(10)申请公布号 CN 108884801 A
(43)申请公布日 2018.11.23

(21)申请号 201780010937.9

(22)申请日 2017.02.10

(30)优先权数据
62/294,067 2016.02.11 US
PCT/US2016/024680 2016.03.29 US
15/137,626 2016.04.25 US
62/424,297 2016.11.18 US

(85)PCT国际申请进入国家阶段日
2018.08.10

(86)PCT国际申请的申请数据
PCT/US2017/017289 2017.02.10

(87)PCT国际申请的公布数据
WO2017/139524 EN 2017.08.17

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(51)Int.Cl.
F02N 11/12(2006.01)
F02N 11/14(2006.01)
F02N 19/00(2006.01)
H02J 7/00(2006.01)
H02J 7/32(2006.01)

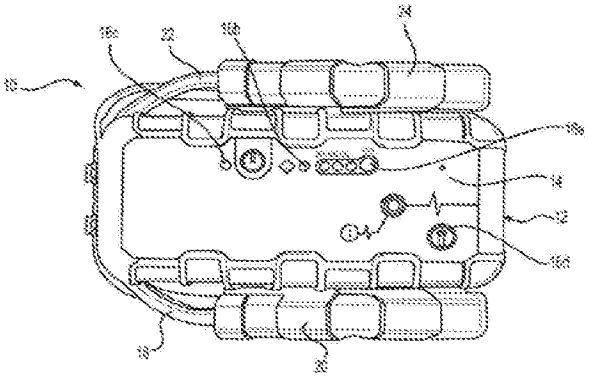
权利要求书2页 说明书11页 附图32页

(54)发明名称

用于电池搭电启动装置的电池连接器装置

(57)摘要

一种在电池搭电启动装置中使用的增强导电性的电池连接器装置。增强导电性的电池连接器提供从电池到正在被电池搭电启动装置充电的电池的增强的导电性。



CN 108884801 A

1.一种用于电池搭电启动装置的电池连接器装置，该电池搭电启动装置具有智能开关，所述电池连接器装置包括：

电池，包括正端子接头和负端子接头；

正端子导体片，连接到所述电池的所述正端子接头；

负端子导体块，连接到所述电池的所述负端子接头；

正电缆，连接到所述电池的所述正端子导体片；

智能开关接口，能够连接到所述电池搭电启动装置的所述智能开关，所述智能开关接口包括电路板，所述电路板具有与第二电路板导体块间隔开的第一电路板导体块，所述第一电路板导体块电连接到所述电池的所述负端子导体块，所述智能开关接口还包括一个以上的继电器，所述一个以上的继电器连接在所述第一电路板导体块和所述第二电路板导体块之间，以提供所述电池的所述负端子接头与正在被搭电启动的电池之间的绝缘；以及

负电缆，连接到所述第二电路板导体块。

2.一种用于电池搭电启动装置的电池连接器装置，该电池搭电启动装置具有智能开关，所述电池连接器装置包括：

可再充电电池，包括正端子接头和负端子接头；

正端子导体片，连接到所述电池的所述正端子接头；

负端子导体块，连接到所述电池的所述负端子接头；

正电缆，连接到所述电池的所述正端子导体片；

智能开关接口，能够连接到所述电池搭电启动装置的所述智能开关，所述智能开关接口包括电路板，所述电路板具有与第二电路板导体块间隔开的第一电路板导体块，所述第一电路板导体块电连接到所述电池的所述负端子导体块，所述智能开关接口还包括多个继电器，所述多个继电器中的每一个继电器连接在所述第一电路板导体块和所述第二电路板导体块之间，以提供所述电池的所述负端子接头与正在被搭电启动的电池之间的绝缘；以及

负电缆，连接到所述第二电路板导体块，所述负电缆直接电连接到所述多个继电器中的每一个继电器。

3.一种用于电池搭电启动装置的电池连接器装置，该电池搭电启动装置具有智能开关，所述电池连接器装置包括：

可再充电电池，包括正端子接头和负端子接头；

正端子导体片，连接到所述电池的所述正端子接头；

负端子导体块，连接到所述电池的所述负端子接头；

正电缆，连接到所述电池的所述正端子导体片；

智能开关接口，能够连接到所述电池搭电启动装置的所述智能开关，所述智能开关接口包括电路板，所述电路板具有与第二电路板导体块间隔开的第一电路板导体块，所述第一电路板导体块电连接到所述电池的所述负端子导体块，所述智能开关接口还包括多个继电器，所述多个继电器中的每一个继电器连接在所述第一电路板导体块和所述第二电路板导体块之间，以提供所述电池的所述负端子接头与正在被搭电启动的电池之间的绝缘；

负电缆，连接到所述第二电路板导体块，所述负电缆直接电连接到所述多个继电器中的每一个继电器；以及

WINPLUS Ex. 1003, p. 754

二极管连接，设置在所述正电缆的第一部分和所述正电缆的第二部分之间。

4.根据权利要求1所述的装置，其中，所述一个以上的继电器是并联连接在所述第一电路板导体块和所述第二电路板导体块之间的多个继电器。

5.根据权利要求1所述的装置，其中，所述负端子导体块被配置为将所述电池与所述智能开关电池接口机械连接和电连接。

6.根据权利要求5所述的装置，其中，所述负端子导体块被配置为定位在所述智能开关电池接口上方并接近所述电池。

7.根据权利要求1所述的装置，其中，所述正端子导体片包裹所述正电缆的一端，以将所述电池电连接到所述正电缆。

8.根据权利要求1所述的装置，其中，所述正端子导体块被超声波熔焊到所述电池的所述正端子接头，所述负端子导体块被超声波熔焊到所述电池的所述负端子接头。

9.根据权利要求1所述的装置，其中，所述电池为矩形，所述电池的正端子导体片的宽度等于所述电池的宽度，所述负端子导体块为L形并被配置为包裹所述电池的对应角。

10.根据权利要求9所述的装置，其中，所述电池接头与所述电池的壳体齐平安装。

11.根据权利要求1所述的装置，其中，在所述正电缆的第一部分和所述正电缆的第二部分之间设置有二极管连接。

12.根据权利要求11所述的装置，其中，所述二极管连接包括连接在所述正电缆的第一部分和所述正电缆的第二部分之间的一个以上的二极管。

13.根据权利要求12所述的装置，其中，所述二极管连接包括多个二极管，所述多个二极管中的每个二极管连接在所述正电缆的第一部分和所述正电缆的第二部分之间。

14.根据权利要求13所述的装置，其中，所述多个二极管的导体接头连接到所述正电缆的第一部分，并且所述多个二极管的导体插脚连接到所述正电缆的第二部分。

15.根据权利要求14所述的装置，其中，所述多个二极管连接到印刷电路板。

16.根据权利要求15所述的装置，其中，所述多个二极管的导体插脚延伸穿过所述印刷电路板并与所述导体插脚的第二部分电连接。

17.根据权利要求16所述的装置，其中，所述多个二极管被配置成沿单条轴线彼此靠近。

18.根据权利要求13所述的装置，其中，所述二极管连接器用热收缩绝缘体绝缘。

WINPLUS Ex. 1003, p. 755

用于电池搭电启动装置的电池连接器装置

技术领域

[0001] 一种便携式电池连接器装置，例如，用于电池搭电启动装置(特别是一种便携式车辆搭电启动设备)的电池连接器的布置或组装，其配置为提高搭电启动设备的电池与正在被充电的电池之间的导电性。

背景技术

[0002] 存在如Nook等人的美国专利第9,007,015号中公开的一种便携式车辆电池搭电启动装置。该设备利用锂离子电池组。在这种类型的设备中，存在将从该电池组到正在被搭电启动的车辆的车辆电池之间的导电性最大化的需要。

[0003] 对于成功的车辆搭电启动，有两个主要因素决定了结果。第一个因素是锂离子电池组提供的功率量，第二个因素是最大导电性。你需要这两个因素来获得搭电启动大型引擎的最好机会。只有其中一个因素而缺少另一个因素是不够的。

发明内容

[0004] 当前所描述的发明主题针对一种电池装置，例如在搭电启动车辆的装置中使用的电池连接器、电池连接器配置或电池导体组装体(assembly)，以及包括电池连接器装置的用于搭电启动车辆的装置。

[0005] 当前所描述的发明主题针对一种电池连接器装置，该电池连接器装置包括或由具有至少一个电池导体的电池构成，该电池导体连接到电池的端子。

[0006] 当前所描述的发明主题针对一种电池连接器装置，该电池连接器装置包括或由具有至少一个电池导体或电缆的电池构成，该电池导体或电缆连接到电池的电池接头。

[0007] 当前所描述的发明主题针对一种电池连接器装置，该电池连接器装置包括或由具有正导体和负导体的电池构成，该正导体和负导体连接到电池。

[0008] 当前所描述的发明主题针对一种电池连接器装置，该电池连接器装置包括或由具有正导体板和/或负导体板的电池构成，该正导体板和/或负导体板与电池连接。

[0009] 当前所描述的发明主题针对一种电池连接器装置，该电池连接器装置包括或由具有正导体板和/或负导体板的电池、以及连接到正导体板的正电缆和/或连接到负导体板的负电缆构成，该正导体板和/或负导体板与电池连接。

[0010] 当前所描述的发明主题针对一种电池连接器装置，该电池连接器装置包括或由具有正极电池导体和/或负极电池导体的电池组成，该正电池导体连接到电池正极端子，该负电池导体连接到电池负极端子。

[0011] 当前所描述的发明主题针对一种电池连接器装置，该电池连接器装置包括或由具有正极电池导体和/或负极电池导体的电池构成，该正极电池导体连接到电池的正端子接触部，该负极电池导体连接到电池的负端子接触部，上述电池导体被焊接到电池的对应端子上。

[0012] 当前所描述的发明主题针对一种电池连接器装置，该电池连接器装置包括或由具

WINPLUS Ex. 1003, p. 756

有正极电池导体和/或负极电池导体的电池、以及继电器构成，该正极电池导体连接到电池的正极端子，该负极电池导体连接到电池的负极端子，该继电器连接到电池的一个电池导体。

[0013] 当前所描述的发明主题针对一种电池连接器装置，该电池连接器装置包括或由具有正极电池导体和/或负极电池导体的电池、以及继电器构成，该正极电池导体连接到电池的正极端子接触部，该负极电池导体连接到电池的负极端子接触部，该继电器连接到负极电池导体。

[0014] 当前所描述的发明主题针对一种电池连接器装置，该电池连接器装置包括或由具有正极电池导体和/或负极电池导体的电池、以及继电器构成，该正极电池导体连接到电池的正极端子接触部，该负极电池导体连接到电池的负极端子接触部，该继电器连接到负极电池导体。

[0015] 当前所描述的发明主题针对一种电池连接器装置，该电池连接器装置包括或由具有正极电池导体和/或负极电池导体的电池、以及多个继电器构成，该正极电池导体连接到电池的正极端子接触部，该负极电池导体连接到电池的负极端子接触部，该多个继电器连接到负极电池导体。

[0016] 当前所描述的发明主题针对一种电池连接器装置，该电池连接器装置包括或由具有正极电池导体和/或负极电池导体的电池、以及正电缆构成，该正极电池导体连接到电池的正极端子接触部，该负极电池导体连接到电池的负极端子接触部，该正电缆连接到正极电池导体。

附图说明

[0017] 图1是夹具未展开的电池搭电启动装置的主视图。

[0018] 图2是图1所示的电池搭电启动装置的立体后视图。

[0019] 图3是图1和图2所示的电池搭电启动装置的立体端视图。

[0020] 图4是图1所示的电池搭电启动装置的立体主视图，然而，该电池搭电启动装置的夹具已展开。

[0021] 图5是图1所示的电池搭电启动装置中包含的电池连接器装置的立体主视图，然而，该电池连接器装置还未安装负电缆。

[0022] 图6是图5所示的电池连接器装置的顶部俯视图。

[0023] 图7是图5所示的电池连接器装置的侧视图。

[0024] 图8是图5所示的电池连接器装置的端视图。

[0025] 图9是图5所示的电池连接器装置的立体图，然而，该电池连接器装置连接有负电缆。

[0026] 图10是图5所示的电池连接器装置的立体图，然而，电池连接器装置具有安装在正电缆上的二极管连接器。

[0027] 图11是电池连接器装置的立体图，该电池连接器装置连接到电池搭电启动装置的其他部件和元件。

[0028] 图12是图5所示的电池连接器装置的电池组装体的立体图。

[0029] 图13是用于电池搭电启动装置的另一电池连接器装置的立体主视图。

WINPLUS Ex. 1003, p. 757

[0030] 图14是焊接到继电器印刷电路板之前与继电器印刷电路板连接的正电缆的详细视图。

[0031] 图15是焊接到继电器印刷电路板之后与继电器印刷电路板连接的正电缆的详细视图。

[0032] 图16是图13所示的电池连接器装置的电池组装体的立体主视图。

[0033] 图17是图16所示的电池组装体的部分顶部俯视图，然而，该电池组装体具有未卷绕状态下的正端子导电片。

[0034] 图18是图16所示的电池组装体的正端子导体的部分顶部俯视图。

[0035] 图19是部分地卷绕正电缆的端部的正端子导体的端部立体图。

[0036] 图20是全部卷绕正电缆的端部的正端子导体的端部立体图。

[0037] 图21是全部卷绕并焊接到正电缆的端部的正端子导体的侧部立体图。

[0038] 图22是全部卷绕并焊接到正电缆的端部的正端子导体的相反端的立体图。

[0039] 图23是正电缆的部分之间的二极管连接器的立体图。

[0040] 图24是在二极管连接器中使用的肖特基二极管的立体图。

[0041] 图25是用收缩包裹套管绝缘的二极管连接器的立体图。

[0042] 图27是示出图5～10中所示的电池连接的负载试验的图示说明。

[0043] 图28是示出图13～25中所示的电池连接的负载试验的图示说明。

[0044] 图29是用于电池搭电启动装置的另一电池连接器装置的主视图。

[0045] 图30是未组装之前的、包括多个电池单元、单独接头和导体(例如，板导体)的电池连接器装置的主视图。

[0046] 图31是包括电池单元的电池连接器装置的主视图，该电池单元准备有用于延长接头的单独接头。

[0047] 图32是组装后的、多个图30所示的包括电池单元、单独接头和导体的电池连接器装置的主视图。

[0048] 图33是示出折叠电池单元之后的、包括图32所示的电池单元组装体的电池连接器装置的立体图。

[0049] 图34是电池连接器装置的端部立体图，该图示出单独接头包裹或卷绕在正电缆的裸露的端部，并被焊接在一起。

[0050] 图35是电池连接器装置的相反端部的立体图，该图示出包裹负端子导体板并与其熔焊和/或焊接在一起的负极电池接头。

[0051] 图36是电池连接器装置的立体图，该图示出连接到正电缆之前的、连接到电池并向外延伸的平坦的单独接头。

[0052] 图37是具有导线和连接器的温度传感器组装体的侧视图。

[0053] 图38是组装成内嵌或拼接到正电缆中的二极管电路板的立体图。

具体实施方式

[0054] 图1和图2示出了电池搭电启动装置10。电池搭电启动装置10包括具有显示器14的壳体12，显示器14设置有发光二极管(LED)16的布置。

[0055] 电池搭电启动装置10还包括正电缆18和负电缆22。正电缆18具有正夹具20，负电

WINPLUS Ex. 1003, p. 758

缆22具有负夹具24。正电缆18和负电缆22分别穿过壳体12中的开口12a、12b。

[0056] 如图1所示，夹具20、24通过各自夹持相应的侧柱26而以未展开的模式收起或收纳，所述侧柱26在壳体12的相对侧上向外延伸。侧柱26在图2中示出。当电池搭电启动装置10不使用时，收纳夹具20、24，然后在使用过程中将其从侧柱26松开。

[0057] 电池搭电启动装置10被配置成对车辆电池进行搭电启动。例如，电池搭电启动装置10可以是美国专利第9,007,015号中所公开的具有安全保护的便携式车辆搭电启动设备，该专利所公开的设备或与其类似的装置或设备通过援引而完全并入本发明。

[0058] 电池搭电启动装置10包括位于壳体12内部的电气部件或元件。例如，电池搭电启动装置10包括图3～9中所示的电池连接器装置100。

[0059] 电池连接器装置100包括具有电池112的电池组装体110。例如，电池112是锂离子可再充电型电池。电池连接器装置100被配置为将从电池112到电池搭电启动装置10的电缆18、22和夹具20、24的导电性最大化。电池112包括电池壳体112a，例如矩形的电池壳体112a。

[0060] 电池112包括位于电池112的(例如宽度)一端的正接头，以及位于电池112的(例如宽度)相反一端的负端子接头。例如，电池112包括一个以上的电池单元，每个电池单元都具有正接头和负接头。例如，一个电池单元的正接头位于电池112的一端，一个电池单元的负接头位于电池112的相反一端。正端子导体板114在电池112的所述一端与电池112的正接头(即接触部)连接(例如焊接、熔焊或声波熔焊)。正端子导体板114沿着电池112的所述(例如宽度)一端延伸。

[0061] 正电缆18可以被连接(例如通过焊接直接连接)到正端子导体板114和/或电池112的正接头。例如，正端子导体块114可以设置有导电环116，该导电环116包裹(例如完全包裹)并连接(例如卷曲和/或焊接)到正电缆18的裸露端18a。例如，正端子导体板114由重规格铜板制成(例如机加工、切割或冲压而成)。

[0062] 如图5和图6所示，正端子导体片114可以被配置(例如弯曲)为(例如L形)包裹电池112的矩形壳体112a的方形角中的一个。如图5所示，L形正端子导体板114可以沿着电池112的端部延伸并沿着电池112的侧部的至少一部分延伸。

[0063] 正端子导体板114也可以机械地连结和/或粘附到电池壳体112a的外表面上，以对该电池壳体提供额外的支撑和稳定性(例如，当对电池搭电启动装置10进行跌落测试时，装配该正端子导体板以承受机械冲击)。例如，正端子导体块114可以通过粘合剂(例如硅粘合剂)、双面胶带、双面泡沫胶带、具有卡扣连接和/或粘附连接的绝缘塑料或陶瓷连接件而机械连接到电池壳体112、和/或电池壳体112可以形成(例如模制)为与正端子导体板114机械连接(例如卡扣连接或过盈连接)。

[0064] 正电缆18可以是从电池110延伸到正夹具20的单根导线或单根电缆(例如绞合线或编织线)。具体地，正电缆18的一端连接到与电池18连接的正端子导体板114，正电缆18的相反一端连接到正夹具20。

[0065] 更具体地说，正电缆18可以包括柔性或弯曲电缆部118，用于改变正电缆18在壳体12内的方向。正电缆18可以安装有柔性外套筒部120以柔性地容纳穿过壳体12的正电缆18，该柔性外套筒部120过渡至柔性内套筒部122。柔性外套筒部120相对于电池搭电启动装置10的壳体12位于外部，并且柔性内套筒部122相对于电池搭电启动装置10的壳体12位于内

WINPLUS Ex. 1003, p. 759

部。

[0066] 柔性外套筒部120被配置为在保持柔性的同时加强电池搭电启动装置的正电缆18和壳体12之间的连接。例如，柔性外套筒部120设置有露出正电缆18的一部分的一个以上的凹槽124(如图5所示的三(3)个)。一个以上的凹槽124起到转轴的作用，以使正电缆18在柔性外套筒部120内的弯曲变得容易。

[0067] 柔性套筒部120包括与内法兰126间隔开(例如约等于电池搭电启动装置10的壳体12的壁厚的较小距离)的外法兰124。法兰124、126进一步将正电缆18固定(anchor)至电池搭电启动装置10的壳体12。

[0068] 柔性套筒120包括套筒部128(图6)，该套筒部128将外法兰124和内法兰126连接到一起。例如，柔性外套筒部120被模制或应用在正电缆18上和其周围，而作为单个单元(例如，在模制过程中柔性套筒120被模制到插入在模具内的正电缆18的一部分上)。替代地，柔性套筒120被分开制造(例如模制)，然后安装或组装到正电缆18的一部分上。

[0069] 正电缆18包括设置在外绝缘护套18c(例如突出塑料护套(extruded plastic shcath))内的内导体18b(例如单根线导体、绞合线或编织线)。例如，内导体18b可以是实心线导体或包括导线束18d的多股金属线导体。内线可由铜或铝制成。柔性套筒120可以被应用(例如被模制或被安装或被组装)到正电缆18的外绝缘护套18c上并围绕它。

[0070] 电池连接器装置100还包括负端子导体板130，该负端子导体板在电池112的相反一端与电池112的负接头(即接触部)连接(例如焊接、熔焊或声波熔焊)。负端子导体板130可以沿着电池112的相反一端延伸。

[0071] 如图5和图6所示，负端子导体板130的另一端设置有负端子导体板连接器部132。

[0072] 负端子导体板130可以被配置成包裹(例如L形)矩形电池112的一个角。如图5和图6所示，L形负端子导体板130可以沿着电池112的端部延伸，并且沿着电池112的侧部的至少一部分延伸。

[0073] 负端子导体块130也可以机械地连结和/或粘附到电池壳体112a的外表面上，以对其提供额外的支撑和稳定性(例如，当对电池搭电启动装置10进行跌落测试时用来承受机械冲击)。例如，负端子导体块114可以通过粘合剂(例如硅粘合剂)、双面胶带、双面泡沫带、具有卡扣连接和/或粘附连接的绝缘塑料或陶瓷连接件机械连接到电池壳体112a、和/或电池壳体112可以形成(例如模制)为与正端子导体板114机械连接(例如卡扣连接或过盈连接)。

[0074] 电池连接器装置100还包括智能开关电池接口134。如图5和图6所示，该智能开关电池接口134包括继电器印刷电路板(PCB)136，该继电器印刷电路板(PCB)具有第一电路板导体块138，该第一电路板导体块与位于电路板136的一侧上的第二电路板导体块140间隔开。

[0075] 一对继电器142安装在电路板136的相对侧上。继电器142包含位于继电器印刷电路板136中的通孔136a中的继电器固定销(anchor pin)142a(图5和图7)。继电器142还包括继电器连接器销142b，该继电器连接器销在设置在电路板136中的通孔136b中延伸并在设置在第一导体块138中的狭缝138a中延伸。继电器142甚至还包括位于通孔136c中并位于通孔140a中的继电器连接器销142c，所述通孔136c设置在电路板136中，所述通孔140a设置在第二导体块140中。继电器固定销136a焊接在适当的位置上，以将继电器142机械地连接到

WINPLUS Ex. 1003, p. 760

电路板136。继电器连接销142b和142c焊接在适当的位置上，以将继电器142机械地且电气地分别连接到电路板导体板138、140。

[0076] 电路板136中的通孔136a是矩形的(图5和图7)，并容纳继电器固定销142a。具体地，继电器固定销142a的基部为具有方形端部的矩形形状。所述方形端部在尺寸上比所述基部窄，所述基部产生与电路板136的外表面定向齐平的横向边缘。当焊料被施加到继电器固定销142a的裸露端时，焊料将方形端部的侧部与横向边缘连接，以将继电器固定销固定并锁定到电路板136。

[0077] 如图3所示，在负端子导体块连接器部132中设置的狭缝132a是矩形的，并且第一电路板导体块138(图3)中的通孔138a是T形的，以容纳三(3)个水平排列的继电器连接器销142b。继电器连接器销142b的端部被示出与负端子导体块连接器部132的外表面齐平。当焊料被施加到继电器连接器销142b的裸露端时，焊料填充在负端子导体块连接器部132的狭缝132a和第一电路板导体块138的通孔138a中，并且将连接器销142b的侧部与狭缝132a和通孔138a的内边缘连接，以将继电器142固定到电路板136和负端子导体块连接器部132。所施加的焊料也将负端子导体块连接器部132电连接到第一电路板导体块138。

[0078] 如图3所示，在第二电路板导体块140中设置的通孔140a是T形的，以容纳三(3)个垂直排列的继电器连接销142c。继电器连接器插脚140a从电路板136的外表面向外延伸，以与负电缆144的裸露导体端144a连接，并在图7中示出。当焊料被施加到裸露导体端144a和继电器连接器插脚140a的端部时，焊料填充在T形狭缝中并与继电器连接器插脚140a、第二电路板导体140和负电缆144的裸露导体端144a电连接。

[0079] 负端子导体块130的负端子导体块连接器部132(例如，通过焊接)连接到电路板136的第一电路板导体块138。如图9所示，负电缆22的裸露导体端22a(即去除了绝缘护套)被连接(例如，通过焊接)到第二电路板导体块140。

[0080] 如图10所示，通过向正电缆18提供二极管连接150，可以修改电池连接器装置100。例如，二极管连接被安装(例如拼接)到正电缆18中。二极管连接150包括二极管印刷电路板(PCB)152和导体块156，该二极管印刷电路板(PCB)设置有一组背电荷二极管154(例如肖特基二极管)，该背电荷二极管位于所述二极管印刷电路板(PCB)的一侧，所述导体块设置在电路板152的相反侧上。

[0081] 组装

[0082] 如图11所示，电池搭电启动装置10包括具有上壳体部12a和下壳体部12b的壳体12。上壳体部12a和下壳体部12b被构造成在组装电池搭电启动装置10时连接在一起。

[0083] 电池搭电启动装置10还包括电池连接装置100和控制器组装体210，两者均设置在壳体12内。控制器组装体210包括位于与另一电路板214接近的位置上的电路板212。

[0084] 电池组装体110(图12)的正端子通过正电源线216连接到电路板212。例如，正电源线216被焊接到正导体块1(图5)。电池组装体110的负端子通过负电源线218连接到电路板214。

[0085] 继电器电路板136设置有具有连接器222的导线组220。连接器222被配置为在电池搭电启动装置10的组装过程中与位于控制器组装体210的电路板212上的继电器板连接器224连接。

[0086] 电池组装体110还包括具有连接器228的导线组226。连接器228被配置为与电池单

WINPLUS Ex. 1003, p. 761

元连接，该电池单元对位于控制器组装体220的电路板212上的连接器230进行充电/监测。

[0087] 电池组装体110也包括电池温度传感器，该电池温度传感器具备具有连接器234的导线组232。连接器234被配置为与位于控制器组装体220的电路板212上的温度传感器连接器236连接。

[0088] 如图11所示，电路板212设置有充电功率电阻器240和输出继电器242。此外，下壳体部12a设置有主用户输出连接器244和主用户输入连接器248，所述主用户输出连接器246具有连接到电路板214的电线组246，所述主用户输入连接器248具有连接到电路板214的电线组250。

[0089] 如图11所示，电池组装体110连接到电池搭电启动装置10。在组装电池搭电启动装置10时电池连接器装置110被安装在电池搭电启动装置10的壳体12内。

[0090] 增强的导电性

[0091] 在图13～25中示出了增强导电性的电池连接器装置400。如图5～10所示，与电池连接器装置100相比，增强导电性的电池连接器装置400提供了显著增加的导电性。

[0092] 将要从电池412传导至夹具的功率量可以以如下方式被增强：

[0093] (1)提高线规格

[0094] 例如，将4AWG(美国线规)的正电缆18和负电缆22(图9)改为2AWG的正电缆318和负电缆322(图13和15)。

[0095] (2)提高负电缆连接的导电性

[0096] 例如，连接到继电器的负电缆端322a(图15)将一直延伸到继电器422的连接器销422c上。

[0097] (3)提高正电缆连接的导电性

[0098] 例如，正电池接头414被加长，使得正电缆318可以在正电池接头414中被卷起(图17～22)，并被彻底焊接在一起；

[0099] (4)提高二极管连接的导电性

[0100] 例如，用二极管连接450(图23)代替二极管连接150(图5)。

[0101] (5)电阻/二极管印刷电路板(PCB)的重新设计

[0102] 例如，用二极管印刷电路板(PCB)452(图23)代替二极管印刷电路板(PCB)152(图10)。

[0103] (6)再连接电阻器

[0104] 例如，将要被再次连接的再连接电阻器R134A&B、R135A&B位于二极管印刷电路板(PCB)152(图10)上。

[0105] 下面将详细描述这些增强的导电性的特性或布置中的每一个。

[0106] (1)提高线规格

[0107] 例如，正电缆18和负电缆22(图9)的规格可以从4AWG(美国线规)电缆提高到用于正电缆318和负电缆322的2AWG电缆(图13和15)。4AWG电缆和2AWG电缆的规格比较如下：

WINPLUS Ex. 1003, p. 762

[0108]

	2AWG	4AWG
直径	0.2576 in	0.2294 in
	(6.544 mm)	(5.189 mm)
线圈数	3.88/in	4.89/in
	(1 .53/cm)	(1 .93/cm)
面积	66.4 kcmil	41 .7 kcmil
	(33.6 mm^2)	(21 .2 mm^2)
电阻/长度	0.5127 mΩ/m	0.8152 mΩ/m
	(0.1563 mΩ/ft)	(0.2485 mΩ/m)
载流量	95 (60° C)	70 (60° C)
	115 (75° C)	85 (75° C)
	130 (90° C)	95 (90° C)
熔断电流	1.3 kA (10s)	946 A (10s)
	10.2 kA (1s)	6.4 kA (1s)
	57 kA (32ms)	36 kA (32ms)

[0109]

[0110] 与1AWG电缆相比，2AWG电缆提供了显著增加(即大约36％)的导电性(即载流量)。

[0111] (2)提高负电缆连接的导电性

[0112] 负电缆322(图15)可以以增加电池412和负电缆322之间的导电性(即载流量)的方式连接到电池412(图13)。例如，负电缆端322a可以直接连接(例如焊接)到继电器442的连接器插脚442c(图15)。具体地，如图14和15所示，负电缆端322a可以延伸并直接连接到智能开关电池接口434的所有继电器342。此外，负电缆端322a可以连接到电路板导体块440的导体环441。

[0113] 例如，负电缆322可以是股线，该股线包括内部电线导体322b，该内部电线导体322b由设置在外部电绝缘护套322c内的未绞合或已绞合的电线束322d构成。负电缆322的电绝缘护套322c可以从负电缆端322a移除，在该负电缆端322a处裸露内部电导体322b。

[0114] 电导体322b的裸露的导线束322d可以被强制提供到继电器442的裸露的连接器销442c的端部上，从而在相邻的连接器销422c之间获得导线股322d。裸露的导线束322d可以进一步强制接触导体块440(例如由铜制成)。焊料423被施加到该组装体上，使得焊料在裸露的导线束422d与连接器销442c和导体块440之间流动，以完成负电缆322和连接到电池412的智能开关电池接口434之间的电连接。

[0115] 裸露的导线束322d的长度选择为使得裸露的导线束322d直接与每个继电器442的每一组连接器销442c连接，以提供负电缆322和电池41之间的最大导电性(即最大载流量)。

[0116] (3)提高正电缆连接的导电性

[0117] 正电缆318可以以增加电池412和正电缆318之间的导电性(即载流量)的方式连接到电池412。例如，正电缆318可以在正电池接头414中卷起并与其完全焊接在一起。正电缆

WINPLUS Ex. 1003, p. 763

318与电池412之间的连接在图16～22中示出。

[0118] 例如，正电缆318可以是股线，该股线包括内部电线导体318b，该内部电线导体318b由设置在外部电绝缘护套318c内的未绞合或已绞合的电线束318d构成。正电缆318的电绝缘护套318c从正电缆端318a移除，在正电缆端318a处裸露内部电导体318b。

[0119] 电池412具有正电池接头414。正电池接头414是连接到电池412的正端子接头414的金属片(例如铜片)。

[0120] 内部电导体318b的裸露的导线束318d可以用锡来焊接，然后在正电池接头312a内卷起。焊料415(图21)应用于裸露的导线束318d和正电池接头312a。

[0121] 裸露的导线束318d的长度选择为使得裸露的导线束318d直接连接正电池接头414的全宽度，以提供电池312和正电缆318之间的最大导电性(即最大载流量)。

[0122] (4)提高二极管连接的导电性

[0123] 如图23～25所示，正电缆318可以设置有二极管连接450，该二极管连接配置成沿正电缆318增加导电性。

[0124] 二极管连接450包括在正电缆部318e和318f(图25)之间连接的多个二极管454。例如，二极管连接450包括六(6)个背电荷型二极管(例如肖特基势垒二极管)。

[0125] 二极管454被焊接在正电缆部318e和318f之间。具体地，二极管导电接头454a焊接到正电缆部318e，二极管导电插脚454b焊接到正电缆部318f。更具体地说，二极管354的二极管导体插脚454b延伸通过二极管电路板452，延伸到导线束318b中，然后焊接在适当的位置上，完成二极管连接450的组装。

[0126] 之后，例如使用收缩包裹绝缘体455(图25)绝缘二极管连接450，该收缩包裹绝缘体被应用在二极管连接450周围，然后通过施加热量(例如使用热枪)收缩。

[0127] (5)电阻/二极管印刷电路板(PCB)的重新设计

[0128] 例如，重新设计电阻器/二极管PCB以消除从其延伸的二极管。

[0129] (6)再连接电阻器

[0130] 例如，电阻器/二极管PCB上的再连接电阻器R134A&B、R135A&B要被再次连接。

[0131] 实验#1

[0132] 图5所示的电池连接装置100经受1250A的负载试验。结果如图27所示，并如下：

[0133] 脉冲#1 平均功率为4799.01W

[0134] 脉冲#2 平均功率为5528.99W

[0135] 脉冲#3 平均功率为6101.63W

[0136] 实验#2

[0137] 在图13中所示的电池连接装置400经受1250A的负载试验。结果如图28所示，并如下：

[0138] 脉冲#1 平均功率6584.61W

[0139] 脉冲#2 平均功率7149.60W

[0140] 脉冲#3 平均功率7325.91W

[0141] 其结果是，与试验#1的结果相比峰值功率显著增加约百分之二十(20%)。

[0142] 图29～37中示出另一种增强导电性的电池导体装置500。与如图5～10所示的电池连接器装置100相比，增强导电性的电池连接器装置500提供了显著增加的导电性。

WINPLUS Ex. 1003, p. 764

[0143] 电池导体装置500包括电池组装体410，该电池组装体包含连接到正电缆518和负极端子导体板530的电池512。正极线519直接或间接地连接到电池530的正接头或正电缆518，负极线523直接或间接地连接到负接头或负端子导体板530。电池导体装置500还可以包含与电池512连接或与电池512的运行相关联的电线束570(例如电池温度传感器、电源等)。

[0144] 电池512可以包括单个电池单元512c(图30)，或者端到端串联连接的多个电池单元512c。在图30中示出了三(3)个单独的电池单元512c。

[0145] 电池单元512c各自具有正负接头512d，该正负接头512d位于每个电池单元512c的相对端。通过将各自的正负接头512d熔焊(例如声波熔焊和/或热熔焊)和/或焊接在一起而将电池单元512c串联连接在一起。例如，接头512d被定位成使得彼此重叠(例如，将相对的接头512d的边缘重叠，或者边缘靠边缘)。

[0146] 接头512d是从每个电池单元512c的主体和相反的边缘向外延伸的金属板(例如，相对较薄的金属箔)。如图30所示，接头512d按照每个电池单元512c的宽度沿相反的边缘延伸。每个接头512d都是居中的，并且延伸每个电池单元512c的每个相对边缘的大部分宽度。

[0147] 如图30和31所示，在电池单元512c的右侧增加或连接单独接头512e，以延长接头512d的长度。单独接头512e被示出具有与接头512d相同的宽度；然而，该宽度可以不同。为了将单独接头512e组装到接头512d，例如，单独接头512e被定位为重叠在接头512d上，然后熔焊(例如，声波熔焊和/或热熔焊)和/或焊接在一起。之后，如图32和34所示，正电缆518的裸露端卷绕在单独接头中。例如，初始平坦的单独接头512e包裹正电缆518的裸露端部，然后通过熔焊(例如，声波熔焊和/或热熔焊)和/或焊接连接到裸露的端部。例如，将焊料层施加到单独接头512e的一侧或两侧，然后在单独接头512e包裹正电缆518的裸露端之后，将组装体加热以熔化分层的焊料而将组装体焊接在一起。

[0148] 如图32所示，一旦三(3)个电池单元512c连接到一起，则彼此折叠成图33所示的分层电池单元的布置。如图34所示，可以将分层电池单元的布置包装(例如，三(3)个电池单元可以被胶带粘牢或收缩包裹在一起)，或者放置在电池盖或壳体内。

[0149] 如图35所示，负接头512d可以附接到负端子导体板530。例如，负接头512d可以如图所示地部分或全部包裹负端子导体板530。负接头512d可设置有多个通孔512f，以便于将负接头512d熔焊和/或焊接到负端子导体板530。例如，如图35所示，通孔512f可以是排列成矩阵的方形通孔。负极线523被示出连接(例如焊接)到负接头512d。

[0150] 单独接头512e(参见图30)可以连接到负接头512d来延长负接头512d，使得加长的负接头可以包裹或卷绕负端子导体板530一次以上(例如2、3、4次或更多次)。以这种方式，可以增强负接头512d和负端子导体板530之间的电连接。单独接头512c可以在其一个或两个侧面上配置有焊料层，使得在单独接头512e包裹或卷绕负端子导体板530之后，该组装体可以被加热以将单独接头512e焊接到负端子导体板530上。

[0151] 在图36中可以看到具有已连接的单独的正接头512d的电池导体装置500的完整组装体，该已连接的单独的正接头512d准备好包裹或卷绕正电缆518的裸露端(图29)。图36所示的电线束570包含用于温度传感器的导线572，该温度传感器嵌入在电池512内(例如，位于电池接头附近或电池单元之间的温度传感器)。在图37中示出具有两个(2)导线572a、572b的温度传感器574。

WINPLUS Ex. 1003, p. 765

[0152] 如图38所示，电池导体装置500可以包括以内嵌(inline)或者拼接(splice)的方式连接到正电缆518中的二极管连接器550。

[0153] 电池导体装置500包括二极管电路板552，其上组装有多个二极管454。每个二极管454都有连接(例如焊接)到正电缆518的裸露端的二极管导体接头454a。二极管454的插脚延伸穿过二极管电路板552的孔，并与电阻器576一起焊接到正极电缆518的导电迹线和裸露端这两方，以完成组装。

WINPLUS Ex. 1003, p. 766

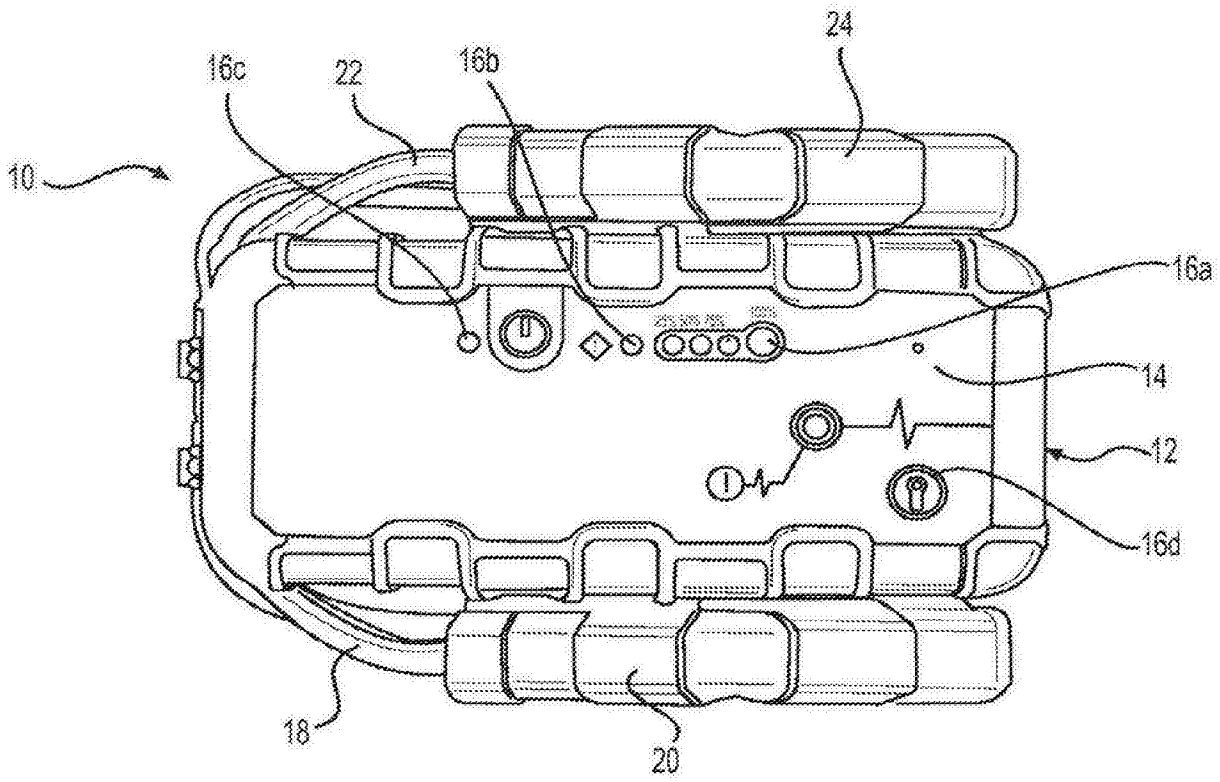


图1

WINPLUS Ex. 1003, p. 767

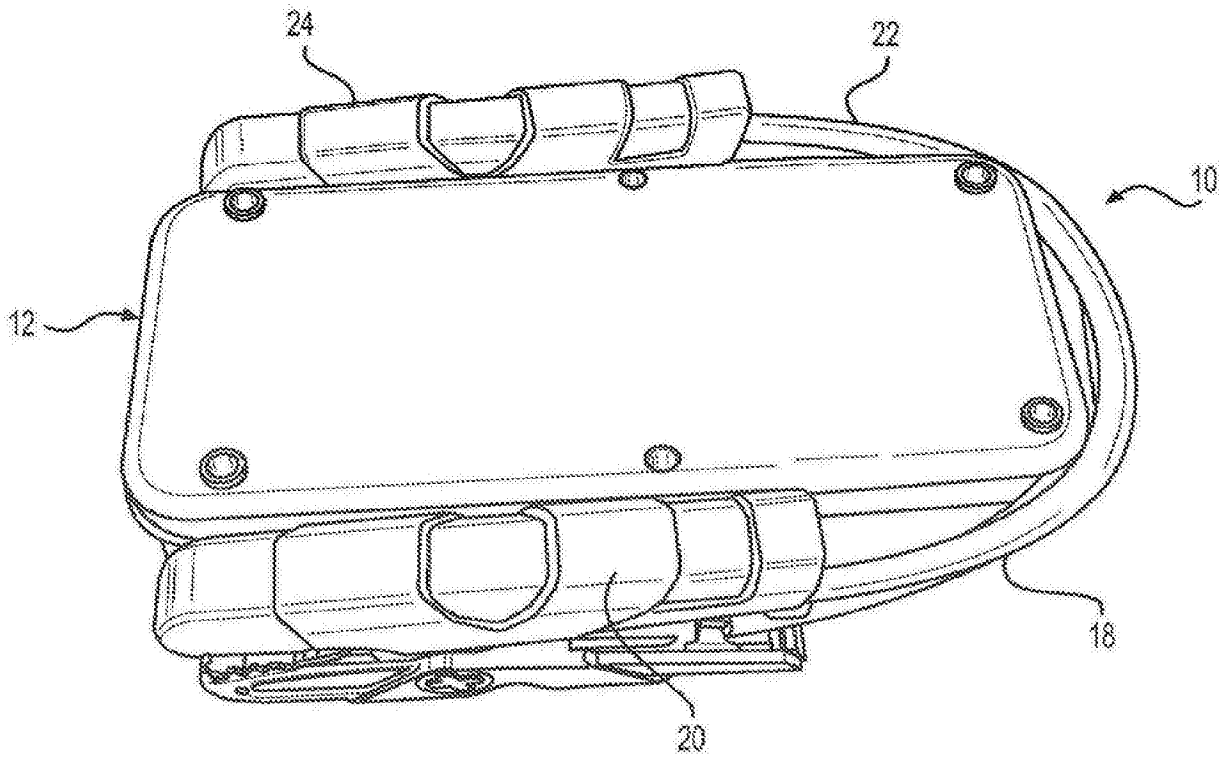


图2

WINPLUS Ex. 1003, p. 768

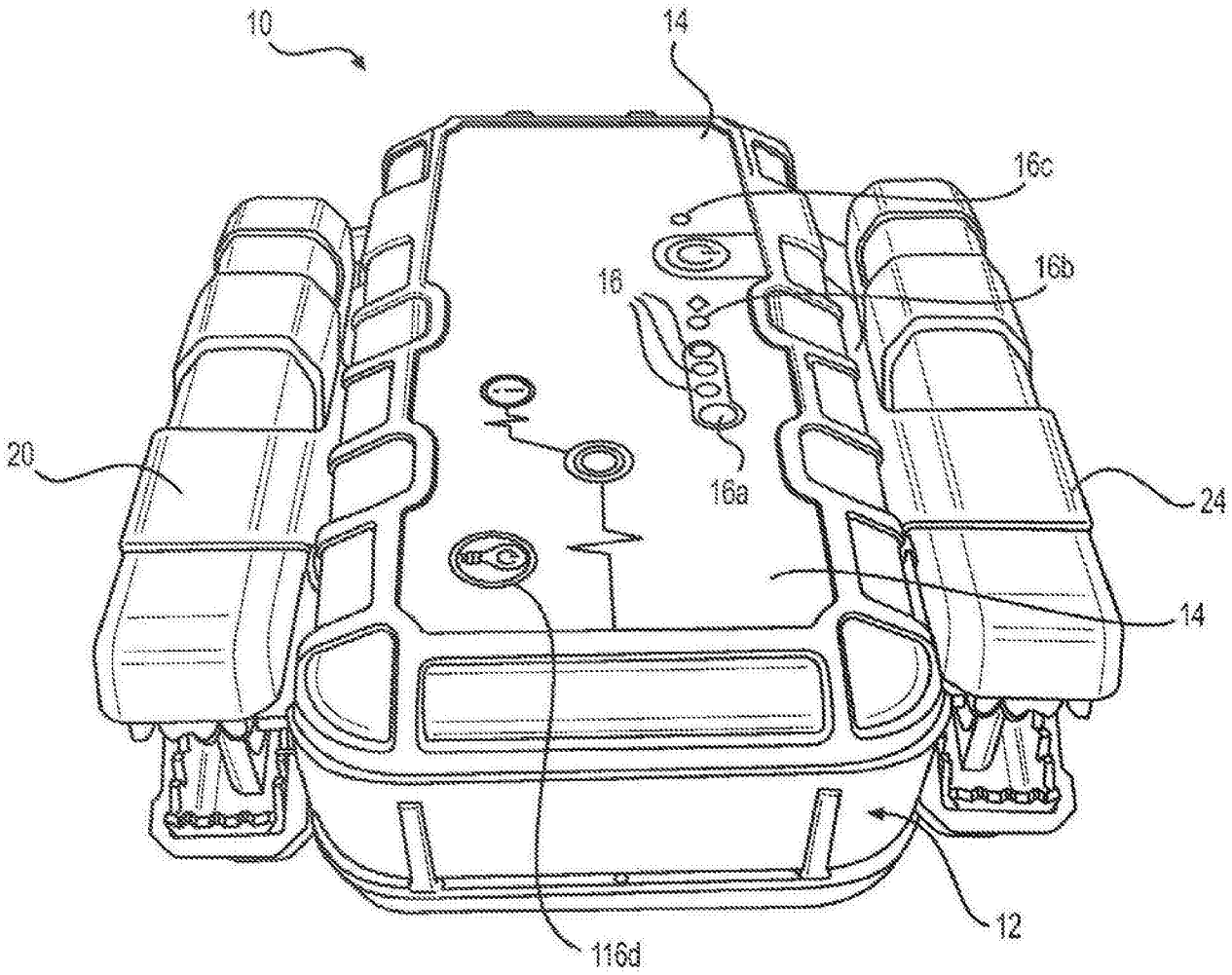


图3

WINPLUS Ex. 1003, p. 769

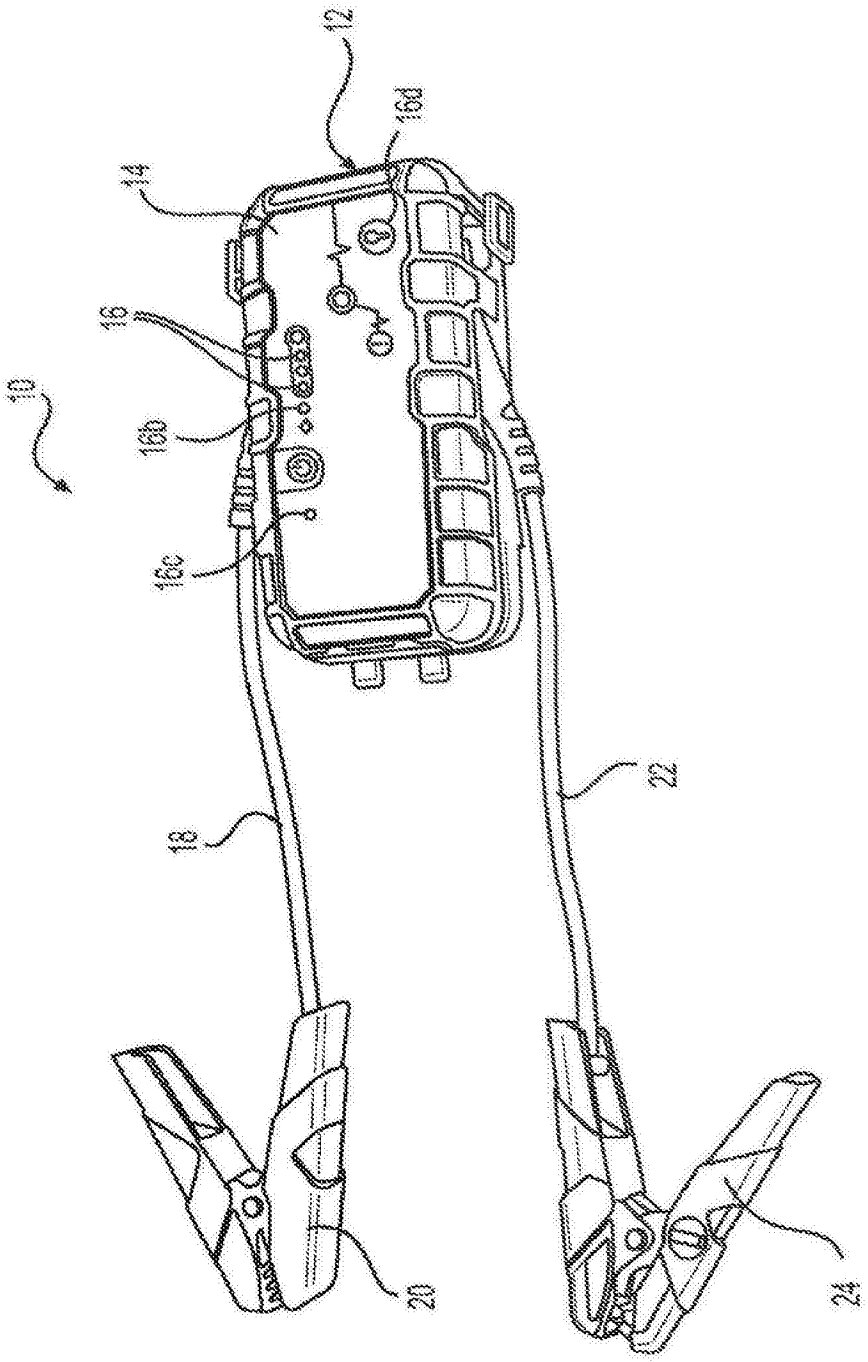


图4

WINPLUS Ex. 1003, p. 770

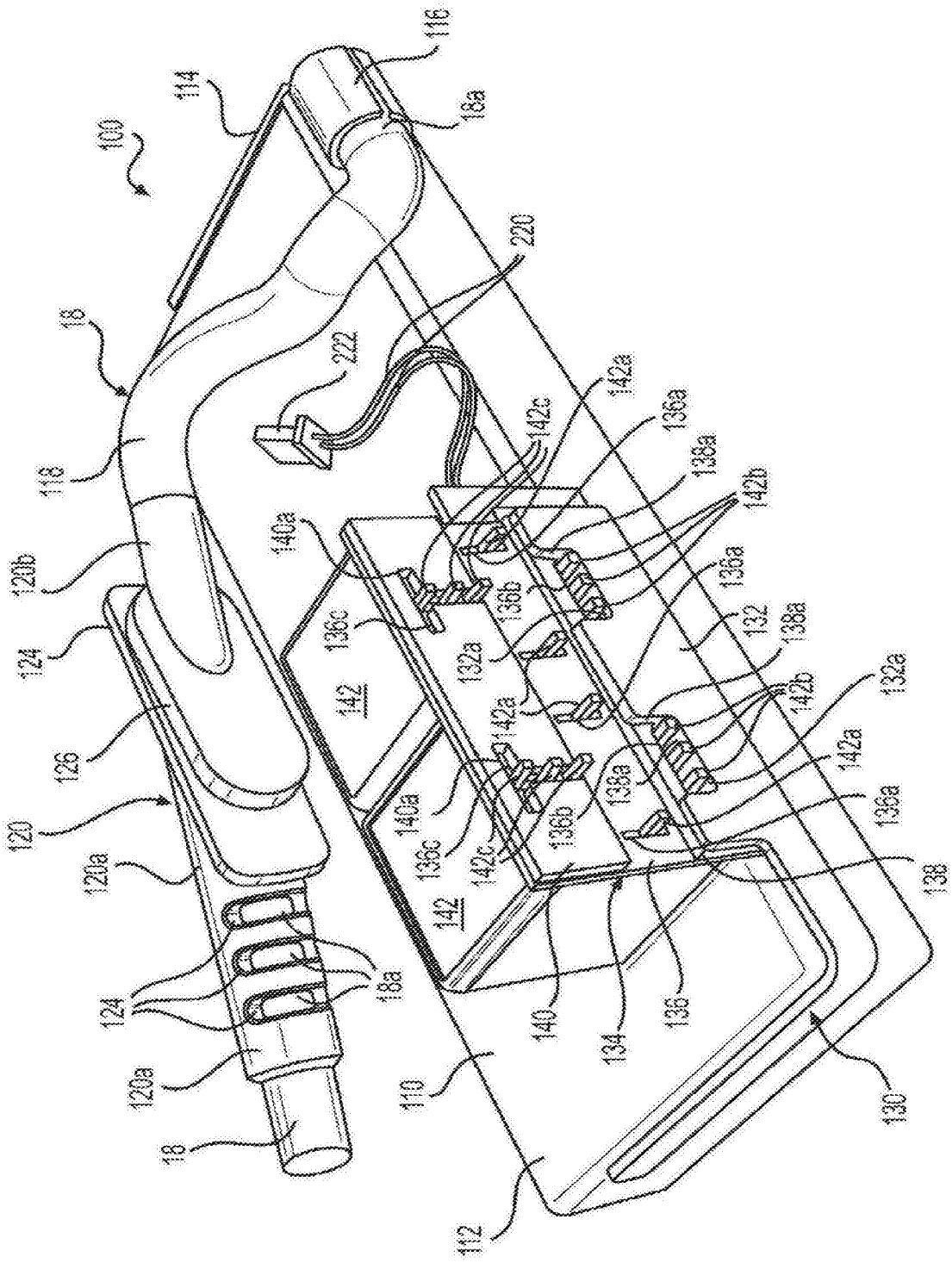


图5

WINPLUS Ex. 1003, p. 771

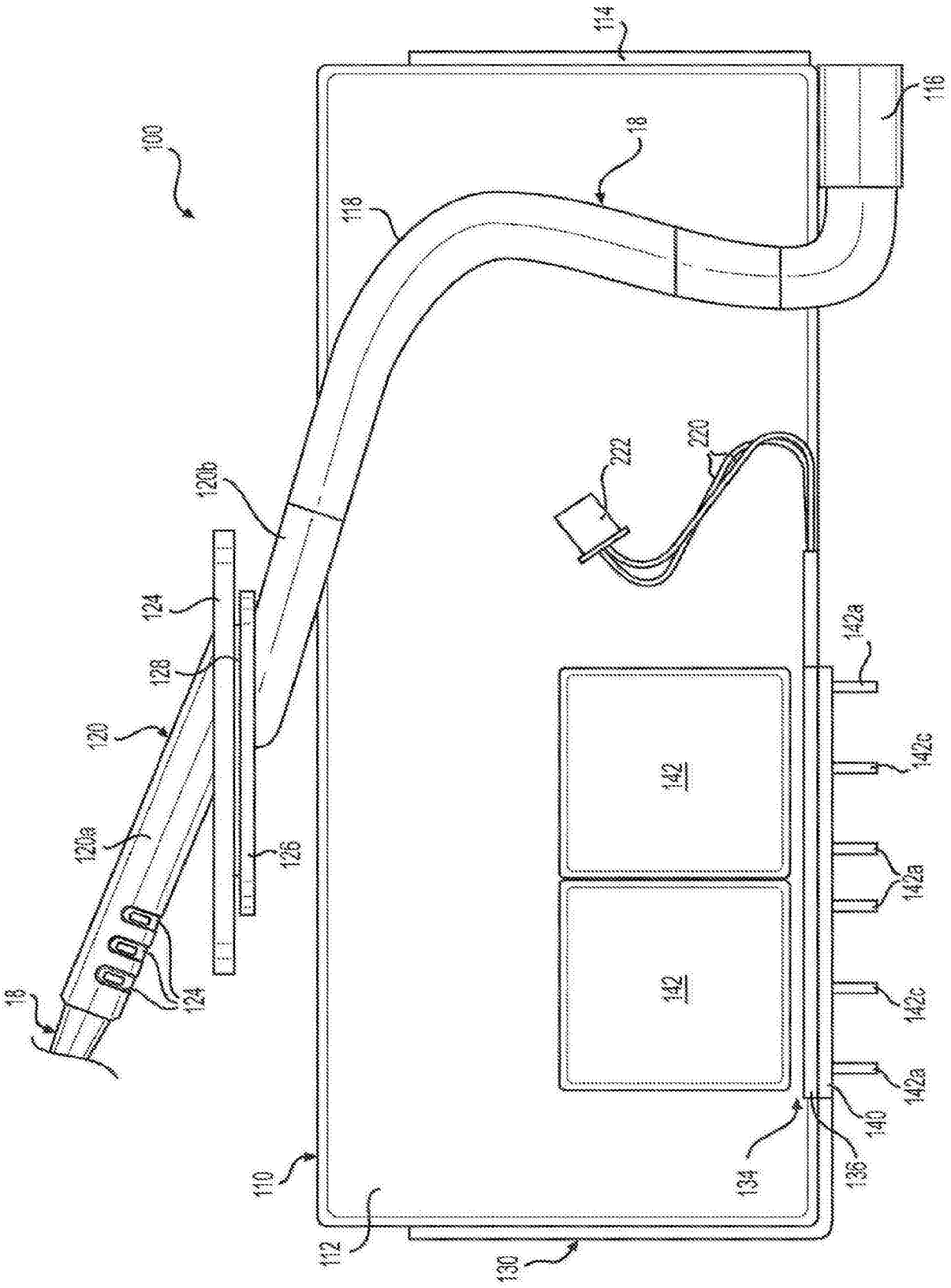


图6

WINPLUS Ex. 1003, p. 772

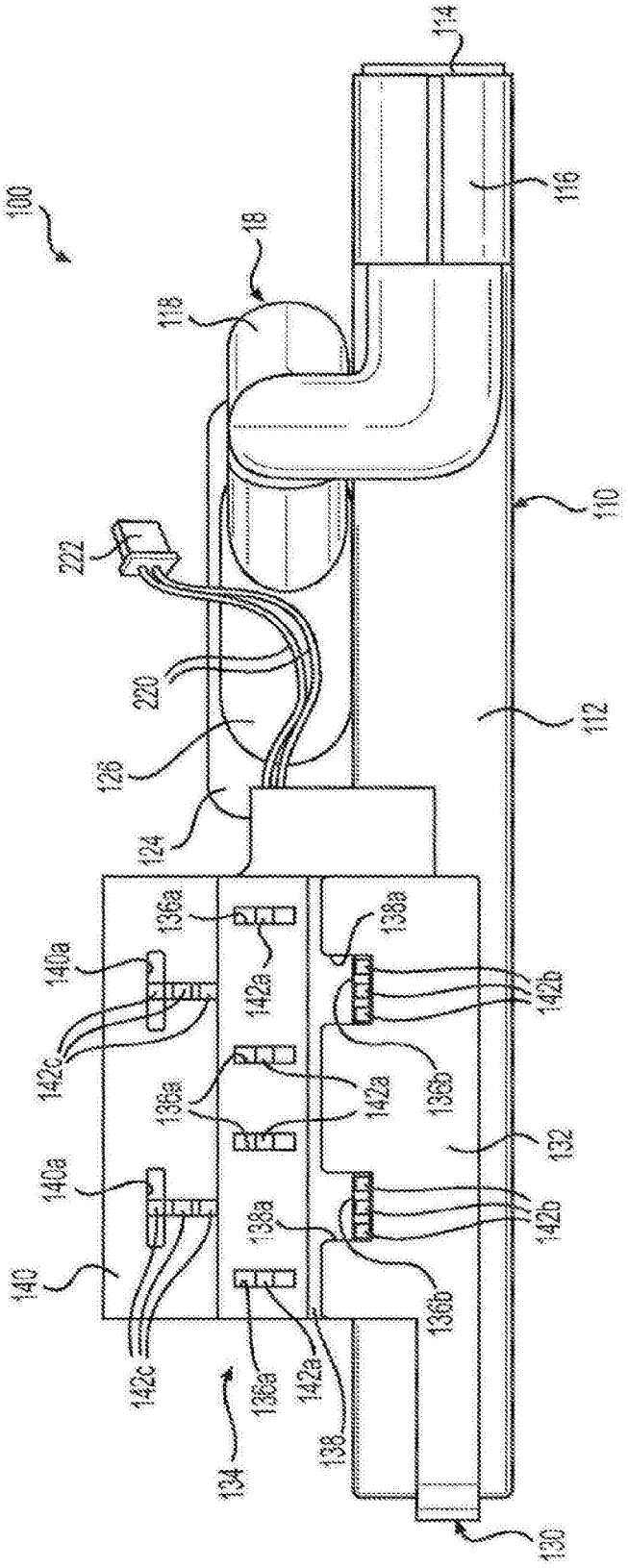


图7

WINPLUS Ex. 1003, p. 773

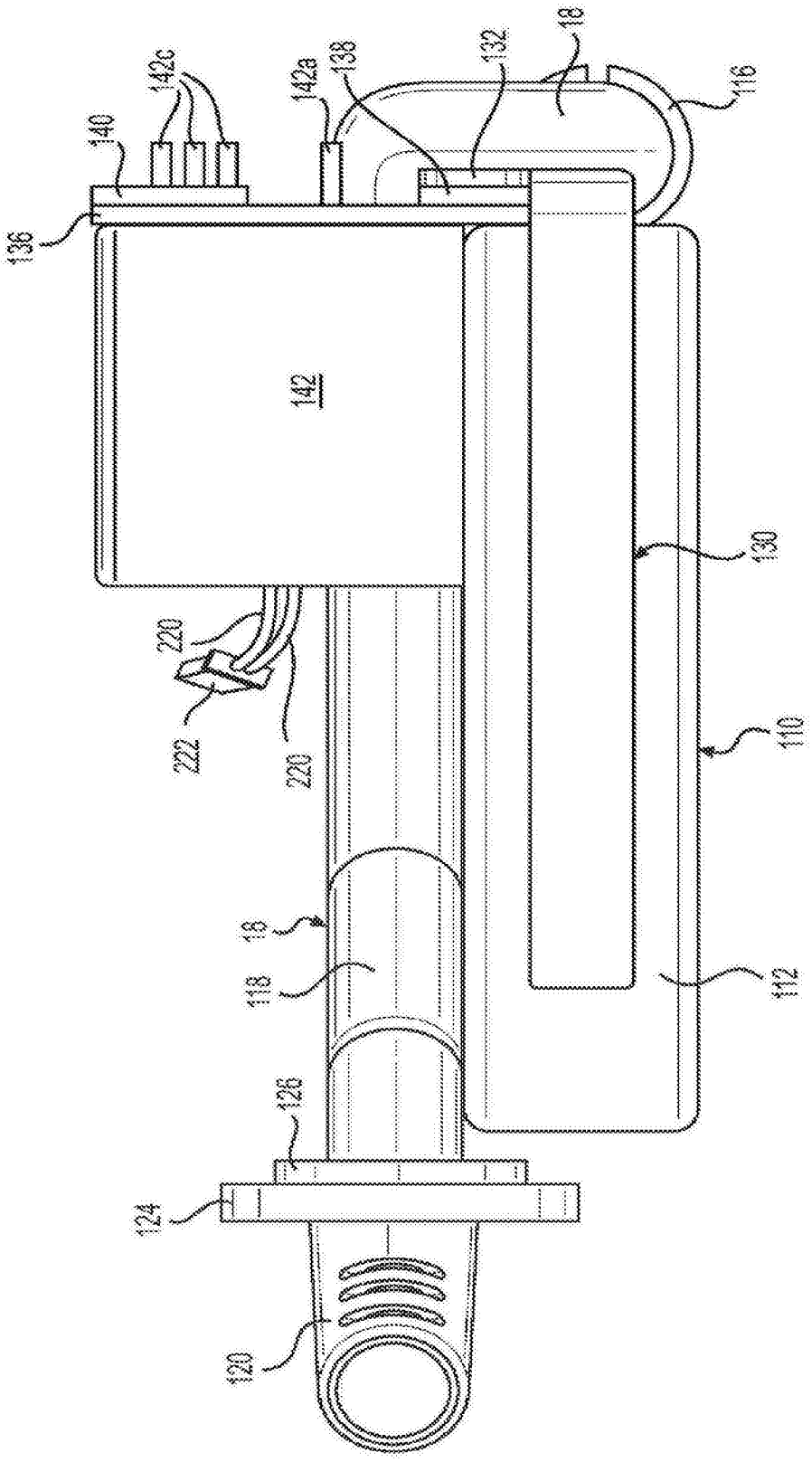


图8

WINPLUS Ex. 1003, p. 774

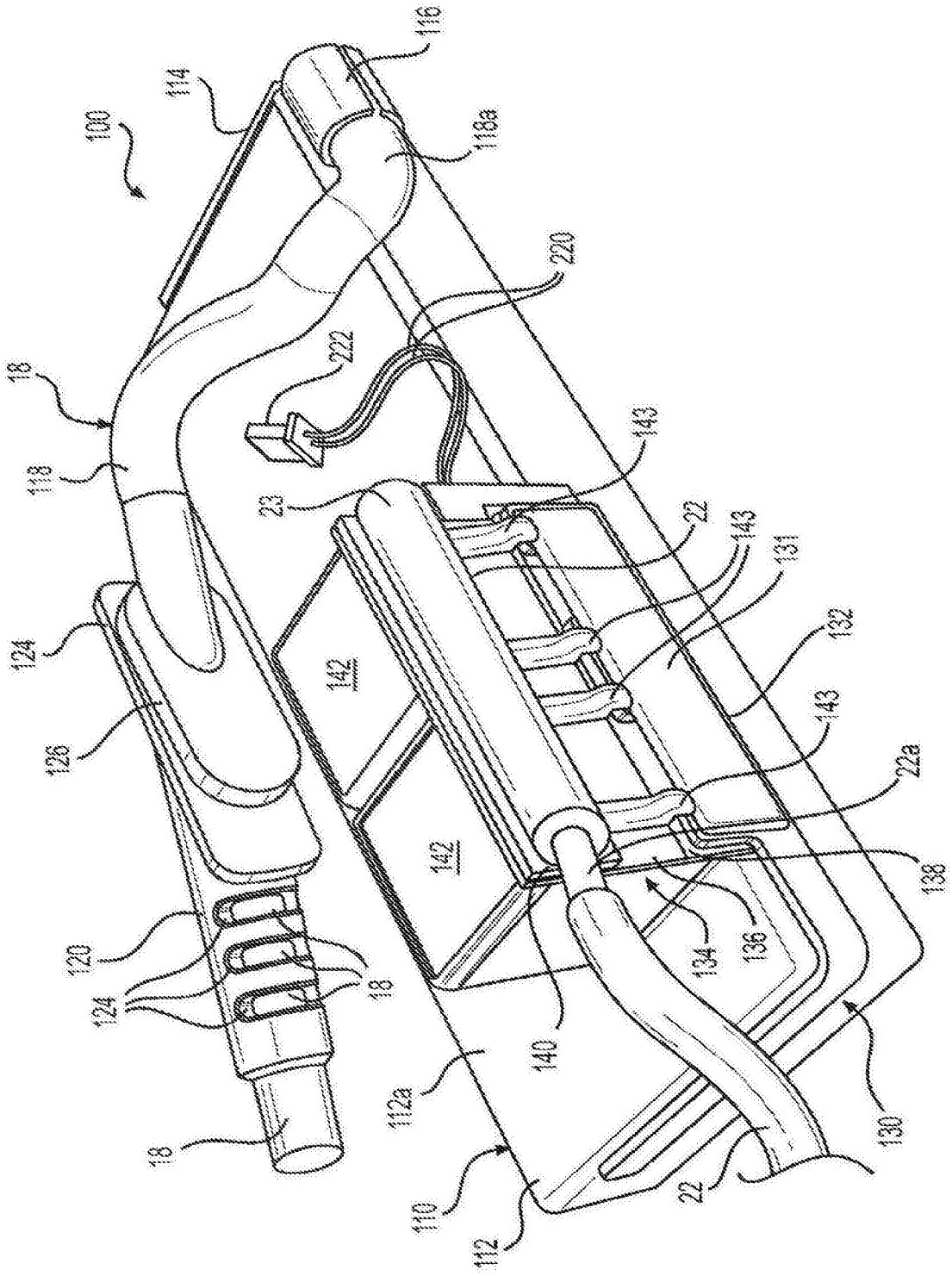


图9

WINPLUS Ex. 1003, p. 775

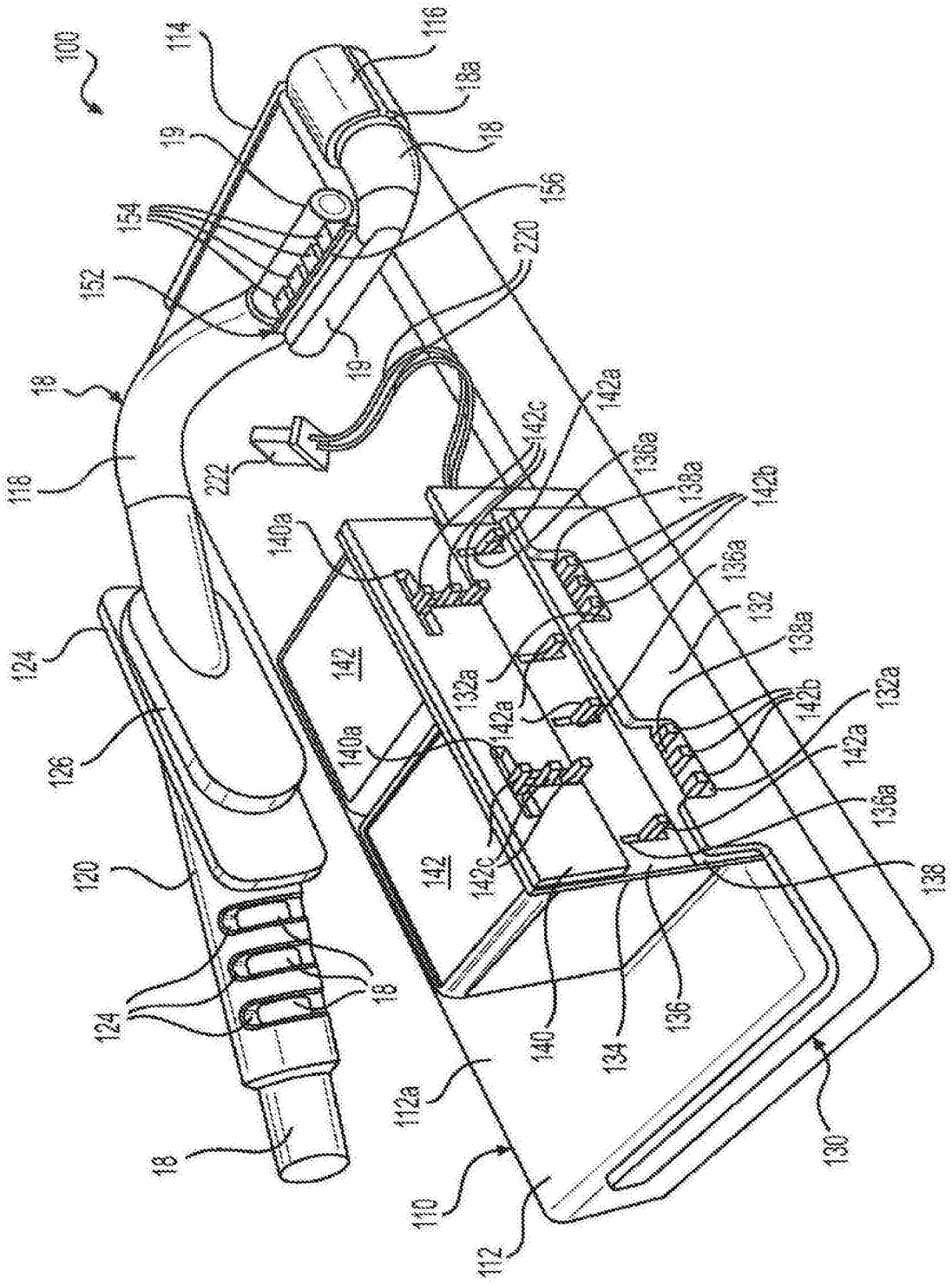


图10

WINPLUS Ex. 1003, p. 776

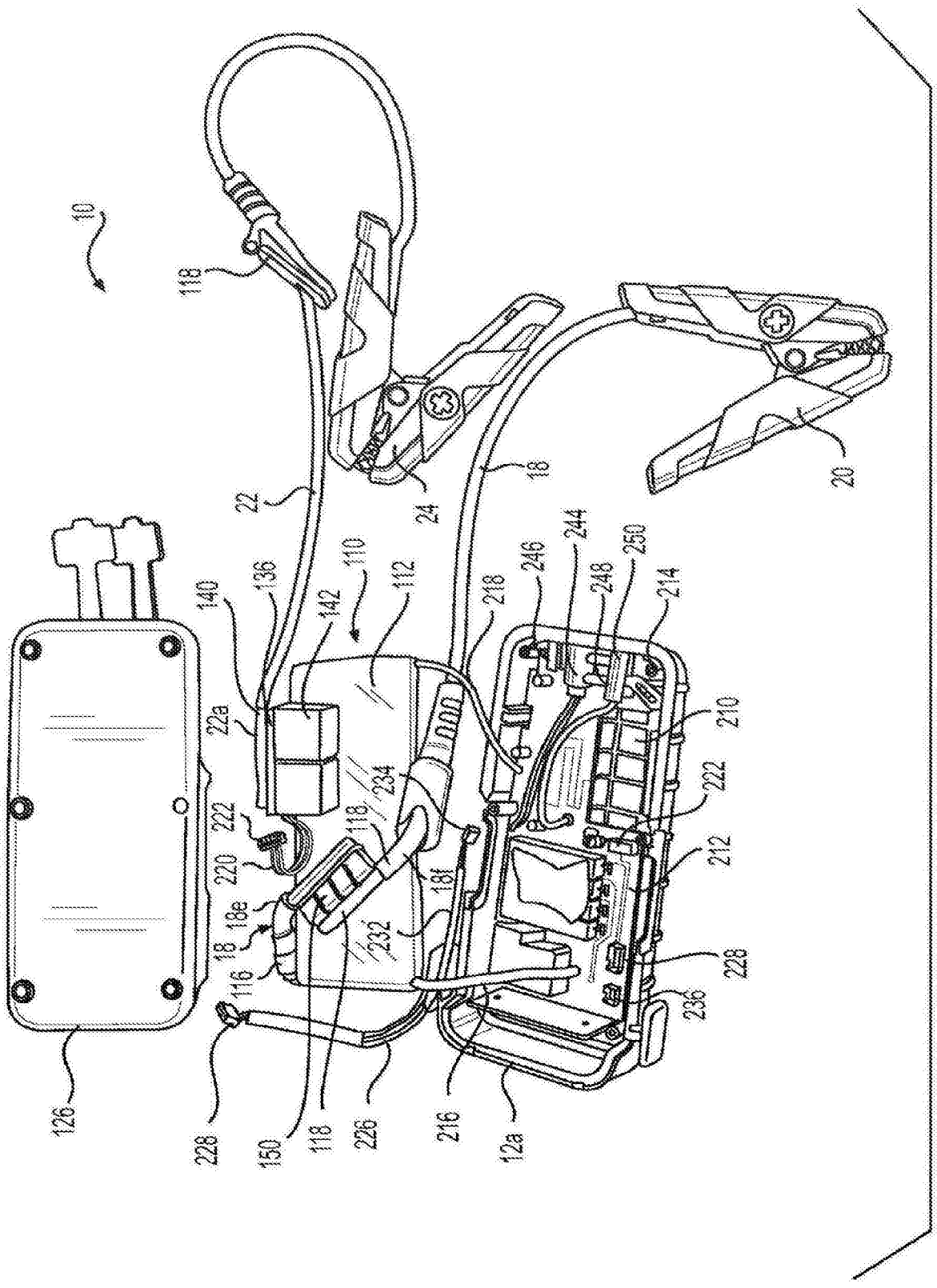


图11

WINPLUS Ex. 1003, p. 777

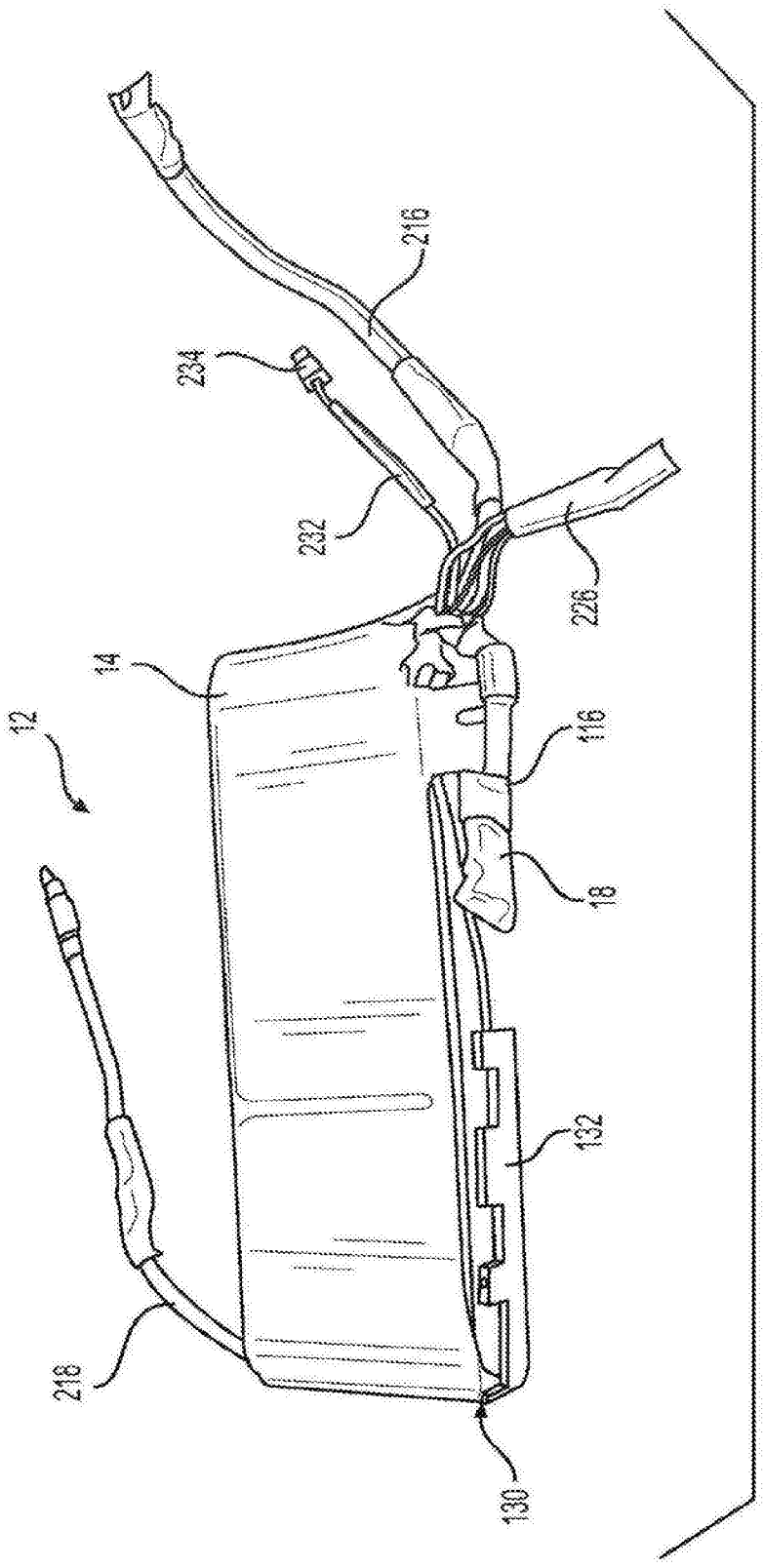


图12

WINPLUS Ex. 1003, p. 778

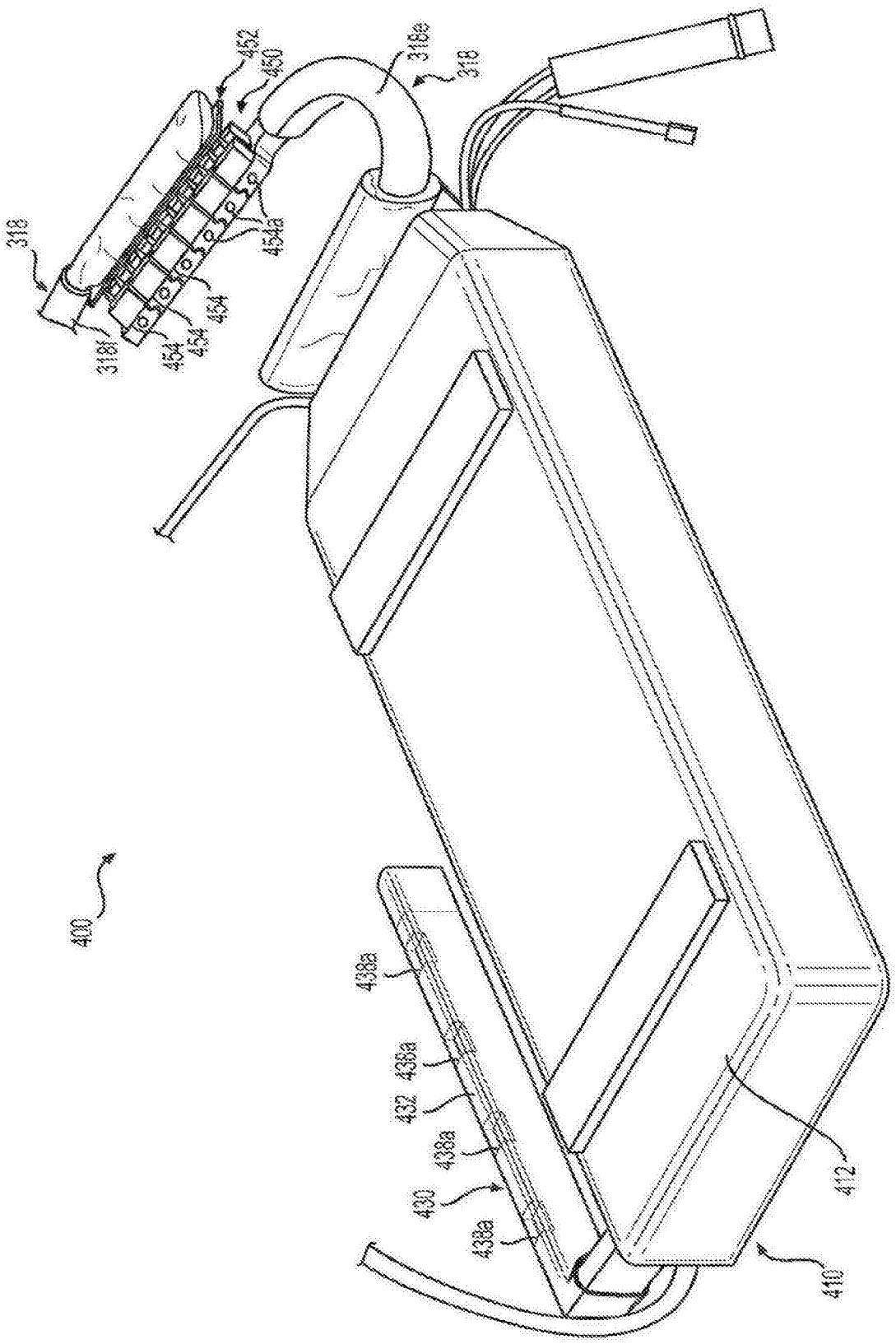


图13

WINPLUS Ex. 1003, p. 779

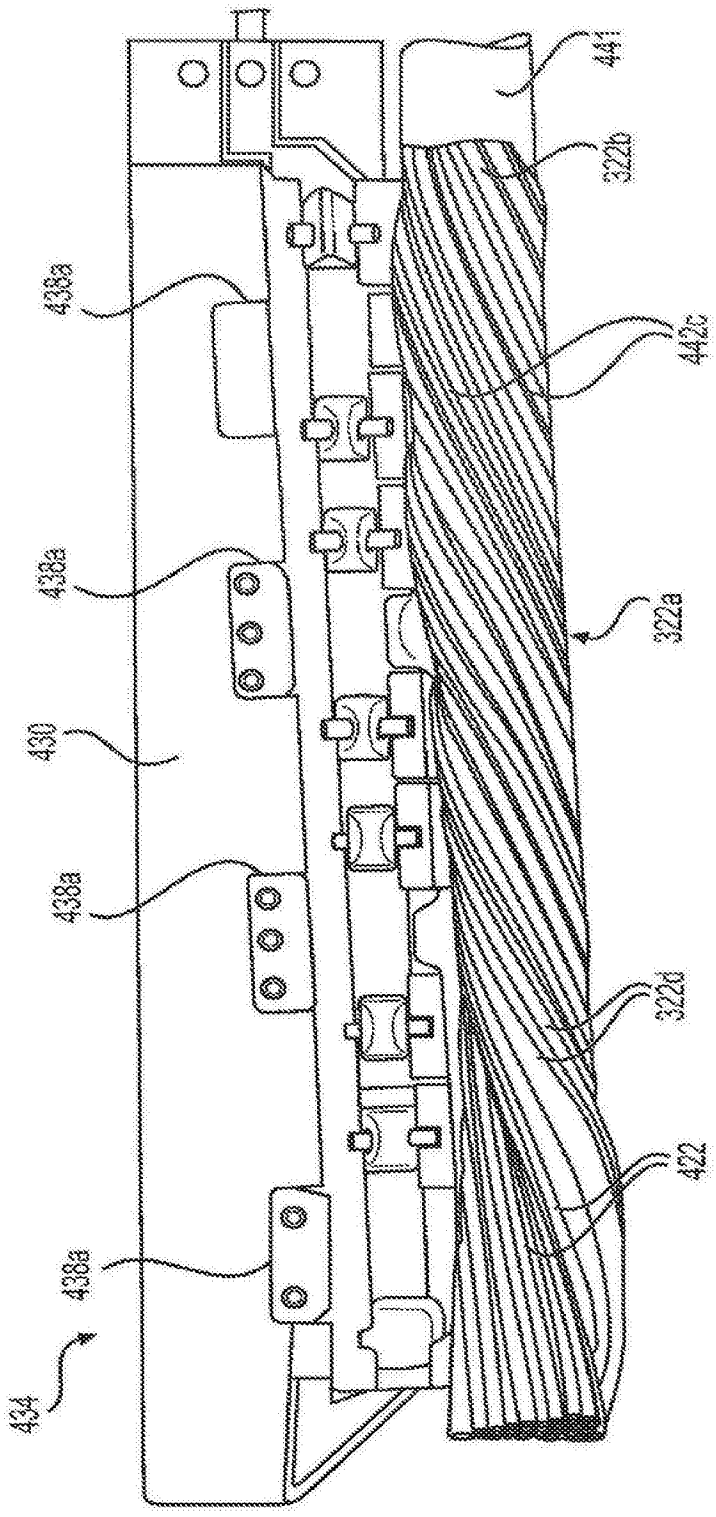


图14

WINPLUS Ex. 1003, p. 780

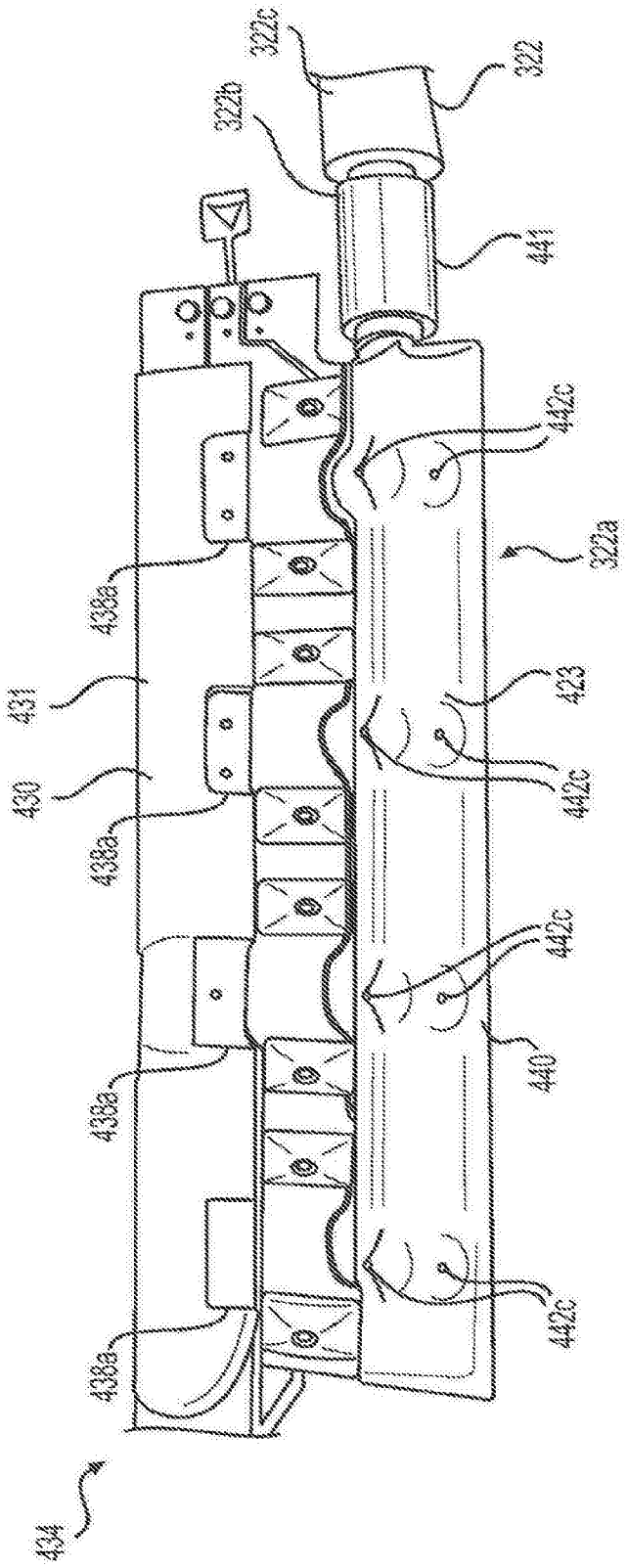


图15

WINPLUS Ex. 1003, p. 781

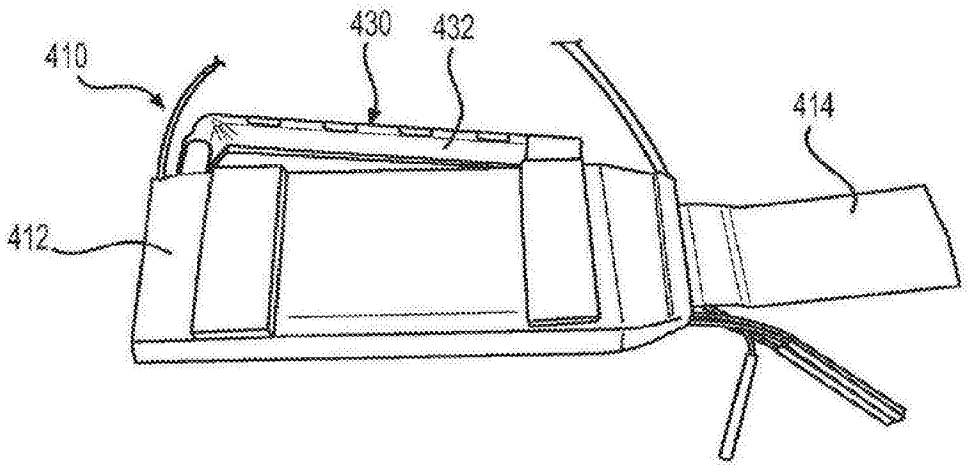


图16

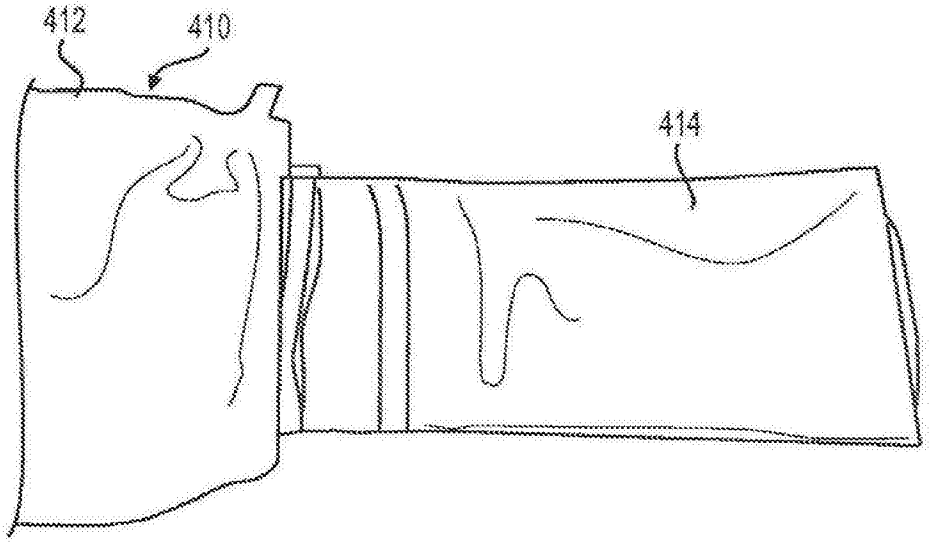


图17

WINPLUS Ex. 1003, p. 782

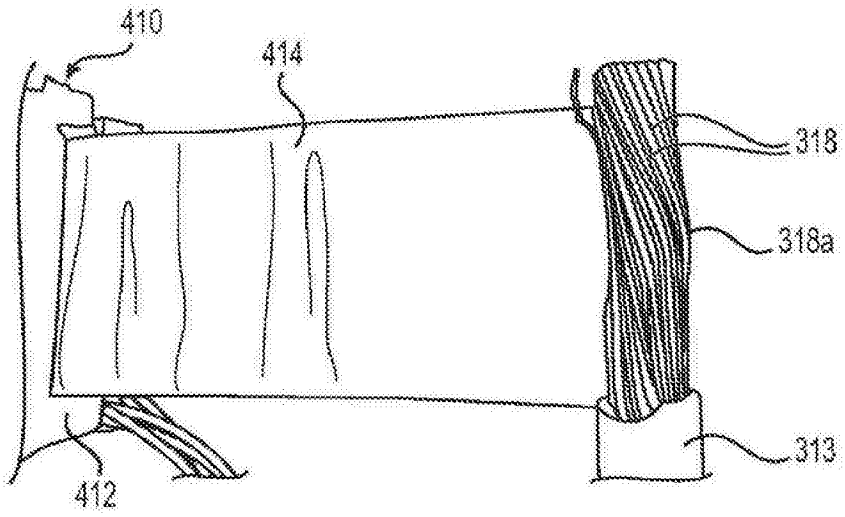


图18

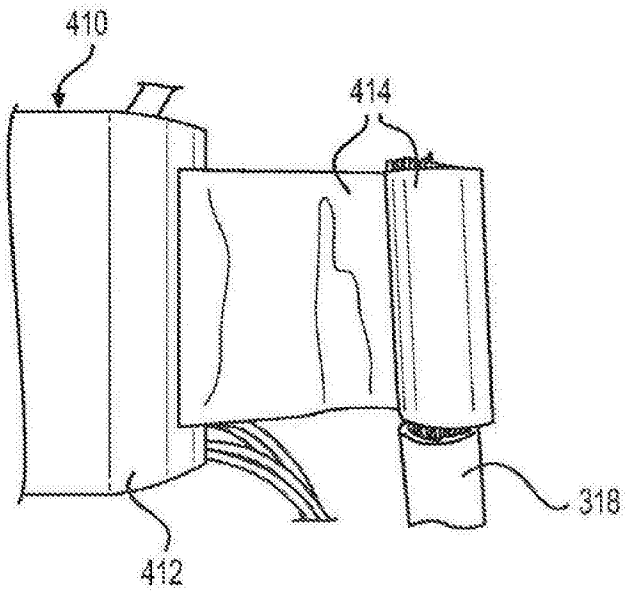


图19

WINPLUS Ex. 1003, p. 783

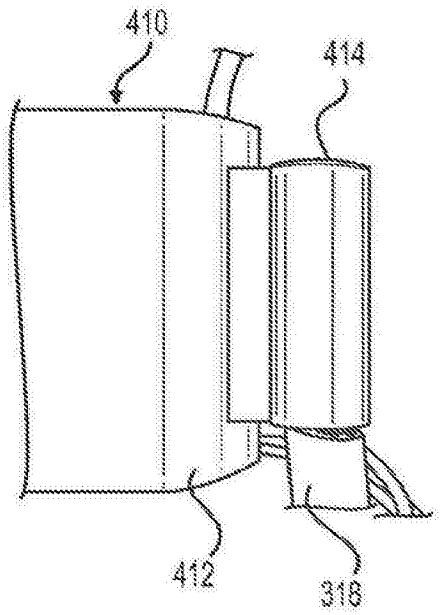


图20

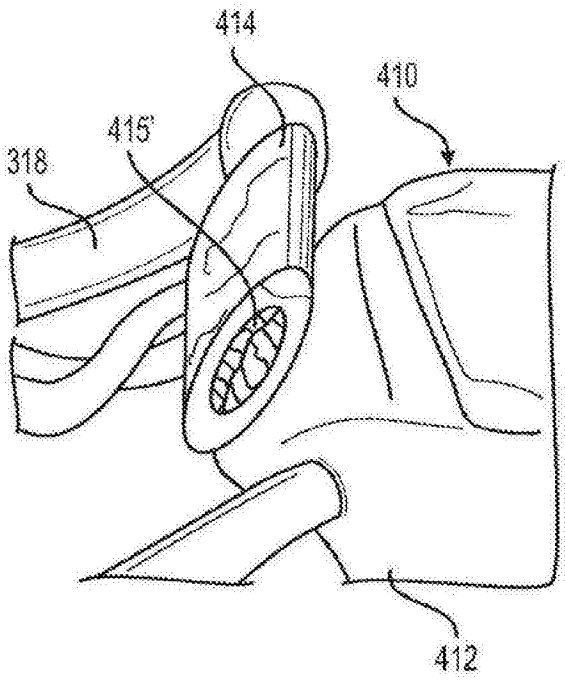
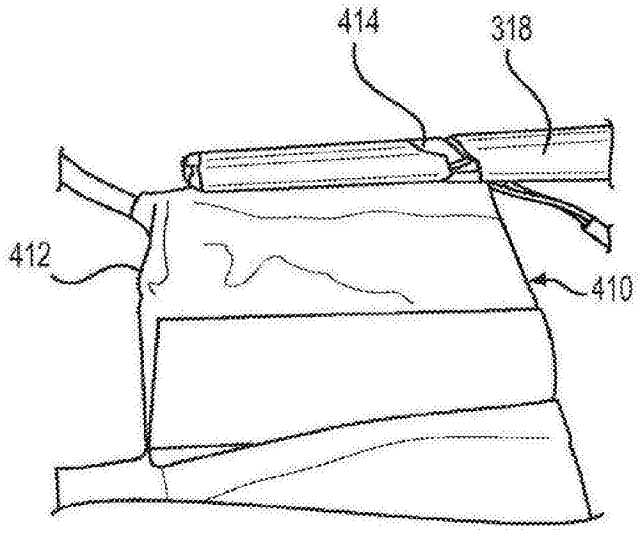


图21

WINPLUS Ex. 1003, p. 784



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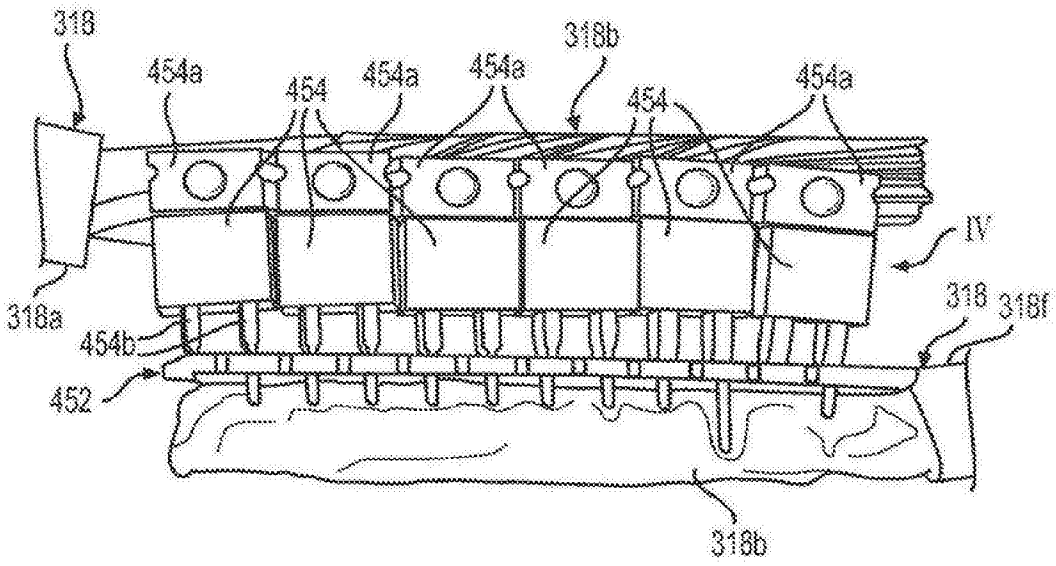

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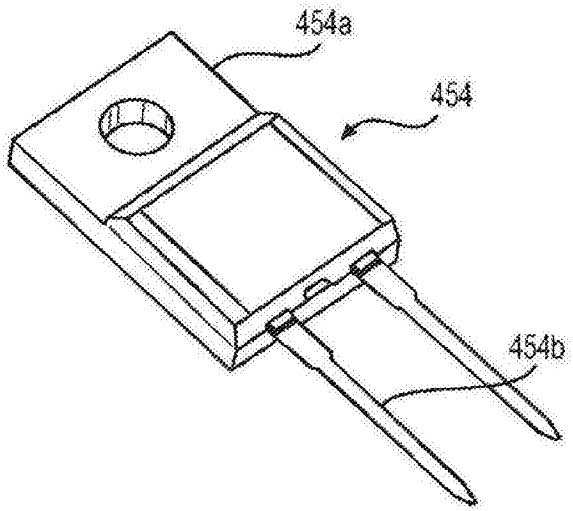


图24

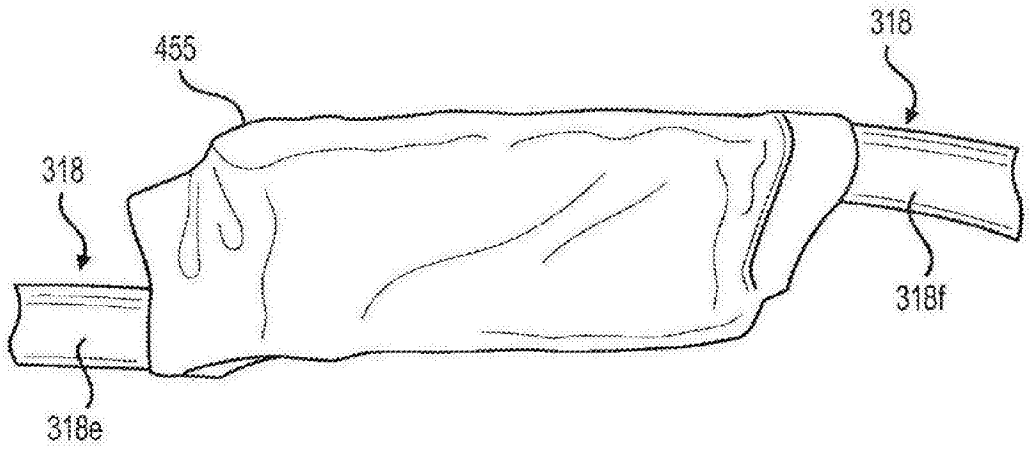


图25

WINPLUS Ex. 1003, p. 786

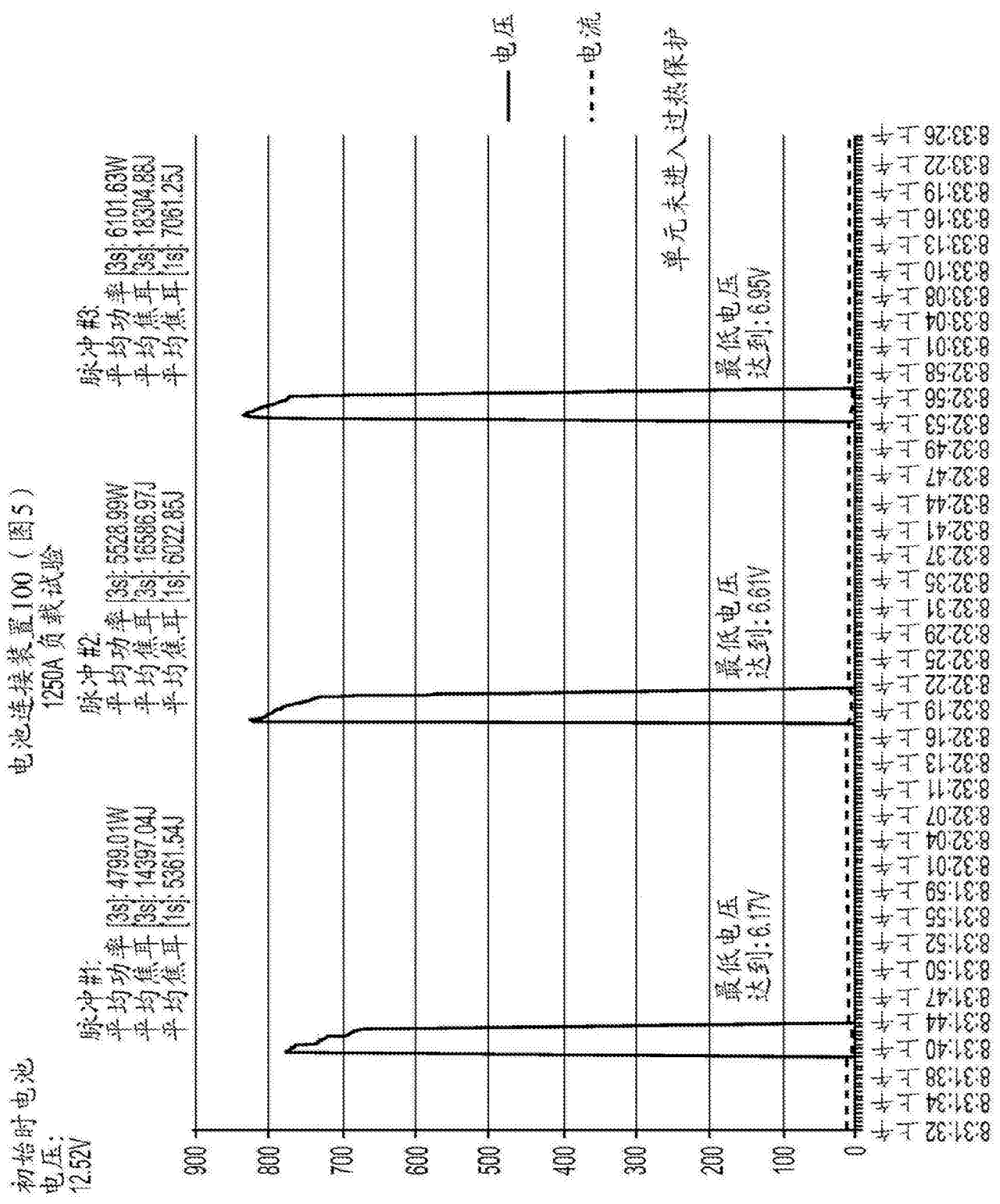
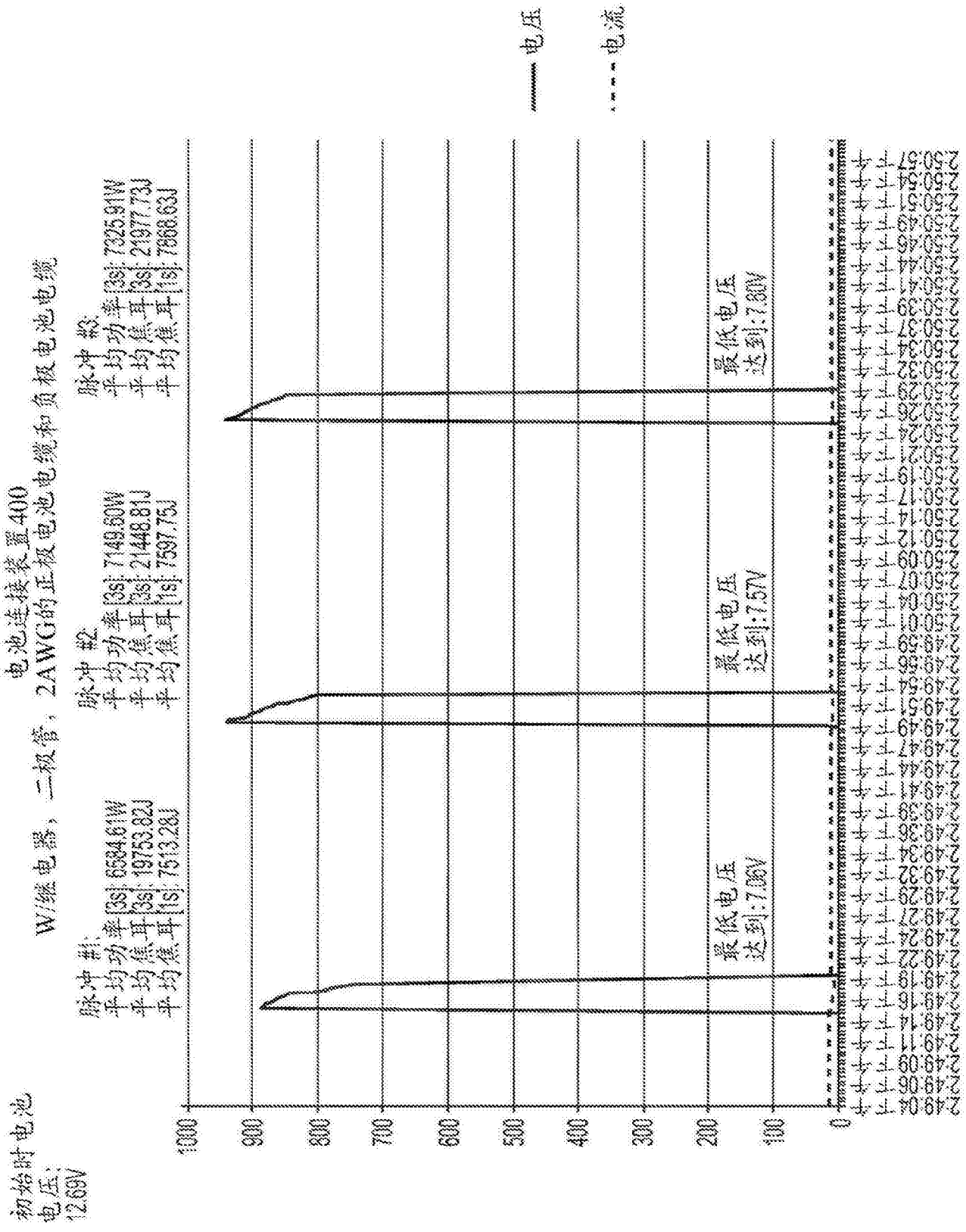


图27

WINPLUS Ex. 1003, p. 787



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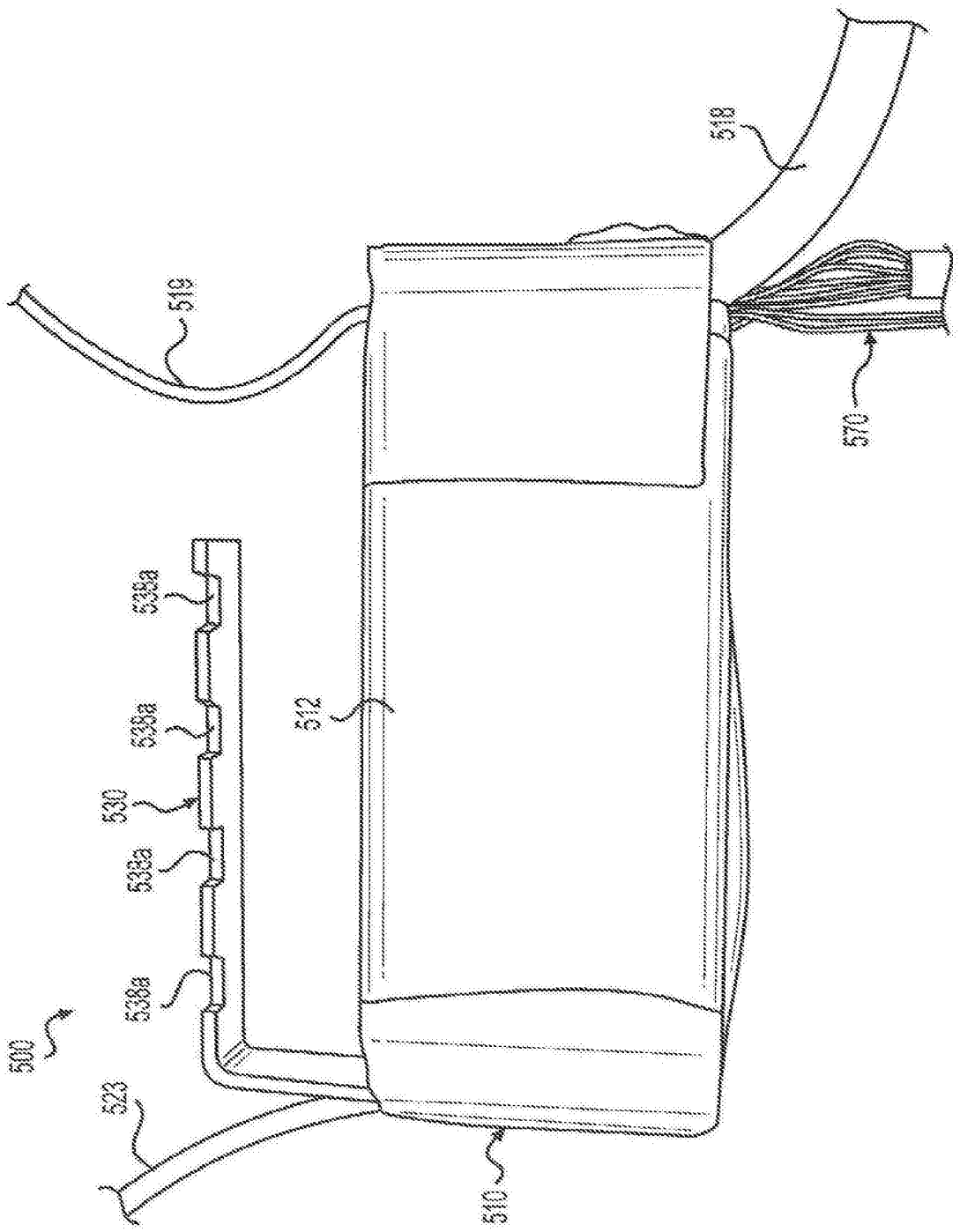

图29

WINPLUS Ex. 1003, p. 789

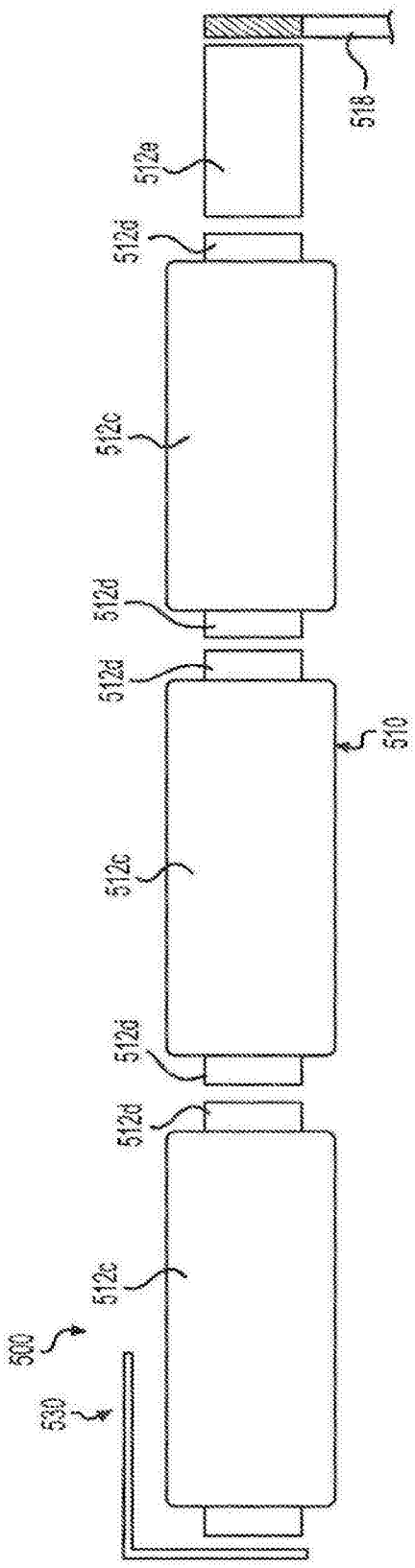

图30

WINPLUS Ex. 1003, p. 790

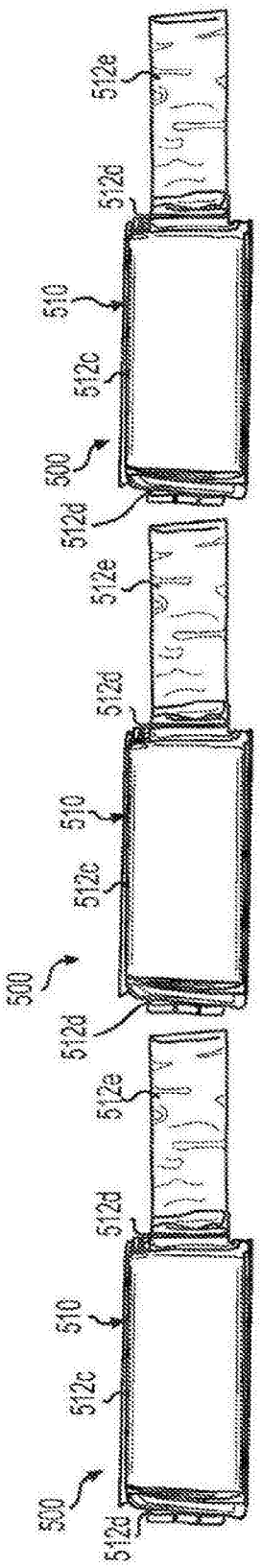

图31

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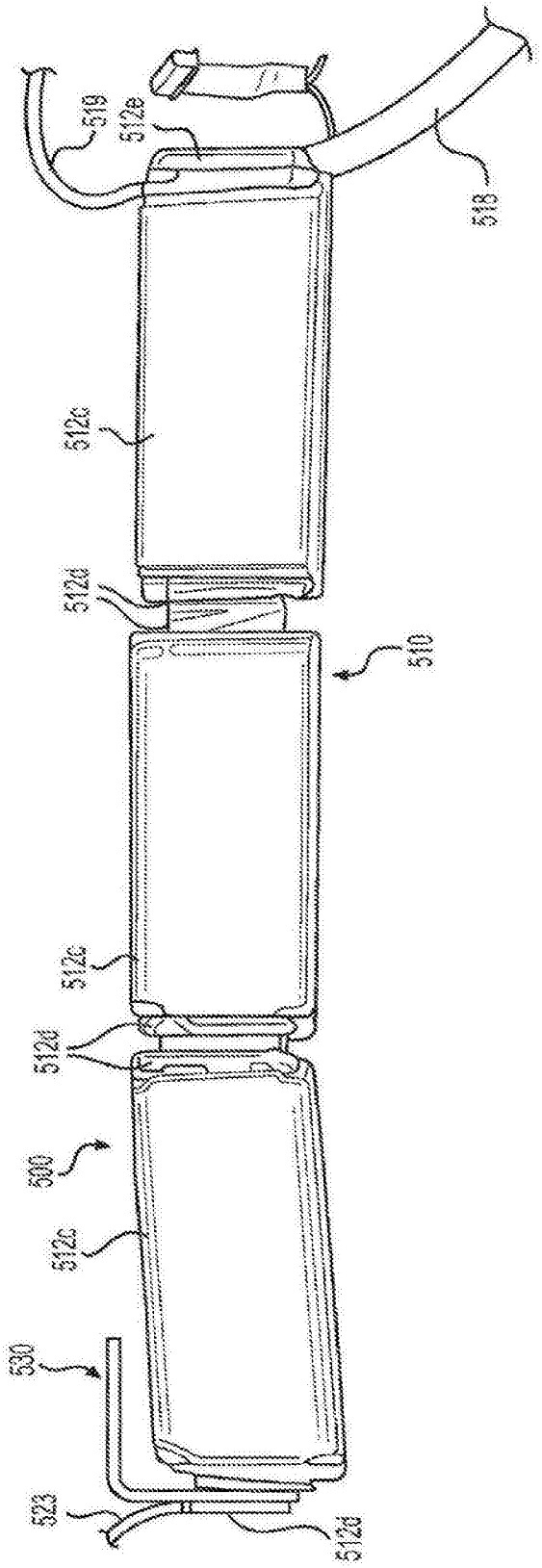

图32

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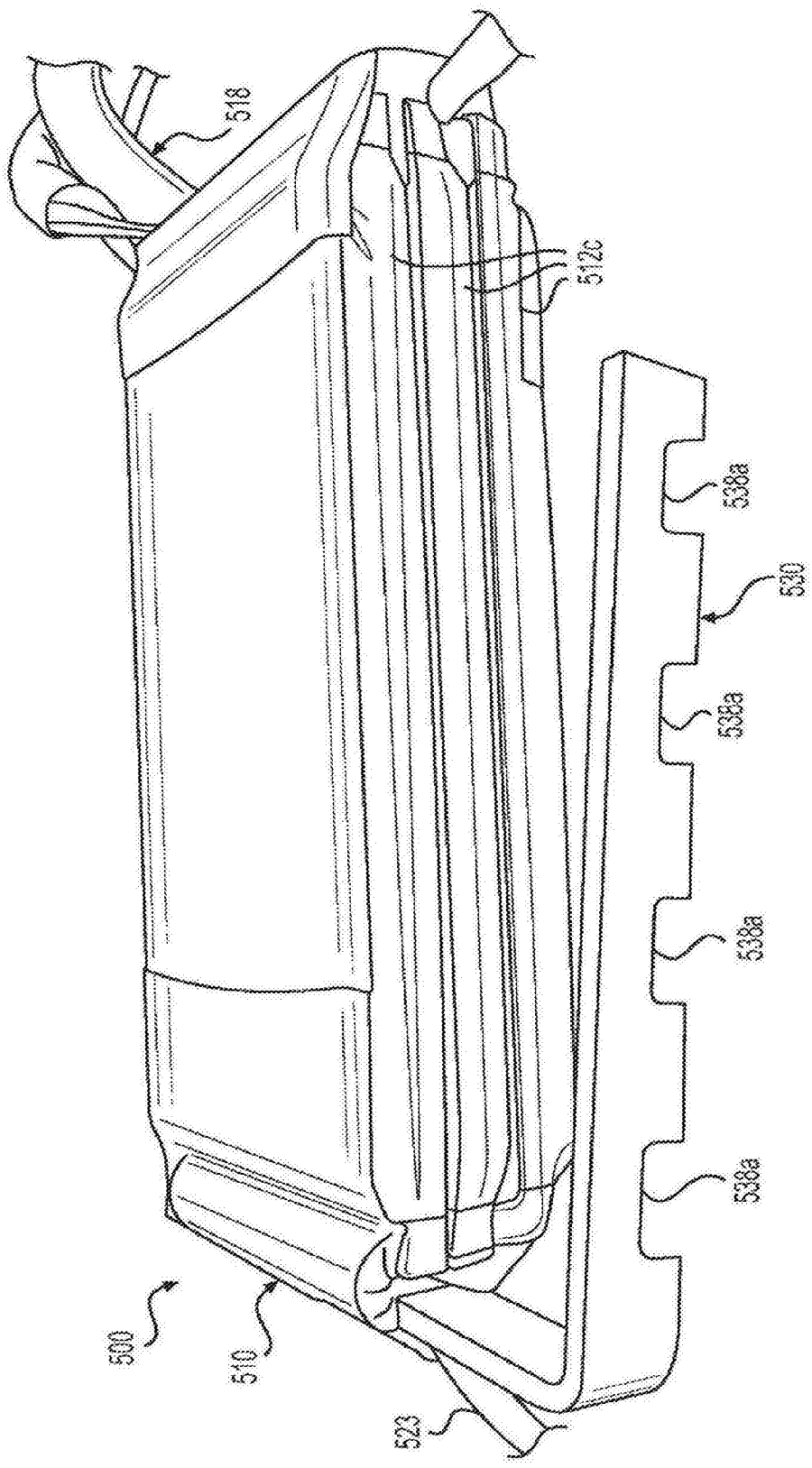

图33

WINPLUS Ex. 1003, p. 793

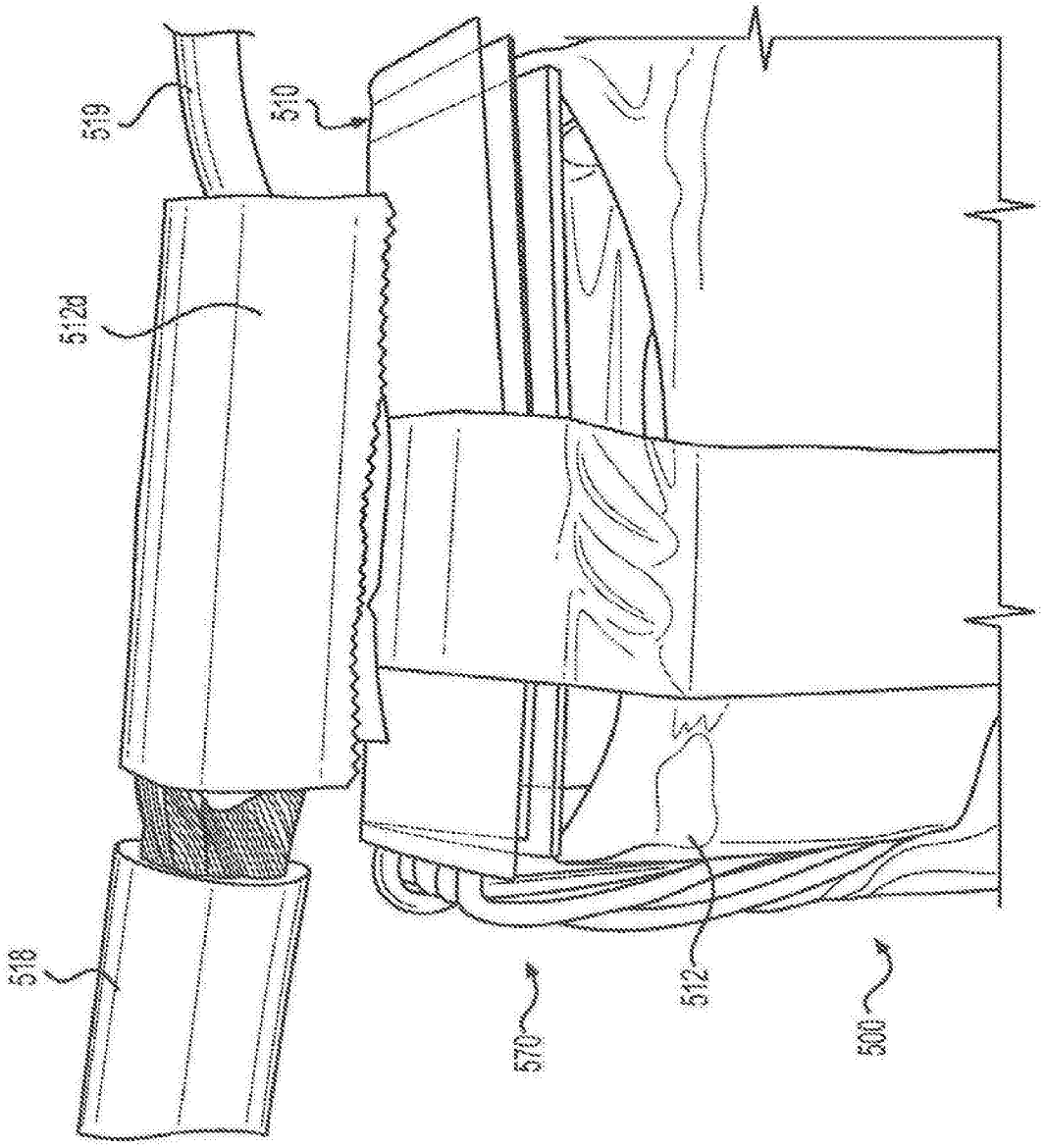

图34

WINPLUS Ex. 1003, p. 794

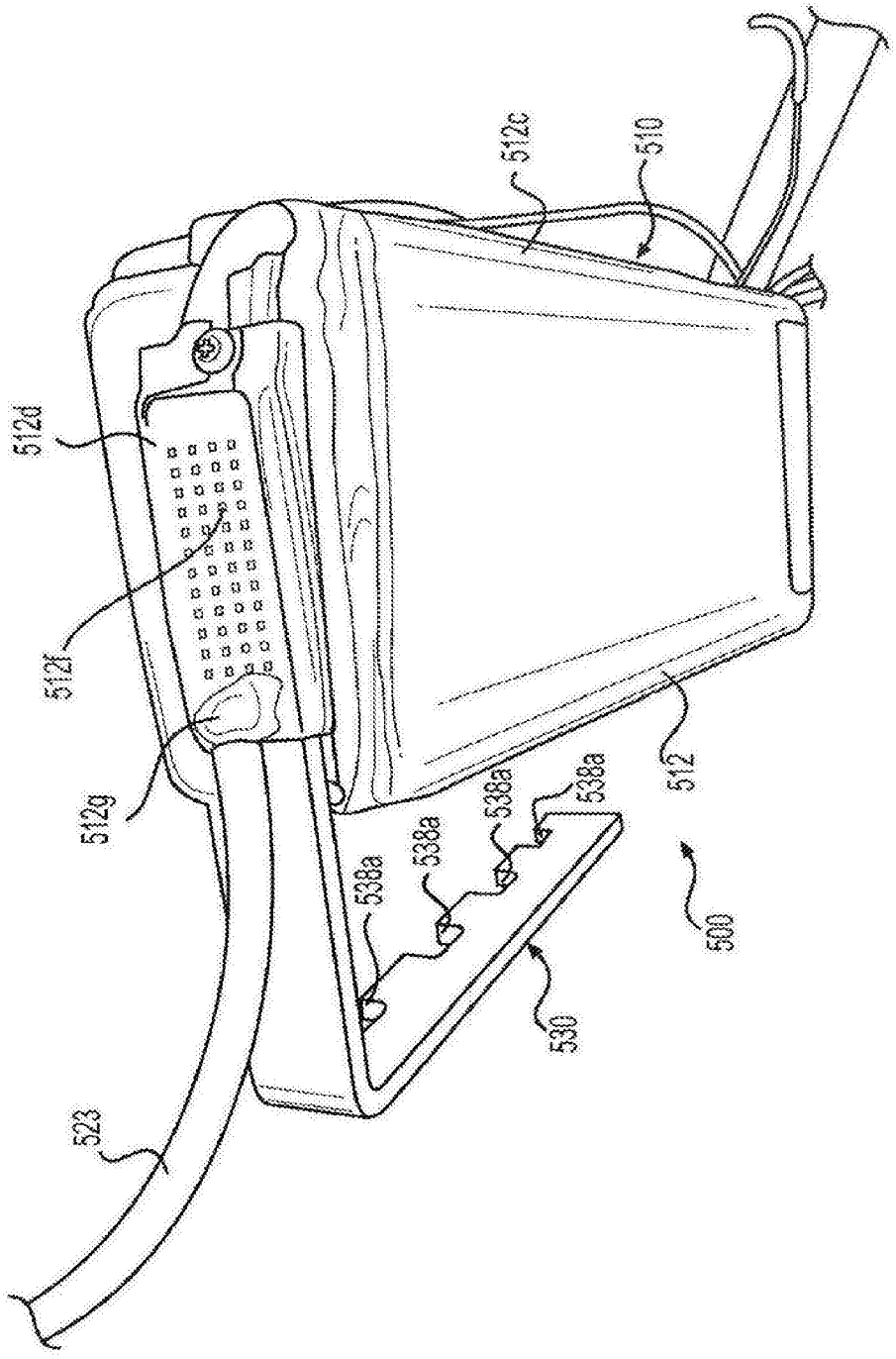

图35

WINPLUS Ex. 1003, p. 795

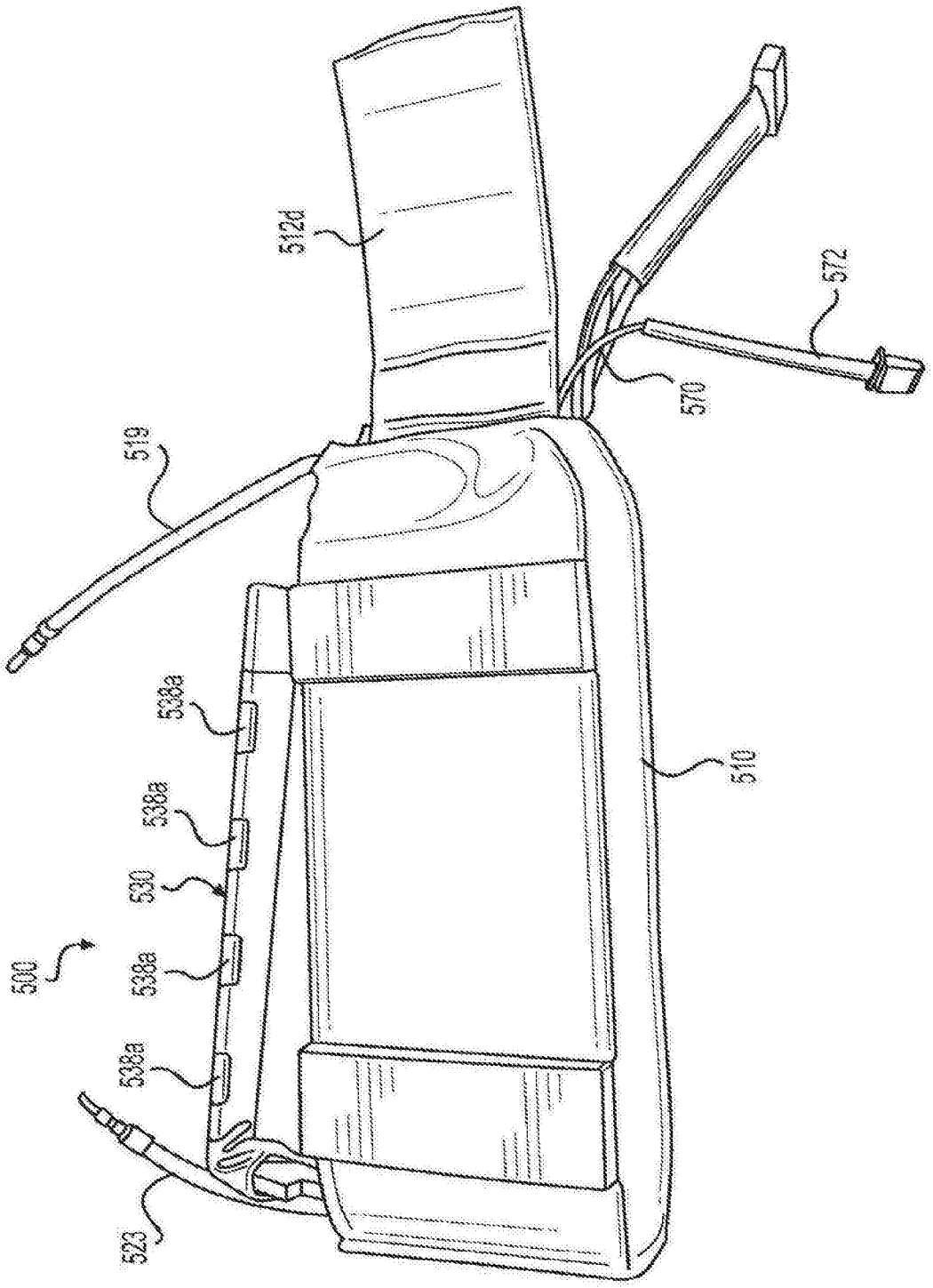

图36

WINPLUS Ex. 1003, p. 796

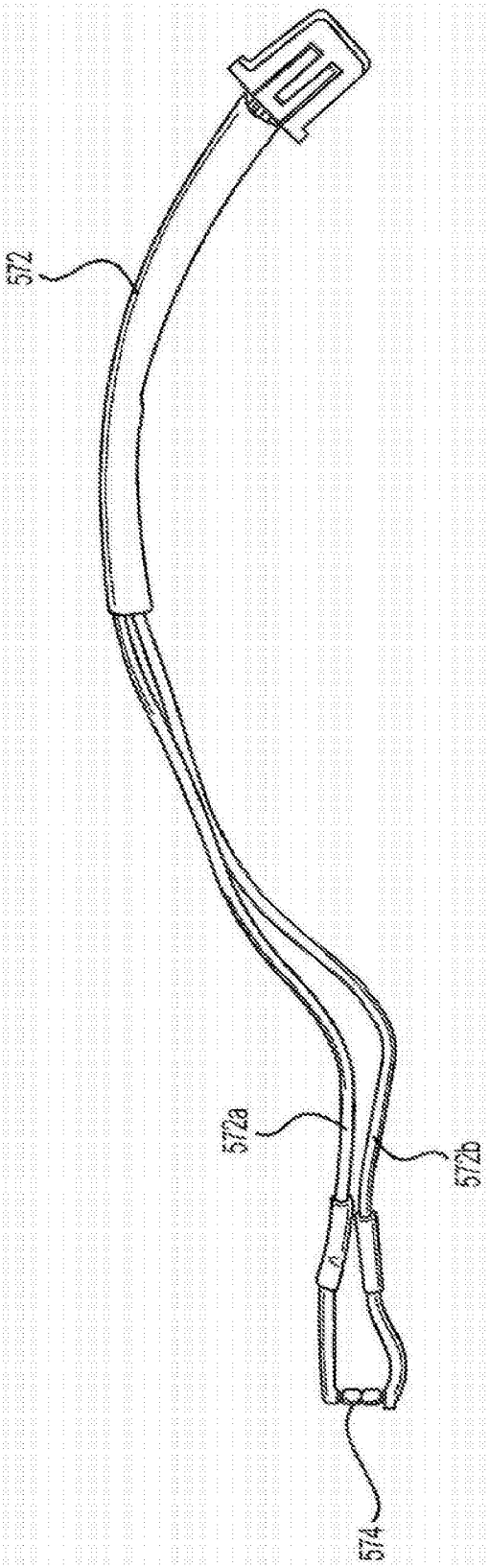

图37

WINPLUS Ex. 1003, p. 797

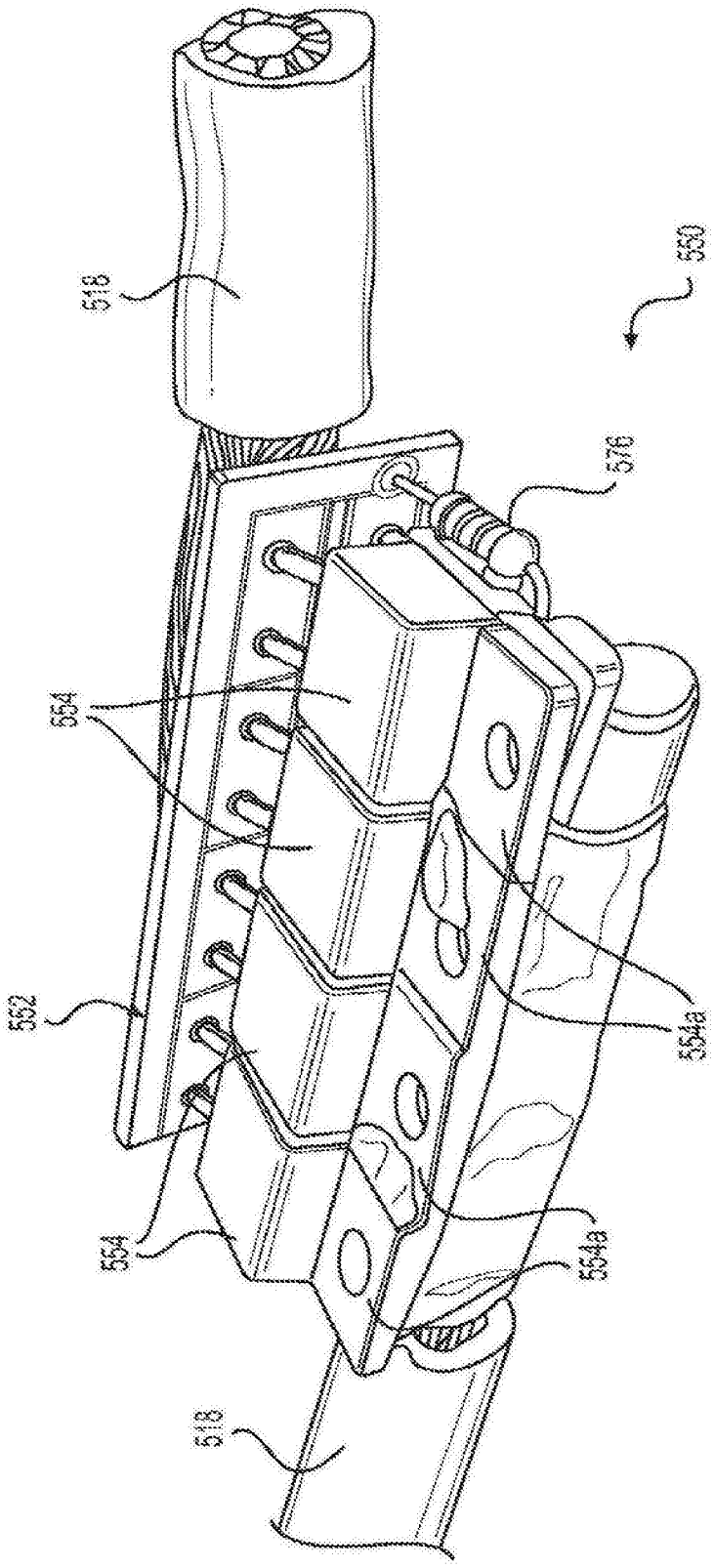

图38

WINPLUS Ex. 1003, p. 798

Espacenet

Bibliographic data: CN203607878 (U) — 2014-05-21

Automotive emergency start power source

Inventor(s): TAN WEIPING ± (TAN WEIPING)

Applicant(s): TAN WEIPING ± (TAN WEIPING)

Classification: **- international:** ***H02J7/00***
- cooperative:

Application number: CN201320682154U 20131030

Priority number(s): CN201320682154U 20131030

Abstract of CN203607878 (U)

The utility model relates to the field of emergency power source equipment and provides an automotive emergency start power source comprising a box body, a battery installed in the box body, two battery clamps connected with the cathode and the anode of the battery, solar battery assembles used for charging the battery and a control assembly used for controlling the charging and discharging of the battery. The solar battery assemblies are electrically connected with the control assembly and the control assembly is electrically connected with the battery. The automotive emergency start power source also comprises a hand generator for charging the battery. The hand generator is electrically connected with the control assembly. The automotive emergency start power source is provided with the solar battery assemblies and the hand generator, both of which can be used for charging the battery, so that the battery can be charged in an environment without light. Meanwhile, solar charging and hand charging can be performed simultaneously in an environment with light for increasing generating efficiency and shortening charging time.

(19)中华人民共和国国家知识产权局

(12)实用新型专利

(10)授权公告号 CN 203607878 U
(45)授权公告日 2014.05.21

(21)申请号 201320682154.4

(22)申请日 2013.10.30

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代理人 张全文

(51)Int.Cl.
H02J 7/00(2006.01)

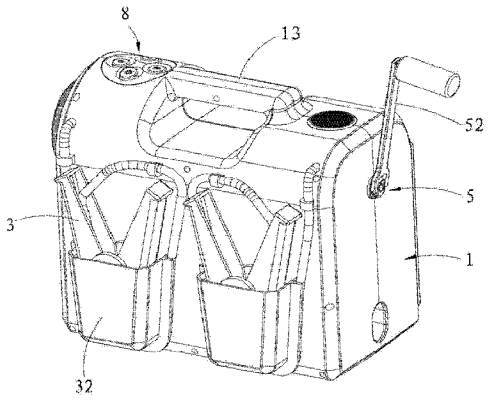
权利要求书1页 说明书5页 附图8页

(54)实用新型名称

汽车应急启动电源

(57)摘要

本实用新型适用于应急电源设备领域，提供了一种汽车应急启动电源，其包括一箱体、安装于所述箱体中的电池、分别与所述电池正负极相连的两电池夹、用于对所述电池充电的太阳能电池组件和用于控制所述电池充放电的控制组件，所述太阳能电池组件与所述控制组件电连接，所述控制组件与所述电池电连接，还包括用于对所述电池充电的手摇发电机，所述手摇发电机与所述控制组件电连接。通过设置太阳能电池组件和手摇发电机，不仅可以使用太阳能对电池进行充电，还可以使用手摇发电机对电池进行充电，因而可以在没有光照的环境下为电池充电，同时，在有光照的环境下，可以使太阳能充电与手摇充电同时进行，提高发电功率，缩短充电时间。



CN 203607878 U

1. 一种汽车应急启动电源，其包括一箱体、安装于所述箱体中的电池、分别与所述电池正负极相连的两电池夹、用于对所述电池充电的太阳能电池组件和用于控制所述电池充放电的控制组件，所述太阳能电池组件与所述控制组件电连接，所述控制组件与所述电池电连接，其特征在于：还包括用于对所述电池充电的手摇发电机，所述手摇发电机与所述控制组件电连接。

2. 如权利要求 1 所述的汽车应急启动电源，其特征在于：所述手摇发电机包括安装于所述箱体中的机体和与所述机体相连的手摇柄，所述手摇柄穿过所述箱体伸出该箱体之外。

3. 如权利要求 1 或 2 所述的汽车应急启动电源，其特征在于：所述太阳能电池组件包括底板、安装于所述底板上的太阳能面板和环绕所述太阳能面板的边框。

4. 如权利要求 3 所述的汽车应急启动电源，其特征在于：所述太阳能电池组件为多组，且所述各太阳能电池组件可折叠于所述箱体内。

5. 如权利要求 1 或 2 所述的汽车应急启动电源，其特征在于：还包括安装于所述箱体中的照明装置和用于控制所述照明装置工作状态的按键机构，所述照明装置与所述电池电连接，所述按键机构与所述照明装置电连接。

6. 如权利要求 1 或 2 所述的汽车应急启动电源，其特征在于：还包括用于提示所述两电池夹与汽车上正负电极连接反相的音频报警机构和监测所述两电池夹与所述汽车上正负电极连接反相的监测电路，所述音频报警机构包括与所述监测电路电连接的报警喇叭，所述监测电路与所述两电池夹电连接。

7. 如权利要求 1 或 2 所述的汽车应急启动电源，其特征在于：所述控制组件包括安装于所述箱体中的主板和固定于所述箱体上的接口板，所述主板与所述接口板固定相连。

8. 如权利要求 7 所述的汽车应急启动电源，其特征在于：所述主板上设有用于对外接设备供电的电压输出模块。

9. 如权利要求 7 所述的汽车应急启动电源，其特征在于：还包括安装于所述箱体中的加热装置和用于监测所述箱体中温度的温度监测器，所述温度监测器与所述主板电连接。

10. 如权利要求 1 或 2 所述的汽车应急启动电源，其特征在于：所述箱体上还安装有的防护罩，所述防护罩固定于所述箱体外侧，并与所述箱体合围成收容所述电池夹的收容槽。

WINPLUS Ex. 1003, p. 801

汽车应急启动电源

技术领域

[0001] 本实用新型属于应急电源设备领域，尤其涉及汽车应急启动电源。

背景技术

[0002] 目前汽车一般装载蓄电池用于启动发动机。当发动机启动后通过自身的发电系统给蓄电池进行充电。正常情况下，蓄电池的电量可以平衡，但是在极限或者不当使用情况下，蓄电池的电量将会放干。这将会导致发动机无法启动。

[0003] 当发生此类情况的时候，就需要用应急电源来启动汽车。目前一般是在汽车上安装备用电池组作为应急电源。这种应急电源一般是采用外接充电储能。然而，汽车需要使用应急电源的情况并不多，应急电源往往用作其他用途，如作为野外照明、充电电源等。而在需要使用应急电源启动汽车时，会出现应急电源中电量不足的情况，而无法启动汽车发动机。此时就需要对应急电源进行充电，现有技术公开了采用带太阳能电池组件的太阳能应急电源，以便可以使用太阳能进行应急充电。但是，这种带太阳能电池组件的应急电源上，太阳能面板较小，发电功率小。因而充电需要的时间长，而且仅能在有阳光照射的环境下充电。

实用新型内容

[0004] 本实用新型的目的在于提供一种带手摇发电机和太阳能电池组件的汽车应急启动电源，旨在解决现有技术太阳能应急电源充电需要的时间长，而且仅能在有阳光照射的环境下充电的问题。

[0005] 本实用新型是这样实现的，一种汽车应急启动电源，其包括一箱体、安装于所述箱体中的电池、分别与所述电池正负极相连的两电池夹、用于对所述电池充电的太阳能电池组件和用于控制所述电池充放电的控制组件，所述太阳能电池组件与所述控制组件电连接，所述控制组件与所述电池电连接，还包括用于对所述电池充电的手摇发电机，所述手摇发电机与所述控制组件电连接。

[0006] 具体地，所述手摇发电机包括安装于所述箱体中的机体和与所述机体相连的手摇柄，所述手摇柄穿过所述箱体伸出该箱体之外。

[0007] 进一步地，所述太阳能电池组件包括底板、安装于所述底板上的太阳能面板和环绕所述太阳能面板的边框。

[0008] 进一步地，所述太阳能电池组件为多组，且所述各太阳能电池组件可折叠于所述箱体内。

[0009] 进一步地，还包括安装于所述箱体中的照明装置和用于控制所述照明装置工作状态的按键机构，所述照明装置与所述电池电连接，所述按键机构与所述照明装置电连接。

[0010] 进一步地，还包括用于提示所述两电池夹与汽车上正负电极连接反相的音频报警机构和监测所述两电池夹与所述汽车上正负电极连接反相的监测电路，所述音频报警机构包括与所述监测电路电连接的报警喇叭，所述监测电路与所述两电池夹电连接。

WINPLUS Ex. 1003, p. 802

[0011] 具体地，所述控制组件包括安装于所述箱体中的主板和固定于所述箱体上的接口板，所述主板与所述接口板固定相连。

[0012] 进一步地，所述主板上设有用于对外接设备供电的电压输出模块。

[0013] 进一步地，还包括安装于所述箱体中的加热装置和用于监测所述箱体中温度的温度监测器，所述温度监测器与所述主板电连接。

[0014] 进一步地，所述箱体上还安装有的防护罩，所述防护罩固定于所述箱体外侧，并与所述箱体合围成收容所述电池夹的收容槽。

[0015] 本实用新型通过设置太阳能电池组件和手摇发电机，不仅可以使用太阳能对电池进行充电，还可以使用手摇发电机对电池进行充电，因而可以在没有光照的环境下为电池充电，同时，在有光照的环境下，可以使太阳能充电与手摇充电同时进行，提高发电功率，缩短充电时间。

附图说明

[0016] 图 1 是本实用新型实施例提供的汽车应急启动电源的立体结构示意图；

[0017] 图 2 是图 1 的汽车应急启动电源的另一个方向的立体结构示意图；

[0018] 图 3 是图 1 的汽车应急启动电源中太阳能电池组件展开时的立体结构示意图；

[0019] 图 4 是图 1 的汽车应急启动电源的分解结构示意图；

[0020] 图 5 是图 4 的汽车应急启动电源中照明装置的分解结构的放大示意图；

[0021] 图 6 是图 4 的汽车应急启动电源中按键机构的分解结构的放大示意图；

[0022] 图 7 是图 4 的汽车应急启动电源中音频报警机构的分解结构的放大示意图；

[0023] 图 8 是图 4 的汽车应急启动电源中控制组件的分解结构放大示意图；

[0024] 图 9 是图 1 的汽车应急启动电源的功能框图。

具体实施方式

[0025] 为了使本实用新型的目的、技术方案及优点更加清楚明白，以下结合附图及实施例，对本实用新型进行进一步详细说明。应当理解，此处所描述的具体实施例仅仅用以解释本实用新型，并不用于限定本实用新型。

[0026] 请参阅图 1 至图 4，本实用新型实施例提供的一种汽车应急启动电源，其包括一箱体 1、电池 2、两电池夹 3、太阳能电池组件 4、手摇发电机 5 和控制组件 6。电池 2 安装于箱体 1 中，方便携带移动。两电池夹 3 分别与电池 2 的正负极相连，用于在应急启动汽车时，将电池 2 与汽车电连接。控制组件 6 用于控制电池 2 的充放电，其与电池 2 电连接。太阳能电池组件 4 与控制组件 6 电连接，用于太阳能发电，以对电池 2 进行充电。手摇发电机 5 与控制组件 6 电连接，用于手摇发电，以对电池 2 进行充电。

[0027] 通过设置太阳能电池组件 4 和手摇发电机 5，不仅可以使用太阳能对电池 2 进行充电，还可以使用手摇发电机 5 对电池 2 进行充电。在有光照的环境下，可以使太阳能充电与手摇充电同时进行，提高发电功率，缩短充电时间。在没有光照的环境下，可以用手摇发电机 5 为电池 2 充电，增加该汽车应急启动电源的环境适应能力。

[0028] 具体地，手摇发电机 5 包括机体 51 和手摇柄 52。机体 51 安装于箱体 1 中，以保护机体 51。手摇柄 52 与机体 51 相连并穿过箱体 1 伸出该箱体 1 外，以方便手摇充电。

WINPLUS Ex. 1003, p. 803

[0029] 具体地，太阳能电池组件 4 包括底板 42、安装于底板 42 上的太阳能面板 41 和环绕太阳能面板 41 的边框 43。底板 42 和边框 43 用于保护太阳能面板 41。

[0030] 进一步地，太阳能电池组件 4 为多组，且各太阳能电池组件 4 可折叠于箱体 1 内。将太阳能电池组件 4 设为多组，可以接收更多的太阳能，提高太阳能发电功率。而各太阳能电池组件 4 在不使用时，可以折叠于箱体 1 内，方便携带，减小体积。本实施例中，太阳能电池组件 4 为三组，折叠时呈三层，展开时呈一字排列。其中，中间一组太阳能电池组件 4 的两端通过转轴分别与另外两组的相应端铰接。从而实现可折叠。展开时靠近箱体 1 的一组太阳能电池组件 4 的靠近箱体 1 的一端与箱体 1 铰接，以便太阳能电池组件 4 可以折叠于箱体 1 内。在其它实施例中，各太阳能电池组件 4 也可以通过滑动连接，实现折叠在一起。

[0031] 请参阅图 4 和图 5，进一步地，该汽车应急启动电源还包括安装于箱体 1 中的照明装置 7 和用于控制照明装置 7 工作状态的按键机构 8。设置照明装置 7 和按键机构 8，所述照明装置 7 与电池 2 电连接，所述按键机构 8 与所述照明装置 7 电连接。可以将该汽车应急启动电源用作照明。

[0032] 具体地，本实施例中，照明装置 7 为大功率电筒，包括散热器 71、照明灯板 72、散热圈 73、基板 74、反光杯 75、透明罩 76 和端盖 77。反光杯 75 固定于散热器 73 上，照明灯板 72 安装于反光杯 75 中，散热圈 73 套设于反光杯 75 上，基板 74 固定于散热圈 73 上，透明罩 76 罩设于反光杯 75 上，端盖 77 环绕透明罩 76，将透明罩 76 固定于反光杯 75 上。基板 74 可以为铝基板。其它实施例中，照明装置 7 还可以为照明灯管或照明灯泡等。

[0033] 具体地，照明灯板 72 上安装有一颗白光 LED，采用降压式 IC 驱动该 LED，通过控制组件 6 实现闪烁、照明、和熄火状态。该 LED 可以为 3W 的 LED。当然，还可以用二颗 LED 作照明使用，各 LED 可以使用 1W 的功率，可以实现高亮、中亮、弱亮和灭四种状态，以实应不同的照明场所和需要。

[0034] 请参阅图 4 和图 6，本实施例中，按键机构 8 包括多个功能按键 82、按键 PCB 板 81 和按键座 83。功能按键 82 安装于按键座 83 中，并固定于按键 PCB 板 81 上。以分别控制照明装置 7 不同工作状态，如亮度、闪烁等。

[0035] 请参阅图 4 和图 7，进一步地，该汽车应急启动电源还包括用于提示两电池夹 3 与汽车上正负电极连接反相的音频报警机构 9 和监测两电池夹 3 相连反向的监测电路。监测电路用于监测两电池夹 3 与汽车上正负电极连接是否反相。由于用应急启动电源启动汽车时，需要的电流较大，一但将电池 2 正负极接反，容易使电池 2 发热，而出现事故，设置音频报警机构 9，如果正负极接反，就报警，及时提醒，防止事故发生。当然还可以包括报警灯，以实现声光结合报警。

[0036] 具体地，音频报警机构 9 包括喇叭盖 91、报警喇叭 92、喇叭座 93、喇叭网 94 和固定圈 95。喇叭座 93 安装于箱体 1 上，其呈环状。喇叭盖 91 固定于喇叭座 93 上，并兜住报警喇叭 92，喇叭网 94 罩于报警喇叭 92 上，固定圈 95 将喇叭网 94 固定在报警喇叭 92 上。在其它实施例，也可以直接使用现有的喇叭。该音频报警机构 9 还包括语音 IC 芯片。语音 IC 芯片用以提供报警音源。

[0037] 请参阅图 4 和图 8，具体地，控制组件 6 包括安装于箱体 1 中的主板 61 和固定于箱体 1 上的接口板 62，主板 61 与接口板 62 固定相连。通过设置主板 61，可以将一些功能模块集成在主板 61 上，减小产品的体积，方便各功能模块的安装固定。各功能模块可以包括

WINPLUS Ex. 1003, p. 804

用于对外接设备供电的电压输出模块，如USB输出模块，16V/20V恒功率输出模块，12V输入/输出模块。USB输出模块可以包括输出5V/2AUSB接口和输出5V/1AUSB接口，以便为一些电子设备进行充电。16V/20V恒功率输出模块可以通过控制开关65在16V/4A与20V/3.25A输出之间转动，实现对不同电压输出的需要。

[0038] 主板61上还可以设置DC12V输入/DC12V输出模块，作为DC12V输出时，可以为外接设备供电，而作为DC12V输入时，可以使用外接电源为该汽车应急启动电源充电。如直接用汽车点烟器为电池2充电。主板61上还可以设置其它充电接口，如可以与AC充电适配器配合的充电接口，从而可以用AC充电适配器外接市电，为电池2充电。

[0039] 控制组件6还包括电池保护板63，主板61通过电池保护板63与电池2相连。充电时，充电电能经主板61到电池保护板63，再为电池2充电。放电时，电池2电能经电池保护板63至主板61再到各功能模块。电池保护板63上设有充电保护MOS管，当电池2充满电后，MOS管会断开，以停止充电。上述照明装置7通过电池保护板63与电池电连接。

[0040] 主板61上还可以连接警示灯模块64，如用红灯警示，具体可以用三颗1W红色LED做报警灯，采用降压式IC驱动，通过控制模块的设置可以实现闪烁、长亮和熄灭三种状态，以表示不同的警示。警示灯模块64和音频报警机构9可以构成声光报警装置。

[0041] 主板61上还设有微处理器(MCU)，以便对各功能模块进行控制，和控制对电池2的充放电。

[0042] 请一并参阅图1，进一步地，该汽车应急启动电源还包括安装于箱体1中的加热装置(图中标示出)和用于监测箱体1中温度的温度监测器(图中标示出)，温度监测器与控制组件6中的主板61电连接。设置加热装置，可以在低温环境下启动加热装置，短时间内使该电源达到可以正常工作的温度，保证环境温度在零下40度时，仍能启动汽车。温度监测器还可以监测电池2温度，当电池2温度超过100℃时，通过主板61和电池保护板63控制电池2不再对外放电，不进行电量输出，电筒也不亮，红色警示，5秒后关闭，以保护电池2。电池2为多个磷酸铁锂动力电池2，电池2内设有电池2充电平衡电路，以保证每个锂电池2在使用过程中容量一致，确保整机有最大的容量输出。

[0043] 进一步地，箱体1上还安装有的防护罩32，防护罩32固定于箱体1外侧，并与箱体1合围成收容槽，电池夹3插装于收容槽中。设置防护罩32可以方便安放电池夹3，便于携带。

[0044] 具体地，电池夹3通过导线31与电池2相连，防护罩32固定在箱体1的侧边，并与箱体1合围成收容槽，电池夹3插入收容槽中。导线31通过卡线扣33夹在箱体1侧边，以防导线31散乱。箱体1上设有手提柄13，便于携带。箱体1具体由左右两外壳扣合而成。定义为左外壳11和右外壳12。而太阳能电池组件4和电池夹3分别位于箱体1的左右两侧。手摇发电机5安装于箱体1的后端，接口板62安装于箱体1的前端，大功率电筒，即照明装置7位于接口板62的上方。

[0045] 控制组件6还包括接口面贴69、车充母座67、控制旋钮和开关65，接口面贴69贴于接口板62上，以提示各功能接口或模块的作用。主板61通过支撑架68支撑在接口板62上。车充母座67、控制旋钮66和开关65均固定在接口板62上，并与主板61相连，以便控制该汽车应急启动电源的各功能模块，实现不同的功能。

[0046] 请参阅图9，本实施例的功能框图。手摇发电机进行手摇充电，经二极管到电池保

WINPLUS Ex. 1003, p. 805

护板 63 再为电池 2 充电。二极管可以起到保护作用。用太阳能电池进行太阳能充电时，太阳能电池组件发出的电能，经 MPPT 控制器，再经电池保护板 63 为电池 2 充电。MPPT 控制器即最大功率点跟踪(Maximum Power Point Tracking)太阳能控制器。MPPT 控制器能够实时侦测太阳能板的发电电压，并追踪最高电压电流值，使系统以最大功率输出对电池 2 充电。DC12V 输入 /DC12V 输出通过一控制开关与电池保护板 63 相连，该控制开关通过 MCU 主控控制。电池 2 向各功能模块输出电能时，先经电池保护板 63，再传送到各功能模块输出，如：5V 输出、16V/20V 恒功率输出、大功率电筒、强光照明、红灯警示和扬声器。扬声器可以作为野外扩音使用。通过 MCU 主控来控制上述各功能模块的工作。通过一温度监测器对电池 2 时行温度检测，并与 MCU 主控相连，通过 MCU 主控来控制对电池 2 的温度检测。从而使该汽车应急启动电池既可以检测箱体内温度，又可以实时检测电池温度，保证安全使用电池。同时 MCU 主控与按键和电量指示灯相连，通过电量指示灯显示电池 2 的电量，电量指示灯可以是 LED 灯。通过按键来控制大功率电筒等功能模块。电池夹 3 与电池 2 之间还设有开关，开关与电池夹 3 间还连接有反接声光报警装置，以便安全使用该汽车应急启动电源启动汽车。电池 2 与逆变器相连，逆变器与负载和 MCU 主控相连。电池 2 通过逆变器为负载供电，MCU 主控与逆变器相连，可以检测逆变器的工作状态，并控制逆变器工作。MCU 主控还与咪头连接。咪头又称麦克风，用于接收声音。

[0047] 以上所述仅为本实用新型的较佳实施例而已，并不用以限制本实用新型，凡在本实用新型的精神和原则之内所作的任何修改、等同替换和改进等，均应包含在本实用新型的保护范围之内。

WINPLUS Ex. 1003, p. 806

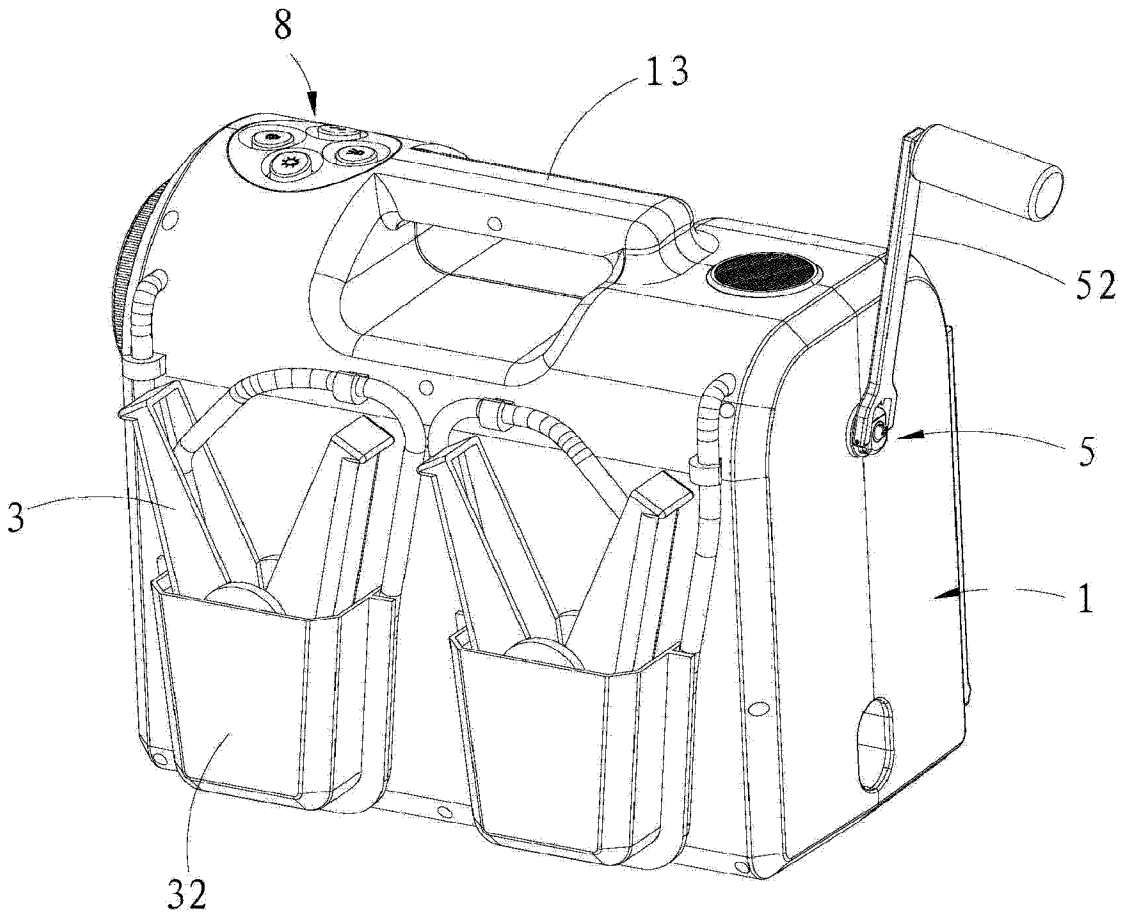


图 1

WINPLUS Ex. 1003, p. 807

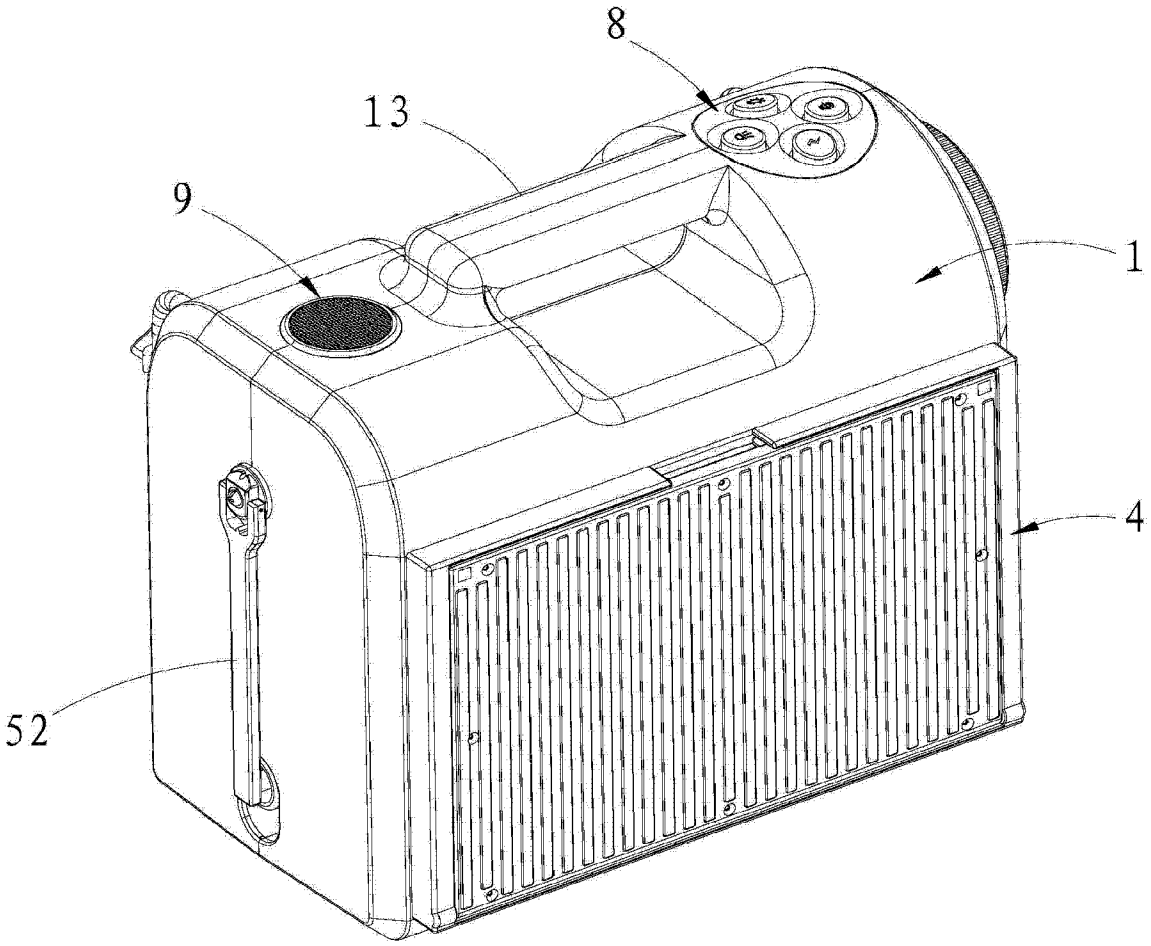


图 2

WINPLUS Ex. 1003, p. 808

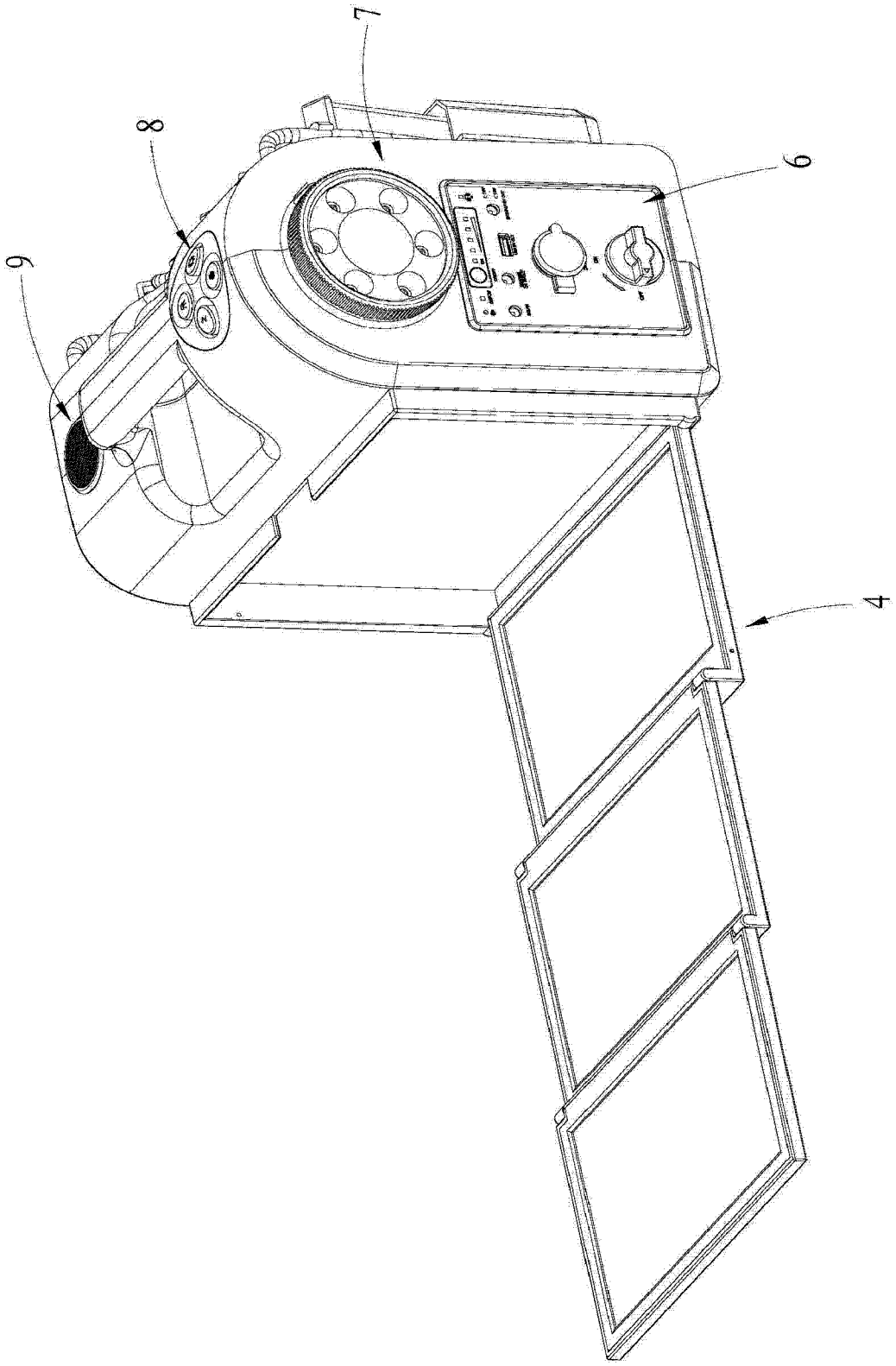


图 3

WINPLUS Ex. 1003, p. 809

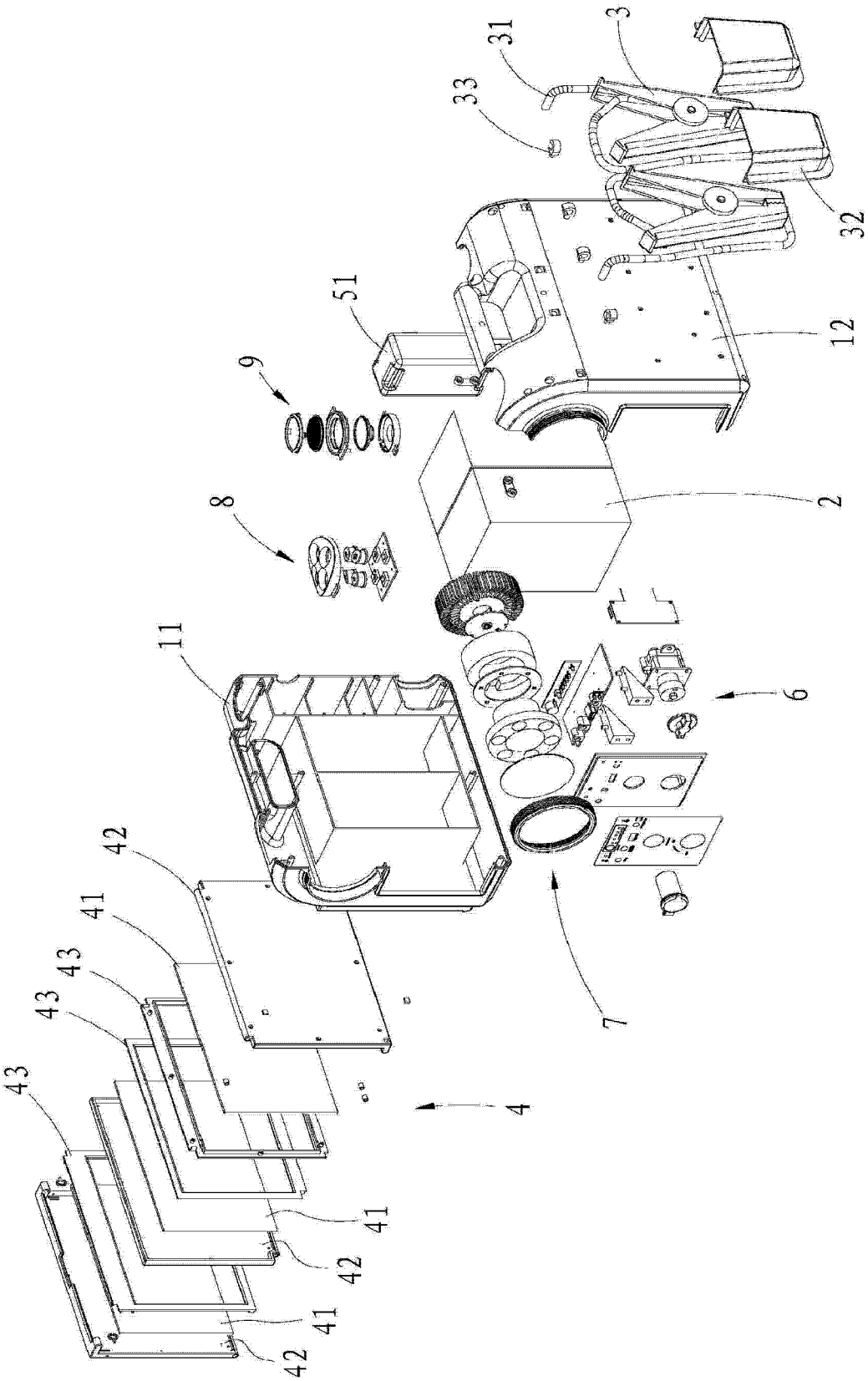


图 4

WINPLUS Ex. 1003, p. 810

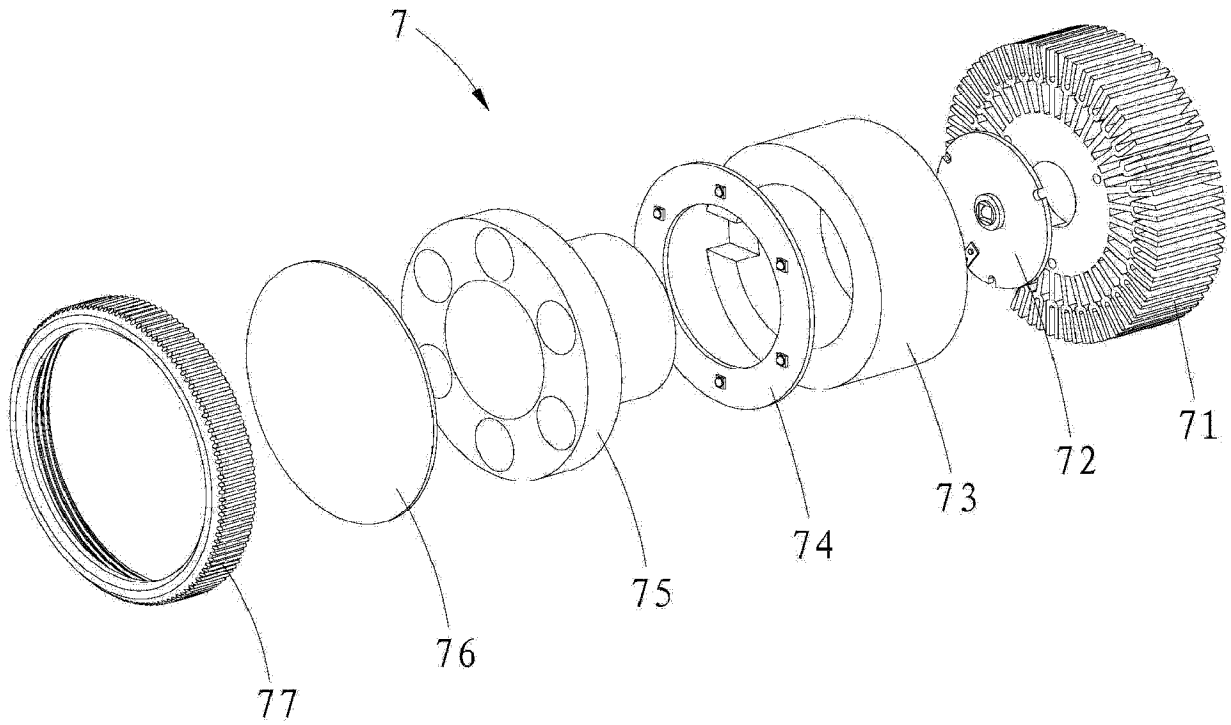


图 5

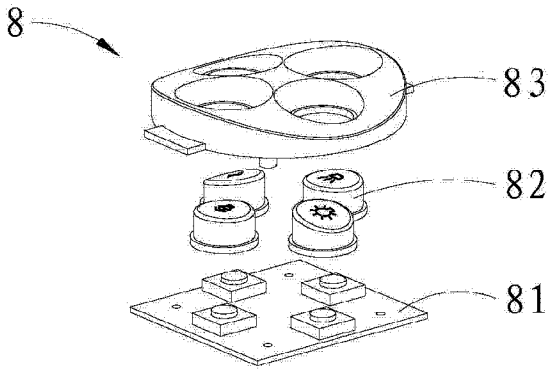


图 6

WINPLUS Ex. 1003, p. 811

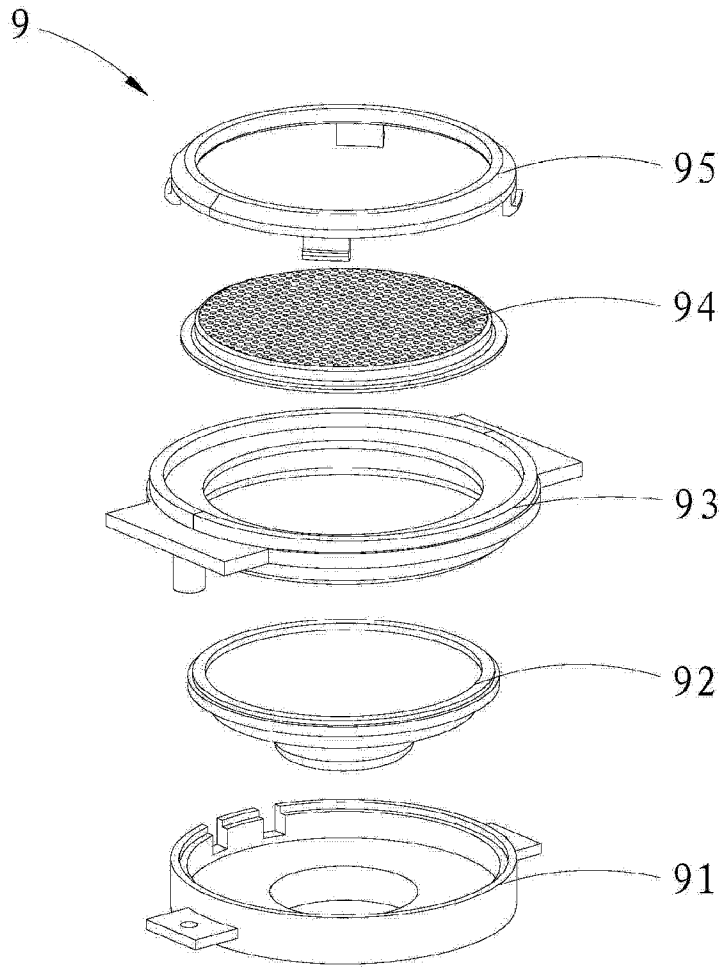


图 7

WINPLUS Ex. 1003, p. 812

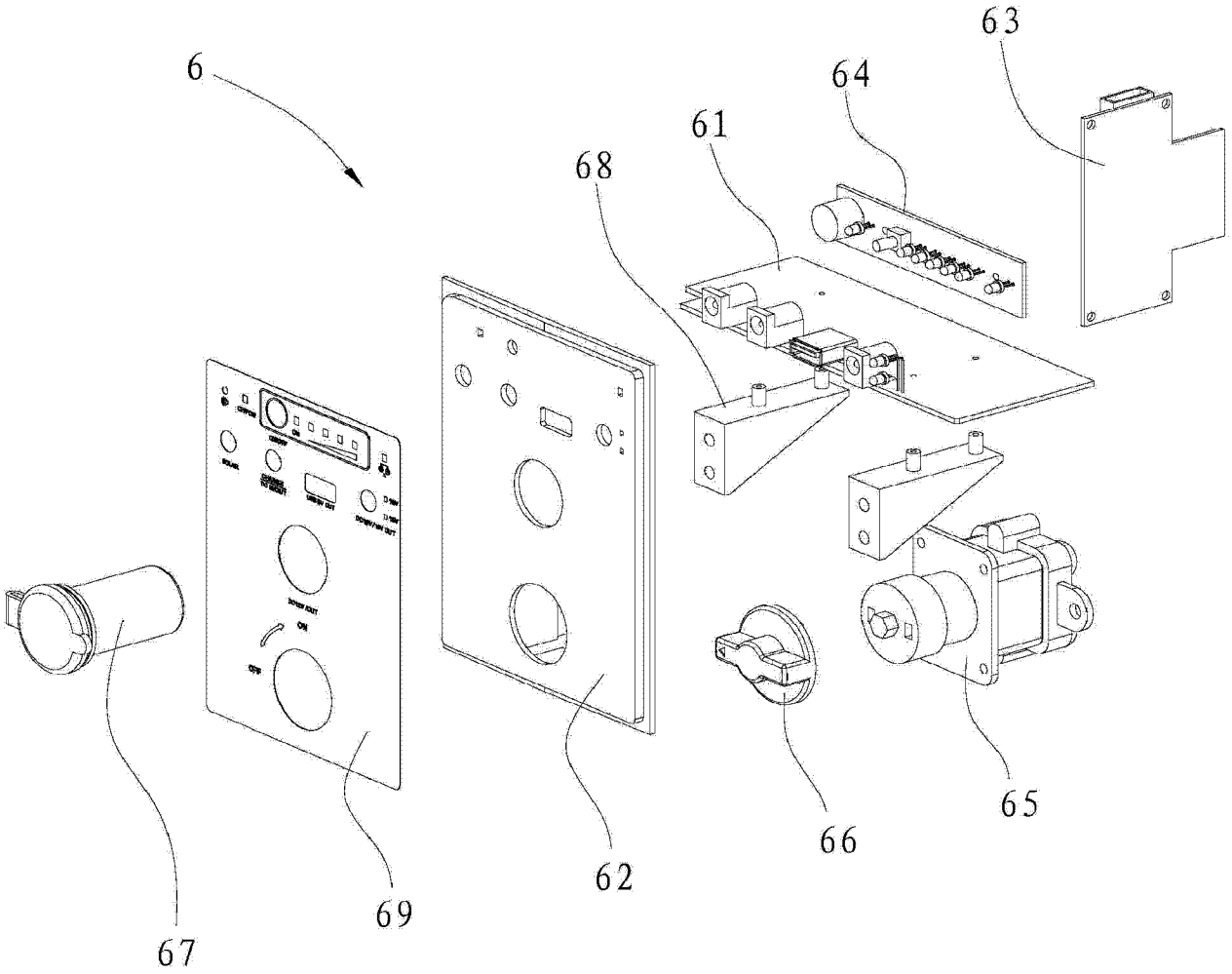


图 8

WINPLUS Ex. 1003, p. 813

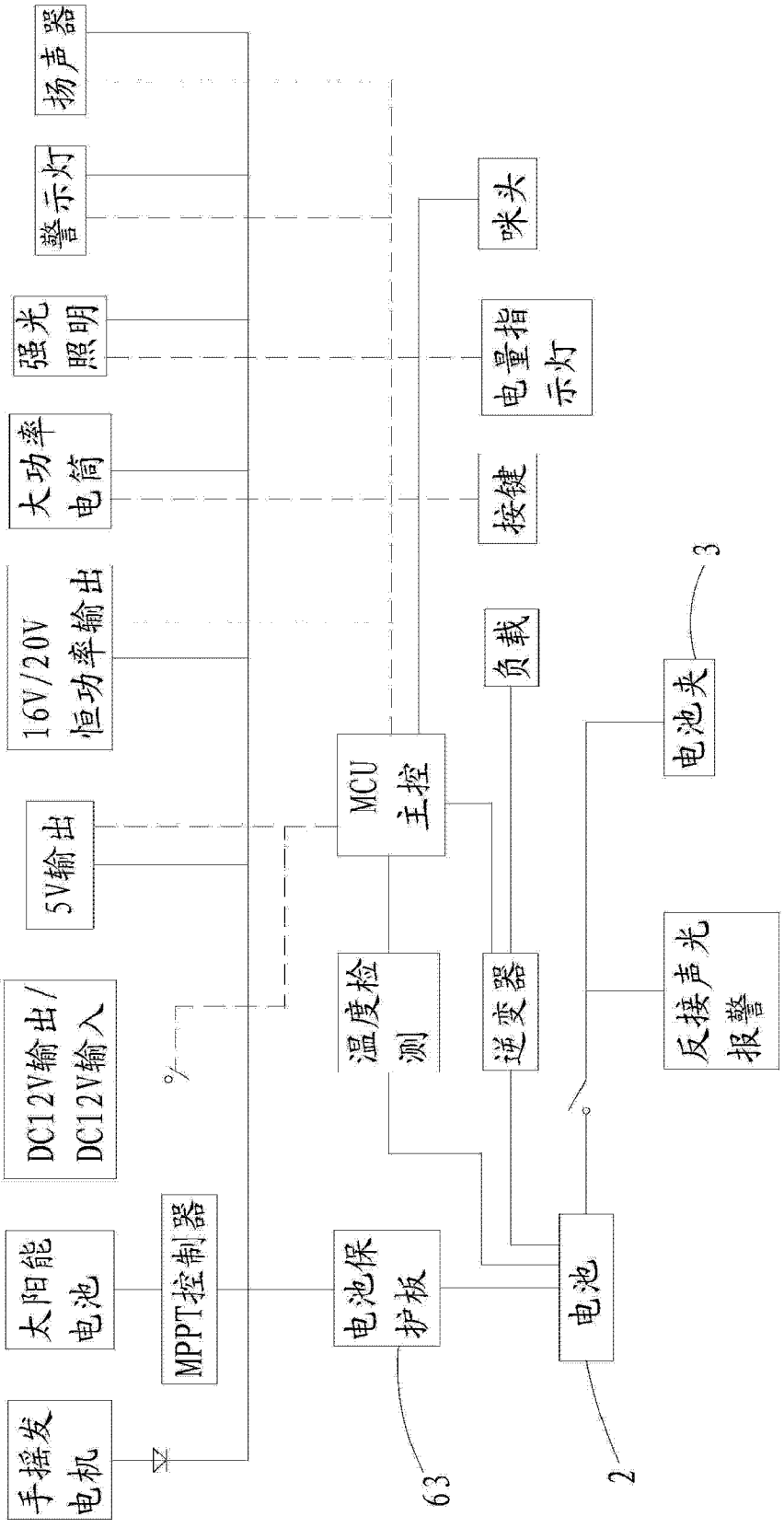


图 9

WINPLUS Ex. 1003, p. 814

Espacenet

Bibliographic data: CN203607878 (U) — 2014-05-21

Automotive emergency start power source

Inventor(s): TAN WEIPING ± (TAN WEIPING)

Applicant(s): TAN WEIPING ± (TAN WEIPING)

Classification: **- international:** ***H02J7/00***
- cooperative:

Application number: CN201320682154U 20131030

Priority number(s): CN201320682154U 20131030

Abstract of CN203607878 (U)

The utility model relates to the field of emergency power source equipment and provides an automotive emergency start power source comprising a box body, a battery installed in the box body, two battery clamps connected with the cathode and the anode of the battery, solar battery assembles used for charging the battery and a control assembly used for controlling the charging and discharging of the battery. The solar battery assemblies are electrically connected with the control assembly and the control assembly is electrically connected with the battery. The automotive emergency start power source also comprises a hand generator for charging the battery. The hand generator is electrically connected with the control assembly. The automotive emergency start power source is provided with the solar battery assemblies and the hand generator, both of which can be used for charging the battery, so that the battery can be charged in an environment without light. Meanwhile, solar charging and hand charging can be performed simultaneously in an environment with light for increasing generating efficiency and shortening charging time.

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DESCRIPTION CN203607878

The utility model is suitable for the field of emergency power supply equipment and provides an automobile emergency start power supply, which includes a box body, a battery installed in the box body, two battery clips respectively connected to the positive and negative poles of the battery A solar cell component for charging the battery and a control component for controlling charging and discharging of the battery, the solar cell component is electrically connected to the control component, the control component is electrically connected to the battery, and further includes For a manual generator that charges the battery, the manual generator is electrically connected to the control assembly. By installing solar cell modules and a hand-cranked generator, not only can the battery be charged with solar energy, but also the hand-cranked generator can be used to charge the battery, so that the battery can be charged in an environment without light, and at the same time, when there is light Under the environment, solar charging and hand charging can be performed at the same time to increase the power generation and shorten the charging time.

Car emergency start power

Technical field

The utility model belongs to the field of emergency power supply equipment, in particular to an automobile emergency start power supply.

Background technique

At present, cars are generally equipped with batteries for starting the engine. When the engine is started, the battery is charged through its own power generation system. Under normal circumstances, the battery power can be balanced, but under extreme or improper use, the battery power will be drained. This will prevent the engine from starting.

When this happens, you need to use emergency power to start the car. At present, a spare battery pack is generally installed on an automobile as an emergency power source. This emergency power supply generally uses external charging energy storage. However, there are not many situations where cars need to use emergency power. Emergency power is often used for other purposes, such as outdoor lighting and charging power. When the emergency power supply is needed to start the car, there will be insufficient power in the emergency power supply, and the car engine cannot be started. At this time, the emergency power supply needs to be charged. The prior art discloses the use of a solar emergency power supply with a solar cell module so that solar energy can be used for emergency charging. However, in this emergency power supply with solar cell modules, the solar panel is small and the power generation power is small. Therefore, the charging takes a long time, and can only be charged in an environment with sunlight.

Utility model content

The purpose of the utility model is to provide a car emergency start power supply with a hand-cranked generator and a solar cell assembly, which aims to solve the long time required for charging of the prior art solar emergency power supply, and can only be charged in the environment with sunlight exposure The problem.

The utility model is realized in this way, an automobile emergency start power supply, which includes a box body, a battery installed in the box body, two battery clips respectively connected to the positive and negative poles of the battery A solar cell

component for battery charging and a control component for controlling charging and discharging of the battery, the solar cell component is electrically connected to the control component, the control component is electrically connected to the battery, and further includes A battery-powered hand-cranked generator, which is electrically connected to the control assembly.

Specifically, the hand-cranked generator includes a body installed in the box and a hand crank connected to the body, and the hand crank extends through the box and extends out of the box.

Further, the solar cell assembly includes a bottom plate, a solar panel mounted on the bottom plate, and a frame surrounding the solar panel.

Further, there are multiple sets of solar cell components, and the solar cell components can be folded in the box.

Further, it also includes a lighting device installed in the box and a key mechanism for controlling the working state of the lighting device, the lighting device is electrically connected to the battery, and the key mechanism is electrically connected to the lighting device connection.

Further, it also includes an audio alarm mechanism for prompting the two battery clips to be connected to the positive and negative electrodes of the car in reverse phase and a monitoring circuit for monitoring the two battery clips to be connected to the positive and negative electrodes of the car in reverse phase. The audio alarm mechanism includes an alarm horn electrically connected to the monitoring circuit, and the monitoring circuit is electrically connected to the two battery clips.

Specifically, the control assembly includes a main board installed in the box and an interface board fixed on the box, and the main board is fixedly connected to the interface board.

Further, a voltage output module for powering external devices is provided on the main board.

Further, it also includes a heating device installed in the box and a temperature monitor for monitoring the temperature in the box, the temperature monitor is electrically connected to the main board.

Further, a protective cover is also installed on the box body, and the protective cover is fixed to the outside of the box body, and surrounds the box body to form an accommodating groove for accommodating the battery clip.

The utility model can not only use solar energy to charge the battery but also use the hand-generator to charge the battery by setting the solar battery assembly and the hand-cranked generator, so the battery can be charged in an environment without light. At the same time, In a lighted environment, solar charging and hand charging can be performed simultaneously to increase power generation and shorten charging time.

BRIEF DESCRIPTION

FIG. 1 is a three-dimensional structural schematic diagram of an automobile emergency start power supply provided by an embodiment of the present invention;

FIG. 2 is a schematic perspective structural view of the automobile emergency start power supply of FIG. 1 in another direction;

3 is a schematic perspective structural view of the solar cell assembly of FIG. 1 when the solar cell assembly is deployed;

4 is a schematic diagram of the exploded structure of the automobile emergency start power supply of FIG. 1;

5 is an enlarged schematic view of the exploded structure of the lighting device in the emergency power supply of the automobile of FIG. 4;

6 is an enlarged schematic view of the exploded structure of the key mechanism in the emergency power supply of the automobile of FIG. 4;

7 is an enlarged schematic view of the exploded structure of the audio alarm mechanism in the automobile emergency start power supply of FIG. 4;

8 is an enlarged schematic view of the exploded structure of the control component in the automobile emergency start power supply of FIG. 4;

FIG. 9 is a functional block diagram of the automobile emergency start power supply of FIG. 1.

detailed description

In order to make the purpose, technical solutions and advantages of the present invention more clear, the present invention will be described in further detail with reference to the accompanying drawings and embodiments. It should be understood that the specific embodiments described herein are only used to explain the utility model, and are not intended to limit the utility model.

Please refer to FIG. 1 to FIG. 4, an automobile emergency start power supply provided by an embodiment of the present invention includes a cabinet 1, a battery 2, two battery clips 3, a solar cell assembly 4, a hand crank generator 5 and a control assembly 6. The battery 2 is installed in the cabinet 1, which is convenient for carrying and moving. The two battery clips 3 are respectively connected to the positive and negative poles of the battery 2 and are used to electrically connect the battery 2 to the vehicle when the vehicle is started in an emergency. The control component 6 is used to control the charging and discharging of the battery 2 and is electrically connected to the battery 2. The solar cell module 4 is electrically connected to the control module 6 for solar power generation to charge the battery 2. The hand generator 5 is electrically connected to the control assembly 6 and is used to generate electricity by hand to charge the battery 2.

By providing the solar cell module 4 and the hand generator 5, not only can the battery 2 be charged with solar energy, but also the hand generator 2 can be used to charge the battery 2. In a lighted environment, solar charging and hand charging can be performed simultaneously to increase power generation and shorten charging time. In an environment without light, the generator 5 can be cranked to charge the battery 2 to increase the environmental adaptability of the emergency power supply of the car.

Specifically, the hand crank generator 5 includes a body 51 and a hand crank 52. The body 51 is installed in the cabinet 1 to protect the body 51. The hand crank 52 is connected to the body 51 and extends out of the box 1 through the box 1 to facilitate hand charging.

Specifically, the solar cell module 4 includes a bottom plate 42, a solar panel 41 mounted on the bottom plate 42, and a frame 43 surrounding the solar panel 41. The bottom plate 42 and the frame 43 are used to protect the solar panel 41.

Further, there are a plurality of solar cell modules 4, and each solar cell module 4 can be folded in the box 1. By setting the solar cell modules 4 into multiple groups, more solar energy can be received and the solar power generation power can be increased. Each solar cell module 4 can be folded in the box 1 when not in use, which is convenient for carrying and reduces the volume. In this embodiment, the solar cell modules 4 are in three groups, and are folded in three layers, and arranged in a line when unfolded. Among them, the two ends of the middle group of solar cell modules 4 are respectively hinged with the corresponding ends of the other two groups through a rotating shaft. Thus foldable. When unfolded, the end of a group of solar cell modules 4 close to the box body 1 close to the box body 1 is hinged with the box body 1 so that the solar cell module 4 can be folded inside the box body 1. In other embodiments, the solar cell modules 4 can also be folded together by sliding connection.

Please refer to FIG. 4 and FIG. 5. Further, the emergency power supply for an automobile further includes a lighting device 7 installed in the cabinet 1 and a key mechanism 8 for controlling the working state of the lighting device 7. A lighting device 7 and a key mechanism 8 are provided. The lighting device 7 is electrically connected to the battery 2 and the key mechanism 8 is electrically connected to the lighting device 7. The emergency power supply of the car can be used as lighting.

Specifically, in this embodiment, the lighting device 7 is a high-power torch, including a heat sink 71, an illumination lamp board 72, a heat sink 73, a base plate 74, a reflector cup 75, a transparent cover 76, and an end cover 77. The reflector cup 75 is fixed on the radiator 73, the illumination lamp board 72 is installed in the reflector cup 75, the heat dissipation ring 73 is sleeved on the reflector cup 75, the substrate 74 is fixed on the heat dissipation ring 73, and the transparent cover 76 is covered on the reflector cup 75 On the top, the end cover 77 surrounds the transparent cover 76 and fixes the transparent cover 76 to the reflector 75. The substrate 74 may be an aluminum substrate. In other embodiments, the lighting device 7 may also be a lighting tube or a lighting bulb.

Specifically, a white LED is installed on the lighting lamp board 72, and the LED is driven by a step-down IC, and the blinking, lighting, and extinguishing states are realized by the control assembly 6. The LED may be a 3W LED. Of course, three LEDs can also be used for lighting, and each LED can use 1W of power, which can achieve four states of high brightness, medium light, weak light and extinction, in order to meet different lighting places and needs.

Please refer to FIGS. 4 and 6. In this embodiment, the key mechanism 8 includes a plurality of function keys 82, a key PCB 81 and a key base 83. The function button 82 is installed in the button base 83 and fixed on the button PCB 81. In order to control the different working states of the lighting device 7 separately, such as brightness, flickering, etc.

Please refer to FIG. 4 and FIG. 7. Further, the emergency power supply of the vehicle further includes an audio alarm mechanism 9 for prompting the two battery clips 3 to be connected to the positive and negative electrodes of the vehicle, and to monitor the two battery clips 3 connected to the reverse monitoring Circuit. The monitoring circuit is used to monitor whether the connection between the two battery clips 3 and the positive and negative electrodes on the car is reversed. Because the current required when starting the car with an emergency start power supply is relatively large, once the positive and negative poles of the battery 2 are reversed, the battery 2 is likely to heat up and an accident occurs. An audio alarm mechanism 9 is provided. If

the positive and negative poles are reversed, Alarm, timely remind to prevent accidents. Of course, an alarm light can also be included to achieve an alarm combining sound and light.

Specifically, the audio alarm mechanism 9 includes a horn cover 91, an alarm horn 92, a horn seat 93, a horn net 94, and a fixing ring 95. The horn base 93 is installed on the box body 1 and has a ring shape. The horn cover 91 is fixed on the horn base 93, and surrounds the alarm horn 92, the horn net 94 covers the alarm horn 92, and the fixing ring 95 fixes the horn net 94 on the alarm horn 92. In other embodiments, existing speakers can also be used directly. The audio alarm mechanism 9 also includes a voice IC chip. Voice IC chip is used to provide alarm sound source.

Please refer to FIGS. 4 and 8. Specifically, the control assembly 6 includes a main board 61 installed in the cabinet 1 and an interface board 62 fixed on the cabinet 1. The main board 61 is fixedly connected to the interface board 62. By setting the main board 61, some functional modules can be integrated on the main board 61, reducing the volume of the product, and facilitating the installation and fixing of each functional module. Each functional module may include a voltage output module for powering an external device, such as a USB output module, a 16V / 20V constant power output module, and a 12V input / output module. The USB output module may include an output 5V / 2AUSB interface and an output 5V / 1AUSB interface to charge some electronic devices. 16The V / 20V constant power output module can be rotated between 16V / 4A and 20V / 3.25A output through the control switch 65 to meet the needs of different voltage output.

The main board 61 can also be provided with a DC12V input / DC12V output module. When used as a DC12V output, it can supply power to an external device. When used as a DC12V input, an external power supply can be used to charge the emergency power supply of the car. Such as directly charging the battery 2 with a car cigarette lighter. The main board 61 can also be provided with other charging interfaces, such as a charging interface that can cooperate with an AC charging adapter, so that the AC charging adapter can be used to connect external power to charge the battery 2.

The control assembly 6 further includes a battery protection board 63, and the main board 61 is connected to the battery 2 through the battery protection board 63. During charging, the charging power passes through the main board 61 to the battery protection board 63, and then charges the battery 2. During discharge, the power of the battery 2 passes through the battery protection board 63 to the main board 61 and then to each functional module. The battery protection board 63 is provided with a charging protection MOS tube. When the battery 2 is fully charged, the MOS tube will be disconnected to stop charging. The above-mentioned lighting device 7 is electrically connected to the battery through the battery protection plate 63.

A warning light module 64 can also be connected to the main board 61. For example, a red light is used for warning. Specifically, three 1W red LEDs can be used as the warning light. The step-down IC driver is used to achieve flashing, long lighting and extinction through the setting of the control module. States to indicate different warnings. The warning light module 64 and the audio alarm mechanism 9 may constitute an audible and visual alarm device.

The main board 61 is also provided with a microprocessor (MCU), so as to control each functional module, and control the charging and discharging of the battery 2.

Please refer to FIG. 1 together. Further, the emergency power supply of the vehicle further includes a heating device (marked in the figure) installed in the cabinet 1 and a temperature monitor (marked in the figure) for monitoring the temperature in the cabinet 1), The temperature monitor is electrically connected to the main board 61 in the control assembly 6. The heating device can be installed to start the heating device in a low-temperature environment, so that the power supply can reach the normal working temperature in a short time, and the car can still be started when the ambient temperature is minus 40 degrees. The temperature monitor can also monitor the temperature of the battery 2. When the temperature of the battery 2 exceeds 100 ° C, the battery 2 is controlled by the main board 61 and the battery protection board 63 to no longer discharge externally, no power output, and the flashlight is not lit. The red warning, 5 Turn off after seconds to protect the battery 2. The battery 2 is a plurality of lithium iron phosphate power batteries 2. The battery 2 is provided with a charging balance circuit of the battery 2 to ensure that each lithium battery 2 has the same capacity during use and to ensure the maximum capacity output of the whole machine.

Further, a protective cover 32 is also installed on the box 1. The protective cover 32 is fixed to the outside of the box 1 and surrounds the box 1 to form a receiving slot, and the battery clip 3 is inserted into the receiving slot. The protective cover 32 is provided to facilitate the placement of the battery clip 3, which is convenient for carrying.

Specifically, the battery clip 3 is connected to the battery 2 through the wire 31, the protective cover 32 is fixed to the side of the box 1, and surrounds the box 1 to form a receiving slot, and the battery clip 3 is inserted into the receiving slot. The lead wire 31 is clamped to the side of the cabinet 1 by the clip 33 to prevent the lead wire 31 from being scattered. A carrying handle 13 is provided on the box 1 for easy carrying. The box body 1 is specifically formed by fastening two left and right shells. It is defined as a left casing 11 and a right casing 12. The solar cell module 4 and the battery clip 3 are respectively located on the left and

right sides of the box 1. The manual generator 5 is installed at the rear end of the cabinet 1, and the interface board 62 is installed at the front end of the cabinet 1. The high-power flashlight, that is, the lighting device 7 is located above the interface board 62.

The control component 6 further includes an interface surface sticker 69, a car charger base 67, a control knob and a switch 65. The interface surface sticker 69 is attached to the interface board 62 to remind the function of each functional interface or module. The main board 61 is supported on the interface board 62 by the support frame 68. The car charger base 67, the control knob 66, and the switch 65 are all fixed on the interface board 62, and are connected to the main board 61, so as to control each functional module of the emergency power supply of the vehicle to realize different functions.

Please refer to FIG. 9, a functional block diagram of this embodiment. The hand-cranked generator performs hand-cranked charging, and then charges the battery 2 via the diode to the battery protection plate 63. The diode can play a protective role. When the solar battery is used for solar charging, the electric energy emitted by the solar battery module is charged by the MPPT controller and then the battery protection board 63 to charge the battery 2. MPPT controller is the maximum power point tracking (Maximum Power Point Tracking) solar controller. The MPPT controller can detect the generated voltage of the solar panel in real time and track the highest voltage and current value, so that the system can charge the battery 2 with the maximum power output. The DC12V input / DC12V output is connected to the battery protection board 63 through a control switch, which is controlled by the MCU main control. When the battery 2 outputs power to each functional module, it first passes through the battery protection board 63, and then is transmitted to each functional module output, such as: 5V output, 16V / 20V constant power output, high-power flashlight, strong light, red light warning and speaker . The speaker can be used as a field amplification. Through the MCU master control to control the work of the above functional modules. The temperature of the battery 2 is detected by a temperature monitor and connected to the MCU main control, and the temperature detection of the battery 2 is controlled by the MCU main control. As a result, the emergency battery of the vehicle can detect the temperature inside the box and the temperature of the battery in real time to ensure the safe use of the battery. At the same time, the main control of the MCU is connected to the buttons and the power indicator, and the power of the battery 2 is displayed through the power indicator. The power indicator can be an LED light. Control the function modules such as high-power flashlight through the buttons. A switch is also provided between the battery clip 3 and the battery 2, and a reverse connected sound and light alarm device is also connected between the switch and the battery clip 3, so as to safely use the emergency power supply of the car to start the car. The battery 2 is connected to the inverter, and the inverter is connected to the load and the MCU main control. The battery 2 supplies power to the load through the inverter, and the MCU main control is connected to the inverter, which can detect the working state of the inverter and control the operation of the inverter. The MCU master is also connected to the microphone. Microphone, also known as microphone, is used to receive sound.

The above is only the preferred embodiment of the utility model and is not intended to limit the utility model. Any modification, equivalent replacement and improvement made within the spirit and principle of the utility model should be included in this Within the scope of protection of the utility model.

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CLAIMS CN203607878

1.

An automobile emergency start power supply, which includes a box, a battery installed in the box, two battery clips respectively connected to the positive and negative electrodes of the battery, a solar cell component for charging the battery and For controlling the charging and discharging of the battery, the solar cell assembly is electrically connected to the control assembly, and the control assembly is electrically connected to the battery, characterized in that it further includes a hand for charging the battery A generator, the hand generator is electrically connected to the control assembly.

2.

The emergency power supply for an automobile according to claim 1, wherein the hand-cranked generator includes a body installed in the box and a hand crank connected to the body, the hand crank passes through The box extends beyond the box.

3.

The emergency power supply for an automobile according to claim 1 or 2, wherein the solar cell module includes a bottom plate, a solar panel mounted on the bottom plate, and a frame surrounding the solar panel.

4.

The emergency power supply for an automobile according to claim 3, wherein the solar cell modules are in multiple groups, and the solar cell modules can be folded in the box.

5.

The emergency power supply for an automobile according to claim 1 or 2, further comprising a lighting device installed in the box and a key mechanism for controlling the working state of the lighting device, the lighting device and all The battery is electrically connected, and the key mechanism is electrically connected to the lighting device.

6.

The emergency power supply for an automobile according to claim 1 or 2, further comprising an audio alarm mechanism for prompting the two battery clips to be connected to the positive and negative electrodes of the vehicle in reverse phase and monitoring the two battery clips and all The positive and negative electrodes on the automobile are connected with a reverse-phase monitoring circuit, the audio alarm mechanism includes an alarm horn electrically connected with the monitoring circuit, and the monitoring circuit is electrically connected with the two battery clips.

7.

The automobile emergency start power supply according to claim 1 or 2, characterized in that the control assembly includes a main board installed in the box and an interface board fixed on the box, the main board and the The interface board is fixedly connected.

8.

The emergency power supply for an automobile according to claim 7, wherein a voltage output module for powering an external device is provided on the main board.

9.

The automobile emergency start power supply according to claim 7, further comprising: a heating device installed in the box and a temperature monitor for monitoring the temperature in the box, the temperature monitor and all Describe the electrical connection of the motherboard.

10.

The automobile emergency start power supply according to claim 1 or 2, characterized in that: a protective cover is also installed on the box body, and the protective cover is fixed to the outside of the box body and is enclosed with the box body to form A storage slot for storing the battery clip.

Espacenet

Bibliographic data: CN102496985 (A) — 2012-06-13

Portable backup power supply

Inventor(s): XINGLIANG LEI ± (LEI XINGLIANG)

Applicant(s): XINGLIANG LEI ± (LEI XINGLIANG)

Classification: **- international:** ***H02J7/00***
- cooperative: **H02J7/0021 (US, US)**; **H02J7/0026 (US, US)**; **H02J9/061 (EP, US)**; **H05B45/37 (EP, US)**; Y02B20/341 (EP, US); Y10T307/352 (EP, US)

Application number: CN201110409190 20111209 Global Dossier

Priority number (s): CN201110409190 20111209

Also published as: CN102496985 (B) EP2790289 (A1) EP2790289 (A4) KR101690607 (B1) KR20140107395 (A) more

Abstract of CN102496985 (A)

A portable backup power supply comprises a battery pack. The battery pack is composed of lithium iron phosphate batteries or cobalt acid lithium batteries and connected with the output end of a charging circuit, the battery pack is connected with a plurality of direct current-direct current (DC-DC) voltage regulating circuits at the same time, and each DC-DC voltage regulating circuit is respectively connected with a microcomputer control circuit of a microprogrammed control unit (MCU). A light-emitting diode (LED) lamp is connected with the battery pack through an LED driving circuit, and the battery pack is further connected with a large current output circuit for starting up automobiles. The portable backup power supply uses the lithium iron phosphate batteries or the cobalt acid lithium batteries as the battery pack, has the advantages of being light in weight, small in volume, durable, large in momentary discharging current and capable of being charged repeatedly, can meet requirements for large start-up current of the automobiles, is connected with the voltage regulating circuits with various voltage classes, and can respectively meet requirements for outdoor power supply of mobile phones, computers, digital cameras and the devices through the microcomputer control circuit of the MCU. The LED lamp can supply outdoor lighting, the portable backup power supply is multi-purpose, convenient to carry and capable of meeting requirements for various power supply in the process of life, outgoing and traveling.

WINPLUS Ex. 1003, p. 823

(19)中华人民共和国国家知识产权局

(12)发明专利申请

(10)申请公布号 CN 102496985 A
(43)申请公布日 2012.06.13

(21)申请号 201110409190.9

(22)申请日 2011.12.09

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(51)Int.Cl.
H02J 7/00(2006.01)

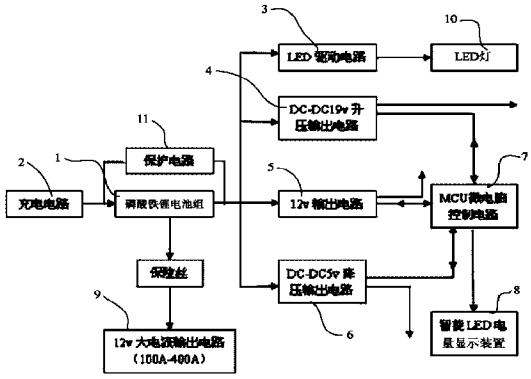
权利要求书 1 页 说明书 3 页 附图 6 页

(54)发明名称

一种便携式备用电源

(57)摘要

一种便携式备用电源，包括电池组，所述电池组为磷酸铁锂或钴酸锂电池组成，其与充电电路的输出端相连接；电池组同时连接有多路DC-DC调压电路，每路DC-DC调压电路均同MCU微电脑控制电路连接；LED灯通过LED驱动电路连接所述电池组；电池组还连接有用于汽车启动的大电流输出电路。其采用磷酸铁锂或钴酸锂电池作为电池组，具有重量轻、体积小、耐用、瞬间放电电流大，能够反复充电的特点，可满足汽车启动的大电流要求；连接多种电压等级的调压电路，通过MCU微电脑控制电路可分别满足手机、电脑、数码相机等设备的户外供电要求；LED灯可提供户外照明，一机多用，方便携带，可满足生活、出游以及旅行过程中的多种供电要求。



CN 102496985 A

1. 一种便携式备用电源，包括电池组，其特征在于：所述电池组为磷酸铁锂或钴酸锂电池组成，其与充电电路的输出端相连接；所述电池组同时连接有多路 DC-DC 调压电路，每路 DC-DC 调压电路均同 MCU 微电脑控制电路连接；LED 灯通过 LED 驱动电路连接所述电池组；所述电池组还连接有用于汽车启动的大电流输出电路。

2. 根据权利要求 1 所述的便携式备用电源，其特征在于：所述 DC-DC 调压电路包括输出电压为 DC19V、DC12V、DC5V 的调压电路。

3. 根据权利要求 1 所述的便携式备用电源，其特征在于：所述用于汽车启动的大电流输出电路的输出电压为 DC12V，瞬间电流为 100A-400A。

4. 根据权利要求 1 所述的便携式备用电源，其特征在于：所述电池组连接有充放电保护电路。

5. 根据权利要求 1-4 所述的任一种便携式备用电源，其特征在于：所述 MCU 微电脑控制电路连接有智能 LED 电量显示装置，用于显于电量存量。

6. 根据权利要求 1-4 所述的任一种便携式备用电源，其特征在于：用于汽车启动的大电流输出电路串接有 150A-250A 的保险丝。

7. 根据权利要求 1-4 所述的任一种便携式备用电源，其特征在于：用于汽车启动的大电流输出电路输出端采用防反接插头，外部连接线正负极线采用不同长度的硅胶线。

8. 根据权利要求 1-4 所述的任一种便携式备用电源，其特征在于：所述磷酸铁锂或钴酸锂电池均为高功率设计，放电倍率能够达到 20c-70c。

9. 根据权利要求 6 所述的便携式备用电源，其特征在于：所述保险丝串接于外部连接线的正极线或者负极线。

WINPLUS Ex. 1003, p. 826

一种便携式备用电源

技术领域

[0001] 本发明涉及直流电源领域，尤其是一种可为多种设备提供直流电的便携式备用电源。

背景技术

[0002] 随着人们生活水平的日益提高，汽车、手机、电脑、数码照相机等成为人们生活、出游以及旅行必备的物品，他们均采用电池供电，一但失去电源，将完全丧失其具有的功能，给人们的生活带来诸多不便。因此，对应每种产品，厂家均提供有相应的充电器，能够将220V市电转换成相应电压的直流电源对其进行充电，一方面造成了携带不便，另一方面也没有解决户外充电的问题。

[0003] 中国专利文献CN101009434A公开了一种随身携带的移动电源供应器，其包括一个细长形的壳体，该壳体上设有一个轴向配置的容置槽，该槽体内至少设有一组正、负极的导电接点，供预定的电池置入导通，形成电源供应端；一个直流对直流的升压控制回路，其设在第一电路板上而置于壳体内，用以将前述电池所输出的低电压大电流升压至5V直流电源；一个USB输出插座，其与容置槽呈轴向配设，并呈母连接器形式，其开口的连接阜设在壳体前端，且内侧的第一接脚是电性连接在该第一电路板上，用以取得升压控制回路输出的5V直流电源，提供一个与其连接的USB插头所需要的电源；具有一物多用，且方便携带，又节省成本的功效。但其不具有自身充电功能，而且仅能提供5V的直流电流，亦不能解决多种电子产品的兼容使用。

[0004] 中国专利文献CN101685974A公开了一种移动电源，包括电池组、充电电路、MCU微控制电路、DC-DC调压输出电路，所述充电电路设有可与外部电源连接的输入端，所述充电电路设有的输出端与电池组电连接，电池组同时与MCU微控制电路和DC-DC调压输出电路电连接，MCU微控制电路电连接并控制充电电路和DC-DC调压输出电路，既可以利用市电充电，又可以通过更换不同的输出转换头给多种电子产品供电或充电，管理、携带和使用方便。该技术方案解决了多种电压等级的输出且具有自充电功能，但其不具备大电流输出能力，不能作为汽车启动电源。

发明内容

[0005] 针对以上问题，本发明提供一种便携式备用电源，其具有充电功能，能提供多种电压等级的直流输出，同时兼具大电流输出能力，可作为汽车的启动电源。

[0006] 本发明的目的是通过以下技术方案来实现：

[0007] 一种便携式备用电源，包括电池组，所述电池组为磷酸铁锂或钴酸锂电池组成，其与充电电路的输出端相连接；所述电池组同时连接有多路DC-DC调压电路，每路DC-DC调压电路均同MCU微电脑控制电路连接；LED灯通过LED驱动电路连接所述电池组；所述电池组还连接有用于汽车启动的大电流输出电路。

[0008] 优选的，所述DC-DC调压电路包括输出电压为DC19V、DC12V、DC5V的调压电路。

WINPLUS Ex. 1003, p. 827

[0009] 优选的，所述用于汽车启动的大电流输出电路的输出电压为 DC12V，瞬间电流为 100A-400A。

[0010] 特别的，所述电池组连接有充放电保护电路。

[0011] 特别的，所述 MCU 微电脑控制电路连接有智能 LED 电量显示装置，用于显于电量存量。

[0012] 特别的，为降低在应急启动过程中，两个电瓶夹碰撞导致短路的概率，用于汽车启动的大电流输出电路串接有 150A-250A 的保险丝。其输出端采用防反接插头，外部连接线正负极线采用不同长度的硅胶线，所述磷酸铁锂或钴酸锂电池均为高功率设计，放电倍率能够达到 20c-70c。

[0013] 所述保险丝串接于外部连接线的正极线或者负极线。

[0014] 本发明所述便携式备用电源，其采用磷酸铁锂或钴酸锂电池作为电池组，具有重量轻、体积小、耐用、瞬间放电电流大，能够反复充电的特点，可满足汽车启动的大电流要求；相应电池组连接多种电压等级的调压电路，通过 MCU 微电脑控制电路可分别满足手机、电脑、数码相机等设备的户外供电要求；LED 灯可提供户外照明，一机多用，方便携带，可满足生活、出游以及旅行过程中的多种供电要求。

附图说明

[0015] 下面根据附图和实施例对本发明作进一步详细说明。

[0016] 图 1 为本发明所述便携式备用电源的原理结构示意图；

[0017] 图 2 为本发明所述便携式备用电源的具体电路图的分割示意图；

[0018] 图 3 为图 2 中所示 4-1 放大图；

[0019] 图 4 为图 2 中所示 4-2 放大图；

[0020] 图 5 为图 2 中所示 4-3 放大图；

[0021] 图 6 为图 2 中所示 4-4 放大图。

[0022] 图中：

[0023] 1、磷酸铁锂或钴酸锂电池组；2、充电电路；3、LED 驱动电路；4、DC-DC19V 升压输出电路；5、12V 输出电路；6、DC-DC5V 降压输出电路；7、MCU 微电脑控制电路；8、智能 LED 电量显示装置；9、12V 大电流输出电路；10、LED 灯；11、保护电路。

具体实施方式

[0024] 如图 1 所示，给出了本发明所述便携式备用电源的原理结构图，磷酸铁锂或钴酸锂电池组 1 同时连接有多路 DC-DC 调压电路，分别为 DC-DC19V 升压输出电路 4、12V 输出电路 5、DC-DC5V 降压输出电路 6，每路 DC-DC 调压电路均同 MCU 微电脑控制电路 7 连接，通过 MCU 微电脑控制电路 7，使用者可灵活选择相应的电压输出，满足手机、电脑、数码相机等设备的户外供电要求；进一步的，可通过与 MCU 微电脑控制电路 7 相连接的智能 LED 电量显示装置 8，可实时监控磷酸铁锂或钴酸锂电池组 1 的电量存量状态。

[0025] 由于本电源采用磷酸铁锂或钴酸锂电池组 1 作为储能器件，具有重量轻、体积小、耐用、瞬间放电电流大，能够反复充电的特点，将其与充电电路 2 的输出端相连，可实现其充电功能，同步连接有 12V 大电流输出电路 9，能够实现 12V 电压下 100-400A 电流输出，可

WINPLUS Ex. 1003, p. 828

作为应急状态下汽车的启动电源使用，汽车启动的大电流输出直接连接在电池组两端而不经过放电保护电路，为防止汽车应急启动的时候正负极夹子短路或者反接引起电池发烫，电路中串接了一个 150A-250A 的保险丝；为降低在应急启动过程中，两个电瓶夹碰撞导致短路的概率，用于汽车启动的大电流输出电路串接有 150A-250A 的保险丝。其输出端采用防反接插头，外部连接线正负极线采用不同长度的硅胶线。为确保电池组的充放电安全，所述磷酸铁锂或钴酸锂电池组 1 连接有保护电路 11，对其进行过流过载保护。

[0026] 同时为满足户外照明的需求，所述磷酸铁锂或钴酸锂电池组 1 依次连接有 LED 驱动电路 3 和 LED 灯 10，可用作应急照明电源使用，其具体电路图如图 2 至图 6 所示。

WINPLUS Ex. 1003, p. 829

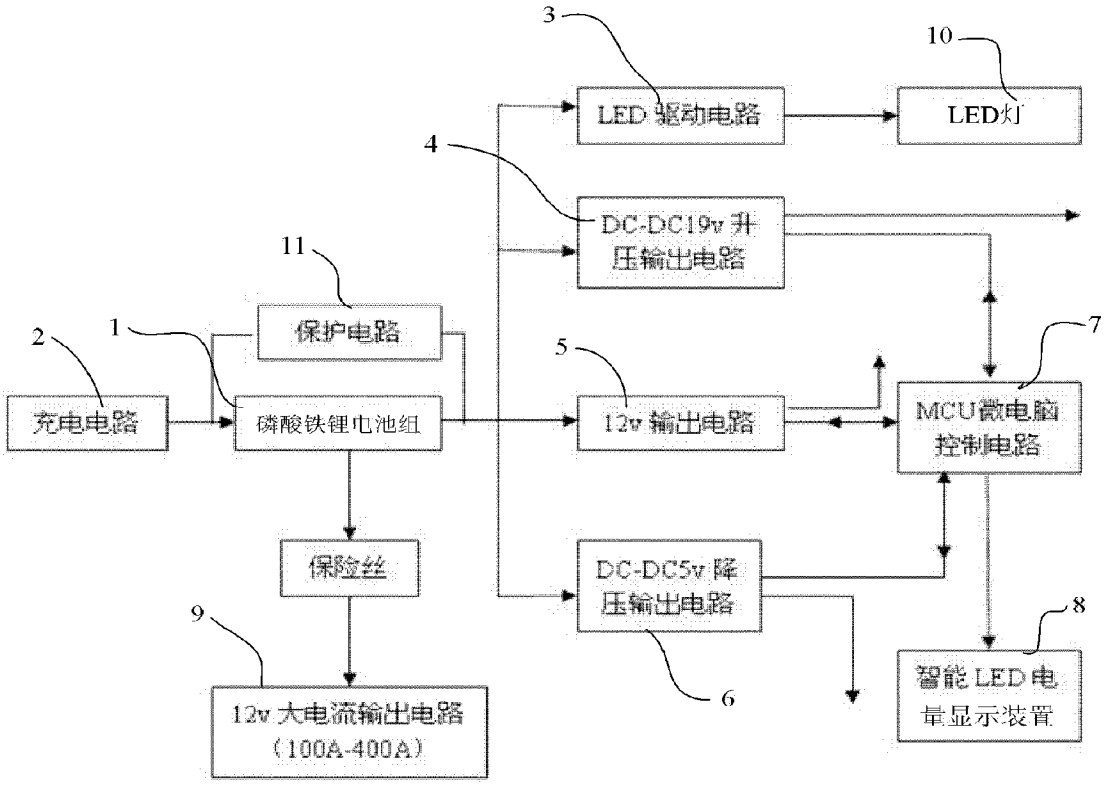


图 1

WINPLUS Ex. 1003, p. 830

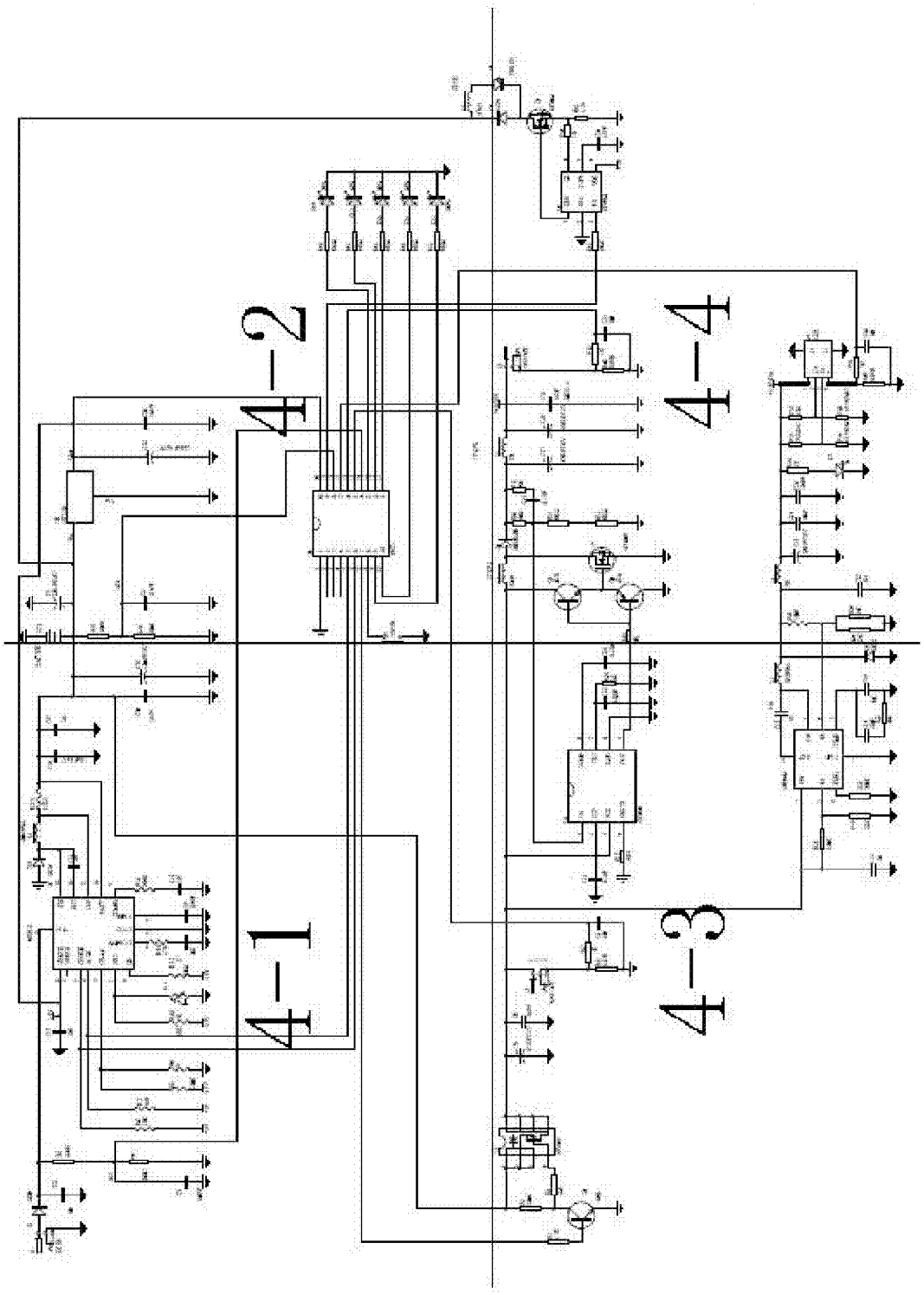


图 2

WINPLUS Ex. 1003, p. 831

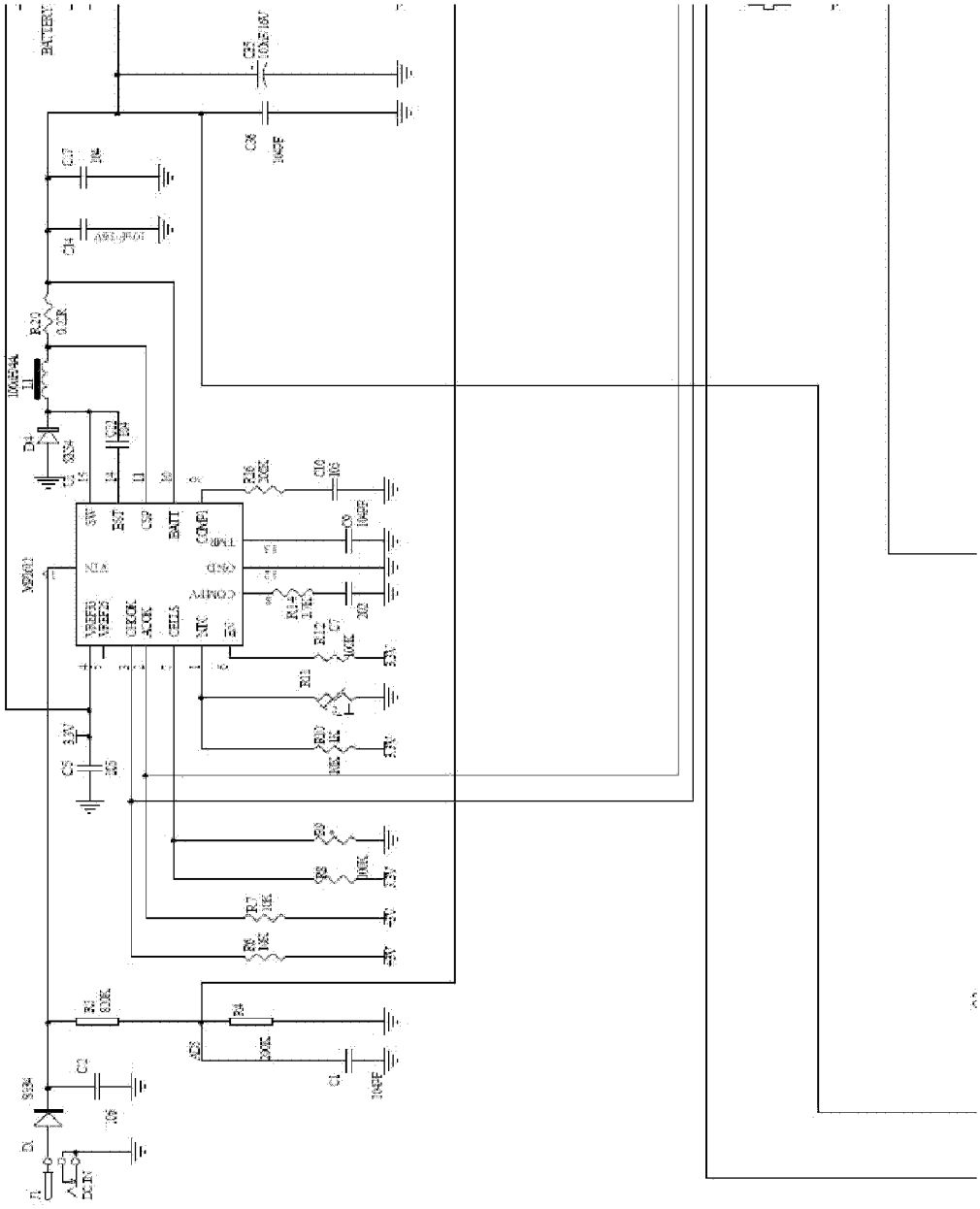


图 3

WINPLUS Ex. 1003, p. 832

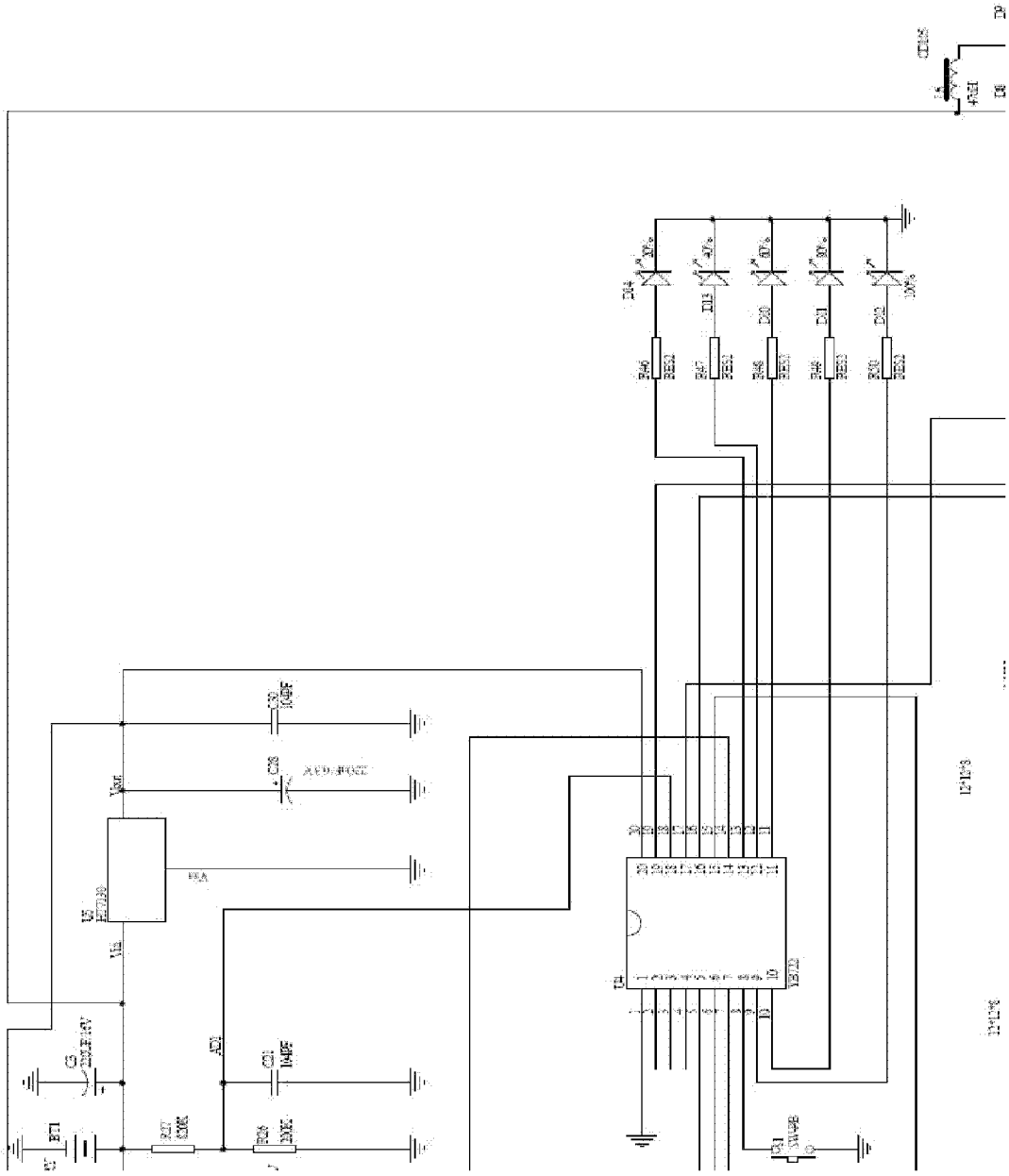


图 4

WINPLUS Ex. 1003, p. 833

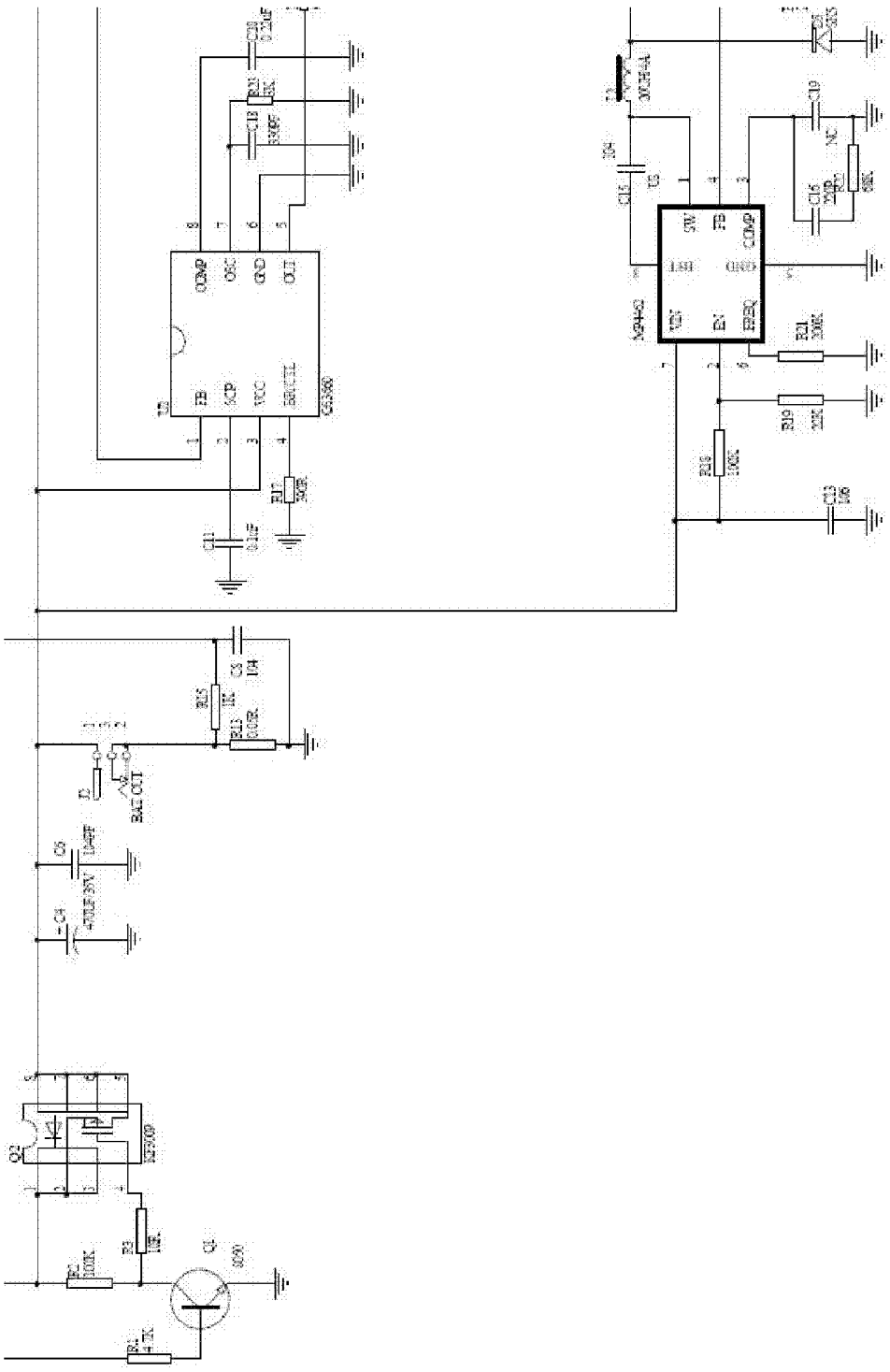


图 5

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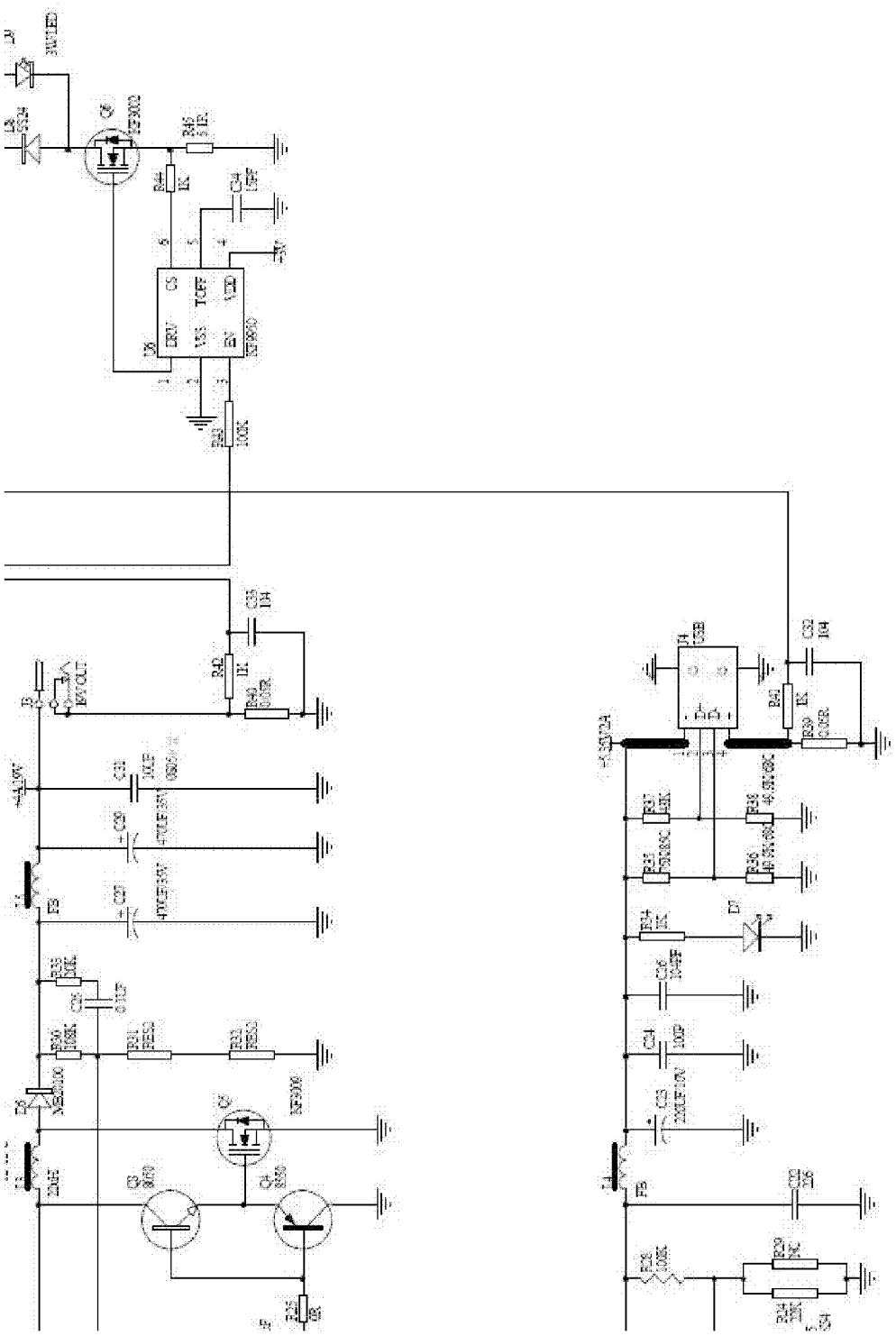

图 6

WINPLUS Ex. 1003, p. 835

Espacenet

Bibliographic data: CN102496985 (A) — 2012-06-13

Portable backup power supply

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Classification: **- international:** ***H02J7/00***
- cooperative: **H02J7/0021 (US, US)**; **H02J7/0026 (US, US)**; **H02J9/061 (EP, US)**; **H05B45/37 (EP, US)**; Y02B20/341 (EP, US); Y10T307/352 (EP, US)

Application number: CN201110409190 20111209 Global Dossier

Priority number (s): CN201110409190 20111209

Also published as: CN102496985 (B) EP2790289 (A1) EP2790289 (A4) KR101690607 (B1) KR20140107395 (A) more

Abstract of CN102496985 (A)

A portable backup power supply comprises a battery pack. The battery pack is composed of lithium iron phosphate batteries or cobalt acid lithium batteries and connected with the output end of a charging circuit, the battery pack is connected with a plurality of direct current-direct current (DC-DC) voltage regulating circuits at the same time, and each DC-DC voltage regulating circuit is respectively connected with a microcomputer control circuit of a microprogrammed control unit (MCU). A light-emitting diode (LED) lamp is connected with the battery pack through an LED driving circuit, and the battery pack is further connected with a large current output circuit for starting up automobiles. The portable backup power supply uses the lithium iron phosphate batteries or the cobalt acid lithium batteries as the battery pack, has the advantages of being light in weight, small in volume, durable, large in momentary discharging current and capable of being charged repeatedly, can meet requirements for large start-up current of the automobiles, is connected with the voltage regulating circuits with various voltage classes, and can respectively meet requirements for outdoor power supply of mobile phones, computers, digital cameras and the devices through the microcomputer control circuit of the MCU. The LED lamp can supply outdoor lighting, the portable backup power supply is multi-purpose, convenient to carry and capable of meeting requirements for various power supply in the process of life, outgoing and traveling.

WINPLUS Ex. 1003, p. 836

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DESCRIPTION CN102496985

A portable backup power supply includes a battery pack composed of lithium iron phosphate or lithium cobalt oxide batteries, which is connected to the output end of the charging circuit; the battery pack is also connected to a multi-channel DC-DC voltage regulator circuit, each The road DC-DC voltage regulating circuits are all connected with the MCU microcomputer control circuit; the LED lamp is connected to the battery pack through the LED driving circuit; the battery pack is also connected with a large current output circuit for car startup. It uses lithium iron phosphate or lithium cobalt oxide batteries as the battery pack. It has the characteristics of light weight, small size, durability, large instantaneous discharge current, and can be repeatedly charged. It can meet the high current requirements of car startup; connect multiple voltage levels The pressure circuit can meet the outdoor power supply requirements of mobile phones, computers, digital cameras and other equipment through the MCU microcomputer control circuit; LED lights can provide outdoor lighting, one machine is versatile, easy to carry, and can meet a variety of life, travel and travel processes Power requirements.

A portable backup power supply

Technical field

The present invention relates to the field of DC power supplies, and particularly to a portable backup power supply that can provide DC power to a variety of devices.

Background technique

With the improvement of people's living standards, cars, mobile phones, computers, digital cameras, etc. have become essential items for people's lives, travel and travel. They are all powered by batteries. Once they lose power, they will completely lose their functions People's lives bring many inconveniences. Therefore, for each product, the manufacturer provides a corresponding charger, which can convert 220V mains power into a DC power supply of the corresponding voltage to charge it. .

Chinese patent document CN101009434A discloses a portable power supply that includes an elongated housing, and an axially-arranged accommodating groove is provided on the housing. Negative conductive contacts for the predetermined battery to be put into conduction to form a power supply end; a DC-to-DC boost control loop, which is placed on the first circuit board and placed in the housing for output of the aforementioned battery The low voltage and large current are boosted to a 5V DC power supply; a USB output socket is axially arranged with the accommodating groove and is in the form of a female connector. The opening of the opening is located at the front of the case, and the inner first One pin is electrically connected to the first circuit board to obtain the 5V DC power output from the boost control loop and provide the power required by the USB plug connected to it; it is multi-purpose and convenient to carry, and Cost-saving effect. However, it does not have its own charging function, and can only provide a DC current of 5V, nor can it solve the compatible use of many electronic products.

Chinese patent document CN101665974A discloses a mobile power supply including a battery pack, a charging circuit, an MCU micro-control circuit, and a DC-DC voltage-regulating output circuit. The charging circuit is provided with an input terminal that can be connected to an external power supply. The charging circuit The output terminal is electrically connected to the battery pack. The battery pack is also electrically connected to the MCU micro-control circuit and the DC-DC voltage regulation output circuit. The MCU micro-control circuit is electrically connected to control the charging circuit and the DC-DC voltage regulation output circuit. It can be charged by city power, and it can supply or charge a variety of electronic products by replacing different

output conversion heads, which is convenient to manage, carry and use. This technical solution solves the output of multiple voltage levels and has a self-charging function, but it does not have a large current output capability and cannot be used as a starting power supply for automobiles.

Summary of the invention

In view of the above problems, the present invention provides a portable backup power supply, which has a charging function, can provide DC output of multiple voltage levels, and has a large current output capability, and can be used as a starting power supply for automobiles.

The purpose of the present invention is achieved by the following technical solutions:

A portable backup power supply includes a battery pack composed of lithium iron phosphate or lithium cobalt oxide batteries, which is connected to the output end of the charging circuit; the battery pack is also connected to a multi-channel DC-DC voltage regulating circuit Each DC-DC voltage regulator circuit is connected to the MCU microcomputer control circuit; the LED lamp is connected to the battery pack through an LED drive circuit; the battery pack is also connected to a large current output circuit for vehicle startup.

Preferably, the DC-DC voltage regulating circuit includes a voltage regulating circuit with an output voltage of DC19V, DC12V, and DC5V.

Preferably, the output voltage of the high-current output circuit for starting a car is DC12V, and the instantaneous current is 100A-400A.

In particular, the battery pack is connected with a charge and discharge protection circuit.

In particular, the MCU microcomputer control circuit is connected with an intelligent LED power display device for displaying the power reserve.

In particular, in order to reduce the probability of a short circuit caused by the collision of two battery clips during the emergency start process, a 150A-250A fuse is connected in series with the high-current output circuit used for vehicle start-up. The output end uses an anti-reverse plug, the external connection line positive and negative lines use different lengths of silicone wire, the lithium iron phosphate or lithium cobalt oxide batteries are all high-power designs, and the discharge rate can reach 20c-70c.

The fuse is connected in series to the positive or negative line of the external connection line.

The portable backup power supply of the present invention uses lithium iron phosphate or lithium cobalt oxide batteries as the battery pack, which has the characteristics of light weight, small size, durability, large instantaneous discharge current, and can be repeatedly charged, which can meet the high current requirements of automobile startup ; The corresponding battery pack is connected to voltage regulating circuits of various voltage levels, and the MCU microcomputer control circuit can meet the outdoor power supply requirements of mobile phones, computers, digital cameras and other equipment; LED lights can provide outdoor lighting, one machine is multi-purpose, convenient to carry, can be Meet various power requirements in life, travel and travel.

BRIEF DESCRIPTION

The present invention will be further described in detail below based on the drawings and embodiments.

1 is a schematic diagram of the principle structure of the portable backup power supply according to the present invention;

2 is a schematic diagram of a specific circuit diagram of the portable backup power supply according to the present invention;

Figure 3 is an enlarged view of 4-1 shown in Figure 2;

Figure 4 is an enlarged view of 4-2 shown in Figure 2;

Figure 5 is an enlarged view of 4-3 shown in Figure 2;

Fig. 6 is an enlarged view of 4-4 shown in Fig. 2.

In the picture:

1、

Lithium iron phosphate or lithium cobalt oxide battery pack; 2. Charging circuit; 3. LED drive circuit; 4. DC-DC19V boost output circuit; 5, 12V output circuit; 6. DC-DC5V step-down output circuit; 7. MCU Microcomputer control circuit; 8. Intelligent LED power display device; 9, 12V high current output circuit; 10. LED light; 11. Protection circuit.

detailed description

As shown in Figure 1, the principle structure diagram of the portable backup power supply of the present invention is given. The lithium iron phosphate or lithium cobalt oxide battery pack 1 is simultaneously connected with multiple DC-DC voltage regulating circuits, which are DC-DC19V boost Output circuit 4, 12V output circuit 5, DC-DC 5V step-down output circuit 6, each DC-DC voltage regulator circuit is connected with MCU microcomputer control circuit 7, through MCU microcomputer control circuit 7, users can flexibly choose the corresponding voltage The output meets the outdoor power supply requirements of mobile phones, computers, digital cameras and other equipment; further, the intelligent LED power display device 8 connected to the MCU microcomputer control circuit 7 can monitor the lithium iron phosphate or lithium cobalt oxide battery pack 1 in real time The status of the power reserve.

Since this power supply uses lithium iron phosphate or lithium cobalt oxide battery pack 1 as an energy storage device, it has the characteristics of light weight, small size, durability, large instantaneous discharge current, and can be repeatedly charged. It is connected to the output of charging circuit 2, It can realize its charging function. It is synchronously connected with a 12V high-current output circuit 9, which can achieve 100-400A current output at 12V. It can be used as a starting power supply for cars in an emergency. The terminal does not go through the discharge protection circuit. In order to prevent the short circuit of the positive and negative clips or the reverse connection causing the battery to become hot during emergency start of the car, a 150A-250A fuse is connected in series in the circuit; The probabiiiity of a short circuit caused by the collision of a battery clip. The large current output circuit used for starting the car is serially connected with 150A-250A fuses.

The output end adopts anti-reverse plug, and the external connection line positive and negative lines use different lengths of silicone wire. To ensure the safety of charging and discharging of the battery pack, the lithium iron phosphate or lithium cobalt oxide battery pack 1 is connected with a protection circuit 11 to protect it from overcurrent and overload.

At the same time, in order to meet the needs of outdoor lighting, the lithium iron phosphate or lithium cobalt oxide battery pack 1 is sequentially connected with an LED driving circuit 3 and an LED lamp 10, and can be used as an emergency lighting power supply. The specific circuit diagram is shown in FIGS. 2 to 6. Show.

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CLAIMS CN102496985

1.

A portable backup power supply, including a battery pack, characterized in that: the battery pack is composed of lithium iron phosphate or lithium cobalt oxide batteries, which is connected to the output end of the charging circuit; the battery pack is also connected to multiple DC- DC voltage regulating circuit, each DC-DC voltage regulating circuit is connected with the MCU microcomputer control circuit; the LED lamp is connected to the battery pack through an LED driving circuit; the battery pack is also connected with a large current output circuit for car starting.

2.

The portable backup power supply according to claim 1, wherein the DC-DC voltage regulating circuit includes a voltage regulating circuit with an output voltage of DC19V, DC12V, or DC5V.

3.

The portable backup power supply according to claim 1, wherein the output voltage of the high-current output circuit for vehicle startup is DC12V, and the instantaneous current is 100A-400A.

4.

The portable backup power supply according to claim 1, wherein the battery pack is connected with a charge and discharge protection circuit.

5.

The portable backup power supply according to any one of claims 1 to 4, characterized in that: the MCU microcomputer control circuit is connected with an intelligent LED power display device, which is used to display the power reserve.

6.

The portable backup power supply according to any one of claims 1 to 4, characterized in that the high-current output circuit used for starting the vehicle is serially connected with fuses of 150A-250A.

7.

The portable backup power supply according to any one of claims 1 to 4, characterized in that the output terminal of the high-current output circuit used for automobile startup adopts an anti-reverse plug, and the positive and negative poles of the external connection line use silicone wires of different lengths .

8.

The portable backup power supply according to any one of claims 1 to 4, characterized in that the lithium iron phosphate or lithium cobalt oxide batteries are of high power design, and the discharge rate can reach 20c-70c.

9.

The portable backup power supply according to claim 6, wherein the fuse is connected in series to the positive or negative line of the external connection line.

Espacenet

Bibliographic data: DE112016002206 (T5) — 2018-03-15

BATTERY ASSEMBLY DEVICE

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Classification: **- international:** ***F02N11/14; H02J7/14***
- cooperative: **H01M2/30 (US); H01R11/24 (US); H02J1/122 (EP); H02J7/14 (EP, GB, US); H02J7/342 (GB);** F02N11/12 (EP); F02N11/14 (EP); H02J1/122 (US)

Application number: DE20161102206T 20160329

Priority number(s): US201662294067P 20160211 ; WO2016US24680 20160329

Also published as: AU2016392707 (A1) AU2016392707 (B2) AU2020200268 (A1) CA2957431 (A1) CN107852004 (A) more

Abstract not available for DE112016002206 (T5)
Abstract of corresponding document: WO2017138963 (A1)

The subject matter relates to a battery assembly device for use with an apparatus for jump starting a vehicle, and an apparatus for jump starting a vehicle comprising the battery assembly device. A battery assembly device for a battery jump starting device. The battery assembly is configured to maximize electrical conductivity from a battery pack of the battery jump starting device to a battery to be recharged.

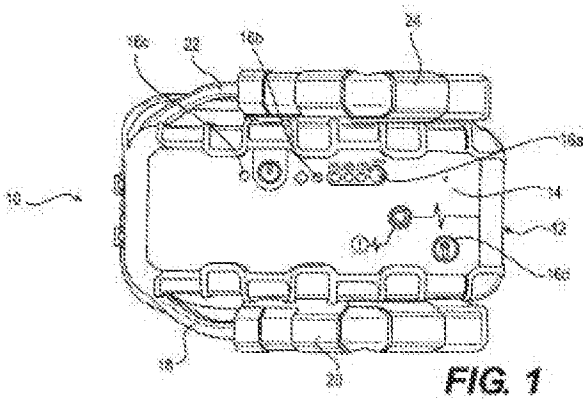

FIG. 1

(19) Deutsches Patent- und Markenamt

(10) **DE 11 2016 002 206 T5** 2018.03.15

(12) # Veröffentlichung

der internationalen Anmeldung mit der
(87) Veröffentlichungs-Nr.: **WO 2017/138963**
in deutscher Übersetzung (Art. III § 8 Abs. 2 IntPatÜG)
(21) Deutsches Aktenzeichen: **11 2016 002 206.9**
(86) PCT-Aktenzeichen: **PCT/US2016/024680**
(86) PCT-Anmeldetag: **29.03.2016**
(87) PCT-Veröffentlichungstag: **17.08.2017**
(43) Veröffentlichungstag der PCT Anmeldung
in deutscher Übersetzung: **15.03.2018**

(51) Int Cl.: ***F02N 11/14*** (2006.01)
H02J 7/14 (2006.01)

(30) Unionspriorität:
62/294,067 **11.02.2016** **US**

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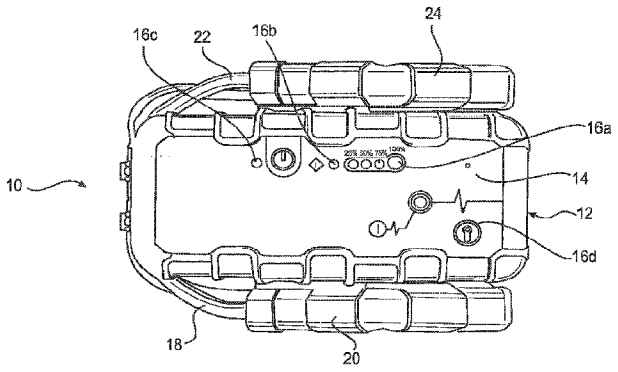
Die folgenden Angaben sind den vom Anmelder eingereichten Unterlagen entnommen.

(54) Bezeichnung: **Batterieanordnungsvorrichtung**

(57) Zusammenfassung: Der Gegenstand bezieht sich auf eine Batterieanordnungsvorrichtung zur Verwendung mit einer Vorrichtung zur Starthilfe eines Fahrzeugs und auf eine Vorrichtung zur Starthilfe eines Fahrzeugs mit der Batterieanordnungsvorrichtung. Eine Batterieanordnungsvorrichtung für eine Batteriestarthilfevorrichtung. Die Batterieanordnung ist konfiguriert, um die elektrische Leitfähigkeit von einem Batteriesatz der Batteriestarthilfevorrichtung zu einer aufzuladenden Batterie zu maximieren.



Beschreibung

GEBIET

[0001] Eine Batterieanordnungsvorrichtung zum Beispiel zur Verwendung in einer Batteriestarthilfevorrichtung ist offenbart.

HINTERGRUND

[0002] Es gibt eine tragbare Batteriestarthilfevorrichtung für Fahrzeuge, wie sie im US-Patent Nr. 9,007,015 von Nook et al. offenbart ist. Die Vorrichtung verwendet einen Lithium-Ionen-Batteriesatz. Bei dieser Art von Vorrichtung besteht ein Bedürfnis, die Leitfähigkeit vom Batteriesatz der Vorrichtung zur Fahrzeugbatterie des Fahrzeugs zu maximieren, bei dem Starthilfe geleistet wird.

[0003] Für erfolgreiche Starhilfen gibt es zwei Hauptfaktoren, die die Ergebnisse bestimmen. Der erste Faktor ist die vom Lithium-Ionen-Batteriesatz bereitgestellte Energiemenge, und der zweite Faktor ist die maximale Leitfähigkeit. Beide werden Faktoren benötigt, um die besten Chancen zu haben, große Motoren zu starten. Ein Faktor ohne den anderen Faktor ist nicht genug.

ZUSAMMENFASSUNG

[0004] Der Gegenstand bezieht sich auf eine Batterieanordnungsvorrichtung zur Verwendung mit einer Vorrichtung zur Starthilfe eines Fahrzeugs, und bezieht sich auf eine Vorrichtung zur Starthilfe eines Fahrzeugs mit der Batterieanordnungsvorrichtung.

[0005] Der Gegenstand betrifft die folgenden Aspekte.

[0006] Eine Batterieanordnungsvorrichtung, umfassend oder bestehend aus einer Batterie, wobei mindestens ein Batterieleiter mit einem Anschluss der Batterie verbunden ist.

[0007] Eine Batterieanordnungsvorrichtung, umfassend oder bestehend aus einer Batterie, wobei mindestens eine Batterieleitung mit einer Anschlussleiste der Batterie verbunden ist.

[0008] Eine Batterieanordnungsvorrichtung, umfassend oder bestehend aus einer Batterie, wobei ein positiver Batterieleiter mit einem positiven Anschlusskontakt der Batterie verbunden ist und ein negativer Batterieleiter mit einem negativen Anschlusskontakt der Batterie verbunden ist.

[0009] Eine Batterieanordnungsvorrichtung, umfassend oder bestehend aus einer Batterie, wobei ein positiver Batterieleiter mit einem positiven Anschlusskontakt der Batterie verbunden ist und ein negativer Batterieleiter mit einem negativen Anschlusskontakt der Batterie verbunden ist, wobei die Batterieleiter an die jeweiligen Anschlusskontakte der Batterie gelötet sind.

[0010] Eine Batterieanordnungsvorrichtung, umfassend oder bestehend aus einer Batterie, wobei ein positiver Batterieleiter mit einem positiven Anschlusskontakt der Batterie verbunden ist und ein negativer Batterieleiter mit einem negativen Anschlusskontakt der Batterie verbunden ist, und einem Relais, das mit einem der Batterieleiter der Batterie verbunden ist.

[0011] Eine Batterieanordnungsvorrichtung, umfassend oder bestehend aus einer Batterie, wobei ein positiver Batterieleiter mit einem positiven Anschlusskontakt der Batterie verbunden ist und ein negativer Batterieleiter mit einem negativen Anschlusskontakt der Batterie verbunden ist, und einem Relais, das mit dem negativen Batterieleiter verbunden ist.

[0012] Eine Batterieanordnungsvorrichtung, umfassend oder bestehend aus einer Batterie, wobei ein positiver Batterieleiter mit einem positiven Anschlusskontakt der Batterie verbunden ist und ein negativer Batterieleiter mit einem negativen Anschlusskontakt der Batterie verbunden ist, und einem Relais, das mit dem negativen Batterieleiter verbunden ist.

[0013] Eine Batterieanordnungsvorrichtung, umfassend oder bestehend aus einer Batterie, wobei ein positiver Batterieleiter mit einem positiven Anschlusskontakt der Batterie verbunden ist und ein negativer Batterieleiter mit einem negativen Anschlusskontakt der Batterie verbunden ist, und mehreren Relais, die mit dem negativen Batterieleiter verbunden sind.

[0014] Eine Batterieanordnungsvorrichtung, umfassend oder bestehend aus einer Batterie, wobei ein positiver Batterieleiter mit einem positiven Anschlusskontakt der Batterie verbunden ist und ein negativer Batterieleiter mit einem negativen Anschlusskontakt der Batterie verbunden ist, und einem positiven Kabel, das mit dem positiven Batterieleiter verbunden ist.

KURZE BESCHREIBUNG DER ZEICHNUNGEN

[0015] **Fig.** 1 ist eine perspektivische Vorderansicht der Batteriestarthilfevorrichtung, wobei die Klemmen fixiert sind.

[0016] **Fig.** 2 ist eine perspektivische Rückansicht der Batteriestarthilfevorrichtung, die in **Fig.** 1 gezeigt ist.

[0017] **Fig.** 3 ist eine perspektivische Endansicht der Batteriestarthilfevorrichtung, die in den **Fig.** 1 und **Fig.** 2 gezeigt ist.

[0018] **Fig.** 4 ist eine perspektivische Vorderansicht der Batteriestarthilfevorrichtung, die in **Fig.** 1 gezeigt ist, wobei jedoch die Klemmen gelöst sind.

[0019] **Fig.** 5 ist eine perspektivische Ansicht einer Batterieanordnungsvorrichtung, die in der in **Fig.** 1 gezeigten Batteriestarthilfevorrichtung enthalten ist, wenn sie darin installiert ist, wobei das negative Kabel jedoch noch nicht installiert ist.

[0020] **Fig.** 6 ist eine Draufsicht auf die in **Fig.** 5 gezeigte Batterieanordnungsvorrichtung.

[0021] **Fig.** 7 ist eine vordere Höhenansicht der in **Fig.** 5 gezeigten Batterieanordnungsvorrichtung.

[0022] **Fig.** 8 ist eine Seitenansicht des gebogenen Kabelverbinders für das positive Kabel.

[0023] **Fig.** 9 ist eine perspektivische Ansicht der in der **Fig.** 5 gezeigten Batterieanordnungsvorrichtung, wobei das negative Kabel mit der Batterieanordnungsvorrichtung verbunden ist.

[0024] **Fig.** 10 ist eine perspektivische Ansicht der in **Fig.** 5 gezeigten Batterieanordnungsvorrichtung, wobei eine Diodenvorrichtung auf dem positiven Kabel installiert ist.

[0025] **Fig.** 11 ist eine perspektivische Ansicht der Batterieanordnungsvorrichtung, die mit anderen Komponenten oder Vorrichtungen der Batteriestarthilfevorrichtung verbunden ist.

[0026] **Fig.** 12 ist eine perspektivische Ansicht der Batteriesatzvorrichtung, die in der in **Fig.** 1 gezeigten Batteriestarthilfevorrichtung enthalten ist, wenn sie darin installiert ist.

DETAILLIERTE BESCHREIBUNG

[0027] Eine Batteriestarthilfevorrichtung **10** ist in den **Fig.** 1 und **Fig.** 2 gezeigt. Die Batteriestarthilfevorrichtung **10** umfasst ein Gehäuse **12** mit einer Anzeige **14**, die mit einer Anordnung von Leuchtdioden **16** (LEDs) versehen ist. Die Batteriestarthilfevorrichtung **10** umfasst ferner ein positives Kabel **18** mit einer positiven Klemme **20** und ein negatives Kabel **22** mit einer negativen Klemme **24**. Das positive Kabel **18** und das negative Kabel **22** gehen durch Öffnungen **12a**, **12b** in dem Gehäuse **12** hindurch und sind mit einer intern angeordneten Komponente (d.h. einer Batterieanordnungsvorrichtung) verdrahtet, die unten im Detail beschrieben wird.

[0028] Die Klemmen **20**, **24** sind in einem nicht eingesetzten Modus verstaut oder angedockt, indem sie jeweils an einen jeweiligen Seitenpfosten **26** geklemmt werden, die sich an gegenüberliegenden Seiten des Gehäuses **12** nach außen erstrecken, wie in **Fig.** 1 gezeigt ist. Die Seitenpfosten **26** sind in **Fig.** 2 gezeigt. Die Klemmen **20**, **24** sind angedockt, wenn die Batteriestarthilfevorrichtung **10** nicht verwendet wird, und sind während des Gebrauchs von den Seitenpfosten **26** losgemacht.

[0029] Die Batteriestarthilfevorrichtung **10** ist für eine Starthilfe einer Fahrzeugbatterie eingerichtet. Zum Beispiel kann die Batteriestarthilfevorrichtung **10** die tragbare Starthilfevorrichtung für Fahrzeuge mit einer Sicherheitsvorrichtung sein, die im US-Patent Nr. 9,007,015 offenbart ist, das hierin vollständig durch Bezugnahme aufgenommen ist, oder eine Vorrichtung ähnlich dazu.

[0030] Die Batteriestarthilfevorrichtung **10** umfasst eine Vielzahl von elektrischen Komponenten oder Teilen, die sich innerhalb des Gehäuses **12** befinden. Zum Beispiel umfasst die Batteriestarthilfevorrichtung **10** die in den **Fig.** 5–**Fig.** 10 gezeigte Batterieanordnung **110** und die in der **Fig.** 11 gezeigten internen elektrischen Komponenten.

[0031] Wie in den **Fig.** 5–**Fig.** 10 gezeigt ist, umfasst die Batterieanordnung **110** eine Batterie **112**. Zum Beispiel ist die Batterie **112** eine wiederaufladbare Lithium-Ionen-Batterie. Die Batterieanordnung **110** ist konfiguriert, um die elektrische Leitfähigkeit von der Batterie **112** zu den Kabeln **18**, **22** und den Klemmen **20**, **24** der Batteriestarthilfevorrichtung **10** zu maximieren. Die Batterie **112** umfasst ein Gehäuse, beispielsweise ein rechteckig geformtes Gehäuse **112a**.

[0032] Die Batterieanordnung **110** umfasst ferner eine Positivanschluss-Leiterschiene **114**, die an einem Ende mit dem Positivanschluss-Streifen (d.h. Kontakt) der Batterie **112** verbunden (z. B. gelötet) ist. Das andere Ende der Positivanschluss-Leiterschiene **114** ist mit einer leitenden Schleife **116** versehen, die um ein freiliegendes Leiterende **18a** eines Kabelleiters für das positive Kabel **18** gewickelt und damit verbunden (beispielsweise gecrimpt und/oder gelötet) ist.

[0033] Wie in den **Fig.** 5 und **Fig.** 6 gezeigt ist, kann die Positivanschluss-Leiterschiene **114** beispielsweise L-förmig sein, um eine quadratische Ecke des rechteckig geformten Gehäuses **112a** der Batterie **112** zu umschließen (z. B. beim Betrachten der Batterie **112** in der Draufsicht). Die L-förmige Positivanschluss-Leiterschiene **114** erstreckt sich entlang eines Endes der Batterie **112** und entlang zumindest eines Abschnitts der Seite der Batterie **112**, wie in der **Fig.** 6 gezeigt ist.

[0034] Die Positivanschluss-Leiterschiene **114** kann auch mechanisch mit der äußeren Oberfläche des Batteriegehäuses **112a** gekoppelt und/oder an diese geklebt sein, um eine zusätzliche strukturelle Unterstützung und Stabilität davon bereitzustellen (z. B.

um mechanische Stöße im Falle eines versehentlichen Fallenlassens der Batteriestarthilfevorrichtung **10** zu überstehen). Zum Beispiel kann die Positivanschluss-Leiterschiene **114** mit dem Batteriegehäuse **112a** durch Klebstoff (z. B. Silikonklebstoff), doppelseitiges Klebeband, doppelseitiges Schaumstoffband, isolierenden Kunststoff oder Keramikverbinder mit einer Schnappverschlussverbindung und/oder einen mechanischen Verschluss mechanisch verbunden sein.

[0035] Das positive Kabel **18** umfasst einen gebogenen Kabelabschnitt **118**, der das positive Kabel **18** mit der Positivanschluss-Leiterschiene **114** verbindet. Der gebogene Kabelabschnitt **118** umfasst einen äußeren Hülsenabschnitt **118a**, der in eine flexible Hülse **120** übergeht. Die flexible Hülse **120** umfasst einen äußeren Hülsenabschnitt **120a**, der außen relativ zu dem Gehäuse **112** der Batteriestarthilfevorrichtung **10** angeordnet ist, und einen flexiblen inneren Hülsenabschnitt **120b**, der innen relativ zu dem Gehäuse **112** der Batteriestarthilfevorrichtung **10** angeordnet ist.

[0036] Die flexible Hülse **120** ist konfiguriert, um die Verbindung zwischen dem positiven Kabel **18** und dem Gehäuse **112** der Batteriestarthilfevorrichtung **10** zu verstärken, während sie flexibel bleibt. Zum Beispiel ist die flexible Hülse **120** mit einer oder mehreren Nuten **124** (in **Fig.** 3 sind drei (3) gezeigt) versehen, die die äußere Hülse **18a** des positiven Kabels **18** freilegen. Die eine oder die mehreren Nuten **124** wirken als Scharniere, um das Biegen des positiven Kabels **18** an der Stelle des flexiblen äußeren Hülsenabschnitts **120** zu erleichtern.

[0037] Die flexible Hülse **120** umfasst ferner einen äußeren Flansch **124**, der von einem inneren Flansch **126** beabstandet ist, wobei eine Nut **125** dazwischen definiert ist. Zum Beispiel ist der äußere Flansch **124** von dem inneren Flansch **126** um einen Abstand beabstandet, der gleich der Wanddicke des Gehäuses **12** ist. Die Flansche **124**, **126** sind konfiguriert, um den flexiblen Verbinder **120** zusammen mit dem positiven Kabel **18** an dem Gehäuse **12** der Batteriestarthilfevorrichtung **10** zu verankern. Ein Hülsenabschnitt **128** (**Fig.** 6) des flexiblen Verbinders **120** verbindet den äußeren Flansch **126** und den inneren Flansch **128** miteinander. Zum Beispiel wird die flexible Hülse **120** separat gegossen und an dem positiven Kabel **18** montiert oder auf das positive Kabel **18** gegossen, um eine einzelne Einheit zu bilden. Zum Beispiel wird der flexible äußere Hülsenabschnitt **120** mit einem Abschnitt des positiven Kabels **18** spritzgegossen, der während des Gießvorgangs in die Form eingesetzt ist. Alternativ wird der flexible äußere Hülsenabschnitt **120** separat hergestellt (z. B. gegossen) und dann auf einem Abschnitt des positiven Kabels **18** installiert oder montiert. Zum Beispiel umfasst das positive Kabel **18** einen inneren Leiter (z.B. einen massiven Drahtleiter oder einen mehrsträngigen Metalldrahtleiter, beispielsweise aus Kupfer, Aluminium) und eine äußere isolierende Hülse **18a** (z.B. eine gegossene Kunststoffhülse). Die flexible Hülse **120** kann auf die äußere Hülse **18a** des positiven Kabels **18** aufgebracht sein (z. B. gegossen oder installiert oder zusammengebaut) und diese umschließen.

[0038] Die Batterieanordnung **110** umfasst ferner eine Negativanschluss-Leiterschiene **130**, die an einem Ende mit dem Negativanschluss-Streifen (d. h. Kontakt) der Batterie **112** verbunden (z. B. gelötet) ist. Das andere Ende der Negativanschluss-Leiterschiene **130** ist mit einem Negativanschluss-Leiterschienen-Verbinderabschnitt **132** versehen, wie in **Fig.** 5 gezeigt ist.

[0039] Die Negativanschluss-Leiterschiene **130** kann L-förmig sein, um sich um eine Ecke der rechteckig geformten Batterie **112** zu wickeln, wie es in **Fig.** 6 gezeigt ist. Die L-förmige Negativanschluss-Leiterschiene **130** erstreckt sich entlang eines Endes der Batterie **112** und entlang zumindest eines Abschnitts der Seite der Batterie **112**.

[0040] Die Negativanschluss-Leiterschiene **130** kann auch mechanisch mit der äußeren Oberfläche des Batteriegehäuses **112a** gekoppelt und/oder an diese geklebt sein, um eine zusätzliche Abstützung und Stabilität davon bereitzustellen (z. B. um einen mechanischen Stoß im Falle eines versehentlichen Herunterfallens der Batteriestarthilfevorrichtung **10** zu überstehen). Zum Beispiel kann die Negativanschluss-Leiterschiene **114** mechanisch mit dem Batteriegehäuse **112a** durch Klebstoff (z. B. Silikonkleber), doppelseitiges Klebeband, doppelseitiges Schaumstoffband, isolierenden Kunststoff oder Keramikverbinder mit Schnappverbindung und/oder mechanische Verschlüsse verbunden sein.

[0041] Die Batterieanordnung **110** umfasst ferner eine Smart-Switch(intelligente Schalter)-Batterie-Schnittstelle **134**, wie in **Fig.** 5 gezeigt ist. Die Smart-Switch-Batterie-Schnittstelle **134** umfasst eine Leiterplatte **136** mit einer ersten Leiterplattenleiterschiene **138**, die von einer zweiten Leiterplattenleiterschiene **140** beabstandet ist, wobei sich beide auf einer Seite der Leiterplatte **136** befinden, wie in **Fig.** 5 gezeigt ist.

[0042] Ein Paar von Relais **142** ist an einer gegenüberliegenden Seite der Leiterplatte **136** montiert. Die Relais **142** weisen Relaisverankerungsstifte **142a** auf, die sich durch die Schlitze **136a** in der Leiterplatte **136** erstrecken (**Fig.** 5). Die Relais **142** umfassen ferner erste Relaisverbinderstifte **142b**, die sich durch die Schlitze in der Leiterplatte **136** und durch Schlitze **132a** im Negativanschluss-Leiterschienen-Verbinderabschnitt **132** erstrecken. Die Relais **142** umfassen ferner zweite Relaisverbinderstifte **142c**, die sich durch die Schlitze in der Leiterplatte **136**, Fenster

WINPLUS Ex. 1003, p. 847

138a der ersten Leiterplatten-Leiterschiene **138**, und Schlitze **132a**, die in der ersten Leiterschiene **138** vorgesehen sind, erstrecken. Die Relaisverankerungsstifte **136a** sind an Ort und Stelle gelötet, um die Relais **142** mechanisch mit der Leiterplatte **136** zu verbinden. Die Relaisverbindungsstifte **142b** und **142c** sind an Ort und Stelle gelötet, um die Relais **142** mechanisch und elektrisch entsprechend mit den Leiterplatten-Leiterplatten **138**, **140** zu verbinden.

[0043] Die Schlitze **136a** in der Leiterplatte **136** sind beispielsweise rechteckig (**Fig.** 5) und nehmen die rechteckigen Relaisverankerungsstifte **142a** auf. Insbesondere ist ein Basisabschnitt der Relaisverankerungsstifte **142a** rechteckförmig und geht in quadratische Enden über. Die quadratischen Enden sind dimensionsmäßig weniger breit gegenüber den Basisabschnitten, wobei Querkanten erzeugt werden, die bündig mit der Außenfläche der Leiterplatte **136** ausgerichtet sind. Wenn Lot auf die freiliegenden Enden der Relaisverankerungsstifte **142a** aufgebracht wird, verbindet sich das Lot mit den Seiten der quadratischen Enden und Querkanten, um die Relaisverankerungsstifte **142a** an der Leiterplatte **136** zu verankern und zu verriegeln.

[0044] Die Schlitze **132a** sind im Negativanschluss-Leiterschienen-Verbinderabschnitt **132** vorgesehen, und die Schlitze **138a** in der ersten Leiterplatten-Leiterschiene **138** sind rechteckig geformt. Die Schlitze **140a** in der zweiten Leiterplatten-Leiterschiene **140** (**Fig.** 5) sind T-förmig, um die drei (3) horizontal ausgerichteten Relaisverbinderstifte **142b** aufzunehmen. Die Enden der Relaisverbinderstifte **142b** sind bündig mit der Außenfläche des Negativanschluss-Leiterschienen-Verbinderabschnitts **132** gezeigt. Wenn Lot auf die freigelegten Enden der Relaisverbinderstifte **142b** aufgebracht wird, füllt das Lot die Schlitze **132a** im Negativanschluss-Leiterschienen-Verbinderabschnitt **132** und die Schlitze **138a** der ersten Leiterplatten-Leiterschiene **138** und verbindet die Seiten der Verbinderstifte **142b** mit Innenkanten der Schlitze **132a** und Schlitze **138a** zum Verankern der Relais **142** an der Leiterplatte **136** und dem Negativanschluss-Leiterschienen-Verbinderabschnitt **132**. Dieses aufgebrachte Lot verbindet auch elektrisch den Negativanschluss-Leiterschienen-Verbinderabschnitt **132** mit der ersten Leiterplatten-Leiterschiene **138**.

[0045] Die Schlitze **140a**, die in der zweiten Leiterplatten-Leiterschiene **140** vorgesehen sind, sind T-förmig, um die drei (3) vertikal ausgerichteten zweiten Relaisverbindungsstifte **142c** aufzunehmen. Die zweiten Relaisverbinderzinken **142c** erstrecken sich von der äußeren Oberfläche der Leiterplatte **136** nach außen, um eine Verbindung mit dem freigelegten Kabelende **14a** des negativen Kabels **14** herzustellen, wie in **Fig.** 9 gezeigt ist. Wenn Lot auf die Enden der zweiten Relaisverbinderzinken **142c** aufgebracht wird, füllt das Lot die T-förmigen Schlitze **140a** (**Fig.** 5) und verbindet die zweiten Relaisverbinderzinken **140c** elektrisch mit der zweiten Leiterplatten-Leiterschiene **140**. Das freiliegende Kabelende **22a** des negativen Kabels **22** ist an die zweiten Relaisverbinderzinken **142c** (**Fig.** 5) angelötet, wie in **Fig.** 9 gezeigt ist.

[0046] Der Negativanschluss-Leiterschienen-Verbinderabschnitt **132** der Negativanschluss-Leiterschiene **130** ist mit der ersten Leiterplatten-Leiterschiene **138** der Leiterplatte **136** verbunden (z. B. durch Löten). Wiederum ist das freigelegte Kabelende **22a** (d. h. mit entfernter Isolierhülse) des negativen Kabels **22** mit der zweiten Leiterplatten-Leiterschiene **140** verbunden (z. B. durch Löten), wie in **Fig.** 9 gezeigt ist. Das negative Kabel **22** ist mit einer flexiblen Hülse **118** versehen, wie in **Fig.** 11 gezeigt ist.

[0047] Als eine Alternative zu der Anordnung des gebogenen Kabelverbinders **118** (**Fig.** 5) ist eine Diodenvorrichtung **150** auf dem flexiblen Kabelverbinder **118** installiert (d. h. in diesen eingespleißt), wie in **Fig.** 10 gezeigt ist. Die Diodenvorrichtung **150** umfasst eine Leiterplatte **152**, die mit einem Satz von Rückladungsdioden **154** versehen ist, der an einer Seite davon angeordnet ist, und eine Leiterschiene **156**, die an einer gegenüberliegenden Seite der Leiterplatte **152** vorgesehen ist.

ANORDNUNG

[0048] Die Batteriestarthilfevorrichtung **10** umfasst das Gehäuse **12** mit einem oberen Gehäuseabschnitt **12a** und einem unteren Gehäuseabschnitt **12b**, wie in **Fig.** 11 gezeigt ist. Der obere Gehäuseabschnitt **12a** und der untere Gehäuseabschnitt **12b** sind konfiguriert, um miteinander verbunden zu werden, wenn die Batteriestarthilfevorrichtung **10** zusammengebaut wird.

[0049] Die Batteriestarthilfevorrichtung **10** umfasst ferner die Batterieanordnung **110** und eine Steuerungsanordnung **210**, die beide im Gehäuse **12** angeordnet sind, wenn die Batteriestarthilfevorrichtung **10** zusammengebaut ist, wie in **Fig.** 11 gezeigt ist. Die Steuerungsanordnung **210** umfasst eine Leiterplatte **212**, die benachbart zu einer anderen Leiterplatte **214** angeordnet ist.

[0050] Der positive Anschluss der Batterieanordnung **110** ist mit der Leiterplatte **212** über einen positiven Stromdraht **216** verbunden, wie in **Fig.** 11 gezeigt ist. Zum Beispiel ist der positive Stromdraht **216** an die positive Leiterschiene **114** (**Fig.** 5) gelötet. Der negative Anschluss der Batterieanordnung **110** ist über einen negativen Stromdraht **218** mit der Leiterplatte **214** verbunden.

WINPLUS Ex. 1003, p. 848

[0051] Die Relais-Leiterplatte **136** ist mit einem Drahtsatz **220** versehen, der einen Verbinder **222** aufweist, wie in **Fig.** 11 gezeigt ist. Der Verbinder **222** ist konfiguriert, um während des Zusammenbaus der Batteriestarthilfevorrichtung **10** mit dem Relaisplatinenverbinder **224**, der sich auf der Leiterplatte **212** der Steuerungsanordnung **210** befindet, verbunden zu werden, wie in **Fig.** 11 gezeigt ist.

[0052] Die Batterieanordnung **110** umfasst ferner einen Drahtsatz **226** mit einem Verbinder **228**, wie in **Fig.** 11 gezeigt ist. Der Verbinder **228** ist konfiguriert, um mit dem Batteriezellen-Lade/Überwachungs-Verbinder **230** verbunden zu werden, der sich auf der Leiterplatte **212** der Steuerungsanordnung **220** befindet.

[0053] Die Batterieanordnung **110** umfasst auch einen Batterietemperatursensor mit einem Drahtsatz **232**, der einen Verbinder **234** aufweist, wie in **Fig.** 11 gezeigt ist. Der Verbinder **234** ist konfiguriert, um mit dem Temperatursensorverbinder **236** verbunden zu werden, der sich auf der Leiterplatte **212** der Steuerungsanordnung **220** befindet.

[0054] Die Leiterplatte **212** ist mit Ladungsleistungswiderständen **240** und einem Ausgangsrelais **242** versehen, wie in **Fig.** 11 gezeigt ist. Ferner ist der untere Gehäuseabschnitt **12a** mit einem Hauptnutzungs-Ausgangsverbinder **244**, der einen Drahtsatz **246** aufweist, der mit der Leiterplatte **214** verbunden ist, und ein Hauptnutzungs-Eingangsverbinder **248**, der einen Drahtsatz **250**, der mit der Leiterplatte **214** verbunden ist, aufweist, versehen.

[0055] Die Batterieanordnung **110** ist mit der Batteriestarthilfevorrichtung **10** verbunden, wie in **Fig.** 11 gezeigt ist. Die Batterieanschlussvorrichtung **110** ist im montierten Zustand innerhalb des Gehäuses **12** der Batteriestarthilfevorrichtung **10** installiert.

Patentansprüche

1. Eine Batterieanordnungsvorrichtung für eine Batteriestarthilfevorrichtung mit einem intelligenten Schalter, wobei die Vorrichtung umfasst:
eine Batterie, die eine positive Anschlussleiste und eine negative Anschlussleiste umfasst;
eine Positivanschluss-Leiterschiene, die mit der positiven Anschlussleiste der Batterie verbunden ist;
eine Negativanschluss-Leiterschiene, die mit der negativen Anschlussleiste der Batterie verbunden ist;
ein positives Kabel, das mit der Positivanschluss-Leiterschiene verbunden ist; und
eine intelligente Schalter-Schnittstelle, die mit dem intelligenten Schalter der Starthilfevorrichtung verbindbar ist, wobei die intelligente Schalter-Schnittstelle eine Leiterplatte mit einer ersten Leiterplatten-Leiterschiene und einer zweiten Leiterplatten-Leiterschiene umfasst, die auf der Leiterplatte voneinander beabstandet sind, wobei die intelligente Schalter-Schnittstelle ferner ein oder mehrere Relais umfasst, die zwischen der ersten Leiterplatten-Leiterschiene und der zweiten Leiterplatten-Leiterschiene verbunden sind, um eine Isolation zwischen der negativen Anschlussleiste der Batterie und einer Batterie, die gestartet wird, bereitzustellen.

2. Eine Batterieanordnungsvorrichtung für eine Batteriestarthilfevorrichtung mit einem intelligenten Schalter, wobei die Vorrichtung umfasst:
eine rechteckförmige Batterie, die eine positive Anschlussleiste und eine negative Anschlussleiste umfasst;
eine Positivanschluss-Leiterschiene, die mit der positiven Anschlussleiste der Batterie verbunden ist;
eine Negativanschluss-Leiterschiene, die mit der negativen Anschlussleiste der Batterie verbunden ist;
ein positives Kabel, das mit der Positivanschluss-Leiterschiene über einen flexiblen Kabelverbinder verbunden ist; und
eine intelligente Schalter-Schnittstelle, die mit dem intelligenten Schalter der Starthilfevorrichtung verbindbar ist, wobei die intelligente Schalter-Schnittstelle eine Leiterplatte mit einer ersten Leiterplatten-Leiterschiene und einer zweiten Leiterplatten-Leiterschiene umfasst, die auf der Leiterplatte voneinander beabstandet sind, wobei die intelligente Schalter-Schnittstelle ferner ein oder mehrere Relais umfasst, die zwischen der ersten Leiterplatten-Leiterschiene und der zweiten Leiterplatten-Leiterschiene verbunden sind, um eine Isolation zwischen der negativen Anschlussleiste der Batterie, die gestartet wird, bereitzustellen.

3. Eine Batterieanordnungsvorrichtung für eine Batteriestarthilfevorrichtung mit einem intelligenten Schalter, wobei die Vorrichtung umfasst:
eine rechteckförmige Batterie, die eine positive Anschlussleiste und eine negative Anschlussleiste umfasst, die jeweils an gegenüberliegenden Enden der Batterie angeordnet sind;
eine L-förmige Positivanschluss-Leiterschiene, die mit der positiven Anschlussleiste der Batterie verbunden ist, wobei sich der L-förmige Positivanschluss um eine Ecke der Batterie biegt und sich entlang wenigstens eines Abschnitts einer Seite der Batterie erstreckt;
eine L-förmige Negativanschluss-Leiterschiene, die mit der negativen Anschlussleiste der Batterie verbunden ist, wobei sich der L-förmige Negativanschluss um eine Ecke der Batterie biegt und sich entlang wenigstens eines Abschnitts einer Seite der Batterie erstreckt;
ein positives Kabel, das mit der Positivanschluss-Leiterschiene verbunden ist; und
eine intelligente Schalter-Schnittstelle, die mit dem intelligenten Schalter der Starthilfevorrichtung verbindbar ist, wobei die intelligente Schalter-Schnittstelle eine Leiterplatte mit einer ersten Leiterplatten-Leiterschiene und einer zweiten Leiterplatten-Leiter-

schiene umfasst, die auf der Leiterplatte voneinander beabstandet sind, wobei die intelligente Schalter-Schnittstelle ferner ein oder mehrere Relais umfasst, die zwischen der ersten Leiterplatten-Leiterschiene und der zweiten Leiterplatten-Leiterschiene verbunden sind, um eine Isolation zwischen der negativen Anschlussleiste der Batterie, die gestartet wird, bereitzustellen.

4. Die Vorrichtung nach Anspruch 1, wobei das Relais Mehrfachrelais enthält, die parallel zwischen der ersten Leiterplatten-Leiterschiene und der zweiten Leiterplatten-Leiterschiene verbunden sind.

5. Die Vorrichtung nach Anspruch 1, wobei die Negativanschluss-Leiterschiene die Batterie mechanisch und elektrisch mit der intelligente Schalter-Batterieschnittstelle verbindet.

6. Die Vorrichtung nach Anspruch 5, wobei die intelligente Schalter-Batterieschnittstelle oberhalb und neben der Batterie durch die Negativanschluss-Leiterschiene positioniert ist.

7. Die Vorrichtung nach Anspruch 1, wobei ein Ende des positiven Kabels so konfiguriert ist, dass es ein freiliegendes Kabelleiterende des positiven Kabels zumindest teilweise umschlingt.

8. Die Vorrichtung nach Anspruch 1, wobei die Positivanschluss-Leiterschiene an die positive Anschlussleiste der Batterie ultraschallgeschweißt ist und die Negativanschluss-Leiterschiene an die negative Anschlussleiste der Batterie ultraschallgeschweißt ist.

9. Die Vorrichtung nach Anspruch 1, wobei die Batterie rechteckig ist und die Positivanschluss-Leiterschiene und die Negativanschluss-Leiterschiene L-förmig sind und um eine jeweilige Ecke der Batterie gewickelt sind.

10. Die Vorrichtung nach Anspruch 9, wobei die Batterievorsprünge bündig mit einem Gehäuse der Batterie montiert sind.

11. Die Vorrichtung nach Anspruch 1, wobei das positive Kabel durch einen flexiblen Kabelverbinder mit der Positivanschluss-Leiterschiene verbunden ist.

12. Die Vorrichtung nach Anspruch 11, wobei der flexible Kabelverbinder einen flexiblen äußeren Hülsenabschnitt und einen flexiblen inneren Hülsenabschnitt aufweist.

13. Die Vorrichtung nach Anspruch 12, wobei der flexible äußere Hülsenabschnitt einen äußeren Flansch umfasst und der flexible innere Hülsenabschnitt einen inneren Flansch umfasst, wobei der äußere Flansch und der innere Flansch eine Gehäusewand der Batteriestarthilfevorrichtung dazwischen einschließen.

14. Die Vorrichtung nach Anspruch 11, wobei der flexible Kabelverbinder einen inneren Serpentinen-Kabelabschnitt aufweist.

15. Die Vorrichtung nach Anspruch 14, wobei der flexible Kabelverbinder konfiguriert ist, um das positive Kabel aufzunehmen, das in einem Winkel relativ zu einer Gehäusewand der Batteriestarthilfevorrichtung ausgerichtet ist, und der innere Serpentinen-Kabelabschnitt konfiguriert ist, um eine Fehlausrichtung zwischen dem Winkel relativ zur Gehäusewand und einem Befestigungswinkel des inneren Serpentinen-Kabelabschnitts mit der Positivanschluss-Leiterschiene aufzunehmen.

Es folgen 11 Seiten Zeichnungen

WINPLUS Ex. 1003, p. 850

Anhängende Zeichnungen

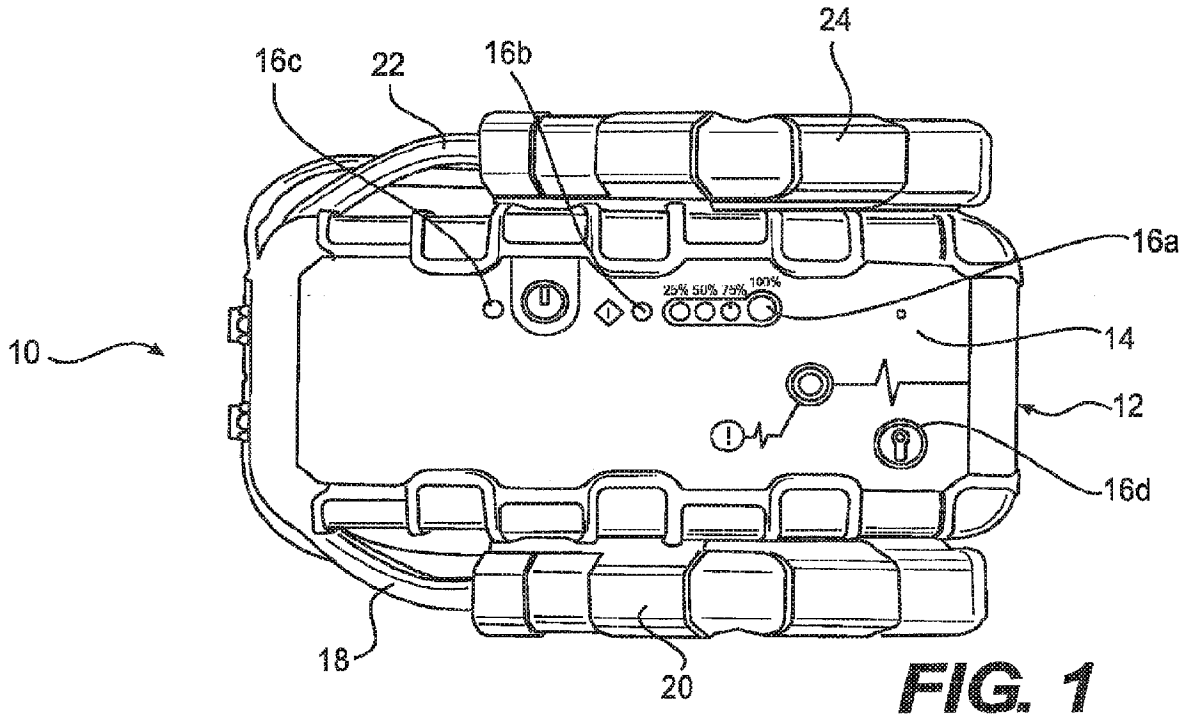


FIG. 1

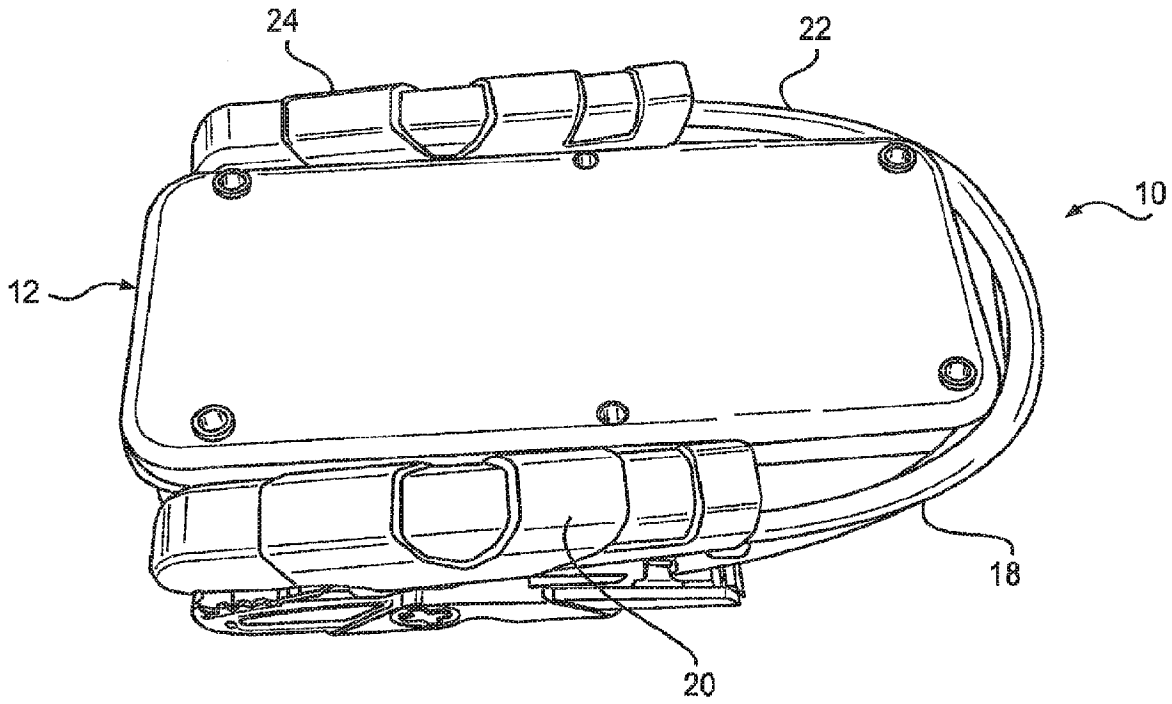


FIG. 2

WINPLUS Ex. 1003, p. 851

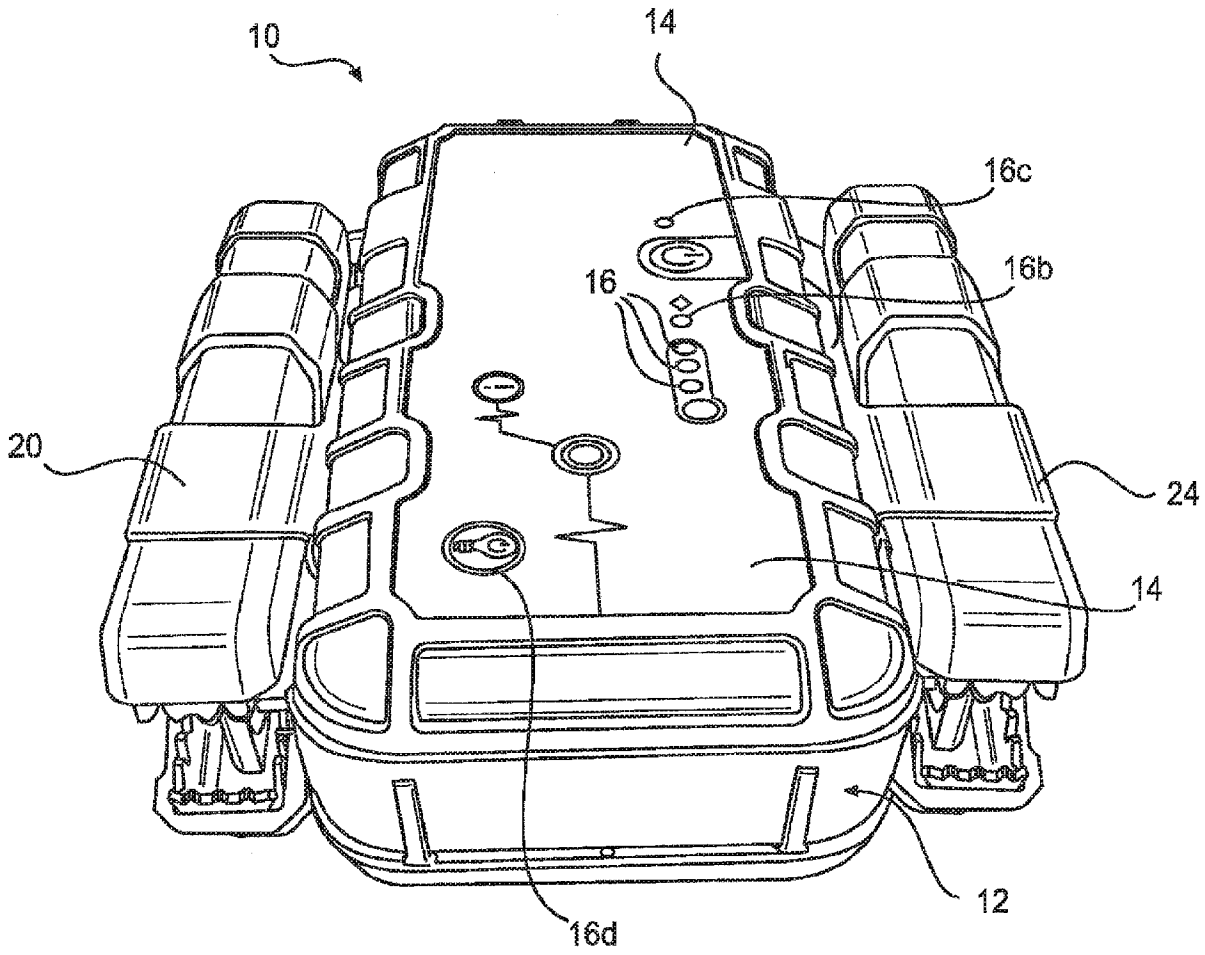


FIG. 3

WINPLUS Ex. 1003, p. 852

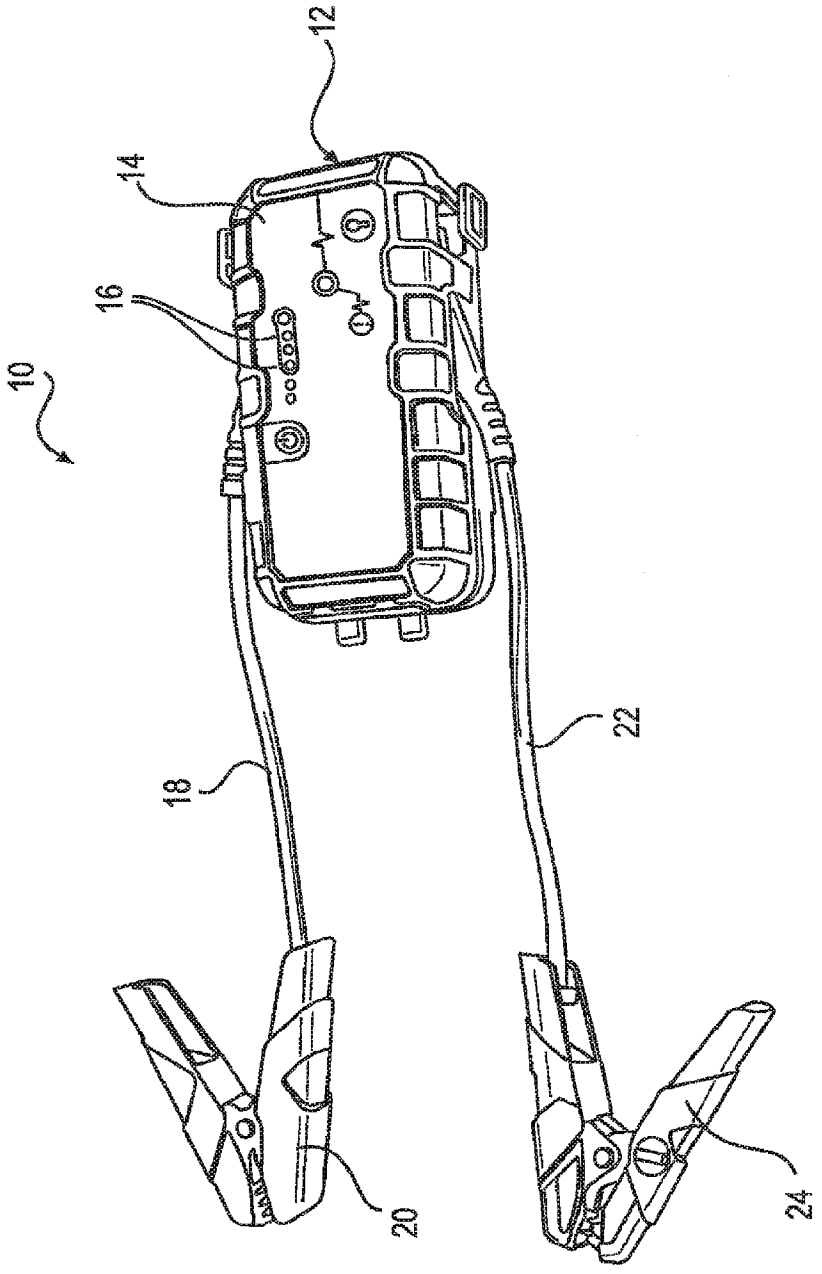


FIG. 4

WINPLUS Ex. 1003, p. 853

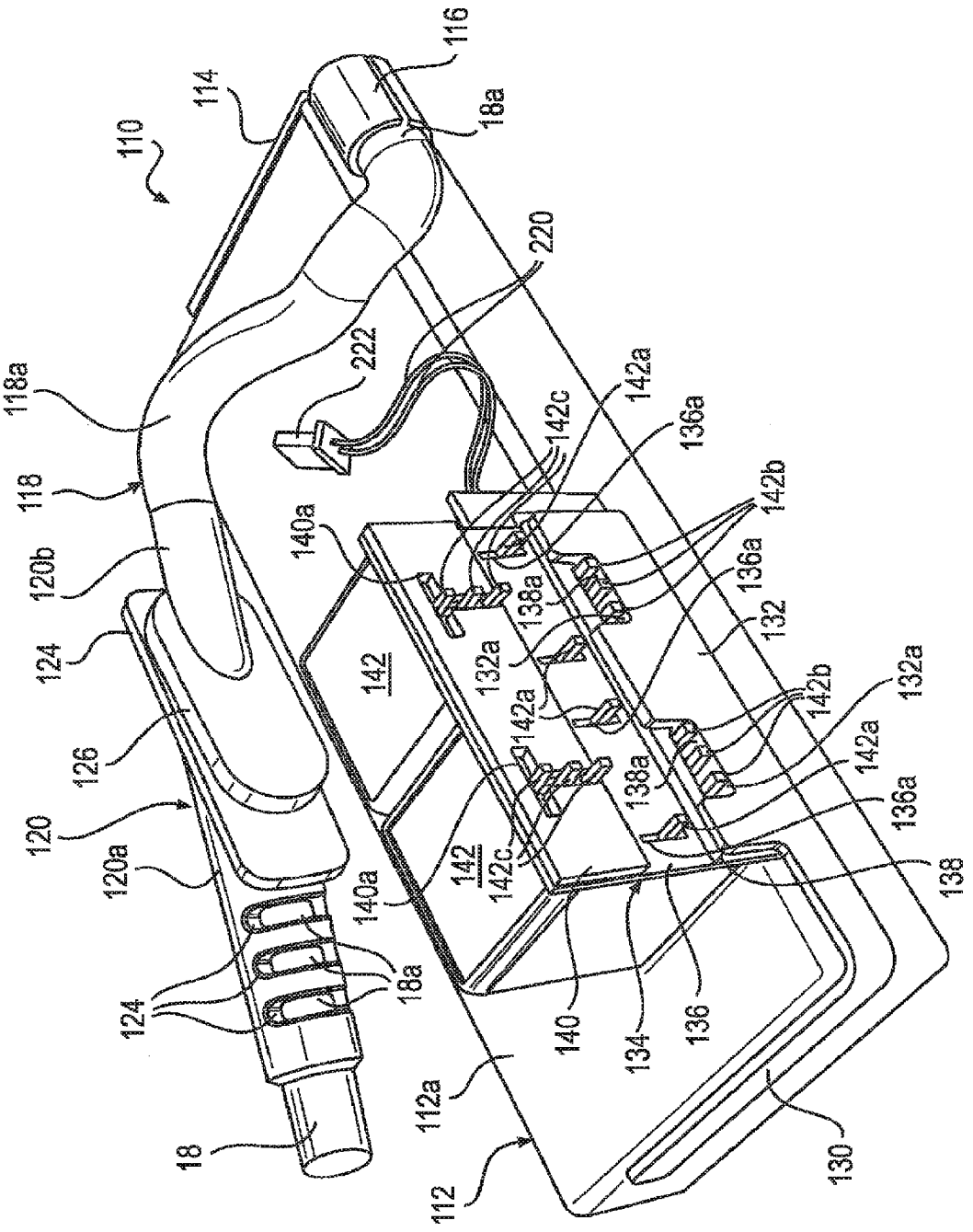


FIG. 5

 WINPLUS Ex. 1003, p. 854

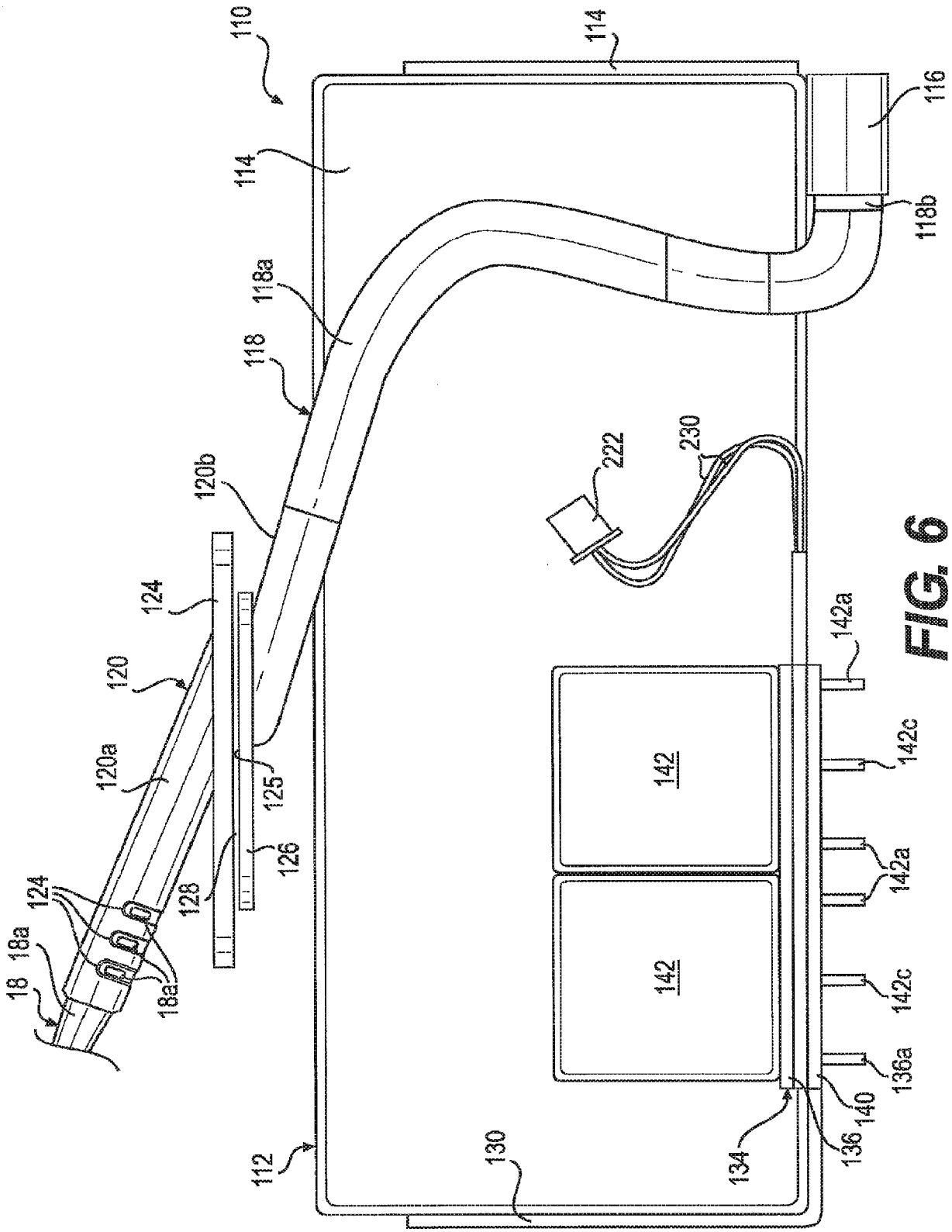

110
114
116
114
118b
118a
118
120b
222
230
124
120
142a
120a
142c
125
142
126
124
142a
128
18a
18
18a
142c
136a
140
136
134
130
112

FIG. 6

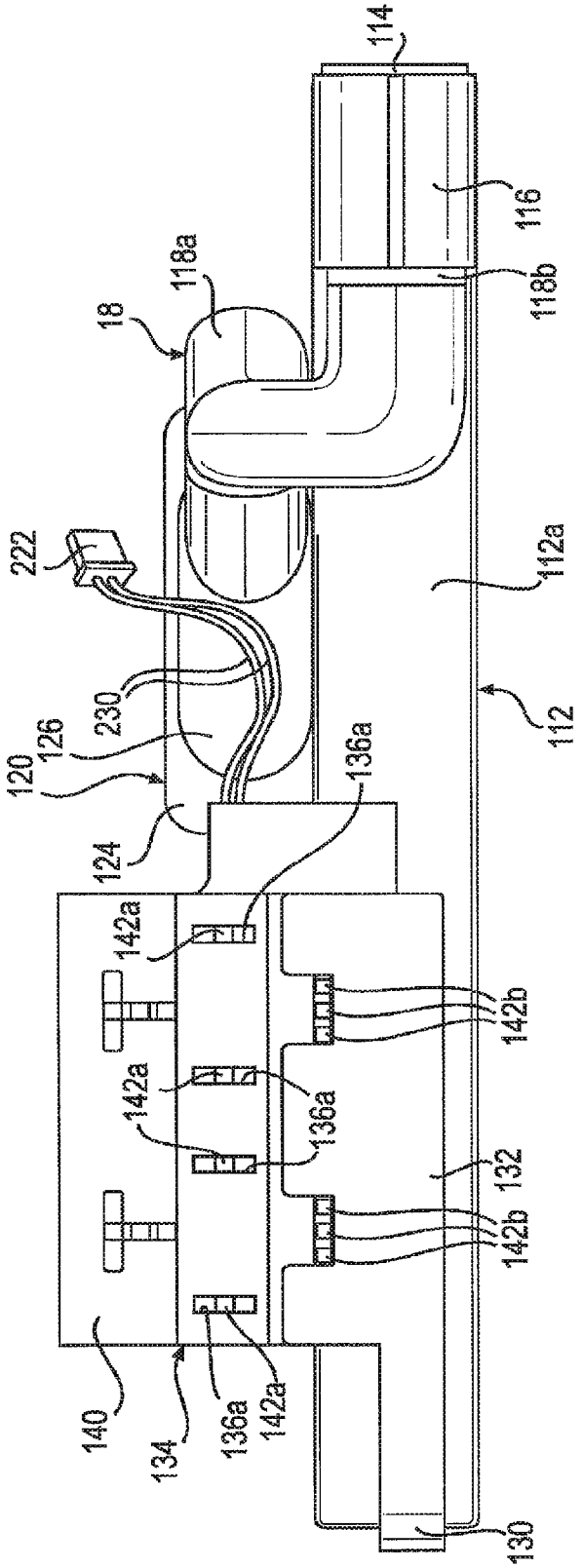

114
116
118a
118b
18
222
112a
230
126
120
112
136a
124
142a
142b
132
140
134
130

FIG. 7

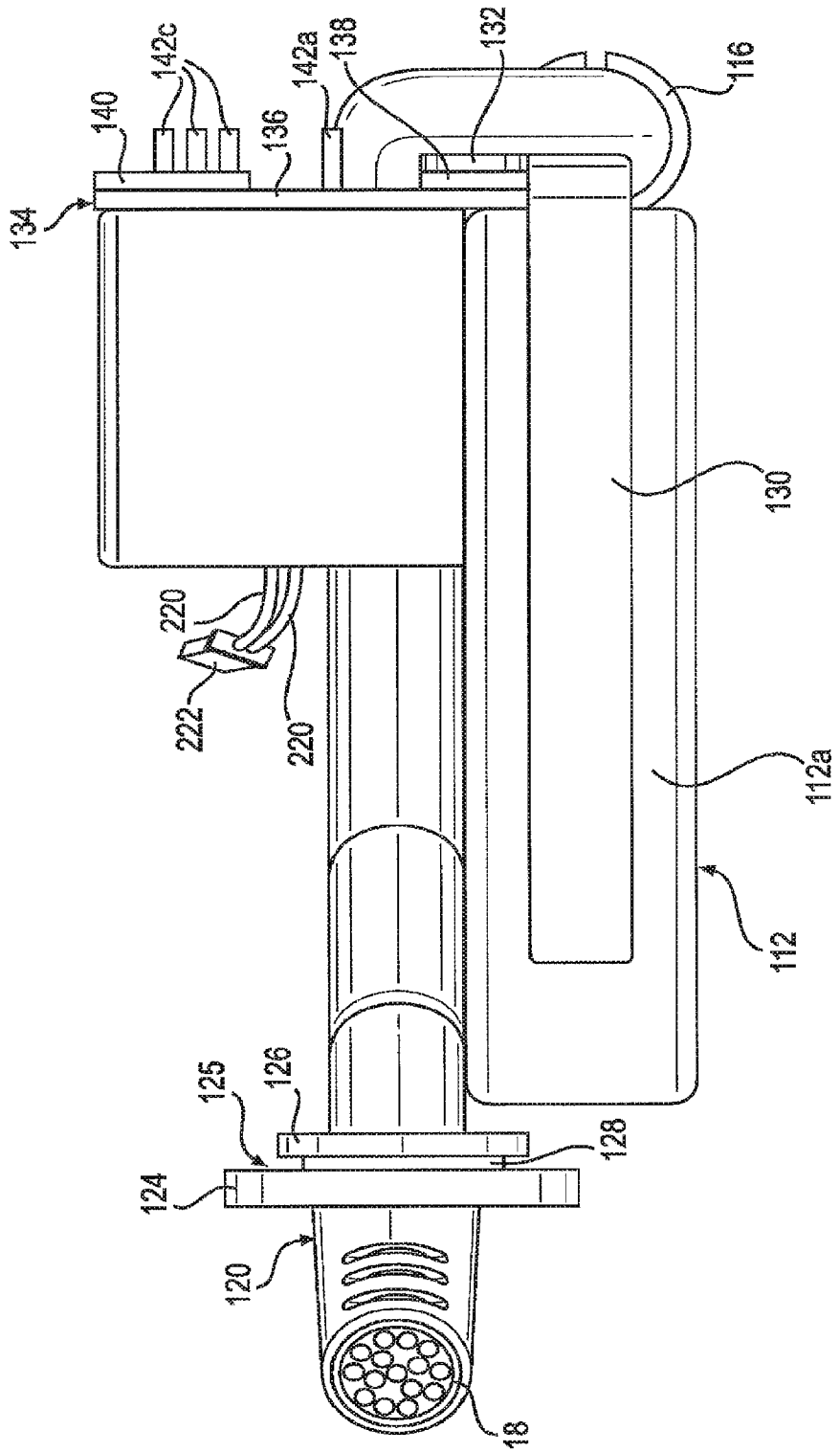


FIG. 8

WINPLUS Ex. 1003, p. 857

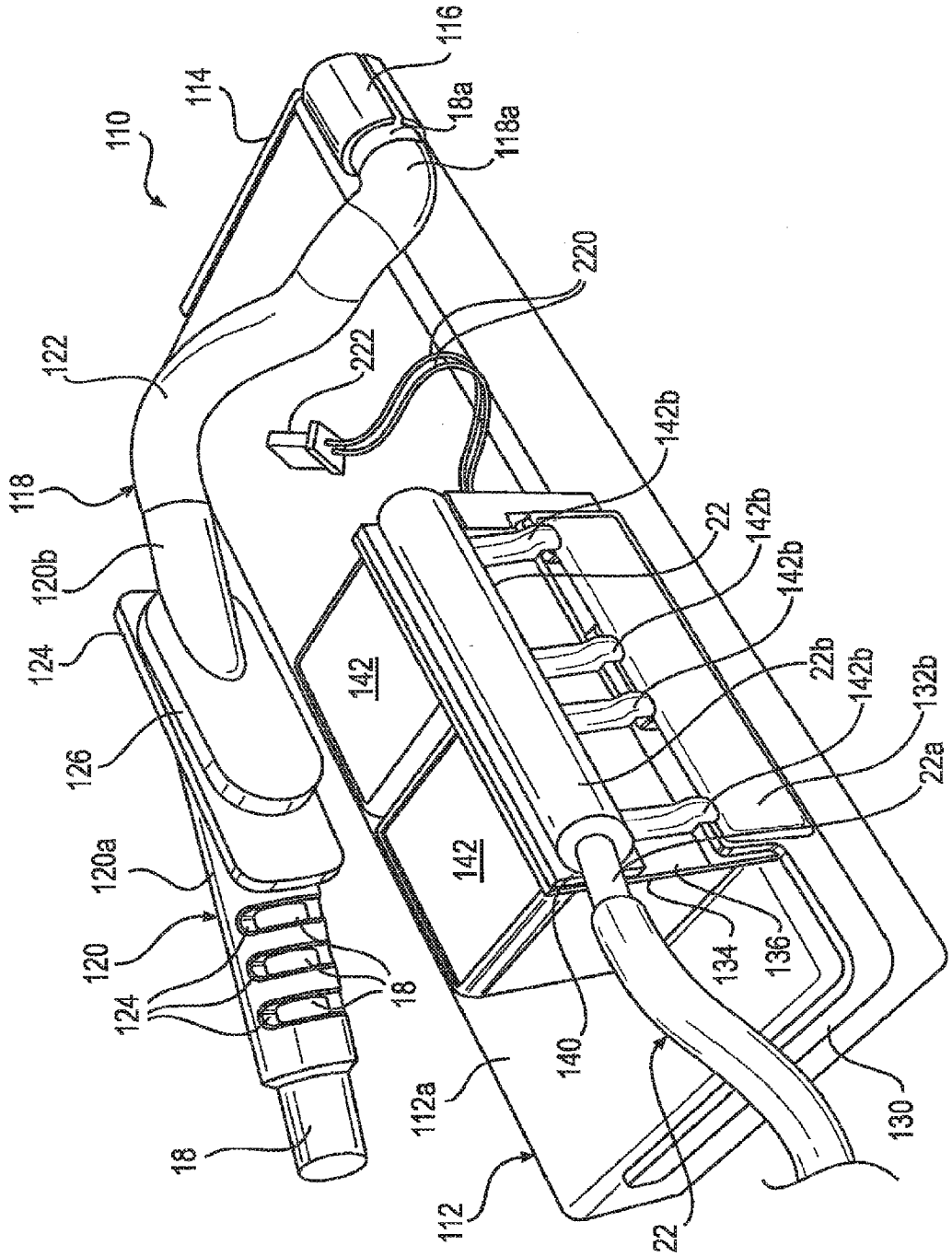


FIG. 9

 WINPLUS Ex. 1003, p. 858

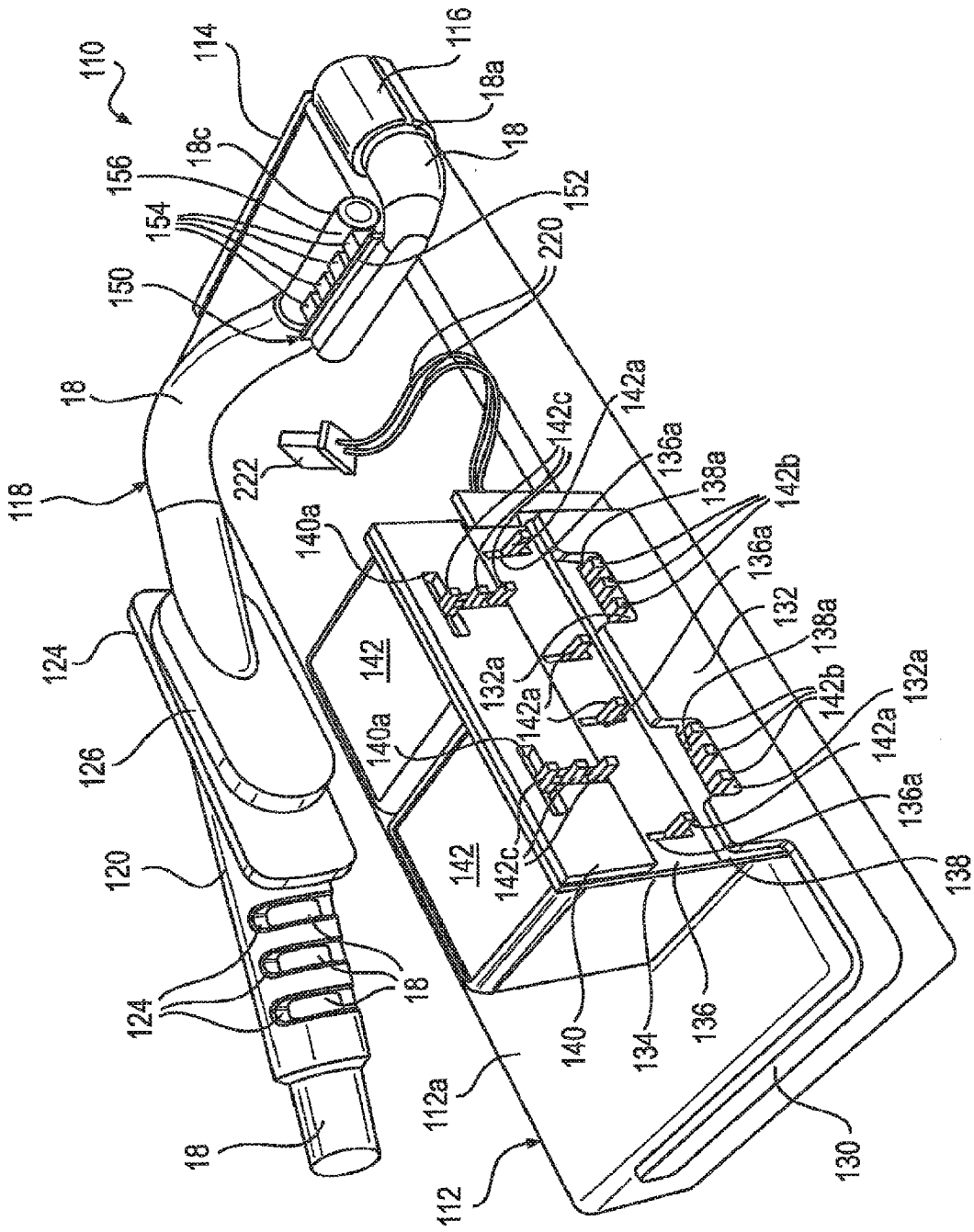


FIG. 10

WINPLUS Ex. 1003, p. 859

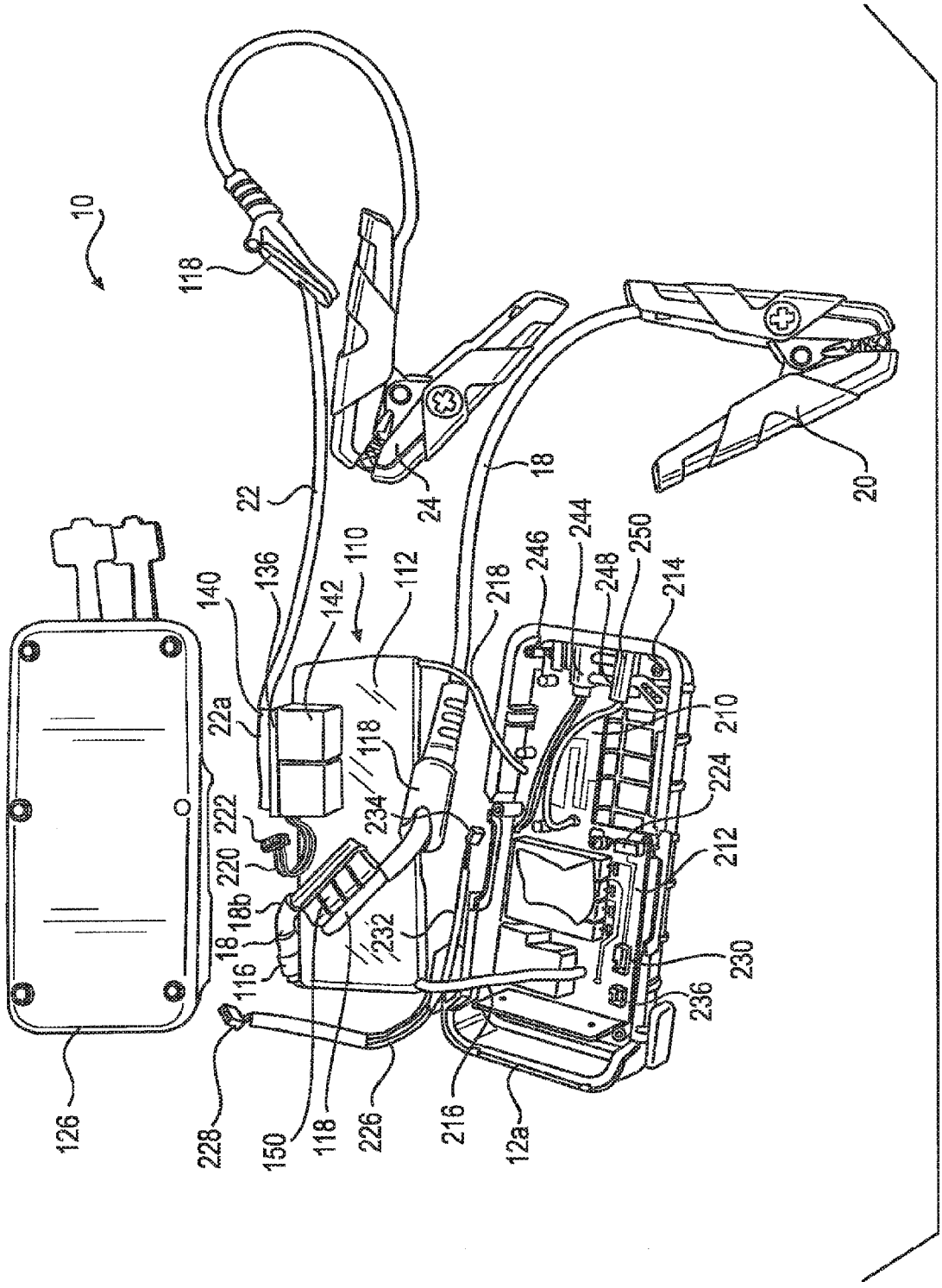


FIG. 11

 WINPLUS Ex. 1003, p. 860

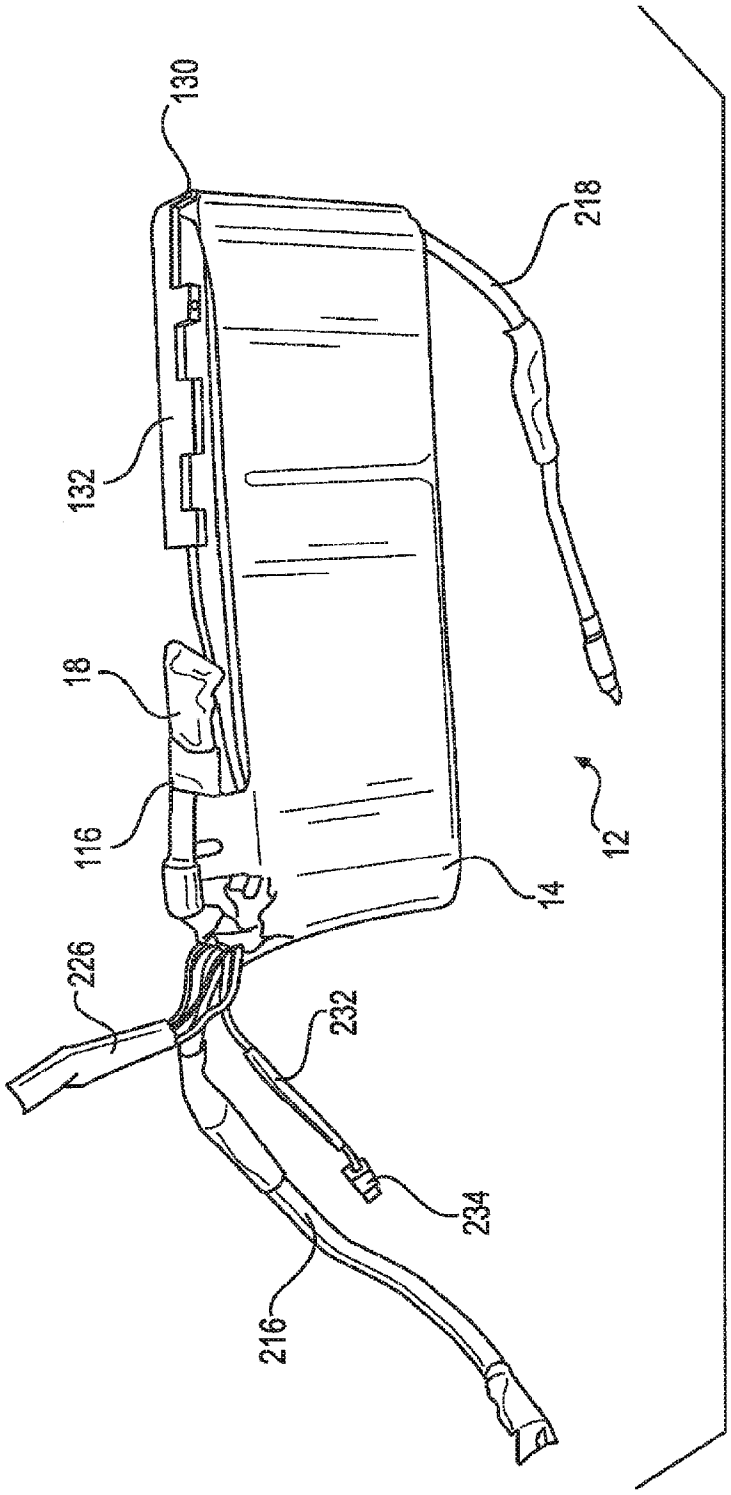


FIG. 12

WINPLUS Ex. 1003, p. 861

Espacenet

Bibliographic data: DE112016002206 (T5) — 2018-03-15

BATTERY ASSEMBLY DEVICE

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Applicant(s): NOCO CO [US] ± (The Noco Company)

Classification: **- international:** ***F02N11/14; H02J7/14***
- cooperative: **H01M2/30 (US); H01R11/24 (US); H02J1/122 (EP); H02J7/14 (EP, GB, US); H02J7/342 (GB);** F02N11/12 (EP); F02N11/14 (EP); H02J1/122 (US)

Application number: DE20161102206T 20160329

Priority number(s): US201662294067P 20160211 ; WO2016US24680 20160329

Also published as: AU2016392707 (A1) AU2016392707 (B2) AU2020200268 (A1) CA2957431 (A1) CN107852004 (A) more

Abstract not available for DE112016002206 (T5)
Abstract of corresponding document: WO2017138963 (A1)

The subject matter relates to a battery assembly device for use with an apparatus for jump starting a vehicle, and an apparatus for jump starting a vehicle comprising the battery assembly device. A battery assembly device for a battery jump starting device. The battery assembly is configured to maximize electrical conductivity from a battery pack of the battery jump starting device to a battery to be recharged.

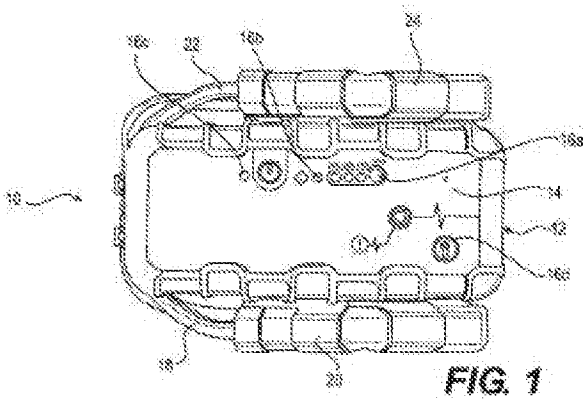

FIG. 1

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DESCRIPTION DE112016002206

AREA

[0001]

A battery placement device, for example, for use in a battery starting aid device is disclosed.

BACKGROUND

[0002]

There is a portable battery starter device for vehicles such as that described in U.S. Patent No. 9,007,015 to Nook et al. is disclosed.

The device uses a lithium ion battery pack. With this type of device, there is a need to maximize the conductivity from the battery pack of the device to the vehicle battery of the vehicle by providing jump start.

[0003]

There are two main factors that determine the results of successful starters. The first factor is the amount of energy provided by the lithium-ion battery pack, and the second factor is the maximum conductivity. Both are factors needed to have the best chance of starting large engines. One factor without the other is not enough.

SUMMARY

[0004]

The subject matter relates to a battery arrangement device for use with a device for starting a vehicle, and relates to a device for starting a vehicle with the battery arrangement device.

[0005]

The subject concerns the following aspects.

[0006]

A battery arrangement device comprising or consisting of a battery, at least one battery conductor being connected to a connection of the battery.

[0007]

A battery arrangement device comprising or consisting of a battery, at least one battery line being connected to a terminal strip of the battery.

[0008]

A battery arrangement device, comprising or consisting of a battery, wherein a positive battery conductor is connected to a positive connection contact of the battery and a negative battery conductor is connected to a negative connection contact of the battery.

[0009]

A battery arrangement device, comprising or consisting of a battery, wherein a positive battery conductor is connected to a positive connection contact of the battery and a negative battery conductor is connected to a negative connection contact of the battery, the battery conductors being soldered to the respective connection contacts of the battery.

[0010]

A battery arrangement device, comprising or consisting of a battery, wherein a positive battery conductor is connected to a positive connection contact of the battery and a negative battery conductor is connected to a negative connection contact of the battery, and a relay which is connected to one of the battery conductors of the battery.

[0011]

A battery assembly device comprising or consisting of a battery, wherein a positive battery conductor is connected to a positive terminal contact of the battery and a negative battery conductor is connected to a negative terminal contact of the battery, and a relay which is connected to the negative battery conductor.

[0012]

A battery assembly device comprising or consisting of a battery, wherein a positive battery conductor is connected to a positive terminal contact of the battery and a negative battery conductor is connected to a negative terminal contact of the battery, and a relay which is connected to the negative battery conductor.

[0013]

A battery assembly device comprising or consisting of a battery, wherein a positive battery conductor is connected to a positive connection contact of the battery and a negative battery conductor is connected to a negative connection contact of the battery, and a plurality of relays connected to the negative battery conductor.

[0014]

A battery assembly device comprising or consisting of a battery, wherein a positive battery conductor is connected to a positive terminal contact of the battery and a negative battery conductor is connected to a negative terminal contact of the battery, and a positive cable which is connected to the positive battery conductor.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015]

1 is a front perspective view of the battery starting aid device with the clamps fixed.

[0016]

FIG. 2 is a rear perspective view of the battery starting aid device shown in FIG. 1.

[0017]

FIG. 3 is an end perspective view of the battery starting aid device shown in FIGS. 1 and 2.

[0018]

FIG. 4 is a front perspective view of the battery starting aid device shown in FIG. 1, but with the clamps released.

[0019]

FIG. 5 is a perspective view of a battery placement device included in the battery starting aid device shown in FIG. 1 when installed therein but the negative cable is not yet installed.

[0020]

FIG. 6 is a top view of the battery placement device shown in FIG. 5.

[0021]

FIG. 7 is a front elevation view of the battery arranging device shown in FIG. 5.

[0022]

Fig. 8 is a side view of the bent cable connector for the positive cable.

[0023]

FIG. 9 is a perspective view of the battery array device shown in FIG. 5 with the negative cable connected to the battery array device.

[0024]

10 is a perspective view of the battery array device shown in FIG. 5 with a diode device installed on the positive cable.

[0025]

11 is a perspective view of the battery assembly device connected to other components or devices of the battery starting aid device.

[0026]

Fig. 12 is a perspective view of the battery pack device included in the battery starting aid device shown in Fig. 1 when installed therein.

DETAILED DESCRIPTION

[0027]

A battery starting aid device 10 is shown in FIGS. 1 and 2.

The battery starting aid device 10 comprises a housing 12 with a display 14 which is provided with an arrangement of light-emitting diodes 16 (LEDs).

The battery starting aid device 10 further comprises a positive cable 18 with a positive terminal 20 and a negative cable 22 with a negative terminal 24.

The positive cable 18 and negative cable 22 pass through openings 12a, 12b in the housing 12 and are wired to an internally located component (i.e., a battery placement device), which will be described in detail below.

[0028]

The clips 20, 24 are stowed or docked in a non-deployed mode by clamping each to a respective side post 26 that extends outwardly on opposite sides of the housing 12, as shown in FIG. 1.

The side posts 26 are shown in FIG. 2.

The clamps 20, 24 are docked when the battery starting aid 10 is not in use and are detached from the side posts 26 during use.

[0029]

The battery starting aid device 10 is set up for starting aid of a vehicle battery.

For example, the battery starting aid 10 may be the portable vehicle starting aid with a safety device disclosed in U.S. Patent No. 9,007,015, which is incorporated herein by reference in its entirety, or a device similar thereto.

[0030]

The battery starting aid device 10 includes a plurality of electrical components or parts that are located within the housing 12.

For example, the battery starting aid device 10 includes those shown in FIGS. 10 battery assembly 110 and the internal electrical components shown in FIG. 11.

[0031]

As shown in Figs. 10, the battery assembly 110 includes a battery 112.

For example, battery 112 is a rechargeable lithium-ion battery.

The battery assembly 110 is configured to maximize electrical conductivity from the battery 112 to the cables 18, 22 and terminals 20, 24 of the battery starting aid device 10.

The battery 112 comprises a housing, for example a rectangular housing 112a.

[0032]

The battery assembly 110 further includes a positive lead bar 114 which is connected at one end to the positive lead strip (i.e.

Contact) of the battery 112 connected (e.g.

B. soldered).

The other end of the positive terminal conductor rail 114 is provided with a conductive loop 116 which is wound around an exposed conductor end 18a of a cable conductor for the positive cable 18 and connected thereto (for example crimped and / or soldered).

[0033]

For example, as shown in FIGS. 5 and 6, the positive lead bar 114 may be L-shaped to enclose a square corner of the rectangular shaped housing 112a of the battery 112 (e.g.

B. when looking at the battery 112 in plan view).

The L-shaped positive terminal conductor rail 114 extends along one end of the battery 112 and along at least a portion of the side of the battery 112, as shown in FIG. 6.

[0034]

The positive lead bar 114 may also be mechanically coupled to and / or glued to the outer surface of the battery case 112a to provide additional structural support and stabilliy thereof (e.g.

To withstand mechanical shocks in the event of accidental dropping of the battery starting aid device 10).

For example, the positive lead bar 114 may be attached to the battery case 112a by adhesive (e.g.

B. silicone adhesive), double-sided adhesive tape, double-sided foam tape, insulating plastic or ceramic connector with a snap lock connection and / or a mechanical lock mechanically connected.

[0035]

The positive cable 18 includes a bent cable section 118 that connects the positive cable 18 to the positive terminal conductor rail 114.

The bent cable section 118 comprises an outer sleeve section 118a which merges into a flexible sleeve 120.

The flexible sleeve 120 includes an outer sleeve portion 120a that is located outside relative to the housing 112 of the battery starting aid device 10 and a flexible inner sleeve portion 120b that is located inside relative to the housing 112 of the battery starting aid device 10.

[0036]

The flexible sleeve 120 is configured to strengthen the connection between the positive cable 18 and the housing 112 of the battery starting aid device 10 while remaining flexible.

For example, flexible sleeve 120 is provided with one or more grooves 124 (three (3) shown in FIG. 3) that expose outer sleeve 18a of positive cable 18.

The one or more grooves 124 act as hinges to facilitate the bending of the positive cable 18 in place of the flexible outer sleeve portion 120.

[0037]

The flexible sleeve 120 further includes an outer flange 124 spaced from an inner flange 126 with a groove 125 defined therebetween.

For example, the outer flange 124 is spaced from the inner flange 126 by a distance equal to the wall thickness of the housing 12. The flanges 124, 126 are configured to anchor the flexible connector 120 together with the positive cable 18 to the housing 12 of the battery starting aid device 10. A sleeve portion 128 (FIG. 6) of the flexible connector 120 connects the outer flange 126 and the inner flange 128 together. For example, the flexible sleeve 120 is cast separately and mounted on the positive cable 18 or cast on the positive cable 18 to form a single unit. For example, the flexible outer sleeve portion 120 is injection molded with a portion of the positive cable 18 that is inserted into the mold during the molding process. Alternatively, the flexible outer sleeve portion 120 is manufactured separately (e.g. Cast) and then installed or assembled on a portion of the positive cable 18. For example, the positive cable 18 includes an inner conductor (e.g.

B. a solid wire conductor or a multi-strand metal wire conductor, for example made of copper, aluminum) and an outer insulating sleeve 18a (z. B. a cast plastic sleeve). The flexible sleeve 120 may be applied to the outer sleeve 18a of the positive cable 18 (e.g. Cast or installed or assembled) and enclose them.

[0038]

The battery assembly 110 further includes a negative lead bar 130 that is connected at one end to the negative lead strip (i.e. Contact) of the battery 112 connected (e.g. B. soldered). The other end of the negative terminal conductor rail 130 is provided with a negative terminal conductor rail connector portion 132, as shown in FIG. 5.

[0039]

The negative terminal lead bar 130 may be L-shaped to wrap around a corner of the rectangular-shaped battery 112, as shown in FIG. 6. The L-shaped negative terminal conductor rail 130 extends along one end of the battery 112 and along at least a portion of the side of the battery 112.

[0040]

The negative lead bar 130 may also be mechanically coupled and / or bonded to the outer surface of the battery case 112a to provide additional support and stability thereof (e.g. To withstand a mechanical shock in the event of accidental falling of the

battery starting aid device 10). For example, the negative lead bar 114 may be mechanically attached to the battery case 112a by adhesive (e.g. B. silicone adhesive), double-sided adhesive tape, double-sided foam tape, insulating plastic or ceramic connector with snap connection and / or mechanical closures.

[0041]

The battery assembly 110 further includes a smart switch battery interface 134, as shown in FIG. 5. The smart switch battery interface 134 includes a circuit board 136 having a first circuit board rail 138 spaced from a second circuit board rail 140, both of which are on one side of the circuit board 136, as shown in FIG. 5.

[0042]

A pair of relays 142 are mounted on an opposite side of the circuit board 136. The relays 142 have relay anchor pins 142a that extend through the slots 136a in the circuit board 136 (FIG. 5). The relays 142 further include first relay connector pins 142b that extend through the slots in the circuit board 136 and through slots 132a in the negative terminal busbar connector portion 132. The relays 142 further include second relay connector pins 142c that extend through the slots in the circuit board 136, windows 138a of the first circuit board conductor bar 138, and slots 132a that are provided in the first conductor rail 138. The relay anchor pins 136a are soldered in place to mechanically connect the relays 142 to the circuit board 136. The relay connector pins 142b and 142c are soldered in place to mechanically and electrically connect the relays 142 to the circuit board circuit boards 138, 140, respectively.

[0043]

The slots 136a in the circuit board 136 are, for example, rectangular (FIG. 5) and receive the rectangular relay anchor pins 142a. In particular, a base portion of the relay anchor pins 142a is rectangular and merges into square ends. The square ends are dimensionally less wide than the base portions, creating transverse edges that are flush with the outer surface of the circuit board 136. When solder is applied to the exposed ends of the relay anchor pins 142a, the solder connects to the sides of the square ends and transverse edges to anchor and lock the relay anchor pins 142a to the circuit board 136.

[0044]

The slots 132a are provided in the negative terminal bus bar connector portion 132, and the slots 138a in the first circuit board bus bar 138 are rectangular in shape. The slots 140a in the second circuit board rail 140 (FIG. 5) are T-shaped to receive the three (3) horizontally aligned relay connector pins 142b. The ends of the relay connector pins 142b are shown flush with the outer surface of the negative terminal lead connector section 132. When solder is applied to the exposed ends of the relay connector pins 142b, the solder fills the slots 132a in the negative terminal bus connector section 132 and the slots 138a of the first circuit board 138 and connects the sides of the connector pins 142b to inner edges of the slots 132a and slots 138a for anchoring the relays 142 to the circuit board 136 and the negative terminal bus bar connector portion 132. This applied solder also electrically connects the negative terminal lead bar connector portion 132 to the first lead bar 138.

[0045]

The slots 140a provided in the second circuit board rail 140 are T-shaped to receive the three (3) vertically aligned second relay connector pins 142c. The second relay connector prongs 142c extend outwardly from the outer surface of the circuit board 136 to connect to the exposed cable end 14a of the negative cable 14, as shown in FIG. 9. When solder is applied to the ends of the second relay connector prongs 142c, the solder fills the T-shaped slots 140a (FIG. 5) and electrically connects the second relay connector tines 140c to the second circuit board lead bar 140. The exposed cable end 22a of the negative cable 22 is soldered to the second relay connector prongs 142c (FIG. 5) as shown in FIG. 9.

[0046]

The negative terminal conductor rail connector portion 132 of the negative terminal conductor rail 130 is connected to the first circuit board conductor rail 138 of the circuit board 136 (e.g. B. by soldering). Again, the exposed cable end 22a (i.e., with the insulating sleeve removed) of the negative cable 22 is connected to the second printed circuit board rail 140 (e.g. By soldering), as shown in Fig. 9. The negative cable 22 is provided with a flexible sleeve 118, as shown in FIG. 11.

[0047]

As an alternative to the arrangement of the bent cable connector 118 (FIG. 5), a diode device 150 is installed on (i.e., spliced into) the flexible cable connector 118, as shown in FIG. 10. Diode device 150 includes a circuit board 152 provided with a set of recharge diodes 154 disposed on one side thereof and a conductor rail 156 provided on an opposite side of circuit board 152.

ARRANGEMENT

[0048]

The battery starting assist device 10 includes the housing 12 with an upper housing portion 12a and a lower housing portion 12b, as shown in FIG. 11. The upper case portion 12a and the lower case portion 12b are configured to be connected to each other when the battery starting assist device 10 is assembled.

[0049]

The battery starting aid device 10 further comprises the battery arrangement 110 and a control arrangement 210, both of which are arranged in the housing 12 when the battery starting aid device 10 is assembled, as shown in FIG. 11. The control arrangement 210 comprises a printed circuit board 212 which is arranged adjacent to another printed circuit board 214.

[0050]

The positive connection of the battery assembly 110 is connected to the circuit board 212 via a positive current wire 216, as shown in FIG. 11. For example, the positive current wire 216 is soldered to the positive conductor bar 114 (FIG. 5). The negative connection of the battery arrangement 110 is connected to the printed circuit board 214 via a negative current wire 218.

[0051]

The relay circuit board 136 is provided with a wire set 220 having a connector 222 as shown in FIG. 11. The connector 222 is configured to connect to the relay board connector 224 located on the circuit board 212 of the control assembly 210 during assembly of the battery starting aid device 10, as shown in FIG. 11.

[0052]

The battery assembly 110 further includes a wire set 226 with a connector 228, as shown in FIG. 11. The connector 228 is configured to connect to the battery cell charge / monitor connector 230 located on the circuit board 212 of the control assembly 220.

[0053]

The battery assembly 110 also includes a battery temperature sensor with a wire set 232 that has a connector 234, as shown in FIG. 11. The connector 234 is configured to connect to the temperature sensor connector 236, which is located on the circuit board 212 of the control arrangement 220.

[0054]

The circuit board 212 is provided with charge power resistors 240 and an output relay 242, as shown in FIG. 11. Further, the lower housing portion 12a is provided with a main use output connector 244 having a wire set 246 connected to the circuit board 214 and a main use input connector 248 having a wire set 250 connected to the circuit board 214 .

[0055]

The battery assembly 110 is connected to the battery starting aid device 10 as shown in FIG. 11. The battery connection device 110 is installed in the assembled state within the housing 12 of the battery starting aid device 10.

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CLAIMS DE112016002206

1.

A battery assembly device for a battery starting assist device having an intelligent switch, the device comprising: a battery including a positive terminal block and a negative terminal block; a positive terminal bus bar connected to the positive terminal block of the battery; a negative terminal bus bar connected to the negative terminal block of the battery; a positive cable connected to the positive terminal bus bar; and an intelligent switch interface that is connectable to the intelligent switch of the jump start device, the intelligent switch interface comprising a circuit board with a first circuit board conductor rail and a second circuit board conductor rail that are spaced apart on the circuit board, the intelligent The switch interface further includes one or more relays connected between the first circuit board rail and the second circuit board rail to provide isolation between the negative terminal block of the battery and a battery that is being started.

2.

A battery arranging device for a battery starting assist device having an intelligent switch, the device comprising: a rectangular battery that includes a positive terminal block and a negative terminal block; a positive terminal bus bar connected to the positive terminal block of the battery; a negative terminal bus bar connected to the negative terminal block of the battery; a positive cable connected to the positive terminal conductor rail via a flexible cable connector; and an intelligent switch interface that is connectable to the intelligent switch of the jump start device, the intelligent switch interface comprising a circuit board with a first circuit board conductor rail and a second circuit board conductor rail that are spaced apart on the circuit board, the intelligent The switch interface further includes one or more relays connected between the first circuit board rail and the second circuit board rail to provide isolation between the negative terminal block of the battery being started.

3.

A battery arranging device for a battery starting assist device having an intelligent switch, the device comprising: a rectangular battery that includes a positive terminal block and a negative terminal block, each disposed at opposite ends of the battery; an L-shaped positive terminal conductor bar connected to the positive terminal block of the battery, the L-shaped positive terminal bending around a corner of the battery and extending along at least a portion of one side of the battery; an L-shaped negative terminal conductor bar connected to the negative terminal block of the battery, the L-shaped negative terminal bending around a corner of the battery and extending along at least a portion of one side of the battery; a positive cable connected to the positive terminal bus bar; and an intelligent switch interface that is connectable to the intelligent switch of the jump start device, the intelligent switch interface comprising a circuit board with a first circuit board conductor rail and a second circuit board conductor rail that are spaced apart on the circuit board, the intelligent The switch interface further includes one or more relays connected between the first circuit board rail and the second circuit board rail to provide isolation between the negative terminal block of the battery being started.

4.

The apparatus of claim 1, wherein the relay includes multiple relays connected in parallel between the first circuit board rail and the second circuit board rail.

5.

The device of claim 1, wherein the negative terminal bus bar mechanically and electrically connects the battery to the intelligent switch battery interface.

6.

6. The device of claim 5, wherein the intelligent switch battery interface is positioned above and adjacent to the battery through the negative terminal lead bar.

7.

The apparatus of claim 1, wherein one end of the positive cable is configured to at least partially wrap around an exposed cable conductor end of the positive cable.

8.

The apparatus of claim 1, wherein the positive lead bar is ultrasonically welded to the positive terminal block of the battery and the negative terminal lead rail is ultrasonically welded to the battery negative terminal block.

9.

The device of claim 1, wherein the battery is rectangular and the positive terminal conductor rail and the negative terminal conductor rail are L-shaped and are wrapped around a respective corner of the battery.

10.

The device of claim 9, wherein the battery protrusions are mounted flush with a housing of the battery.

11.

The device of claim 1, wherein the positive cable is connected to the positive terminal conductor rail by a flexible cable connector.

12.

The apparatus of claim 11, wherein the flexible cable connector has a flexible outer sleeve portion and a flexible inner sleeve portion.

13.

The apparatus of claim 12, wherein the flexible outer sleeve portion includes an outer flange and the flexible inner sleeve portion includes an inner flange, the outer flange and the inner flange including a housing wall of the battery starting aid device therebetween.

14.

The apparatus of claim 11, wherein the flexible cable connector has an inner serpentine cable section.

15.

The apparatus of claim 14, wherein the flexible cable connector is configured to receive the positive cable that is angled relative to a housing wall of the battery starting aid device, and the inner serpentine cable section is configured to misalignment between

the angles relative to the housing wall and an angle bracket of the inner serpentine cable section with the positive terminal conductor rail.

Espacenet

Bibliographic data: DE202009016260 (U1) — 2010-03-25

Batterie-Ladevorrichtung

Inventor(s):

Applicant(s): TSAI MING WEI [TW] ± (TSAI, MING-WEI)

Classification: **- international:** ***H02J7/00***
- cooperative: **H02J7/00719 (EP)**; **H02J7/0077 (EP, EP)**; H01M10/44 (EP)

Application number: DE20092016260U 20091130

Priority number(s): DE20092016260U 20091130

Abstract not available for DE202009016260 (U1)

WINPLUS Ex. 1003, p. 874

(19) Bundesrepublik Deutschland
Deutsches Patent- und Markenamt

(10) **DE 20 2009 016 260 U1** 2010.04.29

(12) # Gebrauchsmusterschrift

(21) Aktenzeichen: **20 2009 016 260.5**
(22) Anmeldetag: **30.11.2009**
(47) Eintragungstag: **25.03.2010**
(43) Bekanntmachung im Patentblatt: **29.04.2010**

(51) Int Cl.[8]: ***H02J 7/00*** (2006.01)

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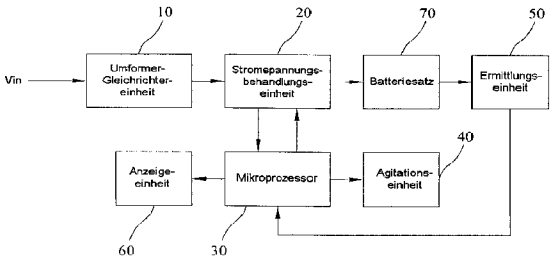
Die folgenden Angaben sind den vom Anmelder eingereichten Unterlagen entnommen

(54) Bezeichnung: **Batterie-Ladevorrichtung**

(57) Hauptanspruch: Ladevorrichtung zur Durchführung eines Ladevorgangs für einen Batteriesatz (70), umfassend: eine Umformer-Gleichrichter-Einheit (10), die eine externe Eingangsenergie empfängt und die Eingangsenergie in eine Gleichstrom-Ausgangs-Energie transformiert; eine Stromspannungs-Behandlungs-Einheit (20), die die Gleichstrom-Ausgangs-Energie der Umformer-Gleichrichter-Einheit (10) in eine Gleichstrom-Energie und eine Ladungs-Energie transformiert; einen Mikroprozessor (30), der in einem Steuermodus arbeitet, um den Ladungsvorgang des Batteriesatzes (70) zu steuern; eine Agitationseinheit (40), die von dem Mikroprozessor (30) gesteuert wird und einen Sinusimpuls zur chemischen Aktivierung des Batteriesatzes (70) erzeugt, bevor der Ladevorgang ausgeführt wird, um dadurch Kohlenstoffablagerung im Inneren einer Batterie des Batteriesatzes (70) zu entfernen; eine Ermittlungseinheit (50), die eine Ausgangsspannung des Batteriesatzes (70) feststellt, welche ein Ermittlungssignal erzeugt und dann das Ermittlungssignal zu dem Mikroprozessor (30) überführt, wobei der Mikroprozessor (30) einen elektrischen Zustand des Batteriesatzes (70) gemäß dem Ermittlungssignal bestimmt, und der elektrische Zustand sich damit befaßt, ob die Aufladung ausgeführt werden kann, die Aufladung beendet ist, die Kohlenstoffabscheidung...



Beschreibung

Hintergrund der Erfindung

1. Erfindungsgebiet

[0001] Die vorliegende Erfindung betrifft eine Batterie-Ladevorrichtung und insbesondere eine solche Batterie-Ladevorrichtung, die zum Aufladen und Regenerieren einer Primärzelle dient, beispielsweise einer alkalischen Zink-Mangan-Batterie.

2. Stand der Technik

[0002] Im Laufe des technologischen Fortschritts sind elektronische Vorrichtungen auf verschiedenen Gebieten verwendet worden, insbesondere für tragbare Geräte, beispielsweise Radios, tragbare Videospielplayer, Mobiltelefone, Videokameras, Kameras und elektronische Spielzeuge. Im allgemeinen benötigen derartige tragbare Vorrichtungen Batterien zur Stromzufuhr. Primärzellen (wegwerfbare Batterien), beispielsweise Zink-Kohlenstoff-Batterien und alkalische Zink-Mangan-Batterien, sind weitverbreitet im Gebrauch, und zwar wegen ihrer niedrigen Kosten und ihrer konstanten Abgabe von elektrischem Strom.

[0003] Beim Entladen erhöht sich aufgrund der elektrischen Reaktion der innere Widerstand der Primärzelle. Somit nimmt die zur Verfügung stehende Spannung ab. Wenn die Ausgangsspannung auf einen kritischen Spannungswert fällt, ist die Ausgangsspannung nicht groß genug, um zu bewirken, daß eine elektronische Vorrichtung normal arbeitet. Obgleich die Primärzelle noch eine kleinere Ausgangsspannung liefern kann, wird die Primärzelle, die eine kleinere Ausgangsspannung hat, durch eine neue ersetzt. Auch kann die Primärzelle nicht wiederbenutzt werden, weshalb sie weggeworfen wird. Der jährliche Verbrauch an Primärzellen ist hoch, und deshalb bilden die weggeworfenen Primärzellen für die Umwelt eine große Belastung.

[0004] Obgleich Sekundärzellen (wiederaufladbare Batterien), beispielsweise Nickel-Metall-Hydrid-Batterien, Nickel-Cadmium-Batterien und Litium-Ionen-Batterien durch Laden wiederverwendet werden können, ist der Preis für die Sekundärzellen sehr viel höher als von Primärzellen. Des weiteren nimmt es etwa 4 bis 8 Stunden in Anspruch, um die Sekundärzellen voll aufzuladen, und die Sekundärzellen können nur weniger als 100 mal wieder geladen werden. Die Sekundärzellen haben weitere Nachteile. Beispielsweise hat eine Nickel-Metall-Hydrid-Batterie eine Spannung von 1,2 V, die sich von den 1,5 V einer Primärzelle unterscheidet, so daß sie für gewisse elektrische Anwendungsfälle, die eine höhere Ausgangsspannung benötigen, nicht benutzt werden kann. Was eine Litium-Ionen-Batterie anbelangt, so hat diese ein Explosionsrisiko. Die Vereinigten Staaten haben Litium-Ionen-Batterien für Laptop-Computer aus dem überprüften Gepäck sogar verbannt, wenn die betreffende Person einen Flug antritt. Daher besteht ein Bedürfnis zur Schaffung einer Ladevorrichtung für eine Primärzelle, die die Primärzelle aufladen und regenerieren kann und die Ausgangsspannung erhöht.

Zusammenfassung der Erfindung

[0005] Eine Hauptaufgabe der vorliegenden Erfindung besteht darin, eine Ladevorrichtung für eine Primärzelle zu entwickeln, die die oben erwähnten Nachteile beseitigt. Eine weitere Aufgabe der vorliegenden Erfindung ist darin zu sehen, eine Ladevorrichtung zu schaffen, die für das Aufladen einer Primärzelle eine kürzere Zeit benötigt als das Aufladen einer Sekundärzelle.

[0006] Um die genannten Aufgaben zu lösen, weist eine Ladevorrichtung gemäß der vorliegenden Erfindung eine Umformer-Gleichrichter-Einheit, eine Stromverarbeitungs-Einheit, einen Mikroprozessor, eine Agitationseinheit, eine Ermittlungseinheit und eine Anzeigeeinheit auf, um einen Aufladevorgang für einen Batteriesatz durchzuführen, wobei der Batteriesatz wenigstens eine Primärzelle aufweist, beispielsweise eine alkalische Zink-Mangan-Batterie. Die Umformer-Gleichrichter-Einheit empfängt eine externe Eingangsenergie und formt diese Eingangsenergie dann in eine Gleichstrom-Ausgangs-Energie um. Die Stromspannungs-Verarbeitungs-Einheit transformiert die Gleichstrom-Ausgangs-Energie in eine Gleichstrom-Energie und eine Lade-Energie. Die Gleichstrom-Energie dient zur Beschickung des Mikroprozessors, der Agitationseinheit, der Ermittlungseinheit und der Anzeigeeinheit. Die Ladeenergie wird zur Aufladung des Batteriesatzes benutzt. Die Ermittlungseinheit stellt eine Ausgangsspannung des Batteriesatzes fest, erzeugt ein Ermittlungssignal und überträgt dieses Ermittlungssignal an den Mikroprozessor. Der Mikroprozessor steuert einen Gesamtladungsvorgang der Aufladevorrichtung gemäß dem Ermittlungssignal und veranlaßt die Agitationseinheit zur Erzeugung eines Sinusimpulses und dessen Abgabe an den chemisch regenerierten Batteriesatz, um Kohlenstoffabschei-

WINPLUS Ex. 1003, p. 876

dung zu entfernen und die Anzeigeeinheit dazu zu bringen, den Ladungsstatus anzuzeigen.

Kurze Beschreibung der Zeichnungen

[0007] Die Erfindung wird dem auf diesem Gebiet tätigen Fachmann durch Lesen der folgenden detaillierten Beschreibung einer bevorzugten Ausführungsform der Erfindung unter Bezug auf die beigefügte Zeichnung offenbart. In der Zeichnung ist

[0008] Fig. 1 eine schematische Darstellung einer Aufladungs-Vorrichtung gemäß der vorliegenden Erfindung.

Detaillierte Beschreibung der bevorzugten Ausführungsform

[0009] Es wird nun im Detail Bezug genommen auf eine Ausführungsform der vorliegenden Erfindung, von der Beispiele in der beigefügten Zeichnung dargestellt sind.

[0010] Fig. 1 zeigt eine Ladevorrichtung für eine Primärzelle gemäß einer Ausführungsform der vorliegenden Erfindung, die eine transformierende Gleichrichter-Einheit **10**, eine Stromspannungs-Verarbeitungs-Einheit **20**, einen Mikroprozessor **30**, eine Agitationseinheit **40**, eine Ermittlungseinheit **50** und eine Darstellungseinheit **60** zum Aufladen und Regenerieren eines Batteriesatzes **70** aufweist. Der Batteriesatz **70** ist mit wenigstens einer Primärzelle versehen, beispielsweise einer Zink-Mangan-Batterie. Die Batterien des Batteriesatzes **70** sind parallel geschaltet.

[0011] Die Umformer-Gleichrichter-Einheit **10** empfängt eine externe Eingangsenergie Vin und transformiert die Eingangsenergie Vin in eine Gleichstrom-Ausgangs-Energie. Die Eingangsenergie kann eine Stromquelle mit einem 110 V Wechselstrom sein, eine Stromquelle mit 220 V Wechselstrom oder eine Stromquelle für Gleichstrom, beispielsweise eine universelle Reihenbus(USB)-Stromquelle von 5 V und einem Maximalstrom von 500 mA. Die Stromspannungs-Verarbeitungseinheit **20** transformiert die Gleichstrom-Ausgangs-Energie der Umformer-Gleichrichter-Einheit **10** in eine Gleichstrom-Energie und eine Ladeenergie. Die Gleichstrom-Energie hat eine geeignete Spannung, die für die Energiezufuhr des Mikroprozessors **30**, der Agitationseinheit **40**, der Ermittlungseinheit **50** und der Anzeigeeinheit **60** verwendet wird. Die Aufladungsenergie dient zum Laden des Batteriesatzes **70** und kann eine Spannung von 1,7 V und einen maximalen Strom von 500 mA haben.

[0012] Der Mikroprozessor **30** dient zur Betätigung eines Steuervorgangs. Der Mikroprozessor **30** kontrolliert, ob die Stromspannungs-Verarbeitungseinheit **20** den Batteriesatz **70** auflädt, einschließlich der Ladezeit, der Ladespannung und des Ladestroms. Bevor die Ladevorrichtung den Batteriesatz **70** auflädt, steuert der Mikroprozessor **30** zunächst die Agitationseinheit **40** in der Weise, daß ein Sinusimpuls erzeugt wird, um dadurch den Batteriesatz **70** chemisch zu aktivieren und zu regenerieren, um die Kohlenstoffablagerung zu entfernen. Die Kohlenstoffablagerung wird in den Batterien des Batteriesatzes **70** erzeugt und angehäuft, sobald sich die Batterien entladen. Die Kohlenstoffablagerung in den Batterien erhöht einen inneren Widerstand und verringert ihre Spannungsabgabe. Wenn der innere Widerstand einen kritischen Wert erreicht, können die Batterien keine Ausgangsspannung erzeugen, die hoch genug ist, um das elektronische Gerät normal arbeiten zu lassen.

[0013] Die Ermittlungseinheit **50** dient zur Feststellung der Ausgangsspannung des Batteriesatzes **70**, um ein Ermittlungssignal zu erzeugen und dieses Ermittlungssignal an den Mikroprozessor **30** zu übertragen. Der Mikroprozessor **30** bestimmt durch das Ermittlungssignal einen elektrischen Zustand. Der elektrische Zustand zeigt entweder, ob die Aufladung durchgeführt werden sollte, die Aufladung vollendet ist, die Kohlenstoff-Ablagerung nicht entfernt werden kann oder ob eine Anomalie vorhanden ist.

[0014] Der Steuervorgang des Mikroprozessors **30** der vorliegenden Erfindung bedeutet folgendes: (1) Das Aufladen wird nicht ausgeführt, wenn die Ausgangsspannung des Batteriesatzes **70** geringer ist als eine erste Aufladungsschwellenspannung, wobei die erste Aufladungsschwellenspannung 0,8 V sein kann; (2) das Aufladen wird ausgeführt, sobald die Ausgangsspannung des Batteriesatzes **70** höher ist als die erste Aufladungsschwellenspannung unter Verwendung einer Spannung von 1,7 V als Aufladungsspannung und eines Stroms von 500 mA als Ladestrom; (3) eine geringe Aufladung wird ausgeführt, sobald die Ausgangsspannung des Batteriesatzes **70** höher ist als eine geringe Aufladungsschwellenspannung, d. h. die geringe Aufladung bleibt die ursprüngliche Aufladungsspannung und senkt den Ladestrom, die geringe Aufladeschwellenspannung kann 1,7 V betragen; (4) wenn die Ausgangsspannung des Batteriesatzes **70** statt dessen während eines Ladevorgangs gesenkt wird, wird der Batteriesatz **70** so betrachtet, als ob eine Anomalie auftritt, und die Aufla-

WINPLUS Ex. 1003, p. 877

dung wird sofort beendet; (5) wenn der Aufladungsvorgang eine bestimmte Ladezeit erreicht, dann ist die Aufladung beendet, wobei die Ladezeit 40 bis 90 Minuten betragen kann; und (6) wenn das Aufladen beendet ist, jedoch die Ausgangsspannung des Batteriesatzes **70** niedriger ist als eine zweite Ladeschwellenspannung, und zwar aufgrund elektrischer Leckage, dann wird der Batteriesatz **70** wieder geladen, d. h. er wird einem erneuten Ladevorgang unterworfen. Die zweite Ladeschwellenspannung ist größer als die erste Ladeschwellenspannung.

[0015] Die Anzeigeeinheit **60** wird durch den Mikroprozessor **30** gesteuert, um einen Ladezustand des Batteriesatzes **70** anzuzeigen. Die Anzeigeeinheit **60** kann mehrere Licht emittierende Komponenten (nicht dargestellt) aufweisen, und diese Licht emittierenden Komponenten weisen eine erste Licht emittierende Diode (LED) und eine zweite Licht emittierende Diode (LED) auf. Eine von der ersten LED emittierte Lichtfarbe unterscheidet sich von der durch die zweite LED emittierten Lichtfarbe. Beispielsweise emittiert die erste LED grünes Licht und die zweite LED rotes Licht.

[0016] Der Ladezustand des Batteriesatzes **70** wird von der Anzeigeeinheit **60** angezeigt und weist folgende Angaben auf: (1) wenn der Mikroprozessor **30** die Stromzufuhr empfangen hat und normal arbeitet, ist die grüne LED eingeschaltet; (2) wenn der Batteriesatz **70** sich nicht zum Aufladen eignet oder wenn die Ausgangsspannung des Batteriesatzes **70** geringer ist als die erste Ladeschwellenspannung, also beispielsweise 0,8 V, dann blinkt die rote LED; (3) wenn die Kohlenstoffablagerung des Batteriesatzes **70** nicht entfernt werden kann, so blinkt die rote LED; (4) wenn die Kohlenstoffablagerung des Batteriesatzes **70** vollständig entfernt ist, wird die grüne LED ausgeschaltet, und die rote LED ist ständig eingeschaltet, um zu zeigen, daß das Aufladen weitergeht und der Ladevorgang normal ist; und (5) wenn der Batteriesatz **70** vollständig aufgeladen ist, wird die rote LED ausgeschaltet, und die grüne LED ist ständig eingeschaltet.

[0017] Es wird darauf hingewiesen, daß die Tatsache, daß die rote LED und die grüne LED eingeschaltet sind, also beispielsweise ständig leuchten oder blinken, nur Beispiele sind, die dazu dienen, Merkmale der vorliegenden Erfindung darzustellen. Sie dienen nicht zur Beschränkung des Schutzbereiches der vorliegenden Erfindung. Daher können die rote LED und die grüne LED auch andere Leuchtweisen haben.

[0018] Der Mikroprozessor **30** gemäß der vorliegenden Erfindung kann des weiteren eine Speichereinheit (nicht gezeigt) aufweisen, die zur Speicherung elektrischer Kenndaten der Batterien dient, so beispielsweise der ersten Ladungsschwellspannungen und der zweiten Ladungsschwellspannungen. Dazu kommt, daß er die optimale Ladezeit speichern kann, die die Batterien fordern, so daß ein optimaler Ladevorgang bei unterschiedlichen Batterien durchgeführt werden kann.

[0019] Der Mikroprozessor **30** gemäß der vorliegenden Erfindung kann des weiteren eine Schaltungstafel (nicht gezeigt) aufweisen, um die umformende Gleichrichtereinheit **10**, die Stromspannungs-Bearbeitungseinheit **20**, den Mikroprozessor **30**, die Agitationseinheit **40**, die Ermittlungseinheit **50** und die Anzeigeeinheit **60** auszubilden. Dazu kommt, daß der Mikroprozessor **30** ein Gehäuse (nicht gezeigt) zur Abdeckung der umformenden Gleichrichtereinheit **10** aufweisen kann sowie der Stromspannungs-Bearbeitungseinheit **20**, des Mikroprozessors **30**, der Agitationseinheit **40**, der Ermittlungseinheit **50** und der Anzeigeeinheit **60**, um dadurch einen Schutz zu bieten. Die Anzeigeeinheit ist außerhalb des Gehäuses, um die Anzeigefunktion zu erfüllen.

[0020] Um die Ladungswirkung der Ladevorrichtung gemäß der vorliegenden Erfindung weiter zu demonstrieren, werden zwei Primärzellen (Zink-Mangan-Batterien) durch die Ladevorrichtung geladen, und die gemessenen Daten werden in der folgenden Tabelle 1 aufgeführt.

Tabelle 1

Ladevorgang	Laden seit	Laden bis	Spannung bei Ladungsstopp	Spannung bei Betriebsstopp	Anzahl der Blitze	Ausgangsenergie-Verhältnis
01	13:42	14:22	1,647 V	1,345 V	255	168%
02	15:31	16:11	1,653 V	1,340 V	218	144%
03	16:36	17:16	1,653 V	1,351 V	196	129%
04	17:49	18:29	1,647 V	1,351 V	199	131%
05	18:58	19:38	1,671 V	1,352 V	201	133%

WINPLUS Ex. 1003, p. 878

06	19:58	20:38	1,685 V	1,347 V	187	123%
07	21:02	21:42	1,675 V	1,339 V	171	113%
08	22:02	22:42	1,671 V	1,391 V	163	107%
09	12:07	12:47	1,681 V	1,343 V	171	113%
10	13:10	13:50	1,679 V	1,355 V	160	105%
11	14:09	14:49	1,685 V	1,339 V	203	134%
12	15:08	15:48	1,686 V	1,358 V	171	113%
13	16:06	16:46	1,687 V	1,350 V	151	100%
14	17:02	17:42	1,695 V	1,345 V	188	124%
15	18:25	19:05	1,688 V	1,371 V	140	92%
16	19:20	20:00	1,693 V	1,368 V	159	105%
17	20:16	20:56	1,699 V	1,355 V	162	107%
18	21:13	21:53	1,693 V	1,352 V	161	107%
19	22:09	22:49	1,697 V	1,354 V	154	101%
20	13:04	13:44	1,692 V	1,398 V	138	91%
21	14:17	14:57	1,675 V	1,357 V	137	90%
22 45 Min.	15:13	15:58	1,688 V	1,359 V	136	90%
23	16:19	16:59	1,690 V	1,360 V	134	88%
24	17:41	18:21	1,690 V	1,380 V	105	69%
25 60 Min.	18:41	19:41	1,692 V	1,362 V	147	97%
26	19:57	20:37	1,688 V	1,367 V	136	90%
27	20:52	21:32	1,700 V	1,359 V	143	94%
28	13:31	14:11	1,692 V	1,385 V	121	80%
29	14:25	15:05	1,702 V	1,400 V	111	73%
30	15:20	16:00	1,695 V	1,400 V	109	72%
31 60 Min.	16:13	17:13	1,709 V	1,411 V	113	74%
32	17:25	18:05	1,705 V	1,378 V	102	67%
33	18:20	19:00	1,704 V	1,380 V	89	58%
34	19:15	19:55	1,709 V	1,370 V	140	92%
35	20:18	20:58	1,695 V	1,385 V	112	74%
36	13:25	14:05	1,701 V	1,366 V	106	70%
37	15:56	16:36	1,705 V	1,372 V	121	80%
38	16:57	17:37	1,690 V	1,392 V	129	85%
39	17:56	18:36	1,694 V	1,391 V	113	74%
40	14:11	14:51	1,692 V	1,361 V	140	92%
41	15:08	15:48	1,710 V	1,367 V	121	80%
42	16:02	16:42	1,712 V	1,371 V	131	86%
43	19:41	20:21	1,703 V	1,373 V	116	76%
44	20:36	21:16	1,707 V	1,365 V	125	82%
45	21:31	22:11	1,713 V	1,376 V	119	78%
46	22:26	23:06	1,711 V	1,370 V	114	75%
47	11:35	12:15	1,691 V	1,375 V	116	76%
48	12:28	13:08	1,699 V	1,376 V	133	88%

WINPLUS Ex. 1003, p. 879

49	13:22	14:02	1,709 V	1,372 V	106	70%
50	16:32	17:12	1,716 V	1,368 V	116	76%
51	17:28	18:08	1,711 V	1,372 V	120	80%
52	19:17	19:57	1,709 V	1,376 V	116	76%
53	20:16	20:56	1,702 V	1,358 V	116	76%
54 60 Min.	21:16	22:16	1,715 V	1,371 V	115	76%
55	22:31	23:11	1,712 V	1,373 V	133	88%
56	12:24	13:04	1,708 V	1,378 V	117	77%
57	13:13	13:53	1,705 V	1,380 V	110	72%
58	14:08	14:48	1,710 V	1,385 V	138	91%
59	15:05	15:45	1,707 V	1,368 V	110	72%
60	16:00	16:40	1,708 V	1,372 V	109	72%
61	16:55	17:35	1,706 V	1,382 V	117	77%
62	17:58	18:38	1,710 V	1,378 V	102	67%
63	18:50	19:30	1,715 V	1,369 V	123	81%
64	19:50	20:30	1,740 V	1,379 V	105	69%
65	21:04	21:44	1,720 V	1,389 V	87	57%
66	12:07	12:47	1,736 V	1,372 V	133	88%
67	12:59	13:39	1,742 V	1,378 V	138	91%
68	16:16	16:56	1,738 V	1,377 V	115	76%
69	17:16	17:56	1,746 V	1,370 V	125	82%
70	19:37	20:17	1,731 V	1,385 V	118	78%
71	22:22	23:02	1,741 V	1,390 V	108	71%
72	16:10	16:50	1,726 V	1,367 V	130	86%
73	17:03	17:43	1,732 V	1,386 V	103	68%
74	18:02	18:42	1,736 V	1,381 V	110	72%
75	18:56	19:36	1,730 V	1,390 V	125	82%
76	19:50	20:30	1,725 V	1,380 V	135	89%
77	20:44	21:24	1,741 V	1,385 V	138	91%
78	21:45	22:25	1,732 V	1,380 V	103	68%
79	22:40	23:20	1,728 V	1,375 V	106	70%
80	23:40	24:20	1,739 V	1,379 V	121	80%
81	13:11	13:51	1,744 V	1,391 V	123	81%

[0021] In der Tabelle 1 sind zwei im Handel erhältliche Duracell -AA- Alkali-Batterien als Batteriesatz gewählt, und die ursprüngliche Ausgangsspannung beträgt 1,611 V.

[0022] Eine im Handel erhältliche Epson-Digitalkamera wird als elektronische Vorrichtung gewählt. Die Duracell -AA- Alkali-Batterien werden in die Epson-Digitalkamera eingesetzt. Eine Blitzeinheit der Kamera wird kontinuierlich so lange aktiviert, bis die Ausgangsspannung der Duracell -AA- Alkali-Batterien zu niedrig ist, um die Blitzeinheit zu aktivieren. Die Anzahl der Blitze der Blitzeinheit wird als Referenzwert für die Kapazität des Batteriesatzes gewählt. Die normale Betriebsspannung der Blitzeinheit der Digitalkamera ist 2,5 V, und der Stromverbrauch beträgt 0,3 A.

[0023] Neue Alkali-Batterien können die Blitzeinheit 151 mal aktivieren, und die untere Grenze der Betriebsspannung der Blitzeinheit beträgt 1,4 V. Vom ersten Mal bis zum 21. Mal der Ladung einer Alkali-Batterie beträgt jede Ladezeit 40 Minuten.

WINPLUS Ex. 1003, p. 880

[0024] Von dem 21. Mal bis zum 24. Mal der Ladung steigt jede Ladezeit auf 45 Minuten an. Von dem 25. Mal bis zum 81. Mal der Ladung erhöht sich jede Ladezeit weiter auf 60 Minuten. Es wird darauf hingewiesen, daß die Ladezeit durch den Mikroprozessor **30** gesteuert werden kann.

[0025] Die Meßresultate der Tabelle 1 zeigen, daß die Alkali-Batterien die Blitzeinheit 255 mal nach dem ersten Mal Ladung aktivieren, und dies ist 168% neuer Alkali-Batterien. D. h., nach dem ersten Mal Laden erhöht sich die Kapazität der Batterien um 68%. Nach dem 81. Mal Laden können die Alkali-Batterien noch die Blitzeinheit 123 mal aktivieren, dies ist etwa 81% der neuen Alkali-Batterien. Demnach kann die Ladevorrichtung gemäß der vorliegenden Erfindung sicherlich die Primärzelle laden, so beispielsweise die alkalischen Zink-Mangan-Batterien. Darüber hinaus kann die Ladevorrichtung die Kapazität der Batterien nach dem Laden erhöhen, und die Batterien können über 100 mal wieder geladen werden. Somit überwindet die Ladevorrichtung gemäß der vorliegenden Erfindung die Nachteile der herkömmlichen Vorrichtungen und ist darüber hinaus umweltfreundlich.

[0026] Obgleich die vorliegende Erfindung mit Bezug auf ihre bevorzugte Ausführungsform beschrieben worden ist, versteht es sich für den auf diesem Gebiet tätigen Fachmann, daß eine Vielzahl von Modifikationen und Änderungen vorgenommen werden können, ohne vom Schutzbereich der vorliegenden Erfindung abzuweichen, der durch die beigefügten Ansprüche definiert werden soll.

Schutzansprüche

1. Ladevorrichtung zur Durchführung eines Ladevorgangs für einen Batteriesatz (**70**), umfassend: eine Umformer-Gleichrichter-Einheit (**10**), die eine externe Eingangsenergie empfängt und die Eingangsenergie in eine Gleichstrom-Ausgangs-Energie transformiert; eine Stromspannungs-Behandlungs-Einheit (**20**), die die Gleichstrom-Ausgangs-Energie der Umformer-Gleichrichter-Einheit (**10**) in eine Gleichstrom-Energie und eine Ladungs-Energie transformiert; einen Mikroprozessor (**30**), der in einem Steuermodus arbeitet, um den Ladungsvorgang des Batteriesatzes (**70**) zu steuern; eine Agitationseinheit (**40**), die von dem Mikroprozessor (**30**) gesteuert wird und einen Sinusimpuls zur chemischen Aktivierung des Batteriesatzes (**70**) erzeugt, bevor der Ladevorgang ausgeführt wird, um dadurch Kohlenstoffablagerung im Inneren einer Batterie des Batteriesatzes (**70**) zu entfernen; eine Ermittlungseinheit (**50**), die eine Ausgangsspannung des Batteriesatzes (**70**) feststellt, welche ein Ermittlungssignal erzeugt und dann das Ermittlungssignal zu dem Mikroprozessor (**30**) überführt, wobei der Mikroprozessor (**30**) einen elektrischen Zustand des Batteriesatzes (**70**) gemäß dem Ermittlungssignal bestimmt, und der elektrische Zustand sich damit befaßt, ob die Aufladung ausgeführt werden kann, die Aufladung beendet ist, die Kohlenstoffabscheidung nicht entfernt werden kann und ob eine Anomalie auftritt; und weiter umfassend eine Displayeinheit (**60**), die von dem Mikroprozessor (**30**) gesteuert wird, um einen Ladungszustand des Batteriesatzes (**70**) anzuzeigen; wobei der Batteriesatz (**70**) wenigstens eine Batterie aufweist, die Batterie eine Primärzelle ist, die Eingangsenergie entweder eine Wechselstrom-Eingangs-Energie oder eine Gleichstrom-Eingangs-Energie ist und wobei die Gleichstrom-Eingangs-Energie der Stromspannungs-Bearbeitungseinheit (**20**) dazu dient, den Mikroprozessor (**30**), die Agitationseinheit (**40**), die Ermittlungseinheit (**50**) und die Displayeinheit (**60**) mit Energie zu versorgen, und wobei die Ladeenergie zur Aufladung des Batteriesatzes (**70**) verwendet wird.

2. Ladevorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die Primärzelle eine alkalische Zink-Mangan-Batterie ist.

3. Ladevorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die Wechsel-Eingangs-Energie eine Energiequelle mit einem 110 V Wechselstrom und eine Energiequelle mit einem 220 V Wechselstrom aufweist, und daß die Gleichstromenergiequelle eine universelle Reihenbus(USB)-Energiequelle einer Spannung von 5 V und einem maximalen Strom von 500 mA aufweist.

4. Ladevorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die die Ladeenergiequelle eine Spannung von 1,7 V sowie einen maximalen Strom von 500 mA aufweist.

5. Ladevorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß der Steuervorgang des Mikroprozessors (**30**) folgendes umfaßt: das Aufladen wird nicht ausgeführt, wenn die Ausgangsspannung des Batteriesatzes (**70**) niedriger ist als eine erste Ladeschwellenspannung; das Aufladen wird ausgeführt, wenn die Ausgangsspannung des Batteriesatzes (**70**) höher ist als die erste Ladeschwellenspannung; eine kleine Aufladung wird ausgeführt, wenn die Ausgangsspannung des Batteriesatzes (**70**) höher ist als eine kleine Ladeschwellenspannung, wobei die kleine Aufladung eine Ladespannung aufweist, die der Aufladung entspricht, sowie einen Ladestrom, der kleiner ist als der der Aufladung; wenn die Ausgangsspannung des Batteriesatzes (**70**)

WINPLUS Ex. 1003, p. 881

während eines Ladevorgangs sinkt, wird der Batteriesatz (**70**) wie das Auftreten einer Anomalie beurteilt und das Aufladen wird sofort beendet; wenn der Ladevorgang des Batteriesatzes (**70**) eine vorbestimmte Ladezeit erreicht, dann ist das Laden abgeschlossen; und wenn das Laden abgeschlossen ist, jedoch die Ausgangsspannung geringer ist als eine zweite Ladeschwellenspannung, die höher ist als die erste Ladeschwellenspannung, dann wird der Batteriesatz wieder geladen.

6. Ladevorrichtung nach Anspruch 5, dadurch gekennzeichnet, daß die erste Ladeschwellenspannung 0,8 V beträgt.

7. Ladevorrichtung nach Anspruch 5, dadurch gekennzeichnet, daß die kleine Ladeschwellenspannung 1,7 V beträgt.

8. Ladevorrichtung nach Anspruch 5, dadurch gekennzeichnet, daß die vorbestimmte Ladezeit 40 bis 90 Minuten beträgt.

9. Ladevorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die Displayeinheit (**60**) mehrere Licht emittierende Komponenten aufweist, daß die Licht emittierenden Komponenten eine erste Licht emittierende Diode (LED) und eine zweite Licht emittierende Diode (LED) sind, und daß ein farbiges Licht, das von der ersten LED emittiert wird, sich von einem farbigen Licht, das von der zweiten LED emittiert wird, unterscheidet.

10. Ladevorrichtung nach Anspruch 9, dadurch gekennzeichnet, daß die erste LED eine grüne LED und die zweite LED eine rote LED sind.

11. Ladevorrichtung nach Anspruch 10, dadurch gekennzeichnet, daß der Ladezustand des Batteriesatzes (**70**), der durch die Displayeinheit (**60**) angezeigt wird, folgendes beinhaltet: wenn der Mikroprozessor (**30**) Zufuhr erhalten hat und normal arbeitet, dann ist die grüne LED eingeschaltet; wenn der Batteriesatz (**70**) sich für das Laden nicht eignet oder wenn die Ausgangsspannung des Batteriesatzes (**70**) niedriger ist als die erste Ladeschwellenspannung, dann blinkt die rote LED; wenn die Kohlenstoffabscheidung des Batteriesatzes (**70**) nicht entfernt werden kann, so blinkt die rote LED; wenn die Kohlenstoffabscheidung des Batteriesatzes (**70**) nicht vollständig entfernt ist, dann wird die grüne LED abgeschaltet und die rote LED durchgehend eingeschaltet, um aufzuzeigen, daß das Aufladen weitergeht und das Aufladen normal ist; und wenn das Laden des Batteriesatzes (**70**) beendet ist, dann wird die rote LED abgeschaltet und die grüne LED leuchtet durchgehend.

12. Ladevorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß der Mikroprozessor (**30**) des weiteren eine Speichereinheit aufweist, mit der elektrische Kenndaten und die optimale Ladezeit des Batteriesatzes (**70**) gespeichert werden, wobei die elektrischen Kenndaten die erste Ladeschwellenspannung beinhalten.

13. Ladevorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß der Mikroprozessor (**30**) des weiteren eine Schaltungsplatte aufweist, um die Umformer-Gleichrichter-Einheit (**10**), die Stromspannungs-Behandlungseinheit (**20**), den Mikroprozessor (**30**), die Agitationseinheit (**40**), die Ermittlungseinheit (**50**) und die Anzeigeeinheit (**60**) räumlich zu gestalten.

14. Ladevorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß der Mikroprozessor (**30**) des weiteren ein Gehäuse zur Abdeckung der Umformer-Gleichrichter-Einheit (**10**), der Stromspannungs-Behandlungseinheit (**20**), des Mikroprozessors (**30**), der Agitationseinheit (**40**), der Ermittlungseinheit (**50**) und der Anzeigeeinheit (**60**) aufweist, wobei die Anzeigeeinheit (**60**) zwecks Erfüllung ihrer Anzeigefunktion freiliegt.

Es folgt ein Blatt Zeichnungen

WINPLUS Ex. 1003, p. 882

Anhängende Zeichnungen

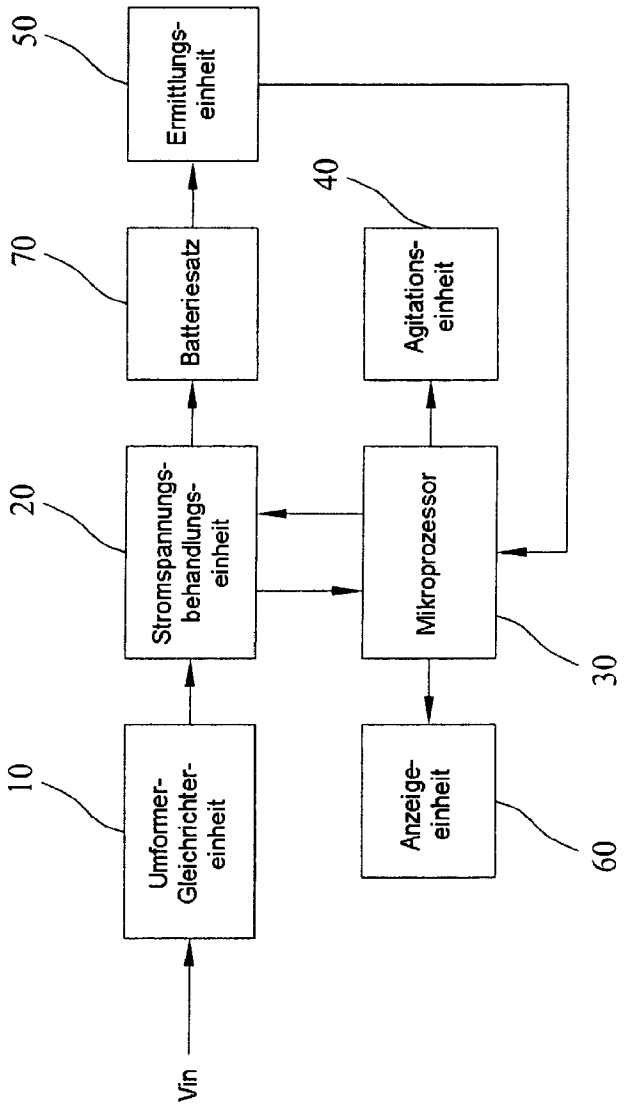


FIG. 1

WINPLUS Ex. 1003, p. 883

Espacenet

Bibliographic data: DE202009016260 (U1) — 2010-03-25

Batterie-Ladevorrichtung

Inventor(s):

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Classification: **- international:** ***H02J7/00***
- cooperative: **H02J7/00719 (EP)**; **H02J7/0077 (EP, EP)**; H01M10/44 (EP)

Application number: DE20092016260U 20091130

Priority number(s): DE20092016260U 20091130

Abstract not available for DE202009016260 (U1)

WINPLUS Ex. 1003, p. 884

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DESCRIPTION DE202009016260

Background of the Invention

1.

Field of invention

[0001] The present invention relates to a battery charging device and in particular to such a battery charging device which is used for charging and regenerating a primary cell, for example an alkaline zinc-manganese battery.

2.

State of the art

[0002]

As technology advances, electronic devices have been used in various fields, particularly for portable devices such as radios, portable video game players, cell phones, video cameras, cameras and electronic toys.

In general, such portable devices require batteries to provide power. Primary cells (disposable batteries), such as zinc-carbon batteries and alkaline zinc-manganese batteries, are in widespread use because of their low cost and constant supply of electrical current.

[0003]

When discharging, the internal resistance of the primary cell increases due to the electrical reaction. Thus the available voltage decreases. If the output voltage drops to a critical voltage value, the output voltage is not high enough to cause an electronic device to operate normally. Although the primary cell can still provide a lower output voltage, the primary cell, which has a lower output voltage, is replaced with a new one. The primary cell cannot be reused, which is why it is thrown away. The annual consumption of primary cells is high, and therefore the discarded primary cells are a great burden on the environment.

[0004]

Although secondary cells (rechargeable batteries), such as nickel metal hydride batteries, nickel cadmium batteries and lithium ion batteries, can be reused by charging, the price of the secondary cells is much higher than that of primary cells. Furthermore, it takes about 4 to 8 hours to fully charge the secondary cells, and the secondary cells can be recharged less than 100 times. The secondary cells have other disadvantages. For example, a nickel metal hydride battery has a voltage of 1.2 V, which differs from the 1.5 V of a primary cell, so that it cannot be used for certain electrical applications that require a higher output voltage. As for a lithium-ion battery, it has an explosion risk. The United States has banned lithium-ion batteries for laptop computers from checked baggage even when the person is on a flight. Therefore, there is a need to provide a primary cell charger that can charge and regenerate the primary cell and increase the output voltage.

Summary of the invention

[0005]

A main object of the present invention is to develop a charging device for a primary cell which overcomes the above-mentioned drawbacks. Another object of the present invention is to provide a charging device which takes a shorter time to charge a primary cell than to charge a secondary cell.

[0006]

In order to achieve the above-mentioned objects, a charging device according to the present invention has a converter-rectifier unit, a power processing unit, a microprocessor, an agitation unit, a determination unit and a display unit for carrying out a charging process for a battery pack, the battery pack has at least one primary cell, for example an alkaline zinc-manganese battery. The converter-rectifier unit receives an external input energy and then converts this input energy into a DC output energy. The voltage processing unit transforms the DC output energy into a DC energy and a charging energy. The direct current energy is used to feed the microprocessor, the agitation unit, the determination unit and the display unit. The charging energy is used to charge the battery pack. The determining unit determines an output voltage of the battery pack, generates a determining signal and transmits this determining signal to the microprocessor.

The microprocessor controls an overall charge of the charger according to the detection signal and causes the agitation unit to generate a sine pulse and deliver it to the chemically regenerated battery pack to remove carbon deposition and cause the display unit to display the charge status.

Brief description of the drawings

[0007]

The invention will be apparent to those skilled in the art upon reading the following detailed description of a preferred embodiment of the invention with reference to the accompanying drawings. In the drawing is

[0008]

Fig. 1 is a schematic representation of a charging device according to the present invention.

Detailed description of the preferred embodiment

[0009]

Reference will now be made in detail to an embodiment of the present invention, examples of which are illustrated in the accompanying drawings.

[0010]

1 shows a charging device for a primary cell according to an embodiment of the present invention, which comprises a transforming rectifier unit 10, a voltage processing unit 20, a microprocessor 30, an agitation unit 40, a determination unit 50 and a display unit 60 for charging and Regenerating a battery pack 70 has.

The battery pack 70 is provided with at least one primary cell, for example a zinc-manganese battery.

The batteries of the battery pack 70 are connected in parallel.

[0011]

The converter-rectifier unit 10 receives an external input energy Vin and transforms the input energy Vin into a DC output energy. The input power may be a 110 VAC power source, a 220 VAC power source, or a DC power source, such as a 5 V universal series bus (USB) power source and a maximum current of 500 mA. The current voltage processing unit 20 transforms the DC output energy of the converter-rectifier unit 10 into a DC energy and a charging energy. The direct current energy has a suitable voltage which is used for the energy supply of the microprocessor 30, the agitation unit 40, the determination unit 50

and the display unit 60. The charging energy is used to charge the battery pack 70 and can have a voltage of 1.7 V and a maximum current of 500 mA.

[0012]

The microprocessor 30 serves to actuate a control process. The microprocessor 30 controls whether the voltage processing unit 20 is charging the battery pack 70, including the charging time, the charging voltage and the charging current. Before the charger charges the battery pack 70, the microprocessor 30 first controls the agitation unit 40 to generate a sine pulse, thereby chemically activating and regenerating the battery pack 70 to remove the carbon deposit. The carbon deposit is generated in the batteries of the battery pack 70 and accumulates as the batteries discharge. The carbon deposit in the batteries increases internal resistance and reduces their voltage output. When the internal resistance reaches a critical value, the batteries cannot produce an output voltage high enough to make the electronic device work normally.

[0013]

The determination unit 50 serves to determine the output voltage of the battery pack 70 in order to generate a determination signal and to transmit this determination signal to the microprocessor 30. The microprocessor 30 determines an electrical state using the detection signal. The electrical condition shows either whether charging should be performed, charging is complete, the carbon deposit cannot be removed, or whether there is an abnormality.

[0014]

The control process of the microprocessor 30 of the present invention means the following: (1) charging is not performed when the output voltage of the battery pack 70 is less than a first charging threshold voltage, where the first charging threshold voltage can be 0.8 V; (2) charging is performed when the output voltage of the battery pack 70 is higher than the first charging threshold voltage using a voltage of 1.7 V as the charging voltage and a current of 500 mA as the charging current; (3) a low charge is performed once the output voltage of the battery pack 70 is higher than a low charge threshold voltage, i.e. H. the low charge remains the original charging voltage and lowers the charging current, the low charging threshold voltage can be 1.7 V; (4) if the output voltage of the battery pack 70 is lowered instead during charging, the battery pack 70 is considered as if an abnormality occurs and the charging is stopped immediately; (5) when the charging process reaches a certain charging time, the charging is finished, and the charging time may be 40 to 90 minutes; and (6) when charging is complete but the output voltage of the battery pack 70 is lower than a second charging threshold voltage due to electrical leakage, the battery pack 70 is recharged, i. H. it will be reloaded.

The second charging threshold voltage is greater than the first charging threshold voltage.

[0015]

The display unit 60 is controlled by the microprocessor 30 to display a state of charge of the battery pack 70. The display unit 60 may have a plurality of light-emitting components (not shown), and these light-emitting components have a first light-emitting diode (LED) and a second light-emitting diode (LED). A light color emitted by the first LED differs from the light color emitted by the second LED. For example, the first LED emits green light and the second LED red light.

[0016]

The state of charge of the battery pack 70 is displayed by the display unit 60 and has the following information: (1) when the microprocessor 30 has received the power supply and is operating normally, the green LED is on; (2) if the battery pack 70 is not suitable for charging or if the output voltage of the battery pack 70 is lower than the first charging threshold voltage, for example 0.8 V, the red LED flashes; (3) if the carbon deposit of the battery pack 70 cannot be removed, the red LED flashes; (4) when the carbon deposit of battery pack 70 is completely removed, the green LED is turned off and the red LED is on continuously to show that charging is continuing and charging is normal; and (5) when the battery pack 70 is fully charged, the red LED is off and the green LED is on continuously.

[0017]

It is pointed out that the fact that the red LED and the green LED are switched on, for example continuously lit or flashing, are only examples which serve to illustrate features of the present invention.

They are not intended to limit the scope of the present invention. Therefore, the red LED and the green LED can have other lighting modes.

[0018]

The microprocessor 30 according to the present invention can furthermore have a storage unit (not shown) which is used to store electrical characteristics of the batteries, for example the first charge threshold voltages and the second charge threshold voltages. In addition, it can store the optimal charging time that the batteries demand, so that an optimal charging process can be carried out with different batteries.

[0019]

The microprocessor 30 according to the present invention may further include a circuit board (not shown) for forming the rectifying unit 10, the voltage processing unit 20, the microprocessor 30, the agitation unit 40, the determination unit 50 and the display unit 60. In addition, the microprocessor 30 can have a housing (not shown) for covering the shaping rectifier unit 10 and the voltage processing unit 20, the microprocessor 30, the agitation unit 40, the determination unit 50 and the display unit 60, in order thereby to provide protection . The display unit is outside the housing to perform the display function.

[0020]

To further demonstrate the charging effect of the charging device according to the present invention, two primary cells (zinc-manganese batteries) are charged by the charging device, and the measured data are shown in Table 1 below. Charging process Charging since Charging to Voltage when charging stops Voltage when operating stops Number of flashes Output energy ratio 01 13:42 <SEP > 14:22 1.647 V 1.345 V 255 168% 02 15:31 16:11 1.653 V 1.340 V < SEP> 218 144% 03 16:36 17:16 1.653 V 1.351 V 196 129% 04 17:49 18:29 1,647 V 1,351 V 199 131% 05 18:58 19:38 1,671 V < SEP> 1.352 V 201 133% 06 19:58 20:38 1.685 V 1.347 V 187 123% <tb > 07 21:02 21:42 1,675 V 1,339 V 171 113% 08 22:02 22:42 < SEP> 1.671 V 1.391 V 163 107% 09 12:07 12:47 1.681 V 1.343 V 171 <SEP > 113% 10 13:10 13:50 1,679 V 1,355 V 160 105% 11 14:09 <SEP > 14:49 1,685 V 1,339 V 203 134% 12 15:06 15:48 1,686 V 1,358 V < SEP> 171 113% 13 16:06 16: 4 6 1,687 V 1,350 V 151 100% 14 17:02 17:42 1,695 V 1,345 V 188 124% 15 18:25 19:05 1.688 V 1.371 V 140 92% 16 19:20 20:00 1.693 V 1.368 V 159 105% 17 20:16 20:56 1.699 V 1.355 V 162 107% 18 21:13 21:53 1.693 V 1.352 V 161 107% 19 < SEP> 22:09 22:49 1,697 V 1,354 V 154 101% 20 13:04 13:44 1,692 V 1.398 V 138 91% 21 14:17 14:57 1.675 V 1.357 V 137 90% 22 45 min.

15:13 15:58 1.688 V 1.359 V 136 90% 23 16:19 16:59 1.690 V 1.360 V 134 88% 24 17:41 18:21 1.690 V 1.380 V 105 69 % 25 60 min. 16:41 19:41 1.692 V 1.362 V 147 97% 26 19:57 20:37 1,688 V 1,367 V 136 90% 27 20:52 21:32 1,700 V 1,359 V 143 94 % 28 13:31 14:11 1.692 V 1.385 V 121 80% 29 14:25 15 : 05 1.702 V 1,400 V 111 73% 30 15:20 16:00 1,695 V 1,400 V 109 72% 31 60 min. 16:13 17:13 1.709 V 1.411 V 113 74% 32 17:25 18:05 1.705 V 1.378 V 102 67% 33 18:20 19:00 1.704 V 1.380 V 89 58 % 34 19:15 19:55 1.709 V 1,370 V 140 92% 35 20:18 20 : 58 1.695 V 1.385 V 112 74% 36 13:25 14:05 1.701 V 1.366 V 106 70% 37 15:56 16:36 1.705 V 1.372 V 121 80% 38 16: 57 17:37 1.690 V 1.392 V 129 85% 39 17:56 18:36 1.694 V 1.391 V 113 74% 40 14:11 14:51 1.692 V 1.361 V 140 92% 41 15:08 15:48 1.710 V 1.367 V 121 80% 42 16:02 16:42 1.712 V 1.371 V 131 86% 43 19:41 20:21 1.703 V 1.373 V 116 76 % 44 20:36 21:16 1.707 V 1.365 V 125 82% 45 21:31 22 : 11 1.713 V 1.376 V 119 78% <t b> 46 22:26 23:06 1.711 V 1.370 V 114 75% 47 11:35 12:15 1.691 V 1.375 V 116 76% 48 12:28 13:08 1.699 V 1.366 V 133 < SEP> 88% 49 13:22 14:02 1.709 V 1.372 V 106 70% 50 16:32 < SEP> 17:12 1.716 V 1.368 V 116 76% 51 17:28 18:06 1.711 V 1.372 V 120 80% 52 19:17 19:57 1.709 V 1.376 V 116 76% 53 <SEP > 20:16 20:56 1.702 V 1.356 V 116 76% 54 60 min.

21:16 22:16 1.715 V 1.371 V 115 76% 55 22:31 23:11 1.712 V 1.373 V 133 88% 56 12:24 13:04 1.708 V 1.378 V 117 77 % 57 13:13 13:53 1.705 V 1,360 V 110 72% 58 14:08 14 : 48 1.710 V 1.365 V 138 91% 59 15:05 15:45 1.707 V 1.368 V 110 72% 60 16:00 16:40 1.708 V 1.372 V 109 72% 61 16: 55 17:35 1.706 V 1.382 V 117 77% 62 17:58 18:38 1.710 V 1.378 V 102 67% 63 18:50 19:30 1.715 V 1.369 V 123 81% 64 19:50 20:30 1,740 V 1,379 V 105 69% 65 21:04 21:44 1.720 V 1.389 V 87 57% 66 12:07 12:47 1.736 V 1.372 V 133 88 % 67 12:59 13:39 1,742 V 1,376 V 136 91% 68 16:16 16 : 56 1.738 V 1.377 V 115 76% <t b> 69 17:16 17:56 1,746 V 1,370 V 125 82% 70 19:37 20:17 1.731 V 1.385 V 118 78% 71 22:22 23:02 1.741 V 1.390 V 108 < SEP> 71% 72 16:10 16:50 1.726 V 1.367 V 130 86% 73 17:03 < SEP> 17:43 1.732 V 1.386 V 103 68% 74 18:02 18:42 1.736 V 1.381 V 110 72% 75 18:56 19:36 1.730 V 1.390 V 125 82% 76 <SEP > 19:50 20:30 1.725 V 1.360 V 135 89% 77 20:44 21:24

1.741 V 1.385 V 138 91% 78 21:45 22:25 1.732 V 1.380 V 103 68% < tb> 79 22:40 23:20 1,728 V 1,375 V 106 70% 80 23:40 24:20 1.739 V 1.379 V 121 80% 81 13:11 13:51 1.744 V 1.391 V 123 < SEP> 81%

[0021]

In Table 1, two commercially available Duracell AA alkaline batteries are selected as the battery pack, and the original output voltage is 1.611 V.

[0022]

A commercially available Epson digital camera is chosen as the electronic device.

The Duracell -AA- alkaline batteries are used in the Epson digital camera. A flash unit of the camera is continuously activated until the output voltage of the Duracell -AA- alkaline batteries is too low to activate the flash unit. The number of flashes of the flash unit is chosen as the reference value for the capacity of the battery pack. The normal operating voltage of the flash unit of the digital camera is 2.5 V and the power consumption is 0.3 A.

[0023]

New alkaline batteries can activate the flash unit 151 times, and the lower limit of the operating voltage of the flash unit is 1.4 V. From the first time to the 21st Times the charge of an alkaline battery, each charging time is 40 minutes.

[0024]

From the 21st Times until the 24th The number of times each charge increases to 45 minutes. From the 25th Times until the 81st The number of times each charge increases to 60 minutes. It should be noted that the loading time can be controlled by the microprocessor 30.

[0025]

The measurement results in Table 1 show that the alkaline batteries activate the flash unit 255 times after the first charge, and this is 168% of new alkaline batteries. This means that after the first charge, the capacity of the batteries increases by 68%. After the 81st When charging, the alkaline batteries can activate the flash unit 123 times, which is approximately 81% of the new alkaline batteries. Accordingly, the charging device according to the present invention can certainly charge the primary cell, such as the alkaline zinc-manganese batteries. In addition, the charger can increase the capacity of the batteries after charging, and the batteries can be recharged over 100 times. Thus, the charging device according to the present invention overcomes the disadvantages of the conventional devices and is also environmentally friendly.

[0026]

While the present invention has been described with reference to its preferred embodiment, it will be understood by those skilled in the art that a variety of modifications and changes can be made without departing from the scope of the present invention as defined by the appended claims shall be.

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CLAIMS DE202009016260

A charging apparatus for charging a battery pack (70), comprising: a converter-rectifier unit (10) that receives an external input energy and transforms the input energy into a DC output energy; a voltage treatment unit (20) which transforms the DC output energy of the converter-rectifier unit (10) into a DC energy and a charge energy; a microprocessor (30) operating in a control mode to control the charging of the battery pack (70); an agitation unit (40) controlled by the microprocessor (30) and generating a sine pulse to chemically activate the battery pack (70) before charging, thereby removing carbon deposits inside a battery of the battery pack (70); a determination unit (50) which determines an output voltage of the battery pack (70), which generates a detection signal and then transfers the detection signal to the microprocessor (30), the microprocessor (30) determining an electrical state of the battery pack (70) according to the detection signal , and the electrical state is concerned with whether the charging can be carried out, the charging is finished, the carbon deposition cannot be removed, and whether an abnormality occurs; and further comprising a display unit (60) controlled by the microprocessor (30) to indicate a state of charge of the battery pack (70); wherein the battery pack (70) comprises at least one battery, the battery is a primary cell, the input energy is either an AC input energy or a DC input energy, and wherein the DC input energy of the voltage processing unit (20) does so serves to supply the microprocessor (30), the agitation unit (40), the determination unit (50) and the display unit (60) with energy, and wherein the charging energy is used to charge the battery pack (70).

Charging device according to claim 1, characterized in that the primary cell is an alkaline zinc-manganese battery.

Charging device according to claim 1, characterized in that the alternating input energy comprises an energy source with a 110 V alternating current and an energy source with a 220 V alternating current, and in that the direct current energy source is a universal series bus (USB) energy source with a voltage of 5 V and has a maximum current of 500 mA.

Charging device according to claim 1, characterized in that the charging energy source has a voltage of 1.7 V and a maximum current of 500 mA.

Charging device according to claim 1, characterized in that the control process of the microprocessor (30) comprises: charging is not carried out if the output voltage of the battery pack (70) is lower than a first charging threshold voltage; charging is performed when the output voltage of the battery pack (70) is higher than the first charging threshold voltage; a small charge is performed when the output voltage of the battery pack (70) is higher than a small charge threshold voltage, the small charge having a charge voltage that corresponds to the charge and a charging current that is less than that of the charge; if the output voltage of the battery pack (70) drops during charging, the battery pack (70) is judged as the occurrence of an abnormality and the charging is stopped immediately; when the charging of the battery pack (70) reaches a predetermined charging time, the charging is completed; and when charging is complete, but the output voltage is less than a second charging threshold voltage that is higher than the first charging threshold voltage, the battery pack is recharged.

Charging device according to claim 5, characterized in that the first charging threshold voltage is 0.8 V.

Charging device according to claim 5, characterized in that the small charging threshold voltage is 1.7 V.

Charging device according to claim 5, characterized in that the predetermined charging time is 40 to 90 minutes.

Charging device according to claim 1, characterized in that the display unit (60) has a plurality of light-emitting components, that the light-emitting components are a first light-emitting diode (LED) and a second light-emitting diode (LED), and in that a colored light, that is emitted by the first LED differs from a colored light that is emitted by the second LED.

Charging device according to claim 9, characterized in that the first LED is a green LED and the second LED is a red LED.

Charging device according to claim 10, characterized in that the state of charge of the battery pack (70) indicated by the display unit (60) includes the following: if the microprocessor (30) has received supply and is operating normally, the green LED is switched on; if the battery pack (70) is not suitable for charging or if the output voltage of the battery pack (70) is lower than the first charging threshold voltage, the red LED flashes; if the carbon deposit of the battery pack (70) cannot be removed, the red LED flashes; if the carbon deposition from the battery pack (70) is not completely removed, then the green LED is turned off and the red LED is on continuously to indicate that charging is ongoing and charging is normal; and when charging of the battery pack (70) is complete, the red LED is switched off and the green LED lights up continuously.

Charging device according to Claim 1, characterized in that the microprocessor (30) furthermore has a storage unit with which electrical characteristic data and the optimal charging time of the battery pack (70) are stored, the electrical characteristic data including the first charging threshold voltage.

Charging device according to claim 1, characterized in that the microprocessor (30) further comprises a circuit board to the converter-rectifier unit (10), the voltage treatment unit (20), the microprocessor (30), the agitation unit (40) to spatially design the determination unit (50) and the display unit (60).

Charging device according to claim 1, characterized in that the microprocessor (30) further comprises a housing for covering the converter-rectifier unit (10), the voltage treatment unit (20), the microprocessor (30), the agitation unit (40), of the determination unit (50) and the display unit (60), the display unit (60) being exposed for the purpose of fulfilling its display function.

Espacenet

Bibliographic data: DE29507501 (U1) — 1995-06-29

Tragbare elektrische Leuchte mit einer Leuchtstofflampe

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Classification:
- **international:** ***H02J7/00; H02J7/35; H05B41/285;*** (IPC1-7): F21L9/00; F21V23/00; H02H7/18; H02J7/35; H05B41/14
- **cooperative:** **H02J7/0047 (EP)**; **H02J7/35 (EP)**; **H05B41/2853 (EP)**

Application number: DE19952007501U 19950505

Priority number (s): DE19952007501U 19950505

Abstract not available for DE29507501 (U1)

(19) BUNDESREPUBLIK DEUTSCHLAND

DEUTSCHES PATENTAMT

(12) **Gebrauchsmuster**

(10) **DE 295 07 501 U 1**

(11) Aktenzeichen: 295 07 501.5
(22) Anmeldetag: 5. 5. 95
(47) Eintragungstag: 29. 6. 95
(43) Bekanntmachung im Patentblatt: 10. 8. 95

(51) Int. Cl.[6]:
F 21 L 9/00
F 21 V 23/00
H 05 B 41/14
H 02 J 7/35
H 02 H 7/18

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(54) Tragbare elektrische Leuchte mit einer Leuchtstofflampe

DE 295 07 501 U 1

DE 295 07 501 U 1

WINPLUS Ex. 1003, p. 893

Titel

Tragbare elektrische Leuchte mit einer Leuchtstofflampe

Beschreibung

Die Erfindung betrifft eine tragbare elektrische Leuchte mit einer Leuchtstofflampe und einem integriertem Laderegler zum Aufladen eines eingebauten Akkumulators aus einer externen Stromversorgungsquelle, insbesondere aus einem Solarmodul.

Aus der DE 39 22 024 ist bereits eine Akku-Leuchte bekannt, die für sich Universalität (Auto und Haushalt), Leistung aus kleinem Volumen (Ni-Cd-Akkus und Leuchtstoffröhre) und enormer Lebensdauer (10000 h Leuchtstoffröhre, 1000 Zyklen Ni-Cd-Akkus) in Anspruch nimmt. Erreicht werden sollen diese Leistungsmerkmale insbesondere durch eine spezielle Elektronik (2-Takt-Wandler mit Starthilfe am Reflektor). Die Leuchte ist in einer Halterung untergebracht, die gleichzeitig das Ladeteil beinhaltet. Das Ladeteil ist an das Auto-Bordnetz angeschlossen. Ferner kann die Leuchte direkt an die Autosteckdose, oder die Zigarettenanzünderbuchse angeschlossen werden. Zur Verwendung im Haushalt dient ein besonderes Netzstecker-ladegerät, das an das Lichtnetz im Haushalt angeschlossen ist. Als Leuchtstofflampe ist eine Energiesparlampe vorgesehen.

Nach der DE 35 19 370 A1 wird die Betriebsbereitschaft von galvanischen Elementen, bzw. eines mit derartigen Elementen versehenen Geräts, wie Taschenlampe, durch integrierte Solarzellen gesichert, die die Selbstentladeverluste der unbelasteten Batterie durch Erhaltungsladung ausgleicht.

Weiter ist aus der DE 35 37 947 A1 ein Verfahren zur Ladung von Akkumulatoren, insbesondere Bleiakkumulatoren, aus kurzschlußfesten Stromquellen, insbesondere Solargeneratoren, bekannt. In der angegebenen Ladeschaltung wird durch Kurzschlie-

WINPLUS Ex. 1003, p. 894

ßen des Solargenerators mittels eines Halbleiterschalters eine Überladung des Akkumulators sowie eine Entladung des Akkumulators über den Solargenerator durch eine sperrende Halbleiterdiode verhindert.

Aus dem DE 88 09 222 U1 ist eine Solarzellenladestromvorrichtung mit dauerhafter Stromabnahme am Akkumulator bekannt, die auf Basis eines Spannungswandlers arbeitet. Eine optische Ladekontrolle mit einer LED ist vorgesehen. Ferner ist ein Entladeschutzmodul vorhanden, der einen Rückstrom zu den Akku-Zellen verhindert.

Ferner ist eine tragbare elektrische Leuchte bekannt, die mit einer Energiesparlampe ausgerüstet und deren Bleiakkumulator vorzugsweise mittels eines Solarmoduls aufgeladen wird. Der Bleiakkumulator und die Ladeschaltung sind im Unterteil der Leuchte untergebracht.

Aufgabe der Erfindung ist es, die Funktionalität einer tragbaren elektrischen Lampe zu erhöhen.

Die Aufgabe wird durch die im kennzeichnenden Teil des Anspruchs 1 angegebenen Merkmale gelöst. Weitere vorteilhafte Ausgestaltungen sind in den Ansprüchen 2 bis 12 angegeben.

Durch die Erfindung wird es möglich, alternativ oder zusätzlich zu der Leuchtfunktion der tragbaren Leuchte einen oder mehrere zusätzliche Verbraucher anzuschließen. Insbesondere läßt sich über die Verbraucherbuchse ein tragbarer Rundfunkempfänger oder ein tragbarer Fernsehempfänger betreiben. Beispielhaft werden als weitere Verbraucher Rasierapparat, Tischventilator und Funktelefon genannt. Entsprechend der Größe des verwendeten Akkumulators und des Ladestroms sind den anschließbaren Verbrauchern Grenzen gesetzt.

Besonders interessant sind die neu erschlossenen Anwendungsgebiete für Leuchten, die mit Solarstromgeneratoren gekoppelt sind, da hierdurch die Nutzung zusätzlicher Verbraucher in

WINPLUS Ex. 1003, p. 895

Gebieten ermöglicht wird, die energetisch noch nicht erschlossen sind und für die der Einsatz von Trockenbatterien zu aufwendig ist.

Zur Erhöhung der Gebrauchseigenschaften tragen weiterhin bei ein Verpolschutz an beiden Buchsen, Schutz vor Rückstrom, Schutz vor Überlastung, Kurzschluß und defekter Lampe, Schutz vor Überladung und Tiefentladung des Akkumulators, kein Ruhestromverbrauch der Ladeschaltung, Zustandsanzeige über Leuchtdioden und lange Leuchtdauer der Lampe bei ausreichender Lichtstärke.

Die Erfindung soll anhand eines Ausführungsbeispiels näher erläutert werden. In der zugehörigen Zeichnung ist der Stromlaufplan der Leuchtenschaltung dargestellt.

Eine Moduleingangsbuchse X1 zum Anschluß eines nicht näher dargestellten Solarmoduls der Leistungsklasse von vorzugsweise 5 W_p bis 12W_p mit einem optimalen Arbeitspunkt bei 15,5 V bis 19 V und einem maximalen Arbeitsstrom von 1 A ist mittels einer Diode VD3 verpolungsgeschützt.

Die eigentliche Ladeschaltung besteht im wesentlichen aus einem Längsregler N1 für einen wartungsfreien Bleiakkumulator von beispielsweise 12V, 6,5 Ah, einer Zuschaltautomatik mit den Transistoren VT1, VT2 und den Widerständen R1, R2, R3, R4, den Kondensatoren C1, C3, dem Speicherkondensator C2 und der Freilaufdiode VD1. Eine Schutzdiode VD3 dient als Verpolschutz für den Solarmodul und als Rückstromschutzdiode.

Die Ladeschaltung entzieht dem Akkumulator keinen Ruhestrom, da eine Zuschaltung des Ladereglers (N1) erst beim Anliegen einer ausreichenden Ladespannung (1 V über der Akkumulatorenspannung) erfolgt.

Gegen die Verpolung des nicht näher dargestellten Bleiakkumulators dient eine Reihenschaltung von einer 2A-Sicherung E1 und einer in Verpolrichtung durchlassenden Diode VD9. Bei

WINPLUS Ex. 1003, p. 896

Verpolung wird der Akkumulator über die Diode Vd9 kurzgeschlossen und die Sicherung E1 spricht an.

Die Sicherung E1 schützt weiterhin vor überhöhtem Ladestrom und zu hoher Stromaufnahme eines Verbrauchers bzw. Kurzschluß an der DC-Verbraucherausgangsbuchse X2.

Eine LED VD2 zeigt an, sobald die Ladespannung vom Solarmodul anliegt und der Akkumulator aufgeladen wird. Ein Überladen des Akkumulators ist aufgrund des Überladeschutzes (N1, VD2) nicht möglich.

Mittels eines dreistufigen Kippschalters S1 sind folgende Betriebsweisen wählbar:

1. EIN DC-Ausgang (S1, 1)
2. AUS (Mittelstellung)
3. EIN DC-Ausgang und EIN Lampe (S1, 2).

Zunächst soll die Wirkungsweise der Schaltung bei Schaltstellung 1 beschrieben werden:

In Schaltstellung 1 ist nur die DC-Verbraucherausgangsbuche X2 eingeschaltet. Es können externe Verbraucher bis zu 1,2 A und 12 V direkt angeschlossen werden. Eine Diode VD11 im Stromlängspfad dient als Rückstromsperre.

Durch den Transistor VT7 mit den Widerständen R26, R27, R28, den Kondensatoren C11, C13 und der Diode VD10 wird die Stromentnahme an der Verbraucherausgangsbuchse X2 überwacht und bei Überschreitung des eingestellten Wertes, z.B. bei Kurzschluß am Ausgang, abgeschaltet. Hierzu dient ein Tiefentladeschutz für den Akkumulator, bestehend aus dem OP-Verstärker N2, den Widerständen R8, R9, R10, R20, dem Kondensator C5 und dem MOSFET VT3. Die Abschaltschwelle für den Tiefentladungsschutz ist durch eine Schwelleneinstellschaltung, bestehend aus dem Spannungsteiler R21, R22 und der Spannungsreferenz VD4 mit dem Vorwiderstand R5 sowie dem Kon-

WINPLUS Ex. 1003, p. 897

densator C4 einstellbar. Die Entladetiefe läßt sich zur Schonung des Akkumulators mit dem Potentiometer R21 auf 50% bis 80% werksseitig voreinstellen. Mit der Einstellung für die zulässige Entladetiefe wird zugleich der Schwellwert einer Vorwarnstufe, bestehend aus den Widerständen R11 bis R14, dem Kondensator C6 und der Diode VD7, eingestellt. Eine LED VD8 signalisiert im Zusammenwirken mit dem OP-Verstärker N2, dem Kondensator C8, den Widerständen R15 bis R18 und der Diode VD6 bei etwa 10% der noch verfügbaren Akkumulatorenkapazität, daß alsbald die Abschaltschwelle erreicht ist und die Abschaltung erfolgen wird.

Die Rücksetzung des Tiefentladeschutzes erfolgt durch Entladung der Kapazität C4 über die Diode VD12 in der Schalterstellung 2 (AUS) des Dreistellungsschalters S1.

In Schaltstellung 3 ist zusätzlich die Leuchtstofflampe H1, eine 7W-Energiesparlampe, eingeschaltet. Über den Transistor VT6, die Widerstände R24, R25 und den Kondensator C12 und die Diode VD10 wird die Lampe H1 und die elektronische Zündschaltung auf eventuellen Kurzschluß überwacht. Ansonsten wirken ebenso die Überstromüberwachung, die Vorwarnung für alsbaldige Abschaltung und der Tiefentladeschutz.

Die Ansteuerschaltung für die Lampe H1 besteht aus dem Vorschaltgerät mit den Transistoren VT4, VT5, dem Transformator TR1, der Drossel L1, dem Vorschaltkondensator C9, dem Vorwiderstand R19 und der Störschutzbeschaltung, bestehend aus dem Widerstand R23 und dem Kondensator C10. Die Lampe H1 wird auf etwa 50% ihrer Stromentnahme gedrosselt, was noch eine akzeptable Lichtausbeute bedeutet.

Durch die komfortable Schaltungstechnik und die universelle Anwendungsmöglichkeit ist die erfindungsgemäße Leuchte als echte Bereicherung der Technik zu werten.

- hierzu 1 Blatt Zeichnungen -

WINPLUS Ex. 1003, p. 898

Ansprüche:

1. Tragbare elektrische Leuchte mit einer Leuchtstofflampe und einem integrierten Laderegler zum Aufladen eines eingebauten Akkumulators aus einer externen Stromversorgungsquelle, insbesondere aus einem Solarmodul, sowie einem integrierten Schutz vor einer Tiefentladung des Akkumulators, **gekennzeichnet durch:**
a) eine Modulbuchse (X1), über die der Akkumulator von einem Solarmodul oder einer Netzstromversorgung aufgeladen werden kann,
b) eine Verbraucherbuchse (X2) zum direkten Betrieb eines externen Verbrauchers,
c) einen Dreistellungsschalter (S1) mit den Schaltstellungen:
- nur Verbraucherbuchse (X2) angeschaltet
- Leuchtstofflampe (H1) und Verbraucherbuchse (X2) abgeschaltet; Tiefentladeschutz nicht gesetzt
- Leuchtstofflampe (H1) und Verbraucherbuchse (X2) angeschaltet,
d) eine LED (VD2) zur Anzeige des Aufladevorgangs des Akkumulators,
e) eine weitere LED (VD8) zur Anzeige einer weitgehenden Entladung des Akkumulators und Anzeige des ausgelösten Tiefentladeschutzes.

2. Tragbare Leuchte nach Anspruch 1, **dadurch gekennzeichnet,** daß die Modulbuchse (X1) einen Schutz vor Verpolung durch eine in Sperrichtung zwischen dem Minuspol der Modulbuchse (X1) und dem Minuspol der Schaltung angeordnete Diode (VD3) besitzt, welche auch das Fließen eines Rückstroms über den Solarmodul verhindert.

3. Tragbare Leuchte nach Anspruch 1, **dadurch gekennzeichnet,** daß der Akkumulatoranschluß einen Schutz vor Verpolung besitzt, indem der Akkumulator bei Verpolung über eine Sicherung (E1) und eine in Verpolrichtung durchlassende Diode

WINPLUS Ex. 1003, p. 899

(VD9) kurzgeschlossen wird.

4. Tragbare Leuchte nach Anspruch 1, **dadurch gekennzeichnet,** daß der Akkumulator mittels einer Sperrdiode (VD11) vor einem unzuzlässigen Aufladen über die Verbraucherbuchse (X2) geschützt ist.

5. Tragbare Leuchte nach Anspruch 1, **dadurch gekennzeichnet,** daß die Verbraucherbuche (X2) und die Lampe (H1) gegen übermäßige Stromentnahme und Kurzschluß geschützt sind, indem Transistorschalter (VT6, VT7) bei Vorhandensein eines eingestellten Überstroms die Lampe (H1) und/oder die Verbraucherbuchse (X2) abschalten.

6. Tragbare Leuchte nach Anspruch 1, **dadurch gekennzeichnet,** daß in die Ladeschaltung, bestehend aus einem Längsregler (N1) mit einer Freilaufdiode (Vd1) sowie einer LED (VD2), ein automatischer Überladeschutz für den Akkumulator integriert ist, bestehend aus komplementären Transistoren (VT1, VT2) und peripheren Widerständen (R1 bis R4).

7. Tragbare Leuchte nach Anspruch 1, **dadurch gekennzeichnet,** daß die Ladeschaltung keinen Ruhestrom verbraucht, indem ihre Zuschaltung über die Transistoren (VT1, VT2) und Widerstände (R1 bis R4) erst beim Anliegen einer ausreichenden Ladespannung (1 V über der Akkumulatorenspannung) erfolgt.

8. Tragbare Leuchte nach Anspruch 1, **dadurch gekennzeichnet,** daß ein automatischer Tiefentladeschutz für den Akkumulator mittels eines die Spannung am Akkumulator abfühlenden OP-Verstärkers (N2) vorgesehen ist, wobei die LED (VD8) vorab eine alsbaldige Abschaltung signalisiert.

9. Tragbare Leuchte nach Anspruch 1, **dadurch gekennzeichnet,** daß die Auslösung des Tiefentladeschutzes bis zu seiner Rücksetzung über den Dreistellungsschalter (S1) durch Blinken der LED (VD8) angezeigt wird.

WINPLUS Ex. 1003, p. 900

10. Tragbare Leuchte nach Anspruch 1, **dadurch gekennzeichnet,** daß als Leuchtstofflampe (H1) eine sogenannte Energiesparlampe dient.

11. Tragbare Leuchte nach Anspruch 1, **dadurch gekennzeichnet,** daß der Leistungsverbrauch der Leuchtstofflampe (H1) auf 50% gedrosselt ist.

12. Tragbare Leuchte nach Anspruch 1, **dadurch gekennzeichnet,** daß die Modulbuchse (X1) und die Verbraucherbuchse (X2) verwechselungssicher ausgeführt sind.

WINPLUS Ex. 1003, p. 901

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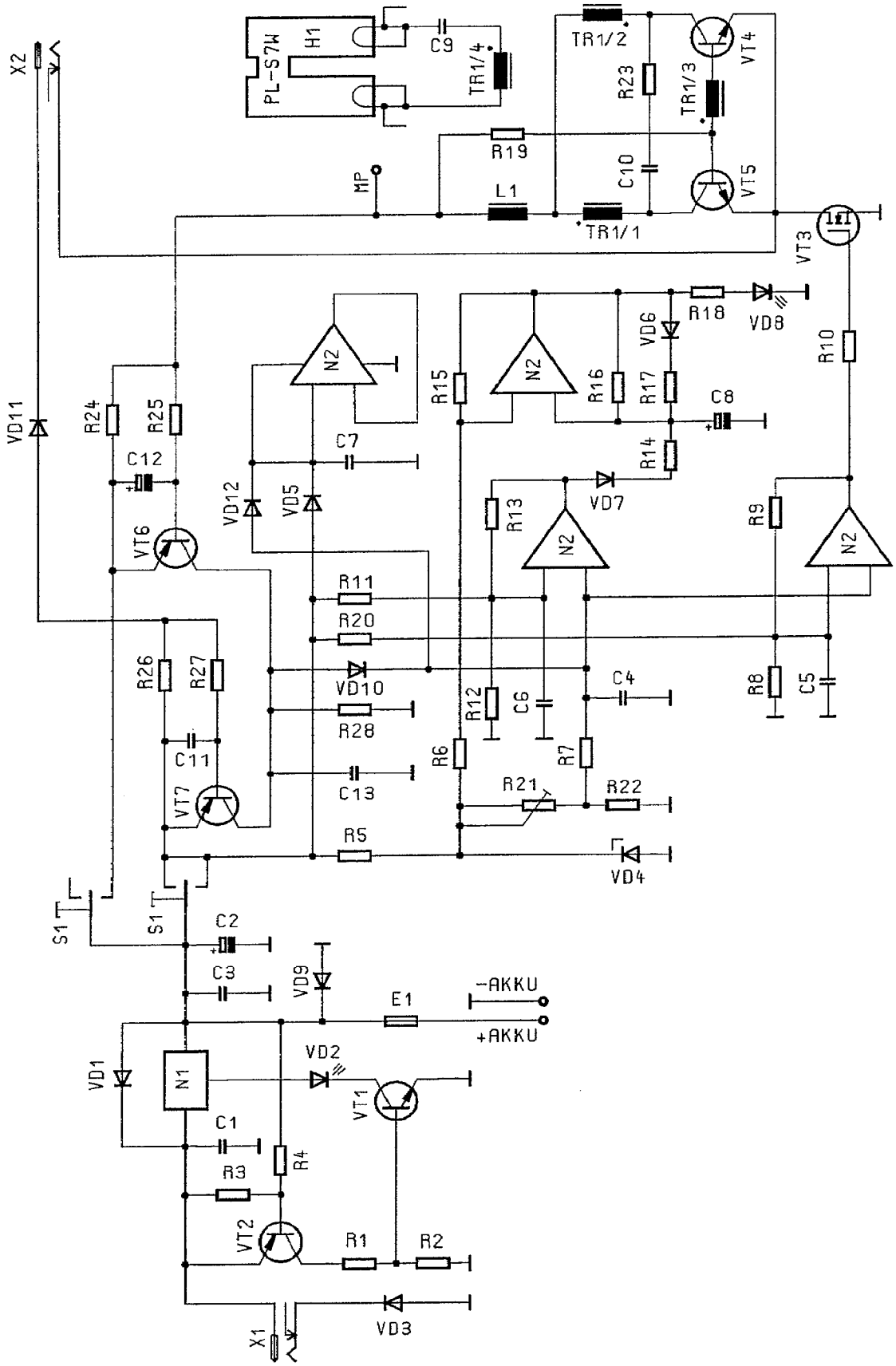

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WINPLUS Ex. 1003, p. 902

Espacenet

Bibliographic data: DE29507501 (U1) — 1995-06-29

Tragbare elektrische Leuchte mit einer Leuchtstofflampe

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Classification:
- **international:** ***H02J7/00; H02J7/35; H05B41/285;*** (IPC1-7): F21L9/00; F21V23/00; H02H7/18; H02J7/35; H05B41/14
- **cooperative:** **H02J7/0047 (EP)**; **H02J7/35 (EP)**; **H05B41/2853 (EP)**

Application number: DE19952007501U 19950505

Priority number (s): DE19952007501U 19950505

Abstract not available for DE29507501 (U1)

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DESCRIPTION DE29507501

[0001]

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[0002]

Portable electric light with a fluorescent lamp

description

[0003]

The invention relates to a portable electric light with a fluorescent lamp and an integrated charge controller for charging a built-in rechargeable battery from an external power supply source, in particular from a solar module.

[0004]

From DE 39 22 024 a cordless lamp is already known, which for itself universality (car and household), performance from a small volume (Ni-Cd batteries and fluorescent tube) and enormous service life (10000 h fluorescent tube, 1000 cycles Ni-Cd -Batteries).

These performance features are to be achieved in particular by means of special electronics (2-stroke converter with start aid on the reflector).

The lamp is housed in a holder that also contains the charging unit. The charger is connected to the car electrical system. Furthermore, the lamp can be connected directly to the car socket or the cigarette lighter socket. A special mains plug charger is used for household use and is connected to the household lighting network. An energy-saving lamp is provided as the fluorescent lamp.

[0005]

According to DE 35 19 370 A1, the operational readiness of galvanic elements, or of a device provided with such elements, such as a flashlight, is ensured by integrated solar cells, which compensates for the self-discharge losses of the unloaded battery by means of trickle charging.

[0006]

Furthermore, DE 35 37 947 A1 discloses a method for charging accumulators, in particular lead accumulators, from short-circuit-proof current sources, in particular solar generators.

In the specified charging circuit, short-circuiting

[0007]

. ?

[0008]

. "» & Ggr; " ilpat / 19520DE-6 (9) * · · · · ·

[0009]

ß of the solar generator by means of a semiconductor switch prevents overcharging the battery and discharging the battery via the solar generator by a blocking semiconductor diode.

[0010]

From DE 88 09 222 Ul a solar cell charging current device with permanent current draw on the accumulator is known, which works on the basis of a voltage converter.

An optical charge control with an LED is provided. There is also a discharge protection module that prevents reverse current to the battery cells.

[0011]

Furthermore, a portable electric lamp is known, which is equipped with an energy-saving lamp and whose lead accumulator is preferably charged by means of a solar module. The lead accumulator and the charging circuit are housed in the lower part of the lamp.

[0012]

The object of the invention is to increase the functionality of a portable electric lamp.

[0013]

The object is achieved by the features specified in the characterizing part of claim 1.

Further advantageous refinements are specified in claims 2 to 12.

[0014]

The invention makes it possible, alternatively or in addition to the lighting function of the portable lamp, to connect one or more additional consumers. In particular, a portable radio receiver or a portable television receiver can be operated via the consumer socket. Examples include shaver, table fan and radio telephone as additional consumers. Depending on the size of the accumulator used and the charging current, there are limits to the connectable consumers.

[0015]

The newly developed areas of application for luminaires that are coupled with solar power generators are particularly interesting, as this enables the use of additional consumers in

[0016]

. . .-,: * ". *%; ··· ilpat / 19520DE-7 (9)

[0017]

Areas are made possible which are not yet energetically developed and for which the use of dry cell batteries is too expensive.

[0018]

To increase the performance characteristics, reverse polarity protection at both sockets, protection against reverse current, protection against overload, short circuit and defective lamp, protection against overcharging and deep discharge of the battery, no quiescent current consumption of the charging circuit, status display via LEDs and long lamp life with sufficient light intensity .

[0019]

The invention will be explained in more detail using an exemplary embodiment.

The circuit diagram of the lamp circuit is shown in the accompanying drawing.

[0020]

A module input socket XI for connecting a solar module of the power class of preferably 5 Wp to 12Wp, with an optimal operating point at 15.5 V to 19 V and a maximum working current of 1 A, is protected against polarity reversal by means of a diode VD3.

[0021]

The actual charging circuit essentially consists of a series regulator NI for a maintenance-free lead accumulator of, for example, 12V, 6.5 Ah, an automatic switch-on device with the transistors VTI, VT2 and the resistors RI, R2, R3, R4, the capacitors CI, C3, the storage capacitor C2 and the free-wheeling diode VDI. A protection diode VD3 serves as reverse polarity protection for the solar module and as a reverse current protection diode.

[0022]

The charging circuit does not draw any quiescent current from the accumulator, since the charge controller (NI) is only switched on when a sufficient charging voltage (1 V above the accumulator voltage) is applied.

[0023]

A series connection of a 2A fuse E1 and a diode VD9 which transmits in the polarity reversal direction serves to reverse the polarity of the lead accumulator, which is not shown.

At

[0024]

,*.:.'. .*.:*.. .

...; ... ilpat / 19520DE-8 (9)

[0025]

Reverse polarity, the accumulator is short-circuited via the diode Vd9 and the fuse EI responds.

[0026]

The fuse EI further protects against excessive charging current and excessive current consumption by a consumer or

Short circuit at the DC consumer output socket X2.

[0027]

An LED VD2 shows as soon as the charging voltage from the solar module is present and the accumulator is being charged.

Overcharging the accumulator is not possible due to the overcharge protection (NI, VD2).

[0028]

The following operating modes can be selected using a three-stage toggle switch S1:

[0029]

1. ON DC output (Si, 1)

[0030]

2. OFF (middle position)

[0031]

3. One DC output and one lamp (SI, 2).

[0032]

First, the mode of operation of the circuit in switch position 1 will be described:

[0033]

In switch position 1, only the DC consumer output socket X2 is switched on.

External consumers up to 1.2 A and 12 V can be connected directly.

A diode VDII in the longitudinal current path serves as a non-return valve.

[0034]

Through the transistor VT7 with the resistors R26, R27, R28, the capacitors CII, C13 and the diode VD10 the current draw at the consumer output socket X2 is monitored and when the set value is exceeded, e.g.

B. in the event of a short circuit at the output, switched off.

A deep discharge protection for the accumulator, consisting of the OP amplifier N2, the resistors R8, R9, RIO, R20, the capacitor C5 and the MOSFET VT3, is used for this.

The shutdown threshold for deep discharge protection is a threshold setting circuit consisting of the voltage divider R21, R22 and the voltage reference VD4 with the series resistor R5 and the Kon-

[0035]

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[0036]

adjustable capacitor C4. The discharge depth can be preset at the factory to 50% to 80% using the R21 potentiometer to protect the battery. With the setting for the permissible discharge depth, the threshold value of a prewarning stage consisting of the resistors R11 to R14, the capacitor C6 and the diode VD7 is set at the same time. An LED VD6, in cooperation with the OP amplifier N2, the capacitor C8, the resistors R15 to R18 and the diode VD6 at about 10% of the still available battery capacity, indicates that the switch-off threshold has been reached and the switch-off will take place.

[0037]

The deep discharge protection is reset by discharging the capacitance C4 via the diode VD12 in the switch position 2 (OFF) of the three-position switch S1.

[0038]

In switch position 3, the fluorescent lamp HI, a 7W energy-saving lamp, is also switched on.

The lamp H1 and the electronic ignition circuit are monitored for possible short circuits via the transistor VT6, the resistors R24, R25 and the capacitor C12 and the diode VD10. Otherwise, overcurrent monitoring, the pre-warning for immediate shutdown and deep discharge protection also work.

[0039]

The control circuit for the lamp HI consists of the ballast with the transistors VT4, VT5, the transformer TRI, the reactor L1, the series capacitor C9, the series resistor Ri9 and the interference protection circuit, consisting of the resistor R23 and the capacitor CiO. The lamp HI is throttled to about 50% of its current draw, which still means an acceptable luminous efficacy.

[0040]

Due to the convenient circuit technology and the universal application, the luminaire according to the invention can be seen as a real asset to the technology.

[0041]

- plus 1 sheet of drawings -

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CLAIMS DE29507501

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Expectations:

1.

Portable electric light with a fluorescent lamp and an integrated charge controller for charging a built-in rechargeable battery from an external power supply source, in particular from a solar module, and integrated protection against deep discharge of the rechargeable battery, characterized by:

a) a module socket (XI), via which the accumulator can be charged by a solar module or a mains power supply,

b) a consumer socket (X2) for the direct operation of an external consumer,

c) a three-position switch (SI) with the switch positions:

- Only consumer socket (X2) switched on

- Fluorescent lamp (HI) and consumer socket (X2) switched off; Deep discharge protection not set

- fluorescent lamp (HI) and consumer socket (X2) switched on,

d) an LED (VD2) to indicate the charging process of the battery,

e) another LED (VD8) to indicate extensive discharge of the battery and display of the triggered deep discharge protection.

2.

Portable lamp according to claim 1, characterized in

that the module socket (XI) has protection against reverse polarity by a diode (VD3) arranged in the reverse direction between the negative pole of the module socket (XI) and the negative pole of the circuit, which also prevents the flow of a reverse current through the solar module.

3.

Portable lamp according to claim 1, characterized in

that the accumulator connection has protection against polarity reversal, in that the accumulator has polarity reversal via a fuse (EI) and a diode that transmits in the polarity reversal direction

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"lipat / 19520DE-3 (9)

(VD9) is short-circuited.

4.

Portable lamp according to claim I7, characterized in that

that the accumulator is protected by means of a blocking diode (VDil) against undue charging via the consumer socket (X2).

5.

Portable lamp according to claim 1, characterized in

that the consumer socket (X2) and the lamp (Hl) are protected against excessive current drain and short circuit by switching off the lamp (Hi) and / or the consumer socket (X2) in the presence of a set overcurrent in the presence of transistor switches (VT6, VT7).

6.

Portable lamp according to claim 1, characterized in

that in the charging circuit, consisting of a series regulator (Nl) with a free-wheeling diode (Vdl) and an LED (VD2), an automatic overcharge protection for the battery is integrated, consisting of complementary transistors (VTl, VT2) and peripheral resistors (Rl to R4).

7.

Portable lamp according to claim 1, characterized in that the charging circuit does not consume a quiescent current, since it is switched on via the transistors (VTl, VT2) and resistors (Rl to R4) only when a sufficient charging voltage (1 V above the accumulator voltage) is present.

8.

Portable lamp according to claim 1, characterized in

that an automatic deep discharge protection for the accumulator is provided by means of an OP amplifier (N2) that senses the voltage at the accumulator, the LED (VD8) signaling an immediate shutdown in advance.

9.

Portable lamp according to claim 1, characterized in that the triggering of the deep discharge protection until it is reset is indicated by the three-position switch (S1) by the LED (VD8) flashing.

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10.

Portable lamp according to claim 1, characterized in

that a so-called energy-saving lamp is used as the fluorescent lamp (Hl).

11.

Portable lamp according to claim 1, characterized in

that the power consumption of the fluorescent lamp (Hl) is throttled to 50%.

12.

Portable lamp according to claim 1, characterized in

that the module socket (X1) and the consumer socket (X2) are designed to be confused.

Espacenet

Bibliographic data: DE202013102599 (U1) — 2013-08-13

Not-Startstromversorgung für Fahrzeuge

Inventor(s):

Applicant(s): ASIA BRIGHT IND HONG KONG CO [HK] ± (ASIA BRIGHT INDUSTRIAL (HONG KONG) CO., LTD)

Classification: **- international:*F02N11/14***
- cooperative: **F02N11/0866 (EP)**; **F02N11/12 (EP)**; **F02N11/14 (EP)**

Application number: DE201320102599U 20130618

Priority number (s): DE201320102599U 20130618

Abstract of DE202013102599 (U1)

Not-Startstromversorgung für Fahrzeuge, dadurch gekennzeichnet, dass sie einen wiederaufladbaren Lithium-Ionen-Akku, einen Mikrocontroller, eine Ladeeingabeeinheit, die mit dem wiederaufladbaren Lithium-Ionen-Akku und dem Mikrocontroller verbunden ist und unter der Steuerung des Mikrocontrollers den wiederaufladbaren Lithium-Ionen-Akku auflädt, eine Zündausgabeeinheit, die mit dem wiederaufladbaren Lithium-Ionen-Akku und dem Mikrocontroller verbunden ist und unter der Steuerung des Mikrocontrollers die Elektrizitätsmenge des wiederaufladbaren Lithium-Ionen-Akkus durch Zündung ausgibt, und ein Relais, das an die Stelle zwischen dem Mikrocontroller und der Zündausgabeeinheit angeschlossen ist und die Zündausgabe der Zündausgabeeinheit an- und abschaltet, aufweist.

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ABSTRACT DE202013102599

Emergency start power supply for vehicles, characterized in that it has a rechargeable lithium-ion battery, a microcontroller, a charging input unit that is connected to the rechargeable lithium-ion battery and the microcontroller and under the control of the microcontroller the rechargeable lithium-ion -Battery recharges, an ignition output unit connected to the rechargeable lithium-ion battery and the microcontroller and under the control of the microcontroller outputs the amount of electricity of the rechargeable lithium-ion battery by ignition, and a relay that takes the place between the Microcontroller and the ignition output unit is connected and switches the ignition output of the ignition output unit on and off.

(19) Deutsches Patent- und Markenamt

(10) **DE 20 2013 102 599 U1** 2013.10.02

(12) # Gebrauchsmusterschrift

(21) Aktenzeichen: **20 2013 102 599.2**
(22) Anmeldetag: **18.06.2013**
(47) Eintragungstag: **13.08.2013**
(45) Bekanntmachungstag im Patentblatt: **02.10.2013**

(51) Int Cl.: ***F02N 11/14*** (2013.01)

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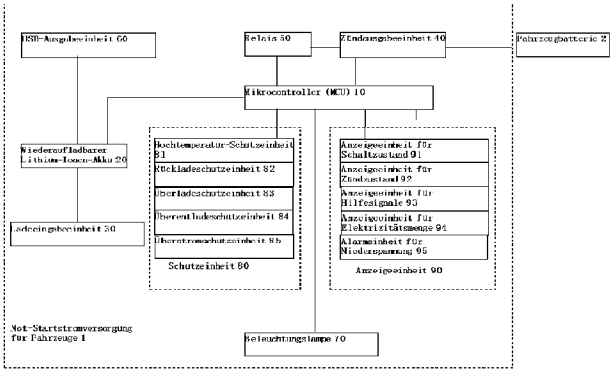
Die folgenden Angaben sind den vom Anmelder eingereichten Unterlagen entnommen

(54) Bezeichnung: **Not-Startstromversorgung für Fahrzeuge**

(57) Hauptanspruch: Not-Startstromversorgung für Fahrzeuge, dadurch gekennzeichnet, dass sie einen wiederaufladbaren Lithium-Ionen-Akku, einen Mikrocontroller, eine Ladeeingabeeinheit, die mit dem wiederaufladbaren Lithium-Ionen-Akku und dem Mikrocontroller verbunden ist und unter der Steuerung des Mikrocontrollers den wiederaufladbaren Lithium-Ionen-Akku auflädt, eine Zündausgabeeinheit, die mit dem wiederaufladbaren Lithium-Ionen-Akku und dem Mikrocontroller verbunden ist und unter der Steuerung des Mikrocontrollers die Elektrizitätsmenge des wiederaufladbaren Lithium-Ionen-Akkus durch Zündung ausgibt, und ein Relais, das an die Stelle zwischen dem Mikrocontroller und der Zündausgabeeinheit angeschlossen ist und die Zündausgabe der Zündausgabeeinheit an- und abschaltet, aufweist.



Beschreibung

Technisches Gebiet

[0001] Das vorliegende Gebrauchsmuster betrifft die Notstart-Technik für Fahrzeuge, insbesondere eine Not-Startstromversorgung für Fahrzeuge.

Stand der Technik

[0002] Mit der wirtschaftlichen Entwicklung werden Fahrzeuge schon verbreitet in vielen Bereichen wie in Transport, Bergbau-Produktion und täglichem Leben usw. verwendet. Im Gebrauch des Fahrzeugs kommt es häuft vor, dass das Fahrzeug wegen unzureichender Batteriespannung nicht gestartet werden kann, was dem Benutzer eine Menge Unannehmlichkeiten bringt. Bestehende Lösung ist Bereitstellung der Notstromversorgung für das Fahrzeug. Wenn das Fahrzeug nicht gestartet werden kann, kann die Notstromversorgung die Zündung und den Start des Fahrzeugs ermöglichen. Aber auf dem Markt werden jetzt in der Regel Blei-Säure-Batterien mit großer Kapazität als Not-Startstromversorgung für Fahrzeuge verwendet, die große Abmessungen haben und die Umwelt verschmutzen können.

Inhalt des Gebrauchsmusters

[0003] Das vorliegende Gebrauchsmuster bietet eine Not-Startstromversorgung für Fahrzeuge an, aufweisend einen wiederaufladbaren Lithium-Ionen-Akku, einen Mikrocontroller, eine Ladeeingabeeinheit, die mit dem wiederaufladbaren Lithium-Ionen-Akku und dem Mikrocontroller verbunden ist und unter der Steuerung des Mikrocontrollers den wiederaufladbaren Lithium-Ionen-Akku auflädt, eine Zündausgabeeinheit, die mit dem wiederaufladbaren Lithium-Ionen-Akku und dem Mikrocontroller verbunden ist und unter der Steuerung des Mikrocontrollers die Elektrizitätsmenge des wiederaufladbaren Lithium-Ionen-Akkus durch Zündung ausgibt, und ein Relais, das an die Stelle zwischen dem Mikrocontroller und der Zündausgabeeinheit angeschlossen ist und den Zündausgabe der Zündausgabeeinheit an- und abschaltet.

[0004] Die Not-Startstromversorgung für Fahrzeuge gemäß dem vorliegenden Gebrauchsmuster weist ferner eine USB-Ausgabeeinheit auf, die mit dem wiederaufladbaren Lithium-Ionen-Akku und dem Mikrocontroller verbunden ist und unter der Steuerung des Mikrocontrollers die Elektrizitätsmenge des wiederaufladbaren Lithium-Ionen-Akkus ausgibt.

[0005] Die Not-Startstromversorgung für Fahrzeuge gemäß dem vorliegenden Gebrauchsmuster weist ferner eine Beleuchtungslampe auf, die mit dem wiederaufladbaren Lithium-Ionen-Akku und dem Mikrocontroller verbunden ist.

[0006] Die Not-Startstromversorgung für Fahrzeuge gemäß dem vorliegenden Gebrauchsmuster weist ferner eine Timing-Einheit auf, die mit dem Mikrocontroller verbunden ist und zum Timing der Schaltzeit der Not-Startstromversorgung für Fahrzeuge dient.

[0007] Die Not-Startstromversorgung für Fahrzeuge gemäß dem vorliegenden Gebrauchsmuster weist ferner eine Schutzeinheit auf, die mit dem wiederaufladbaren Lithium-Ionen-Akku und dem Mikrocontroller verbunden ist und dem wiederaufladbaren Lithium-Ionen-Akku voreingestellten Schutz liefert.

[0008] Die Not-Startstromversorgung für Fahrzeuge gemäß dem vorliegenden Gebrauchsmuster weist eine Hochtemperatur-Schutzeinheit, eine Rückladeschutzeinheit, eine Überladeschutzeinheit, eine Überentladeschutzeinheit und eine Überstromschutzeinheit auf.

[0009] Die Not-Startstromversorgung für Fahrzeuge gemäß dem vorliegenden Gebrauchsmuster weist ferner eine Anzeigeeinheit auf, die mit dem wiederaufladbaren Lithium-Ionen-Akku und dem Mikrocontroller verbunden ist und den vorbestimmten Zustand der Not-Startstromversorgung für Fahrzeuge anzeigt.

[0010] Die Anzeigeeinheit der Not-Startstromversorgung für Fahrzeuge gemäß dem vorliegenden Gebrauchsmuster weist eine Anzeigeeinheit für Schaltzustand, eine Anzeigeeinheit für Zündzustand, eine Anzeigeeinheit für Hilfesignale, eine Anzeigeeinheit für Elektrizitätsmenge und eine Alarmeinheit für Niederspannung auf.

[0011] Die Not-Startstromversorgung für Fahrzeuge gemäß dem vorliegenden Gebrauchsmuster hat kleine Abmessungen und ist einfach zu tragen und abzulegen.

WINPLUS Ex. 1003, p. 915

Beschreibung der beigefügten Figuren:

[0012] Fig. 1 ist ein Systemstrukturdiagramm der Not-Startstromversorgung für Fahrzeuge gemäß dem vorliegenden Gebrauchsmuster.

[0013] Fig. 2 ist eine schematische Ansicht der Not-Startstromversorgung für Fahrzeuge gemäß dem vorliegenden Gebrauchsmuster.

[0014] Fig. 3 ist eine Außenansicht der Not-Startstromversorgung für Fahrzeuge gemäß dem vorliegenden Gebrauchsmuster.

Ausführliche Ausführungsform

[0015] Unter Bezugnahme auf die beigefügten Zeichnungen werden die bevorzugten Ausführungsformen der vom vorliegenden Gebrauchsmuster offenbarten Not-Startstromversorgung für Fahrzeuge detailliert beschrieben. Es versteht sich, dass die vom vorliegenden Gebrauchsmuster offenbarte Not-Startstromversorgung für Fahrzeuge sich nicht auf folgend beschriebene detaillierte Ausführungsform beschränkt. Wenn es nicht vom Geist oder Bereich des vorliegenden Gebrauchsmuster abweichend ist, kann der Fachmann des Gebietes verschiedene Änderungen und Modifikationen effektiv vornehmen. Z.B. im Umfang dieser Offenbarung können die Komponenten und/oder Merkmale der unterschiedlich beschriebenen Ausführungsformen miteinander kombiniert oder voneinander ersetzt werden.

[0016] Die Not-Startstromversorgung für Fahrzeuge gemäß dem vorliegenden Gebrauchsmuster liefert hauptsächlich folgende Funktionen:

1) Funktion der Fahrzeugzündung (maximaler Ausgangsstrom beträgt 405A bei 10mS)
2) Mit USB3.0-Ausgang, Ausgabe von 5V/2A
3) Beleuchtung
4) S.O.S.-Hilfe.

[0017] Wie in Fig. 1, Fig. 2 und Fig. 3 dargestellt, wird die Not-Startstromversorgung für Fahrzeuge **1** gemäß dem vorliegenden Gebrauchsmuster für Zündung und Start der Fahrzeugbatterie **2** verwendet. Die Not-Startstromversorgung für Fahrzeuge **1** weist auf: einen Mikrocontroller (MCU) **10**, einen wiederaufladbaren Lithium-Ionen-Akku **20**, eine Ladeeingabeeinheit **30**, die mit dem wiederaufladbaren Lithium-Ionen-Akku **20** und dem Mikrocontroller **10** verbunden ist und unter der Steuerung des Mikrocontrollers **10** den wiederaufladbaren Lithium-Ionen-Akku **20** auflädt, eine Zündausgabeeinheit **40**, die mit dem wiederaufladbaren Lithium-Ionen-Akku **20** und dem Mikrocontroller **10** verbunden ist und unter der Steuerung des Mikrocontrollers **10** die Elektrizitätsmenge des wiederaufladbaren Lithium-Ionen-Akkus **20** durch Zündung ausgibt, und ein Relais **50**, das an die Stelle zwischen dem Mikrocontroller **10** und der Zündausgabeeinheit **40** angeschlossen ist und den Zündausgabe der Zündausgabeeinheit **40** an- und abschaltet. Die Not-Startstromversorgung für Fahrzeuge **1** ermöglicht die Zündungs- und Startfunktion des Fahrzeugs im Notbetrieb. In diesem Fall dient der wiederaufladbare Lithium-Ionen-Akku **20** als die Stromquelle und stellt unter der Steuerung des Mikrocontrollers **10** der Fahrzeugbatterie **2** den Stromausgang bereit. Andererseits nimmt der wiederaufladbare Lithium-Ionen-Akku die Ladeeingabe der äußeren Stromquelle an, um die verbrauchte elektrische Energie zu ergänzen. Ladeparameter der Not-Startstromversorgung für Fahrzeuge **1** beinhalten hauptsächlich: DC-Eingangsspannung zur Aufladung von 12,7–13,0V, deren Normalwert im Allgemeinen 12,85V beträgt; Eingangsstrom zur Aufladung von 0,9–1,1A, dessen Normalwert im Allgemeinen 1,0A beträgt; Abschaltspannung bei voller Aufladung des wiederaufladbaren Lithium-Ionen-Akkus **20** von 12,5–12,75V, deren Betriebswert im Allgemeinen 12,6V beträgt. Zündungsparameter beinhalten einen Normalwert von 205A (Temperatur bei 45 Grad) bis zum maximalen Wert von 405A (Temperatur bei 90 Grad); die maximale Dauer der Zündung dauert 10ms. Die Abschaltspannung der Entladung beträgt 7,5–8,35V, deren Normalwert 8,25V beträgt. Der statische Entladungsstrom beträgt 50–70μA.

[0018] Die Not-Startstromversorgung für Fahrzeuge **1** weist ferner eine USB-Ausgabeeinheit **60** auf, die mit dem wiederaufladbaren Lithium-Ionen-Akku **20** und dem Mikrocontroller **10** verbunden ist und unter der Steuerung des Mikrocontrollers **10** die Elektrizitätsmenge des wiederaufladbaren Lithium-Ionen-Akkus **20** ausgibt. Die Ausgangsspannung der USB-Ausgabeeinheit **60** beträgt 4,5–5,5V, deren Normalwert 5V beträgt. Der Ausgangsstrom beträgt 1,75–2,25A, deren Normalwert 2A beträgt. Das bietet der Not-Startstromversorgung für Fahrzeuge **1** die Funktion der USB-Aufladung an, dadurch können digitale Produkte wie Handy und IPAD usw. aufgeladen werden.

WINPLUS Ex. 1003, p. 916

[0019] Die Not-Startstromversorgung für Fahrzeuge **1** weist ferner eine Beleuchtungslampe **70** auf, die mit dem wiederaufladbaren Lithium-Ionen-Akku **20** und dem Mikrocontroller **10** verbunden ist. Das bietet der Not-Startstromversorgung für Fahrzeuge **1** die Funktion der Beleuchtung an.

[0020] Die Not-Startstromversorgung für Fahrzeuge **1** weist ferner einen Timing-Einheit **71** auf, der mit dem Mikrocontroller **10** verbunden ist und zum Timing der Schaltzeit der Not-Startstromversorgung für Fahrzeuge **1** dient. Der Timing-Einheit **71** dient hauptsächlich zum Timing der Betriebszeit der Not-Startstromversorgung für Fahrzeuge **1**, wie z.B. nach dem Zündungsausgang von halber Stunde wird der Zündungsausgang der Not-Startstromversorgung für Fahrzeuge **1** automatisch abgeschaltet.

[0021] Die Not-Startstromversorgung für Fahrzeuge **1** weist ferner eine Schutzeinheit **81** auf, die mit dem wiederaufladbaren Lithium-Ionen-Akku **20** und dem Mikrocontroller **10** verbunden ist und dem wiederaufladbaren Lithium-Ionen-Akku **20** voreingestellten Schutz liefert. Erforderlicher Schutz von verschiedenen Sorten wird der Not-Startstromversorgung für Fahrzeuge **1** angeboten und beinhaltet hauptsächlich: Hochtemperatur-Schutzeinheit **81**, eine Rückladeschutzeinheit **82**, eine Überladeschutzeinheit **83**, eine Überentladeschutzeinheit **84** und eine Überstromschutzeinheit **85**.

[0022] Die Not-Startstromversorgung für Fahrzeuge **1** weist ferner eine Anzeigeeinheit **90** auf, die mit dem wiederaufladbaren Lithium-Ionen-Akku **20** und dem Mikrocontroller **10** verbunden ist und den vorbestimmten Zustand der Not-Startstromversorgung für Fahrzeuge **1** anzeigt. Die Anzeigeeinheit dient zur Anzeige der verschiedenen vorbestimmten Zustände der Not-Startstromversorgung für Fahrzeuge **1** und beinhaltet hauptsächlich: eine Anzeigeeinheit für Schaltzustand **91**, eine Anzeigeeinheit für Zündzustand **92**, eine Anzeigeeinheit für Hilfesignale **93**, eine Anzeigeeinheit für Elektrizitätsmenge **93** und eine Alarmeinheit für Niederspannung **95**.

[0023] Im Folgenden werden die verschiedenen Schutzeinheiten der Not-Startstromversorgung für Fahrzeuge **1** beschrieben. Jede Schutzeinheit überwacht den entsprechenden Schutzzustand. Wenn es bestätigt ist, dass der aktuelle Zustand des wiederaufladbaren Lithium-Ionen-Akkus **20** der entsprechende Schutzzustand ist, benachrichtigt die jeweilige Schutzeinheit den Mikrocontroller **10**, und der Mikrocontroller **10** kann das entsprechende Relais **50** abschalten, um den entsprechenden Schutz durchzuführen.

1. Hochtemperatur-Schutzeinheit 81

[0024] Wenn die Hochtemperatur-Schutzeinheit **81** erkennt, dass die aktuelle Temperatur des wiederaufladbaren Lithium-Ionen-Akkus **20** über 50 Grad beträgt, wird der Mikrocontroller **10** benachrichtigt, dann wird der Mikrocontroller **10** das Relais **50** abschalten und die Zündungs- und Startfunktion wird verboten.

2. Rückladeschutzeinheit 82

1) Nach der Zündung des Fahrzeugs ist der Startstrom sehr groß, daher sinkt die Spannung des wiederaufladbaren Lithium-Ionen-Akkus **20**. Aber gleichgültig ob die Zündung erfolgreich ist, erhöht sich die Spannung des wiederaufladbaren Lithium-Ionen-Akkus **20** wieder sofort. Die Spannungsänderung wird erkannt. Wenn die Rückladeschutzeinheit **82** erkennt, dass der Änderungswert $\Delta V \geq 1$ ist, schaltet der Mikrocontroller **10** innerhalb von 800mS das Relais **50** ab.
2) Nach der erfolgreichen Fahrzeugzündung läuft der Motor an, und die Ausgangsspannung beträgt 14, 2Vmax. Der wiederaufladbare Lithium-Ionen-Akku **20** wird aufgeladen, und der Strom ist sehr groß. Wenn die Rückladeschutzeinheit **82** erkennt, dass die Spannung vom Lithium-Ionen-Akku 20 > 12,8V ist, schaltet der Mikrocontroller **10** innerhalb von **10** Sekunden das Relais **50** ab, um zu verhindern, dass der wiederaufladbare Lithium-Ionen-Akku **20** überladen wird und Funken beim Lösen der Klemme erzeugt werden.
3) Nach der erfolgreichen Fahrzeugzündung läuft der Motor an, und die Ausgangsspannung beträgt 14,2V max. Der wiederaufladbare Lithium-Ionen-Akku **20** wird aufgeladen, und der Strom ist sehr groß. Wenn die Rückladeschutzeinheit **82** erkennt, dass die Spannung vom Lithium-Ionen-Akku 20 > 13,0V ist, schaltet der Mikrocontroller **10** innerhalb von **10** Sekunden das Relais **50** ab, um zu verhindern, dass der wiederaufladbare Lithium-Ionen-Akku **20** überladen wird und Funken beim Lösen der Klemme erzeugt werden.

3. Überladeschutzeinheit 83

[0025] Wenn die Überladeschutzeinheit **83** erkennt, dass die Spannung des wiederaufladbaren Lithium-Ionen-Akkus **20** über 12,6V beträgt, schaltet der Mikrocontroller **10** die Verbindung zwischen der äußeren Ladestromquelle und dem wiederaufladbaren Lithium-Ionen-Akku **20** ab.

WINPLUS Ex. 1003, p. 917

4. Überentladeschutzeinheit 84

[0026] Wenn die Überentladeschutzeinheit **84** erkennt, dass die Spannung des wiederaufladbaren Lithium-Ionen-Akkus **20** unter 8,25V beträgt, wird die Verbindung zwischen dem wiederaufladbaren Lithium-Ionen-Akku **20** und der Last abgeschaltet. Wenn es erkannt wird, dass die Spannung des wiederaufladbaren Lithium-Ionen-Akkus **20** unter 9,0V beträgt, schaltet MCU20 das ganze Gerät aus.

[0027] Wenn die Not-Startstromversorgung für Fahrzeuge **1** im Ladezustand ist, sind nur USB-Ausgangsfunktion und Anzeigefunktion der Elektrizitätsmenge verfügbar, und die anderen Funktionen sind verboten.

5. Überstromschutzeinheit 85

[0028] Wenn die Überstromschutzeinheit **85** erkennt, dass der Zündungsstrom 600A ± 30A überschreitet, wird das Relais **50** abgeschaltet, um den wiederaufladbaren Lithium-Ionen-Akku **20** vor Beschädigung zu schützen.

[0029] Der Temperaturbereich der Betriebsumgebung der Not-Startstromversorgung für Fahrzeuge gemäß dem vorliegenden Gebrauchsmuster beträgt –10°C –+ 45°C, und die Luftfeuchtigkeit der Betriebsumgebung kann bei 20%–90% liegen. Der Temperaturbereich der Lagerumgebung kann –20°C –+ 45°C betragen, und die Luftfeuchtigkeit der Lagerumgebung kann 20%–90% betragen.

[0030] Die Drucktasten und die Anzeigeeinheit **90** zum Anzeigen des vorbestimmten Zustandes der Not-Startstromversorgung **1** für Fahrzeuge gemäß dem vorliegenden Gebrauchsmuster (einschließlich der der jeweiligen Anzeigeeinheit entsprechenden Anzeigelampen) weisen hauptsächlich auf:

1) POWER-Taste

[0031] Taste zur Einschaltung und Ausschaltung, bei der Einschaltung leuchtet der POWER-Anzeigelampe (Anzeigeeinheit für Schaltzustand **91**). Wenn die Spannung des wiederaufladbaren Lithium-Ionen-Akkus **20** unter 9,0V beträgt, blinkt die Anzeigelampe für POWER-Zustand fünfmal in roter Farbe, dann wird das ganze Gerät ausgeschaltet.

2) JUMP-START-Taste

[0032] Zündtaste. Nach der Einschaltung wird die Not-Startstromversorgung für Fahrzeuge **1** an die Fahrzeugbatterie **2** angeschlossen. Wenn die Spannung der Fahrzeugbatterie **2** über 2V beträgt, wird JUMP-START-Taste leicht gedrückt, dann wird die Zündfunktion angeschaltet. Wenn die Not-Startstromversorgung für Fahrzeuge **1** eingeschaltet aber nicht an die Fahrzeugbatterie **2** angeschlossen wird, wird die JUMP-START-Taste für 3S lang gedrückt, so dass die Zündfunktion zwingend angeschaltet wird. Wenn die Zündfunktion angeschaltet ist, fängt unter allen Umständen gleichzeitig das Timing von 30 Minuten (Timing-Einheit **71** ist verantwortlich für Timing) an, in 30 Minuten wird die Zündfunktion automatisch abgeschaltet.

3) JUMP-START-Anzeige

[0033] Zündanzeige. Wenn nach der Anschaltung der JUMP-START-Funktion die Spannung des wiederaufladbaren Lithium-Ionen-Akkus **20** der Not-Startstromversorgung für Fahrzeuge **1** über 11,5V ± 0,2V beträgt, leuchtet die JUMP-START-Anzeigelampe ständig (Anzeigeeinheit für Zündzustand **92**), das zeigt an, dass das Fahrzeug gezündet werden darf.

[0034] Wenn nach der Anschaltung der JUMP-START-Funktion die Spannung des wiederaufladbaren Lithium-Ionen-Akkus **20** der Not-Startstromversorgung für Fahrzeuge **1** unter 11,5V ± 0,2V beträgt, blinkt die JUMP-START-Anzeigelampe ständig, das zeigt an, dass das Fahrzeug nicht gezündet werden darf. Nur nach der Aufladung kann das Fahrzeug wieder gezündet werden.

4) LIGHT/S.O.S.-Taste

[0035] Starttaste für Hilfesignale. Wenn im Einschaltungszustand die LIGHT/S.O.S.-Taste einmal gedrückt wird, leuchtet S.O.S.-Rote-Lampe (Anzeigeeinheit für Hilfesignale **93**). Wenn die LIGHT/S.O.S.-Taste nochmal gedrückt wird, leuchtet S.O.S.-Weiße-Lampe (Anzeigeeinheit für Hilfesignale **93**). Wenn sie zum dritten Mal gedrückt wird, blinkt die LIGHT-Lampe und die S.O.S.-Lampe (Anzeigeeinheit für Hilfesignale **93**) abwechselnd, und die Hilfesignale werden angeschaltet.

WINPLUS Ex. 1003, p. 918

5) SIDE-LIGHT-Taste

[0036] Schalter der Beleuchtungslampe. Nach der Ausschaltung wird die SIDE-LIGHT-Taste gedrückt, und die Beleuchtungslampen **70** auf den beiden Seiten werden angemacht.

6) Anzeigeeinheit für Elektrizitätsmenge 94

[0037] Die Anzeigeeinheit für Elektrizitätsmenge **94** des wiederaufladbaren Lithium-Ionen-Akkus **20** dient zur Anzeige der aktuellen Elektrizitätsmenge des wiederaufladbaren Lithium-Ionen-Akkus **20** und hat eine Form von streifenförmiger Anzeigelampe, von links nach rechts gibt es die Anzeigelampen für Akku-Elektrizitätsmenge in roter, oranger, gelber und grüner Farbe. Der entsprechende Anzeigebereich der Akku-Elektrizitätsmenge ist wie folgende Tabelle:

rot	orange	gelb	grün	Einheit
10.0~10.8	10.9~11.4	11.5~12.0	12.1~12.6	V

7) Alarmeinheit für Niederspannung (LOW BATTERY) 95

[0038] POWER-OFF-Zustand. Wenn die Spannung des wiederaufladbaren Lithium-Ionen-Akkus **20** unter 10V beträgt, schaltet die Alarmeinheit für Niederspannung (LOW BATTERY) **95** die Not-Startstromversorgung für Fahrzeuge **1** automatisch an, gleichzeitig blinkt die seitliche rote BATTERYLOW-Anzeigelampe (Alarmeinheit für Niederspannung **95**). Das ist ein Hinweis, dass die Elektrizitätsmenge des wiederaufladbaren Lithium-Ionen-Akkus **20** unzureichend ist und er rechtzeitig mittels Adapter aufgeladen werden soll. Wenn die Spannung des wiederaufladbaren Lithium-Ionen-Akkus **20** unter 8,25V beträgt, wird die rote BATTERYLOW-Anzeigelampe abgeschaltet. Die Not-Startstromversorgung für Fahrzeuge **1** wird ausgeschaltet. Wenn jetzt die POWER-ON-Taste gedrückt wird, blinkt die rote Lampe der Anzeigelampe für Schaltzustand fünfmal, dann wird die Not-Startstromversorgung für Fahrzeuge **1** ausgeschaltet.

[0039] Die Not-Startstromversorgung für Fahrzeuge gemäß dem vorliegenden Gebrauchsmuster beinhaltet die hauptsächlichen Bedienungen:

1) Start: POWER-Taste drücken, grüne Lampe der Anzeigelampe für Elektrizitätsmenge leuchtet, die Not-Startstromversorgung für Fahrzeuge **1** wird normal gestartet.

2) Zündung: vor der Zündung wird es zuerst bestätigt, ob die Elektrizitätsmenge des wiederaufladbaren Lithium-Ionen-Akkus **20** zureichend für Start des Fahrzeugs ist. Die POWER-Taste wird gedrückt, um die Spannung des wiederaufladbaren Lithium-Ionen-Akkus **20** anzuzeigen. Wenn alle Anzeigelampen für Spannung des wiederaufladbaren Lithium-Ionen-Akkus **20** leuchten, zeigt es an, dass die Elektrizitätsmenge des wiederaufladbaren Lithium-Ionen-Akkus **20** 100% ist. Wenn rote, orange und gelbe Anzeigelampen leuchten, zeigt es an, dass die Elektrizitätsmenge des wiederaufladbaren Lithium-Ionen-Akkus **20** 70% ist. In diesen zwei Zuständen kann Zündung erfolgen. Wenn nur rote und orange Anzeigelampen leuchten, zeigt es an, dass die Elektrizitätsmenge des wiederaufladbaren Lithium-Ionen-Akkus **20** 40% ist, dann ist Zündung verboten.

[0040] Nachdem es bestätigt ist, dass die Zündung möglich ist, wird die Not-Startstromversorgung für Fahrzeuge **1** korrekt an die Fahrzeugbatterie **2** angeschlossen, die JUMP-START-Taste wird gedrückt, um mit Zündung anzufangen. Wenn sie nicht an die Fahrzeugbatterie **2** angeschlossen wird, wird die JUMP-START-Taste für 3S lang gedrückt, dann kann die Zündfunktion auch gestartet werden. Der Motor des Fahrzeugs wird angeschaltet, gleichgültig ob die Zündung erfolgreich ist, wird das Relais innerhalb von 800mS abgeschaltet. Außerdem kann die Zündausgabeeinheit **60** in Form der elektrischen Klemme an die Fahrzeugbatterie angeschlossen werden. Die elektrische Klemme ist einfach zu verwenden und zu verdrahten. Im Gebrauch kann die elektrische Klemme an der Elektrode des Fahrzeugbatterie **2** geklemmt werden, dann kann die Zündfunktion realisiert werden. Das ist sehr einfach.

[0041] Die POWER-ON-Taste wird gedrückt, dann ist USB-Ausgabeeinheit **40** angeschaltet. Mit dem Ausgangsstrom von 5V/2A können digitale Produkte wie Handy und IPAD usw. aufgeladen werden.

[0042] Sie kann durch einen Adapter von 12V/1A aufgeladen werden. Die Anzeigelampe des wiederaufladbaren Lithium-Ionen-Akkus **20** wird den Ladezustand anzeigen. Jetzt ist die USB-Funktion verfügbar.

WINPLUS Ex. 1003, p. 919

[0043] Die Not-Startstromversorgung für Fahrzeuge gemäß dem vorliegenden Gebrauchsmuster verwendet den wiederaufladbaren Lithium-Ionen-Akku, so dass das ganze Gerät kleine Abmessungen und kleines Gewicht hat sowie einfach zu tragen und abzulegen ist. Im Vergleich zur bestehenden Not-Startstromversorgung für Fahrzeuge mit Blei-Säure-Batterien ist sie 3–5mal kleiner. Sie verursacht keine Umweltverschmutzung. Sie verfügt über verschiedenen Schutz wie z.B. vor Übertemperatur, Überdruck und Überladung, die Batterie hat lange Lebensdauer. Die Not-Startstromversorgung für Fahrzeuge kann im Fahrzeug mitgenommen werden, damit der Fahrer sie jederzeit verwenden kann. Der Lithium-Ionen-Akku hat große Lademenge, kleines Volumen, lange Lebensdauer, hohe Lade- und Entladeleistung und niedrige Selbstentladerate, deshalb ist sie umweltfreundlich. Mit Anzeigelampe für Elektrizitätsmenge kann der Fahrer jederzeit die Elektrizitätsmenge kennen.

[0044] Obwohl im Zusammenhang mit vielen bestimmten Ausführungsformen das vorliegende Gebrauchsmuster angezeigt und beschrieben wird, ist es anzumerken, dass andere verschiedene Änderungen oder Anpassungen vorgenommen werden können, wenn sie nicht abweichend vom Umfang des vorliegenden Gebrauchsmusters sind.

Schutzansprüche

1. Not-Startstromversorgung für Fahrzeuge, **dadurch gekennzeichnet**, dass sie einen wiederaufladbaren Lithium-Ionen-Akku, einen Mikrocontroller, eine Ladeeingabeeinheit, die mit dem wiederaufladbaren Lithium-Ionen-Akku und dem Mikrocontroller verbunden ist und unter der Steuerung des Mikrocontrollers den wiederaufladbaren Lithium-Ionen-Akku auflädt, eine Zündausgabeeinheit, die mit dem wiederaufladbaren Lithium-Ionen-Akku und dem Mikrocontroller verbunden ist und unter der Steuerung des Mikrocontrollers die Elektrizitätsmenge des wiederaufladbaren Lithium-Ionen-Akkus durch Zündung ausgibt, und ein Relais, das an die Stelle zwischen dem Mikrocontroller und der Zündausgabeeinheit angeschlossen ist und die Zündausgabe der Zündausgabeeinheit an- und abschaltet, aufweist.

2. Not-Startstromversorgung für Fahrzeuge nach Anspruch 1, dadurch gekennzeichnet, dass sie ferner eine USB-Ausgabeeinheit aufweist, die mit dem wiederaufladbaren Lithium-Ionen-Akku und dem Mikrocontroller verbunden ist und unter der Steuerung des Mikrocontrollers die Elektrizitätsmenge des wiederaufladbaren Lithium-Ionen-Akkus ausgibt.

3. Not-Startstromversorgung für Fahrzeuge nach Anspruch 1, dadurch gekennzeichnet, dass sie ferner eine Beleuchtungslampe aufweist, die mit dem wiederaufladbaren Lithium-Ionen-Akku und dem Mikrocontroller verbunden ist.

4. Not-Startstromversorgung für Fahrzeuge nach Anspruch 1, dadurch gekennzeichnet, dass sie ferner eine Timing-Einheit aufweist, die mit dem Mikrocontroller verbunden ist und zum Timing der Schaltzeit der Not-Startstromversorgung für Fahrzeuge dient.

5. Not-Startstromversorgung für Fahrzeuge nach Anspruch 1, dadurch gekennzeichnet, dass sie ferner eine Schutzeinheit aufweist, die mit dem wiederaufladbaren Lithium-Ionen-Akku und dem Mikrocontroller verbunden ist und dem wiederaufladbaren Lithium-Ionen-Akku voreingestellten Schutz liefert,.

6. Not-Startstromversorgung für Fahrzeuge nach Anspruch 5, dadurch gekennzeichnet, dass die Schutzeinheit eine Hochtemperatur-Schutzeinheit, eine Rückladeschutzeinheit, eine Überladeschutzeinheit, eine Überentladeschutzeinheit und eine Überstromschutzeinheit aufweist.

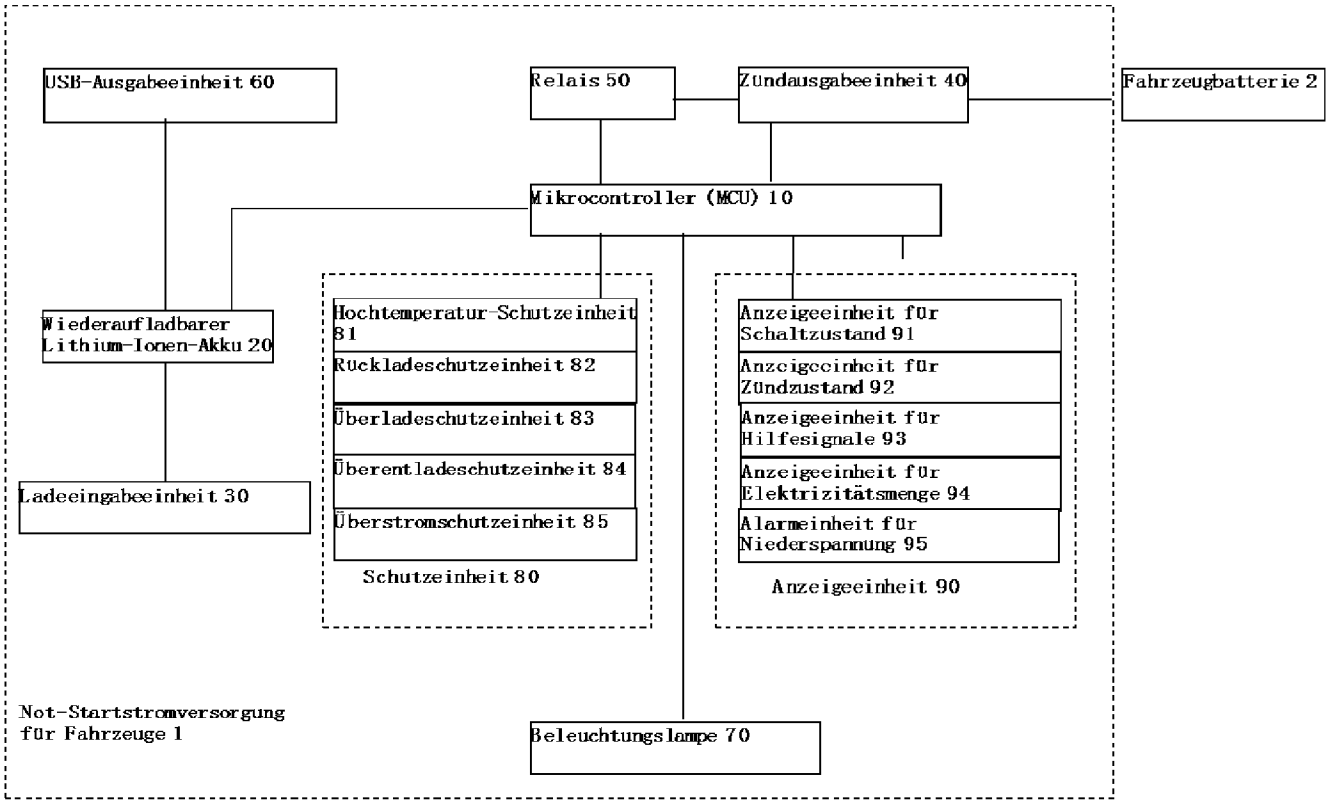
7. Not-Startstromversorgung für Fahrzeuge nach Anspruch 1, dadurch gekennzeichnet, dass sie ferner eine Anzeigeeinheit aufweist, die mit dem wiederaufladbaren Lithium-Ionen-Akku und dem Mikrocontroller verbunden ist und den vorbestimmten Zustand der Not-Startstromversorgung für Fahrzeuge anzeigt.

8. Not-Startstromversorgung für Fahrzeuge nach Anspruch 7, dadurch gekennzeichnet, dass die Anzeigeeinheit eine Anzeigeeinheit für Schaltzustand, eine Anzeigeeinheit für Zündzustand, eine Anzeigeeinheit für Hilfesignale, eine Anzeigeeinheit für Elektrizitätsmenge und eine Alarmeinheit für Niederspannung aufweist.

Es folgen 3 Blatt Zeichnungen

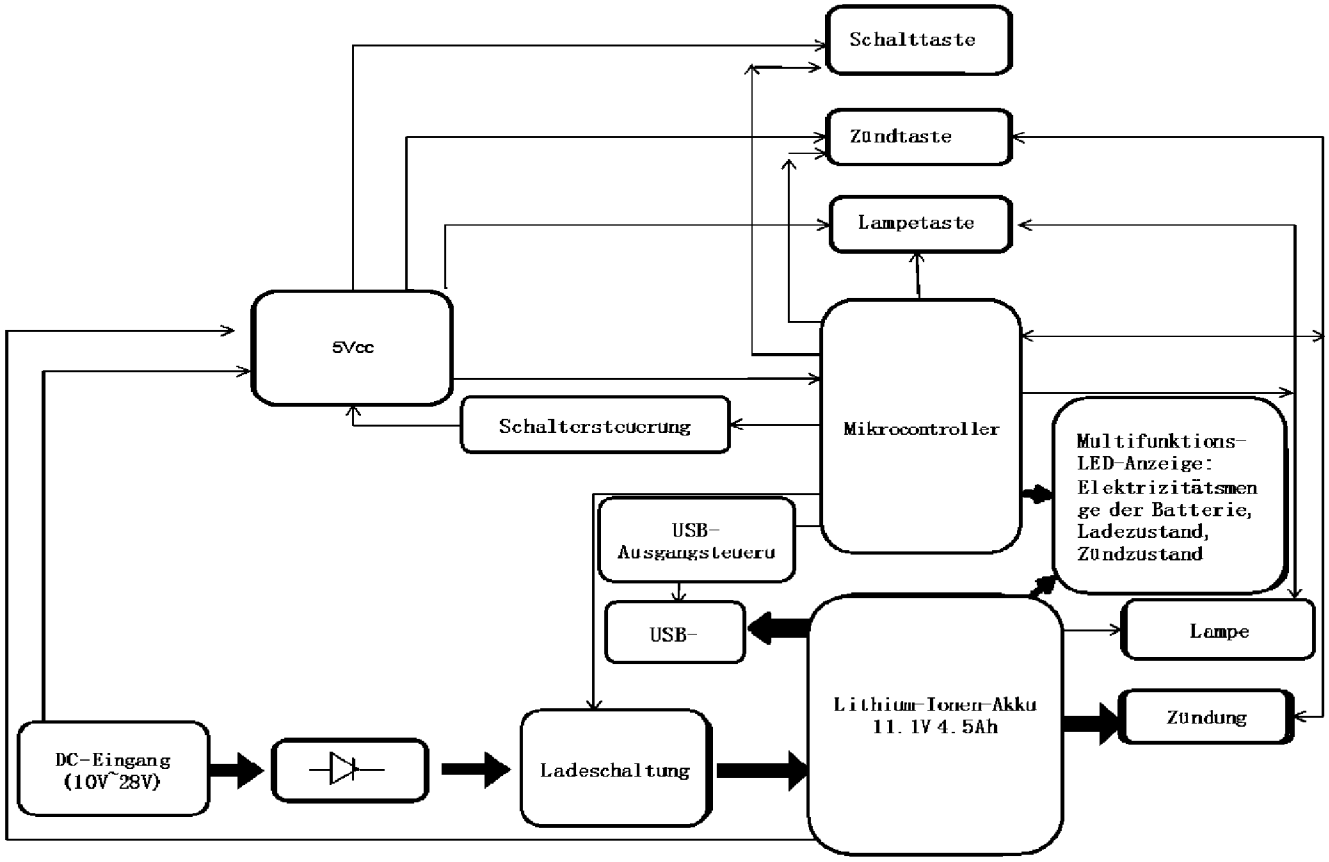
WINPLUS Ex. 1003, p. 920

Anhängende Zeichnungen



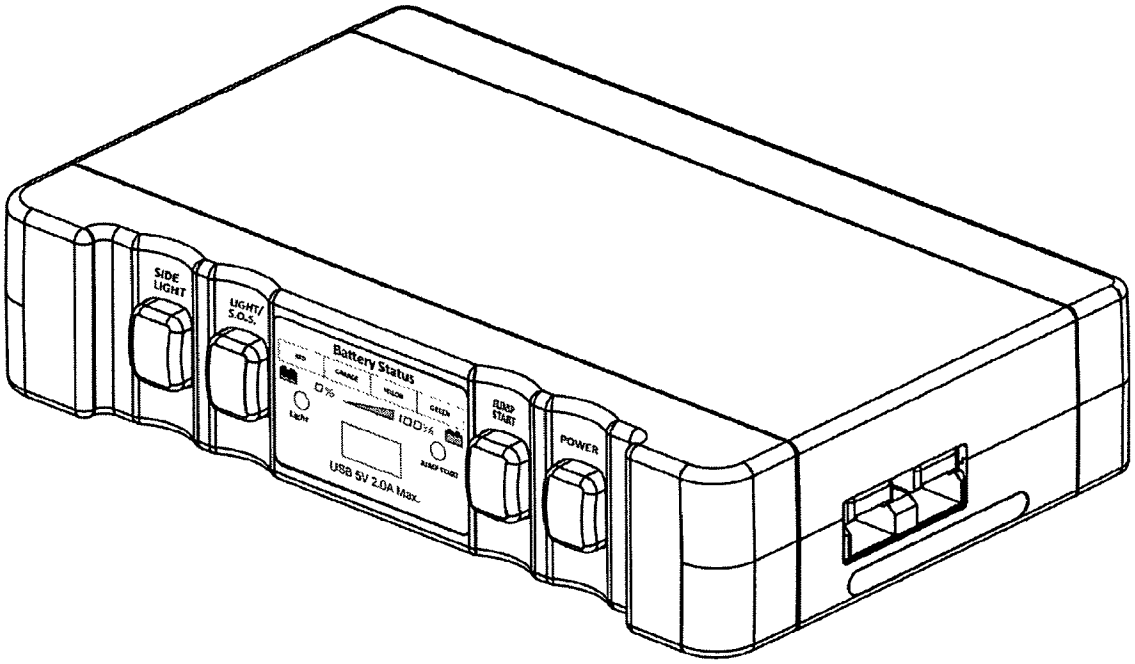
Figur 1

WINPLUS Ex. 1003, p. 921



Figur 2

WINPLUS Ex. 1003, p. 922



Figur 3

 WINPLUS Ex. 1003, p. 923

Espacenet

Bibliographic data: DE202013102599 (U1) — 2013-08-13

Not-Startstromversorgung für Fahrzeuge

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Classification: **- international:*F02N11/14***
- cooperative: **F02N11/0866 (EP)**; **F02N11/12 (EP)**; **F02N11/14 (EP)**

Application number: DE201320102599U 20130618

Priority number (s): DE201320102599U 20130618

Abstract of DE202013102599 (U1)

Not-Startstromversorgung für Fahrzeuge, dadurch gekennzeichnet, dass sie einen wiederaufladbaren Lithium-Ionen-Akku, einen Mikrocontroller, eine Ladeeingabeeinheit, die mit dem wiederaufladbaren Lithium-Ionen-Akku und dem Mikrocontroller verbunden ist und unter der Steuerung des Mikrocontrollers den wiederaufladbaren Lithium-Ionen-Akku auflädt, eine Zündausgabeeinheit, die mit dem wiederaufladbaren Lithium-Ionen-Akku und dem Mikrocontroller verbunden ist und unter der Steuerung des Mikrocontrollers die Elektrizitätsmenge des wiederaufladbaren Lithium-Ionen-Akkus durch Zündung ausgibt, und ein Relais, das an die Stelle zwischen dem Mikrocontroller und der Zündausgabeeinheit angeschlossen ist und die Zündausgabe der Zündausgabeeinheit an- und abschaltet, aufweist.

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ABSTRACT DE202013102599

Emergency start power supply for vehicles, characterized in that it has a rechargeable lithium-ion battery, a microcontroller, a charging input unit that is connected to the rechargeable lithium-ion battery and the microcontroller and under the control of the microcontroller the rechargeable lithium-ion -Battery recharges, an ignition output unit connected to the rechargeable lithium-ion battery and the microcontroller and under the control of the microcontroller outputs the amount of electricity of the rechargeable lithium-ion battery by ignition, and a relay that takes the place between the Microcontroller and the ignition output unit is connected and switches the ignition output of the ignition output unit on and off.

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DESCRIPTION DE202013102599

Technical field

[0001]

The present utility model relates to emergency starting technology for vehicles, in particular an emergency starting power supply for vehicles.

State of the art

[0002]

With the economic development, vehicles are already widely used in many areas such as transportation, mining production and daily life, etc.

When using the vehicle, it often happens that the vehicle cannot be started due to insufficient battery voltage, which brings a lot of inconvenience to the user. The existing solution is to provide the emergency power supply for the vehicle. If the vehicle cannot be started, the emergency power supply can allow the vehicle to ignite and start. But large capacity lead-acid batteries are now commonly used on the market as an emergency starting power supply for vehicles that are large in size and can pollute the environment.

Content of the utility model

[0003]

The present utility model offers an emergency starting power supply for vehicles, comprising a rechargeable lithium-ion battery, a microcontroller, a charging input unit which is connected to the rechargeable lithium-ion battery and the microcontroller and, under the control of the microcontroller, the rechargeable lithium -Ion battery charges, an ignition output unit connected to the rechargeable lithium-ion battery and the microcontroller and under the control of the microcontroller outputs the amount of electricity of the rechargeable lithium-ion battery by ignition, and a relay that takes the place is connected between the microcontroller and the ignition output unit and switches the ignition output of the ignition output unit on and off.

[0004]

The emergency start power supply for vehicles according to the present utility model also has a USB output unit which is connected to the rechargeable lithium-ion battery and the microcontroller and outputs the amount of electricity of the rechargeable lithium-ion battery under the control of the microcontroller.

[0005]

The emergency start power supply for vehicles according to the present utility model also has an illumination lamp which is connected to the rechargeable lithium-ion battery and the microcontroller.

[0006]

The emergency starting power supply for vehicles according to the present utility model also has a timing unit which is connected to the microcontroller and is used for timing the switching time of the emergency starting power supply for vehicles.

[0007]

The emergency start power supply for vehicles according to the present utility model also has a protective unit which is connected to the rechargeable lithium-ion battery and the microcontroller and provides preset protection for the rechargeable lithium-ion battery.

[0008]

The emergency starting power supply for vehicles according to the present utility model has a high-temperature protection unit, a recharge protection unit, an overcharge protection unit, an over-discharge protection unit and an overcurrent protection unit.

[0009]

The emergency starting power supply for vehicles according to the present utility model also has a display unit which is connected to the rechargeable lithium-ion battery and the microcontroller and displays the predetermined state of the emergency starting power supply for vehicles.

[0010]

The display unit of the emergency starting power supply for vehicles according to the present utility model has a display unit for the switching state, a display unit for the ignition state, a display unit for auxiliary signals, a display unit for the amount of electricity and an alarm unit for low voltage.

[0011]

The emergency starting power supply for vehicles in accordance with the present utility model has small dimensions and is easy to carry and store.

Description of the attached figures:

[0012]

1 is a system structure diagram of the emergency starting power supply for vehicles according to the present utility model.

[0013]

2 is a schematic view of the emergency starting power supply for vehicles according to the present utility model.

[0014]

3 is an external view of the emergency starting power supply for vehicles according to the present utility model.

Detailed embodiment

[0015]

The preferred embodiments of the emergency starting power supply for vehicles disclosed by the present utility model will be described in detail with reference to the accompanying drawings.

It is understood that the emergency starting power supply for vehicles disclosed by the present utility model is not limited to the detailed embodiment described below.

Unless it is different from the spirit or scope of the present utility model, various changes and modifications can be effectively made by those skilled in the art.

E.g. Within the scope of this disclosure, the components and / or features of the differently described embodiments can be combined with one another or replaced.

[0016]

The emergency start power supply for vehicles according to the present utility model mainly provides the following functions: 1) Function of the vehicle ignition (maximum output current is 405A at 10mS) 2) With USB3.0 output, output of 5V / 2A 3) Lighting 4) SOS help .

[0017]

As shown in FIGS. 1, 2 and 3, the emergency starting power supply for vehicles 1 according to the present utility model is used for the ignition and starting of the vehicle battery 2.

The emergency starting power supply for vehicles 1 has: a microcontroller (MCU) 10, a rechargeable lithium-ion battery 20, a charging input unit 30 which is connected to the rechargeable lithium-ion battery 20 and the microcontroller 10 and under control of the microcontroller 10 charges the rechargeable lithium-ion battery 20, an ignition output unit 40 which is connected to the rechargeable lithium-ion battery 20 and the microcontroller 10 and under the control of the microcontroller 10 the amount of electricity of the rechargeable lithium-ion battery 20 outputs by ignition, and a relay 50, which is connected in place between the microcontroller 10 and the ignition output unit 40 and turns the ignition output of the ignition output unit 40 on and off.

The emergency start power supply for vehicles 1 enables the ignition and start function of the vehicle in emergency operation.

In this case, the rechargeable lithium-ion battery 20 serves as the current source and provides the current output under the control of the microcontroller 10 of the vehicle battery 2.

On the other hand, the rechargeable lithium-ion battery accepts the charging input from the external power source in order to supplement the electrical energy consumed.

Charging parameters of the emergency starting power supply for vehicles 1 mainly include: DC input voltage for charging 12.7-13.0V, the normal value of which is generally 12.85V; Input current for charging 0.9-1.1A, the normal value of which is generally 1.0A; Switch-off voltage when the rechargeable lithium-ion battery 20 is fully charged from 12.5-12.75V, the operating value of which is generally 12.6V.

Ignition parameters include a normal value from 205A (temperature at 45 degrees) to a maximum value of 405A (temperature at 90 degrees); the maximum duration of the ignition lasts 10ms.

The discharge cut-off voltage is 7.5--8.35V, the normal value of which is 8.25V.

The static discharge current is 50--70μA.

[0018]

The emergency start power supply for vehicles 1 also has a USB output unit 60, which is connected to the rechargeable lithium-ion battery 20 and the microcontroller 10 and outputs the amount of electricity of the rechargeable lithium-ion battery 20 under the control of the microcontroller 10 .

The output voltage of the USB output unit 60 is 4.5-5.5V, the normal value of which is 5V.

The output current is 1.75-2.25A, the normal value of which is 2A. This offers the emergency start power supply for vehicles 1 the function of USB charging, which means that digital products such as cell phones and iPads, etc. can be charged.

[0019]

The emergency starting power supply for vehicles 1 also has an illumination lamp 70 which is connected to the rechargeable lithium-ion battery 20 and the microcontroller 10. This offers the emergency start power supply for vehicles 1 the function of lighting.

[0020]

The emergency start power supply for vehicles 1 also has a timing unit 71 which is connected to the microcontroller 10 and is used for timing the switching time of the emergency start power supply for vehicles 1. The timing unit 71 is mainly used for timing the operating time of the emergency starting power supply for vehicles 1, such as. B. after the ignition output of half an hour, the ignition output of the emergency start power supply for vehicles 1 is automatically switched off.

[0021]

The emergency start power supply for vehicles 1 also has a protective unit 81 which is connected to the rechargeable lithium-ion battery 20 and the microcontroller 10 and provides the rechargeable lithium-ion battery 20 with preset protection. Required protection of various types is offered to the emergency starting power supply for vehicles 1 and mainly includes: high-temperature protection unit 81, a recharge protection unit 82, an overcharge protection unit 83, an over-discharge protection unit 84 and an overcurrent protection unit 85.

[0022]

The emergency start power supply for vehicles 1 also has a display unit 90, which is connected to the rechargeable lithium-ion battery 20 and the microcontroller 10 and displays the predetermined state of the emergency start power supply for vehicles 1. The display unit is used to display the various predetermined states of the emergency starting power supply for vehicles 1 and mainly includes: a display unit for switching state 91, a display unit for ignition state 92, a display unit for auxiliary signals 93, a display unit for electricity quantity 93 and an alarm unit for low voltage 95.

[0023]

The various protective units of the emergency starting power supply for vehicles 1 are described below. Each protection unit monitors the corresponding protection status. If it is confirmed that the current state of the rechargeable lithium-ion battery 20 is the corresponding protection state, the respective protection unit notifies the microcontroller 10 and the microcontroller 10 can switch off the corresponding relay 50 in order to carry out the corresponding protection.

1. High temperature protection unit 81

[0024]

If the high-temperature protection unit 81 detects that the current temperature of the rechargeable lithium-ion battery 20 is above 50 degrees, the microcontroller 10 is notified, then the microcontroller 10 will switch off the relay 50 and the ignition and start function will be prohibited.

2. Reload protection unit 82

1)

After the vehicle is ignited, the starting current is very large, so the voltage of the rechargeable lithium-ion battery drops. Regardless of whether the ignition is successful, the voltage of the rechargeable lithium-ion battery increases again immediately. The voltage change is recognized. If the reload protection unit detects that the change value $\Delta V \geq 1$, the microcontroller switches off the relay within 800mS. 2) After successful vehicle ignition, the engine starts and the output voltage is 14.2Vmax. The rechargeable lithium-ion battery is being charged and the current is very large. When the recharge protection unit detects that the voltage from the lithium-ion battery is 20> 12.6V, the microcontroller switches off the relay within seconds to prevent the rechargeable lithium-ion battery from being overcharged and spark when the battery is released Clamp are generated. 3) After successful vehicle ignition, the engine starts and the output voltage is 14.2V max.

The rechargeable lithium-ion battery is being charged and the current is very large. When the recharge protection unit detects that the voltage from the lithium-ion battery is 20> 13.0V, the microcontroller switches off the relay within seconds to prevent the rechargeable lithium-ion battery from being overcharged and spark when the battery is released Clamp are generated.

3. Overload protection unit 83

[0025]

When the overcharge protection unit 83 detects that the voltage of the rechargeable lithium-ion battery 20 is above 12.6 V, the microcontroller 10 switches off the connection between the external charging current source and the rechargeable lithium-ion battery 20.

4. Over-discharge protection unit 84

[0026]

When the over-discharge protection unit 84 detects that the voltage of the rechargeable lithium-ion battery 20 is below 8.25 V, the connection between the rechargeable lithium-ion battery 20 and the load is switched off.

If it is detected that the voltage of the rechargeable lithium-ion battery 20 is below 9.0 V, the MCU20 switches off the entire device.

[0027]

When the emergency start power supply for vehicles 1 is in the charging state, only the USB output function and the electricity quantity display function are available, and the other functions are prohibited.

5. Overcurrent protection unit 85

[0028]

When the overcurrent protection unit 85 detects that the ignition current exceeds 600A ± 30A, the relay 50 is turned off to protect the rechargeable lithium ion battery 20 from damage.

[0029]

The temperature range of the operating environment of the emergency starting power supply for vehicles according to the present utility model is -10 ° C - + 45 ° C, and the humidity of the operating environment can be 20% -90%.

The temperature range of the storage environment can be -20 ° C - + 45 ° C, and the humidity of the storage environment can be 20% -90%.

[0030]

The pushbuttons and the display unit 90 for displaying the predetermined state of the emergency starting power supply 1 for vehicles according to the present utility model (including the indicator lamps corresponding to the respective display unit) mainly have:

1) POWER button

[0031]

Key for switching on and off, when switched on the POWER indicator lamp lights up (display unit for switching status 91).

When the voltage of the rechargeable lithium-ion battery 20 is below 9.0V, the indicator lamp for the POWER state flashes five times in red, then the entire device is switched off.

2) JUMP START button

[0032]

Ignition button.

After switching on, the emergency starting power supply for vehicles 1 is connected to the vehicle battery 2. If the voltage of the vehicle battery 2 is above 2V, the JUMP START button is pressed lightly, then the ignition function is switched on. If the emergency start power supply for vehicles 1 is switched on but not connected to vehicle battery 2, the JUMP START button is pressed for 3S so that the ignition function is switched on. If the ignition function is switched on, the timing of 30 minutes begins at the same time under all circumstances (timing unit 71 is responsible for timing), in 30 minutes the ignition function is automatically switched off.

3) JUMP START indicator

[0033]

Ignition indicator. If the voltage of the rechargeable lithium-ion battery 20 of the emergency start power supply for vehicles 1 is above 11.5V ± 0.2V after the JUMP-START function has been switched on, the JUMP-START indicator lamp lights up continuously (display unit for ignition status 92), which indicates that the vehicle may be ignited.

[0034]

If the voltage of the rechargeable lithium-ion battery 20 of the emergency start power supply for vehicles 1 is below 11.5V ± 0.2V after the JUMP-START function has been switched on, the JUMP-START indicator lamp flashes continuously, which indicates that the vehicle must not be ignited. The vehicle can only be ignited again after charging.

4) LIGHT / S.O.S. button

[0035]

Start button for help signals. If the LIGHT / S.O.S.button is pressed once when the device is switched on, the S.O.S. red lamp lights up (display unit for help signals 93). If the LIGHT / S.O.S.button is pressed again, the S.O.S. white lamp lights up (display unit for help signals 93). When it is pressed a third time, the LIGHT lamp and the S.O.S. lamp (auxiliary signal display unit 93) flash alternately, and the auxiliary signals are turned on.

5) SIDE-LIGHT button

[0036]

Switch of the lighting lamp. After the switch-off, the SIDE-LIGHT button is pressed and the illumination lamps 70 on both sides are turned on.

6) Electricity quantity display unit 94

[0037]

The display unit for the amount of electricity 94 of the rechargeable lithium-ion battery 20 serves to display the current amount of electricity of the rechargeable lithium-ion battery 20 and has the form of a strip-shaped indicator lamp, from left to right there are the indicator lamps for the amount of battery electricity in red, orange, yellow and green color. The corresponding display range of the battery electricity quantity is as follows: red orange yellow green unit 10.0 ~ 10.8 10.9 ~ 11.4 11.5 ~ 12.0 12.1 ~ 12.6 V

7) Low voltage alarm unit (LOW BATTERY) 95

[0038]

POWER OFF state. If the voltage of the rechargeable lithium-ion battery 20 is below 10V, the low voltage alarm unit (LOW BATTERY) 95 automatically switches on the emergency start power supply for vehicles 1, and the red BATTERYLOW indicator lamp on the side (low voltage alarm unit 95) flashes at the same time. This is an indication that the amount of electricity of the rechargeable lithium-ion battery 20 is insufficient and that it should be charged in time using an adapter. When the voltage of the rechargeable lithium-ion battery 20 is below 8.25V, the red BATTERYLOW indicator lamp is switched off. The emergency start power supply for vehicles 1 is switched off. If the POWER ON button is now pressed, the red lamp of the switching status indicator lamp flashes five times, then the emergency start power supply for vehicles 1 is switched off.

[0039]

The emergency starting power supply for vehicles in accordance with the present utility model includes the main operations: 1) Start: press the POWER button, the green lamp on the electricity quantity indicator lamp lights up, the emergency starting power supply for vehicles is started normally. 2) Ignition: before ignition, it is first confirmed whether the amount of electricity in the rechargeable lithium-ion battery is sufficient to start the vehicle. The POWER button is pressed to indicate the voltage of the rechargeable lithium-ion battery. When all of the voltage indicators of the rechargeable lithium ion battery are lit, it indicates that the amount of electricity of the rechargeable lithium ion battery is 100%. When red, orange and yellow indicator lights are on, it indicates that the amount of electricity in the rechargeable lithium-ion battery is 70%. Ignition can occur in these two states. If only red and orange indicator lights are lit, it indicates that the amount of electricity in the rechargeable lithium-ion battery is 40%, then ignition is prohibited.

[0040]

After it is confirmed that the ignition is possible, the emergency start power supply for vehicles 1 is correctly connected to the vehicle battery 2, the JUMP START button is pressed to start ignition. If it is not connected to vehicle battery 2, the JUMP START button is pressed for 3S, then the ignition function can also be started. The engine of the vehicle is switched on, regardless of whether the ignition is successful, the relay is switched off within 800mS. In addition, the ignition output unit 60 can be connected to the vehicle battery in the form of the electrical clamp. The electrical clamp is easy to use and wire. In use, the electrical clamp can be clamped to the electrode of the vehicle battery 2, then the ignition function can be implemented. That is very easy.

[0041]

The POWER ON button is pressed, then USB output unit 40 is switched on. With the output current of 5V / 2A, digital products such as cell phone and iPad etc. can be charged.

[0042]

It can be charged by a 12V / 1A adapter. The indicator lamp of the rechargeable lithium-ion battery 20 will indicate the state of charge. The USB function is now available.

[0043]

The emergency start power supply for vehicles in accordance with the present utility model uses the rechargeable lithium-ion battery, so that the entire device has small dimensions and weight and is easy to carry and store. Compared to the existing emergency start power supply for vehicles with lead-acid batteries, it is 3-5 times smaller. It does not cause pollution. It has various types of protection such as B. against overtemperature, overpressure and overcharging, the battery has a long service life. The emergency start power supply for vehicles can be carried in the vehicle so that the driver can use it at any time. The lithium-ion battery has a large charge, small volume, long life, high charge and discharge performance and low self-discharge rate, which is why it is environmentally friendly. The driver can know the amount of electricity at any time using the indicator lamp for the amount of electricity.

[0044]

Although the present utility model is shown and described in connection with many particular embodiments, it should be noted that other various changes or adaptations may be made unless they are different from the scope of the present utility model.

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CLAIMS DE202013102599

1.

Emergency start power supply for vehicles, characterized in that it has a rechargeable lithium-ion battery, a microcontroller, a charging input unit that is connected to the rechargeable lithium-ion battery and the microcontroller and under the control of the microcontroller the rechargeable lithium-ion -Battery recharges, an ignition output unit connected to the rechargeable lithium-ion battery and the microcontroller and under the control of the microcontroller outputs the amount of electricity of the rechargeable lithium-ion battery by ignition, and a relay that takes the place between the Microcontroller and the ignition output unit is connected and switches the ignition output of the ignition output unit on and off.

2.

Emergency start power supply for vehicles according to claim 1, characterized in that it further comprises a USB output unit which is connected to the rechargeable lithium-ion battery and the microcontroller and under the control of the microcontroller, the amount of electricity of the rechargeable lithium-ion battery issues.

3.

Emergency start power supply for vehicles according to claim 1, characterized in that it further comprises an illumination lamp which is connected to the rechargeable lithium-ion battery and the microcontroller.

4.

Emergency start power supply for vehicles according to claim 1, characterized in that it further comprises a timing unit which is connected to the microcontroller and is used for timing the switching time of the emergency start power supply for vehicles.

5.

Emergency start power supply for vehicles according to claim 1, characterized in that it further comprises a protection unit which is connected to the rechargeable lithium-ion battery and the microcontroller and provides preset protection for the rechargeable lithium-ion battery.

6.

Emergency start power supply for vehicles according to claim 5, characterized in that the protection unit has a high-temperature protection unit, a recharge protection unit, an overcharge protection unit, an over-discharge protection unit and an overcurrent protection unit.

7.

Emergency start power supply for vehicles according to claim 1, characterized in that it further comprises a display unit which is connected to the rechargeable lithium-ion battery and the microcontroller and indicates the predetermined state of the emergency start power supply for vehicles.

8.

Emergency start power supply for vehicles according to claim 7, characterized in that the display unit has a display unit for the switching state, a display unit for the ignition state, a display unit for auxiliary signals, a display unit for the quantity of electricity and an alarm unit for low voltage.

Espacenet

Bibliographic data: DE102014114997 (A1) — 2016-01-07

Portable vehicle battery jump start apparatus with safety protection

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Classification: **- international:*H02H3/18***
- cooperative: **H02J7/0034 (EP, GB); H02J7/0036 (EP, GB); H02J7/342 (EP, GB)**

Application number: DE201410114997 20141015

Priority number(s): WO2014US45434 20140703

Also published as: AU2015258229 (A1) AU2016269555 (A1) AU2016269555 (B2) AU2019201559 (A1) AU2019201559 (B2) more

Abstract not available for DE102014114997 (A1)
Abstract of corresponding document: GB2527858 (A)

A handheld device for jump starting a vehicle engine includes a rechargeable lithium ion battery pack 32 and a microcontroller 1. The lithium ion battery 32 is coupled to a power output port of the device through a FET smart switch 15 actuated by the microcontroller 1. A vehicle battery isolation sensor 12 detects the presence of a vehicle battery 72 connected between the positive and negative polarity outputs. A reverse polarity sensor 10 detects the polarity of a vehicle battery 72 connected between the positive and negative polarity outputs, such that the microcontroller 1 will enable power to be delivered from the lithium ion power pack 32 to the output port only when a good

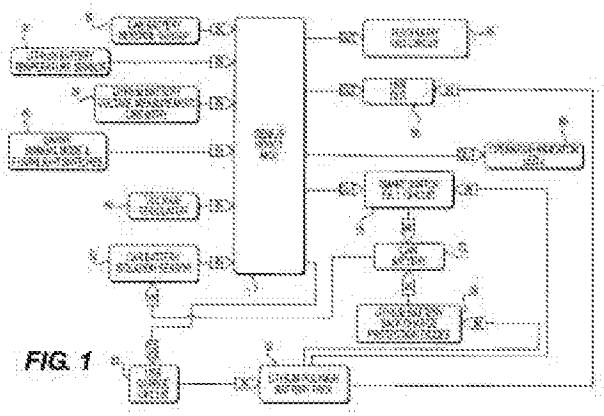

FIG. 1

battery is connected to the output port and only when the battery is connected with proper polarity of positive and negative terminals.

(19) Deutsches Patent- und Markenamt

(10) **DE 10 2014 114 997 A1** 2016.01.07

(12) # Offenlegungsschrift

(21) Aktenzeichen: **10 2014 114 997.1**
(22) Anmeldetag: **15.10.2014**
(43) Offenlegungstag: **07.01.2016**

(51) Int Cl.: ***H02H 3/18*** (2006.01)

(30) Unionspriorität:
PCT/US2014/45434 03.07.2014 US

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(56) Ermittelter Stand der Technik:

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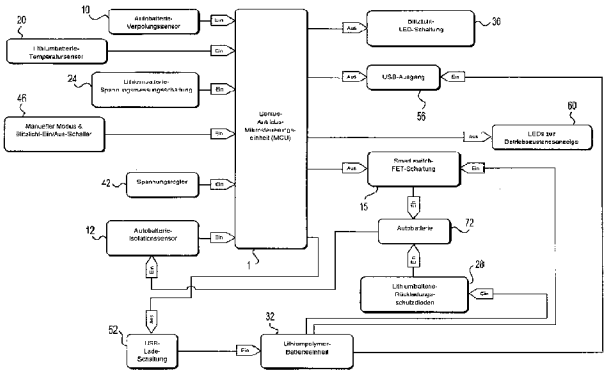
DE	20 2013 102 599	U1
US	7 148 580	B2
US	8 172 603	B1
US	8 493 021	B2
US	4 910 628	A
EP	2 472 698	A2

Prüfungsantrag gemäß § 44 PatG ist gestellt.

Die folgenden Angaben sind den vom Anmelder eingereichten Unterlagen entnommen

(54) Bezeichnung: **Tragbare Starthilfevorrichtung für Fahrzeugbatterien mit Sicherheitsschutzvorrichtung**

(57) Zusammenfassung: Eine tragbare Vorrichtung zur Starthilfe eines Fahrzeugmotors umfasst eine wieder aufladbare Lithiumionenbatterieeinheit und einen Mikrocontroller. Die Lithiumionenbatterie ist durch einen FET-smart-Schalter an eine Stromausgabeschnittstelle der Vorrichtung gekoppelt, die durch den Mikrocontroller betrieben wird. Ein Fahrzeugbatterie-Isolationssensor, der mit positiv und negativ gepolten Ausgängen in einer Schaltung verbunden ist, detektiert das Vorhandensein einer Fahrzeugbatterie, die zwischen positiv und negativ gepolten Ausgängen angeschlossen ist. Ein Verpolungssensor, der mit den positiv und negativ gepolten Ausgängen in einer Schaltung verbunden ist, detektiert die Polung einer Fahrzeugbatterie, die zwischen den positiv und negativ geladenen Ausgängen angeschlossen ist, so dass es dem Mikrocontroller ermöglicht, Spannung von der Lithiumionen-Spannungseinheit an den Ausgangsanschluss nur zu liefern, wenn eine funktionierende Batterie mit dem Ausgangsanschluss verbunden ist und nur wenn die Batterie mit der passenden Polung an die positiven und negativen Anschlüsse angeschlossen ist.



WINPLUS Ex. 1003, p. 937

Beschreibung

Hintergrund der Erfindung

[0001] Die vorliegende Erfindung bezieht sich im Allgemeinen auf eine Starthilfevorrichtung für ein Fahrzeug, das eine verbrauchte oder entladene Batterie aufweist. Gemäß dem Stand der Technik sind Vorrichtungen bekannt, die entweder ein Paar von elektrischen Verbindungskabeln aufweisen, die eine vollständig aufgeladene Batterie eines anderen Fahrzeugs mit der Fahrzeugstartschaltung des Fahrzeugs verbinden, das die erschöpfte Batterie enthält, oder tragbare Starthilfevorrichtungen, die eine vollständig geladene Batterie aufweisen, und die mit der Startvorrichtung des Fahrzeugmotors über ein Kabelpaar in einer Schaltung verbunden werden können.

[0002] Probleme entstanden beim Stand der Technik, wenn entweder die Drahtbrückenanschlüsse oder -klemmen der Kabel irrtümlich miteinander in Kontakt gebracht wurden, während die anderen Enden an eine geladenen Batterie angeschlossen waren, oder wenn die positiven und negativen Anschlüsse mit den Anschlüssen entgegengesetzter Polung im zu überbrückenden Fahrzeug verbunden wurden, wodurch ein Kurzschluss verursacht wurde, der zu einer Funkenbildung und einer potentiellen Beschädigung der Batterien und/oder einem körperlichen Schaden führte.

[0003] Gemäß dem Stand der Technik wurden unterschiedliche Versuche zur Beseitigung dieser Probleme unternommen. US 6,212,054, erteilt am 3. April 2001, offenbart eine Batteriestarthilfeeinheit, die empfindlich auf die Polung reagiert und passende oder unpassende Verbindungen detektieren kann, bevor ein Pfad für den elektrischen Ladungsfluss bereitgestellt wird. Die Vorrichtung verwendet einen Satz von LEDs, die mit durch eine Steuerschaltung ausgerichteten optischen Kopplern verbunden sind. Die Steuerschaltung steuert eine Spulenanordnung, die den Pfad eines Leistungsstroms steuert. Der Steuerschaltkreis lässt einen Leistungsstromfluss durch die Spulenanordnung nur dann zu, wenn die Kontaktpunkte der Starthilfekabelklemmenverbindungen richtig angelegt wurden.

[0004] US 6,632,103, erteilt am 14. Oktober 2003, offenbart ein adaptives Starthilfekabel, das durch zwei Klemmenpaare verbunden ist, wobei die beiden Klemmenpaare jeweils an zwei Batterien angeschlossen sind, um Strom von einer Batterie zu einer anderen Batterie zu übertragen. Das adaptive Starthilfekabel enthält eine mit jeder Klemme verbundene Polungsdetektionseinheit, eine Schalteinheit und eine Stromdetektionseinheit, die beide zwischen den beiden Klemmenpaaren vorhanden sind. Nachdem die Polung jeder Klemme durch die Polungsdetektionseinheit abgetastet wurde, erzeugt die Schalteinheit eine geeignete Verbindung zwischen den beiden Batterien. Daher sind die positiven und negativen Anschlüsse der beiden Batterien basierend auf dem detektierten Ergebnis der Polungsdetektionseinheit passend verbunden.

[0005] US 8,493,021, erteilt am 23. Juli 2013, offenbart eine Vorrichtung, die die Spannung einer Fahrzeugbatterie, welche Starthilfe bekommt und den durch die Starthilfebatterien gelieferte Strom überwacht, um zu bestimmen, ob eine passende Verbindung hergestellt wurde und um eine Fehlerüberwachung bereitzustellen. Nur wenn die geeignete Polung detektiert wird, kann das System betrieben werden. Die Spannung wird überwacht, um einen offenen Stromkreis, getrennte leitende Klemmen, Nebenschlusskabelfehler und Spulenfehlerzustände zu erfassen. Der Strom durch das Nebenschlusskabel wird überwacht, um das Bestehen eines Batterieexplosionsrisikos und eines einen Überhitzungszustand darstellenden Überschussstromzustands zu erkennen, der zu einem Feuer führen kann. Das System enthält eine interne Batterie zum Bereitstellen der Spannung für die Batterie des Fahrzeugs, das Starthilfe bekommen soll. Sobald das Fahrzeug gestartet ist, findet eine automatische elektrische Trennung der Einheit von der Fahrzeugbatterie statt.

[0006] US 5,189,359, erteilt am 23. Februar 1993, offenbart eine Starthilfekabelvorrichtung, die zwei Brückengleichrichter zum Ausbilden einer Referenzspannung, einen Dekodierer mit vier Eingängen zum Erkennen, welche Anschlüsse verbunden werden sollen, basierend auf einem Vergleich der Spannung an jedem der vier Anschlüsse mit der Referenzspannung, und ein Relaispaar aufweist, zum Bewirken der passenden Verbindung in Abhängigkeit von der Erkennung durch den Dekodierer. Es wird keine Verbindung hergestellt, es sei denn, dass nur ein Anschluss einer jeden Batterie eine höhere Spannung als die Referenzspannung aufweist, so dass „positive" Anschlüsse angezeigt werden, und ein Anschluss eine geringere Spannung als die Referenzspannung aufweist, so dass „negative" Anschlüsse angezeigt werden, und dass deshalb die beiden Hochspannungsanschlüsse und die beiden Niedrigspannungsanschlüsse verbunden werden können. Der Strom fließt, sobald die entsprechende Relaisvorrichtung geschlossen wird. Die Relaisvorrichtung ist vorzugsweise eine Metall-Oxid-Halbleiter-Feldeffekttransistor (MOSFET), der mit einer Serienanordnung von Photodioden, die ein MOSFET-gate-Schließ-Potential entwickeln, wenn der Dekodierer-Ausgang eine LED zum Leuchten bewirkt.

[0007] US 5,795,182, erteilt am 18. August 1998, offenbart einen polungsunabhängigen Satz von Batteriestarthilfekabeln, um eine erste Batterie mit einer zweiten Batterie zu überbrücken. Die Vorrichtung weist einen Detektor der relativen Polung auf,

um zu detektieren, ob zwei Batterien über Kreuz oder parallel angeordnet sind. Ein Drei-Punkt-Hochspannungskapazitätsquerriegeldrehschalter reagiert auf den Detektor der relativen Polung zum automatischen Verbinden des Plus-Anschlusses der beiden Batterien miteinander und der Minus-Anschlüsse der beiden Batterien miteinander, ungeachtet dessen, ob die detektierte Anordnung über Kreuz oder parallel ist, und ein Unterstrom-Detektor und eine Verzögerungsschaltung zum Zurücksetzen der Vorrichtung in ihren Anfangs- und nicht angeschlossenen Zustand, nachdem die Vorrichtung von einer der Batterien getrennt wurde. Der Querriegeldrehschalter weist zwei Kontaktpaare und einen Dreharm auf, der sich um zwei getrennte Punkte dreht, um vollen elektrischen Kontakt zwischen den Kontaktpaaren zu sichern. Die Erfindung kann auch verwendet werden, um eine Batterieladevorrichtung herzustellen, die mit einer Batterie ungeachtet der Batteriepolung verbunden werden kann.

[0008] US 6,262,492, erteilt am 17. Juli 2001, offenbart ein Autobatteriestarterkabel zur passenden Kopplung einer effektiven Spannungsquelle an eine fehlerhafte oder ungeladene Batterie, die eine Relaisschaltungsstromkreis aufweist, welcher mit der Spannungsquelle und der Batterie durch zwei Stromleitungspaare verbunden ist. Erste und zweite Spannungspolungserkennungsschaltungen werden jeweils mit der Spannungsquelle und der Batterie durch ein entsprechendes Spannungsleitungspaar verbunden, um die Polung der Spannungsquelle und der Batterie zu erkennen. Eine Logikerkennungsschaltung erzeugt ein Steuersignal, das abhängig von der Polung der Spannungsquelle und der Batterie ist, und eine Treiberschaltung, die durch ein Steuersignal des Logikerkennungsschaltung gesteuert wird, steuert den Relaisschaltungsstromkreis an, so dass das genaue Koppeln der beiden Pole der Spannungsquelle an die beiden Pole der Batterie ermöglicht wird.

[0009] US 5,635,817, erteilt am 3. Juni 1997, offenbart eine Fahrzeugbatterie-Ladevorrichtung, die ein Steuergehäuse aufweist, das Kabel enthält und, die eine Strombegrenzungsvorrichtung zum Verhindern des Überschreitens eines vorbestimmten maximalen Ladestroms von ungefähr 40 bis 60 A enthält. Das Steuergehäuse weist eine Polungsdetektionsvorrichtung zur Überprüfung der passenden Polung der Verbindung der Anschlüsse der beiden Batterien und zur elektrischen Trennung der beiden Batterien im Falle des Vorliegens einer falschen Polung auf.

[0010] US 8,199,024, erteilt am 12. Juni 2012, offenbart eine Sicherheitsschaltung in einem Niedrigspannungsverbindungssystem, das die beiden Niedrigspannungssysteme getrennt lässt, bis es bestimmt, dass es sicher ist, eine Verbindung aufzubauen. Wenn die Sicherheitsschaltung bestimmt, dass keine unsicheren Bedingungen vorliegen, und dass es sicher ist, die beiden Niedrigspannungssysteme zu verbinden, kann die Sicherheitsschaltung die beiden Niedrigspannungssysteme durch einen „sanften Start" verbinden, der eine Verbindung zwischen den beiden Systemen über eine Zeitdauer bereitstellt, die induzierte Spannungsspitzen auf einem oder mehreren der Niedrigspannungssysteme reduziert oder verhindert. Wenn in einem der Niedrigspannungssysteme eine vollständig entladene Batterie eingebaut ist, wird ein Verfahren für die Detektion der passenden Polung der Verbindungen zwischen den Niedrigspannungssystemen verwendet. Die Bestimmung der Polung der entladenen Batterie erfolgt durch das Durchschicken von einem oder mehreren Testströmen durch die entladene Batterie und durch die Bestimmung, ob ein entsprechender Spannungsanstieg beobachtet wird.

[0011] US 5,793,185, erteilt am 11. August 1998, offenbart eine tragbare Starthilfevorrichtung, die Steuerkomponenten und Schaltungen zur Verhinderung von Überladung und falscher Verbindung von Batterien aufweist.

[0012] Während der Stand der Technik Lösungen für die obengenannten Probleme, wie oben diskutiert, vorschlägt, leidet jede der Lösungen des Stands der Technik an anderen Defiziten, entweder in Bezug auf Komplexität, Kosten oder die Anfälligkeit für Fehlfunktionen. Folglich existiert ein Bedarf in diesem technischen Gebiet nach weiteren Verbesserungen für Starthilfevorrichtungen von Fahrzeugen.

Zusammenfassung der Erfindung

[0013] Gemäß einem Aspekt der Erfindung, wird eine Vorrichtung zur Starthilfe eines Fahrzeugmotors bereitgestellt, die Folgendes aufweist: eine interne Spannungsversorgung; einen positiv und negativ gepolte Ausgänge aufweisenden Ausgangsanschluss; einen Fahrzeugbatterie-Isolationssensor, der mit den positiv und negativ gepolten Ausgängen in einer Schaltung verbunden ist und zur Detektion des Vorhandenseins einer Fahrzeugbatterie konfiguriert ist, die zwischen den positiv und negativ gepolten Ausgängen angeschlossen ist; einen Verpolungssensor, der in einer Schaltung mit den positiv und negativ gepolten Ausgängen verbunden ist und zur Detektion der Polarität einer Fahrzeugbatterie konfiguriert ist, die zwischen den positiv und negativ gepolten Ausgängen angeschlossen ist; einen Spannungs-FET-Schalter, der zwischen der internen Spannungsversorgung und dem Ausgangsanschluss angeschlossen ist; und ein Mikrocontroller, der zum Empfangen von Eingabesignalen vom Fahrzeug-Isolationssensor und Verpolungssensor und zum Bereitstellen eines Ausgabesignals an den Spannungs-FET-Schalter so konfiguriert ist, dass der Spannungs-FET-Schalter als Antwort auf Signale der Senso-

ren, die das Vorhandensein einer Fahrzeugbatterie am Ausgangsanschluss und die passende Polverbindung von positiven und negativen Anschlüssen der Fahrzeugbatterie mit positiv und negativ gepolten Ausgängen anzeigen, eingeschaltet wird, um die interne Spannungsversorgung mit dem Ausgangsanschluss zu verbinden.

[0014] Gemäß einem weiteren Aspekt der Erfindung, besteht die interne Spannungsversorgung aus einer wieder aufladbaren Lithiumionenbatterieeinheit.

[0015] Gemäß noch einem weiteren Aspekt der Erfindung, wird eine Starthilfekabelvorrichtung bereitgestellt, die einen Stecker aufweist, der zum Einstecken in einen Ausgangsanschluss einer tragbaren Vorrichtung zur Batterieladestarthilfe, die eine interne Spannungsversorgung aufweist, konfiguriert ist; ein Kabelpaar, an dessen jeweiligem einen Ende der Stecker integriert ist; wobei das Kabelpaar zum getrennten Anschließen an die Anschlüsse einer Batterie an dessen jeweiligem anderen Ende konfiguriert ist.

Kurze Beschreibung der Zeichnungen

[0016] **Fig.** 1 stellt einen Funktionsplan einer tragbaren Vorrichtung zur Batteriestarthilfe von Fahrzeigen gemäß einem Aspekt der vorliegenden Erfindung dar;

[0017] **Fig.** 2A–**Fig.** 2C stellen schematische Schaltpläne einer beispielhaften Ausführungsform einer tragbaren Vorrichtung zur Batteriestarthilfe von Fahrzeugen gemäß einem Aspekt der vorliegenden Erfindung dar;

[0018] **Fig.** 3 stellt eine perspektivische Ansicht einer tragbaren Vorrichtung zur Starthilfe gemäß einer beispielhaften Ausführungsform der vorliegenden Erfindung dar; und

[0019] **Fig.** 4 stellt eine Draufsicht eines Starthilfekabels dar, das mit der tragbaren Vorrichtung zur Starthilfe gemäß einem weiteren Aspekt der vorliegenden Erfindung verwendbar ist.

Detaillierte Beschreibung der Erfindung

[0020] **Fig.** 1 stellt einen Funktionsplan einer tragbaren Vorrichtung zur Batteriestarthilfe gemäß einem Aspekt der vorliegenden Erfindung dar. Das Herzstück der tragbaren Vorrichtung zur Batteriestarthilfe ist eine Lithiumpolymerbatterieeinheit **32**, die genügend Energie speichert, um einem Fahrzeugmotor Starthilfe zu leisten, welcher von einer konventionellen 12 Volt Bleisäure- oder von einer durch ein Ventil regulierten Bleisäure-Batterie beliefert wird. In einer beispielhaften Ausführungsform weist eine Überspannungslithiumpolymerbatterieeinheit drei 3,7 V, 2666 mAh Lithiumpolymerbatterien in einer 3S1P-Konfiguration auf. Die sich ergebende Batterieeinheit liefert 11,1 V, 2666 Ah (8000 Ah bei 3,7 V, 29,6 Wh). Ein kontinuierlicher Entladungsstrom beträgt 25 C (oder 200 A), und eine Entladungsstromspitze beträgt 50 C (oder 400 A). Der maximale Ladungsstrom der Batterieeinheit beträgt 8000 mA (8 A).

[0021] Eine programmierbare Mikrocontrollereinheit (MCU) **1** erhält verschiedene Eingaben und erzeugt Informations- als auch Steuerungsausgaben. Die programmierbare MCU **1** stellt ferner eine Flexibilität für das System bereit, in dem es Aktualisierungen der Funktionalität und der Systemparameter zulässt, ohne eine Änderung der Hardware zu benötigen. Gemäß einer beispielhaften Ausführungsform wird ein 8-bit-Mikrocontroller mit einem 2K × 15-bit-Flash-Speicher verwendet, um das System zu steuern. Ein solcher Mikrocontroller ist HT67F30, der kommerziell bei Holtek Semiconductors Inc. erhältlich ist.

[0022] Eine Autobatterie-Verpolungssensor **10** überwacht die Polung der Fahrzeugbatterie **72**, wenn die tragbare Vorrichtung zur Batteriestarthilfe mit dem elektrischen System des Fahrzeugs verbunden wird. Wie unten erklärt, verhindert die Starthilfevorrichtung, dass die Lithiumbatterieeinheit mit der Fahrzeugbatterie **72** verbunden wird, wenn die Anschlüsse der Batterie **72** mit den falschen Anschlüssen der Starthilfevorrichtung verbunden sind. Ein Autobatterie-Isolationssensor **12** detektiert, ob ein eine Fahrzeugbatterie **72** mit der Starthilfevorrichtung verbunden ist oder nicht, und verhindert, dass die Lithiumbatterieeinheit mit den Ausgangsanschlüssen der Starthilfevorrichtung verbunden wird, es sei denn, dass eine gute (z. B. aufladbare) Batterie an die Ausgangsanschlüsse angeschlossen ist.

[0023] Ein smart-switch-FET-Schaltung **15** schaltet die Lithiumbatterie der tragbaren Vorrichtung zur Batteriestarthilfe elektrisch an das elektrische System des Fahrzeugs, nur wenn bestimmt wird, dass die Fahrzeugbatterie durch die MCU **1** als vorhanden erfasst wird (als Antwort auf ein von einem Isolationssensor **12** bereitgestelltes Detektionssignal) und mit der passenden Polung angeschlossen ist (als Antwort auf ein von einem Verpolungssensor **10** bereitgestelltes Detektionssignal). Ein Lithiumbatterie-Temperatursensor **20** überwacht die Temperatur der Lithiumbatterieeinheit **32**, um eine Überhitzung aufgrund von hohen Umgebungstemperaturbedingungen und übermäßiger Stromaufnahme während des Starthilfevorgangs zu detektieren. Eine Lithiumbatterie-Spannungsmessungsschaltung **24** überwacht die Spannung der Lithiumbatterieeinheit **32**, um das Spannungspotential daran zu hindern, während eines Ladevorgangs zu hoch zusteigen, und während eines Entladevorgangs zu tief zu fallen.

[0024] Lithiumbatterie-Rückladungsschutzdioden **28** verhindern, dass irgendein Ladungsstrom, der an

WINPLUS Ex. 1003, p. 940

die Fahrzeugbatterie **72** geliefert wird, vom elektrischen System des Fahrzeugs in die Lithiumbatterieeinheit **32** zurückfließt. Eine Blitzlicht-LED-Schaltung **36** wird bereitgestellt, um eine Blitzlicht-Funktion zur Verstärkung des Lichts unter der Fahrzeughaube bei dunklen Bedingungen zu liefern, sowie SOS- und Stroboskoplichtfunktionen aus Sicherheitsgründen bereitzustellen, wenn ein Fahrzeug an einem potentiell gefährlichen Ort fahruntauglich wird. Ein Spannungsregler **42** stellt eine Regulierung der internen Betriebsspannung für den Mikrocontroller und die Sensoren bereit. Ein manueller Modus- und Blitzlicht-Ein/Aus-Schalter **46** erlauben es dem Nutzer, das Einschalten der tragbaren Vorrichtung zur Batterieladestarthilfe zu steuern, um den manuellen Starthilfebetrieb zu steuern, wenn das Fahrzeug keine Batterie aufweist, und die Blitzlichtfunktion zu steuern. Der manuelle Knopf funktioniert nur, wenn die Starthilfevorrichtung eingeschaltet ist. Dieser Knopf erlaubt es dem Nutzer, Fahrzeugen Starthilfe zu leisten, denen entweder eine Batterie fehlt, oder deren Batteriespannung so niedrig ist, dass eine automatische Detektion durch die MCU nicht möglich ist. Wenn der Nutzer den manuellen Starthilfeknopf drückt und für eine vorbestimmte Zeit (wie z. B. drei Sekunden) gedrückt hält, um eine ungewollte Betätigung des manuellen Modus zu verhindern, wird die Spannung der internen Lithiumionenbatterie auf den Fahrzeugbatterie-Verbindungsanschluss geschaltet. Die einzige Ausnahme zum manuellen Starthilfebetrieb erfolgt, wenn die Autobatterie verpolt wurde. Wenn die Autobatterie verpolt wurde, sollte die Spannung der internen Lithiumbatterie niemals auf den Fahrzeugbatterie-Verbindungsanschluss geschaltet werden.

[0025] Eine USB-Ladeschaltung **52** wandelt eine Spannung von irgendeiner der USB-Ladespannungsquellen um, so dass Spannung und Strom zum Laden der Lithiumbatterieeinheit **32** geladen werden. Ein USB-Ausgang **56** stellt eine tragbare USB-Ladevorrichtung zum Laden von Smartphones, Tablet-Computern (im Folgenden Tablet genannt) und weiteren wieder aufladbaren elektronischen Vorrichtungen bereit. LEDs zur Betriebszustandsanzeige **60** stellen eine visuelle Anzeige des Lithiumbatterie-Kapazitätsstatus sowie eine Anzeige des Aktivierungsstatus des smart-switchs dar (die anzeigt, dass dem elektrischen System eine Spannung bereitgestellt wird).

[0026] Ein detaillierter Betrieb der tragbaren Starthilfevorrichtung wird nun gemäß den schematischen Diagrammen der **Fig.** 2A bis **Fig.** 2C beschrieben werden. Wie in **Fig.** 2A gezeigt, stellt die Mikrocontrollereinheit **1** das Zentrum aller Ein- und Ausgänge dar. Der Batterie-Verpolungssensor **10** umfasst einen optisch gekoppelten Isolationsphototransistor (4N27), der mit den Anschlüssen der Fahrzeugbatterie **72** an den Eingangspins 1 und 2 mit einer Diode D8 im Leiterdraht des Pins 1 (der am negativen Anschluss CB– angeschlossen ist), so dass, falls die Batterie **72** mit den Anschlüssen der Starthilfevorrichtung mit passender Polung verbunden ist, die LED des optischen Kopplers **11** keinen Strom leiten wird, und deshalb ausgeschaltet wird, wobei der MCU **1** eine „1" oder ein hohes Ausgabesignal bereitgestellt wird. Der Autobatterie-Isolationssensor **12** umfasst einen optisch gekoppelten Isolationsphototransistor (4N27), der mit den Anschlüssen der Fahrzeugbatterie **72** an den Eingangspins 1 und 2 mit einer Diode D7 im Leitungsdraht des Pins 1 (angeschlossen an den positiven Anschluss CB+) verbunden ist, so dass, falls die Batterie **72** an die Anschlüsse der Starthilfevorrichtung mit der passenden Polung verbunden ist, die LED des optischen Kopplers **11A** einen Strom leiten wird, und deshalb eingeschaltet wird, wobei der MCU eine „0" oder ein niedriges Ausgabesignal bereitgestellt wird, und das Vorhandensein einer Batterie über die Starthilfeausgangsanschlüsse der tragbaren Starthilfevorrichtung anzeigt.

[0027] Falls die Autobatterie **72** mit der tragbaren Starthilfevorrichtung verpolt verbunden ist, wird die LED des optischen Kopplers **11** des Verpolungssensors **10** den Strom leiten, wobei der Mikrocontrollereinheit **1** eine „0" oder ein niedriges Signal bereitgestellt wird. Ferner, falls keine Batterie mit der tragbaren Starthilfevorrichtung verbunden ist, wird die LED des optischen Kopplers **11A** des Isolationssensors **12** keinen Strom leiten und wird deshalb ausgeschaltet, wobei der MCU eine „1" oder ein hohes Ausgabesignal bereitgestellt wird, das die Abwesenheit irgendeiner mit der tragbaren Starthilfevorrichtung verbundener Batterie anzeigt. Unter Verwendung dieser spezifischen Eingaben kann die Mikrocontrollersoftware der MCU **1** bestimmen, wann es sicher ist, den smart-switch-FET **15** einzuschalten, wodurch die Lithiumbatterieeinheit mit den Starthilfeanschlüssen der Starthilfevorrichtung verbunden wird. Folglich kann die MCU **1** den smart-switch-FET-Schaltung **15** davor bewahren, eingeschaltet zu werden und somit das Erzeugen von Funken/Kurzschlüssen der Lithiumbatterieeinheit verhindert werden, wenn die Autobatterie **72** entweder überhaupt nicht mit der Starthilfevorrichtung verbunden ist oder verpolt verbunden ist.

[0028] Wie in **Fig.** 2B gezeigt, wird der smart-switch-FET **15** durch eine Mikrocontrollerausgabe **1** angesteuert. Der FET-smart-switch **15** weist drei FETs (Q15, Q18 und Q19) in Parallelschaltung auf, die die Spannung der Lithiumbatterieeinheit auf die FETs verteilt. Wenn diese Mikrocontrollerausgabe in einen logisch niedrigen Zustand gesteuert wird, befinden sich die FETs **16** alle in einem Hochwiderstandszustand, weswegen kein Stromfluss vom negativen Kontakt **17** der internen Lithiumbatterie zum negativen Kontakt der Autobatterie **72** zugelassen wird. Wenn die Mikrocontrollerausgabe in einen logisch hohen Zustand gesteuert wird, sind die FETs **16** (Q15, Q18, Q19) in einem Niedrigwiderstands-

WINPLUS Ex. 1003, p. 941

zustand, der einen freien Stromfluss vom negativen Kontakt **17** (LB–) der internen Lithiumbatterieeinheit zum negativen Kontakt (CB–) der Autobatterie **72** zulässt. Auf diese Art steuert die Mikrocontrollersoftware die Verbindung der internen Lithiumbatterieeinheit **32** mit der Fahrzeugbatterie **72**, um dem Fahrzeugmotor Starthilfe zu leisten.

[0029] Gemäß **Fig.** 2A, kann die Spannung der internen Lithiumbatterieeinheit unter Verwendung der Schaltung **24** und einem der Analog-zu-Digital-Eingänge des Mikrocontrollers **1** präzise gemessen werden. Die Schaltung **24** ist vorgesehen, um zu erfassen, wann die Spannung des Haupt-3,3 V-Reglers **42** eingeschaltet ist und den Transistor **23** einzuschalten, wenn die Spannung des Reglers **42** eingeschaltet ist. Wenn der Transistor **23** leitet, schaltet er den FET **22** ein, womit dem positiven Kontakt (LB+) der internen Lithiumbatterie ein leitender Pfad zu einem Spannungsteiler **21** bereitgestellt wird, der es zulässt, der Mikrocontroller einen niedrigeren Spannungsbereich zum Einlesen zuzuführen. Durch Verwendung dieser Eingabe kann die Mikrocontrollersoftware bestimmen, ob die Lithiumbatteriespannung während des Entladevorgangs zu niedrig oder während des Aufladevorgangs zu hoch ist, und sie kann eine entsprechende Maßnahme zur Verhinderung der Beschädigung der elektronischen Komponenten unternehmen.

[0030] Weiterhin kann gemäß **Fig.** 2A durch zwei Vorrichtungen **20** mit negativem Temperaturkoeffizienten (NTC) die Temperatur der internen Lithiumbatterieeinheit **32** präzise gemessen werden. Dies sind Vorrichtungen, die ihren Widerstand verringern, wenn ihre Temperatur steigt. Die Schaltung stellt einen Spannungsteiler dar, der das Ergebnis den beiden Analog-zu Digital-(A/D)-Eingänge dem Mikrocontroller zuführt. Die Mikrocontrollersoftware kann dann bestimmen, wann die interne Lithiumbatterie zu heiß ist, um einen Starthilfevorgang zuzulassen, wodurch der Aufbau Betriebssicherheit erhält.

[0031] Die Hauptspannungsreglersschaltung **42** ist so gestaltet, dass die Spannung der internen Lithiumbatterie in einen geregelten Wert von 3,3 V umgewandelt wird, der vom Mikrocontroller **1** sowie von anderen Komponenten der Starthilfevorrichtung für die interne Betriebsspannung verwendet wird. Drei Lithiumbatterie-Rückaufladungs-(backcharging)-Schutzdioden **28** (siehe **Fig.** 2B) werden eingesetzt, um den Stromfluss nur von der internen Lithiumbatterieeinheit **32** zur Autobatterie **72** zuzulassen, und nicht von der Autobatterie zur internen Lithiumbatterie. Auf diese Art kann, falls das elektrische System des Autos von seiner Lichtmaschine geladen wird, die interne Lithiumbatterie nicht rückaufladen (und hierbei beschädigt werden), was eine weitere Stufe der Betriebssicherheit bereitstellt.

[0032] Der Hauptspannungseinschalter **46** (**Fig.** 2A) ist eine Kombination, die einen Doppelpol- oder Zweiwegebetrieb zulässt, so dass das Produkt mit einem Drücken eingeschaltet werden kann, wenn es sich im Aus-Zustand befindet, oder ausgeschaltet werden kann, wenn es sich im Ein-Zustand befindet. Diese Schaltung verwendet auch einen Mikrocontrollerausgang **47**, um die Spannung aufrecht zu erhalten, wenn die Schaltung durch den Ein-Schalter aktiviert wurde. Wenn der Schalter gedrückt wird, schiebt der Mikrocontroller diesen Ausgang auf eine Hochlogikstufe, um die Spannung „am Leben" zu erhalten, wenn der Schalter losgelassen wird. Auf diese Art behält der Mikrocontroller die Kontrolle, wenn die Spannung ausgeschaltet wird, wenn der Ein-/Aus-Schalter wieder aktiviert wird, oder wenn die Lithiumbatteriespannung zu niedrig wird. Die Mikrocontrollersoftware weist auch einen Zeitschalter auf, der die Spannung nach einer vorbestimmten Zeitdauer (wie z. B. 8 Stunden) bei Nichtverwendung ausschaltet.

[0033] Die Blitzlicht-LED-Schaltung **45**, die in **Fig.** 2B gezeigt wird, steuert den Betrieb der Blitzlicht-LEDs. Zwei Ausgänge des Mikrocontrollers **1** sind den beiden separaten LEDs zugeordnet. Daher können die LEDs zur Ausbildung von Stroboskopen und SOS-Mustern unabhängig software-gesteuert werden, was der Starthilfevorrichtung noch ein weiteres Sicherheitsmerkmal hinzugefügt. LED-Anzeigen geben dem Betreiber die Rückmeldung, die dieser braucht, um zu verstehen, was mit dem Produkt passiert. Vier separate LEDs **61** (**Fig.** 2A) werden durch entsprechende einzelne Ausgänge des Mikrocontrollers **1** gesteuert, um eine Anzeige der verbleibenden Kapazität der internen Lithiumbatterie bereitzustellen. Diese LEDs werden in einem Format vergleichbar dem einer „Kraftstoffanzeige" mit 25%-, 50%-, 75%- und 100%-(rot, rot, gelb, grün)-Kapazitätsanzeigen gesteuert. Eine LED-Anzeige **63** (**Fig.** 2B) gibt dem Benutzer eine visuelle Warnung, wenn die Fahrzeugbatterie **72** verpolt angeschlossen worden ist. Starthilfe- und Ein-/Aus-LEDs **62** stellen jeweils visuelle Anzeigen bereit, wenn die Starthilfevorrichtung Starthilfespannung bereitstellt, und wenn die Starthilfevorrichtung eingeschaltet wird.

[0034] Eine USB-Ausgangsschaltung **56** (**Fig.** 2C) weist einen USB-Ausgang auf, zum Laden von tragbaren elektronischen Vorrichtungen, wie z. B. Smartphones durch die interne Lithiumbatterieeinheit **32**. Eine Steuerschaltung **57** des Mikrocontrollers **1** lässt es zu, den USB-Ausgang **56** durch die Softwaresteuerung ein- oder auszuschalten, um zu verhindern, dass die interne Lithiumbatterie eine zu niedrige Kapazität erreicht. Die USB-Ausgabe wird mittels einer Standard-USB-Verbindung **58** an das Äußere der Vorrichtung geführt, wobei die Standard-USB-Verbindung **58** den erforderlichen Standardspannungsteiler aufweist, um es zu ermöglichen, Smartphones eine

bestimmte Spannung zuzuführen, die sie benötigenden.

[0035] Die USB-Ladeschaltung **52** lässt es zu, dass die interne Batterieeinheit **32** durch eine Standard-USB-Ladevorrichtung geladen wird. Dieser Spannungseingang verwendet eine Standard-Mikro-USB-Verbindung **48**, die es erlaubt, Standardkabel zu verwenden. Das von der Standard-USB-Ladevorrichtung bereitgestellte Potential von 5 V wird in 12,4 V DC-Spannung hochgewandelt, das zum Laden der internen Lithiumbatterieeinheit unter Verwendung eines DC-DC-Konverters **49** benötigt wird. Der DC-DC-Konverter **49** kann durch die Schaltung **53** mittels eines Mikrocontrollerausgangs **1** ein- und ausgeschaltet werden.

[0036] Auf diese Art kann die Mikrocontrollersoftware den Ladevorgang ausschalten, falls die Batteriespannung durch den A/D-Eingang **22** als zu hoch bestimmt worden ist. Zusätzliche Betriebssicherheit wird zur Abhilfe der Beseitigung von Überladung der internen Lithiumbatterie durch Verwendung einer Lithiumbatterie-Ladesteuerung **50** bereitgestellt, die einen Ladungsausgleich der internen Lithiumbatteriezellen **51** bereitstellt. Diese Steuerung stellt auch eine redundante Betriebssicherheit zur Beseitigung von Überladung der internen Lithiumbatterie bereit.

[0037] **Fig.** 3 stellt eine perspektivische Ansicht einer tragbaren Vorrichtung **300** gemäß einer beispielhaften Ausführungsform der Erfindung dar. **301** ist ein Spannungseinschalter. **302** zeigt die LED-„Kraftstoff"-Anzeigen **61**. **303** zeigt einen 12 V-Ausgangsanschluss, der mit einer weiter unten beschriebenen Kabelvorrichtung **400** verbindbar ist. **304** zeigt einen Blitzlichtsteuerungsschalter zum Aktivieren der Blitzlicht-LEDs **45**. **305** stellt einen USB-Eingangsanschluss zum Laden der internen Lithiumbatterie dar, und **306** ist ein USB-Ausgangsanschluss, um anderen tragbaren Vorrichtungen, wie z. B. Smartphones, Tablets, Musikspieler, usw., Ladung durch die Lithiumbatterie bereitzustellen. **307** stellt eine „Starthilfe-Ein"-Anzeige dar, die anzeigt, dass die Spannung dem 12 V-Ausgangsanschluss bereitgestellt wird. **308** stellt eine Verpolungsanzeige dar, die anzeigt, dass die Fahrzeugbatterie in Bezug auf die Polung falsch verbunden ist. **309** stellt eine „Spannung-Ein"-Anzeige dar, die anzeigt, dass die Vorrichtung für den Betrieb hochgefahren ist.

[0038] **Fig.** 4 zeigt eine Starthilfekabelvorrichtung **400**, die insbesondere für eine Verwendung mit der tragbaren Vorrichtung **300** ausgestaltet ist. Die Vorrichtung **400** weist einen Stecker **401** auf, der so gestaltet ist, dass er in den 12 V-Ausgangsanschluss **303** der tragbaren Vorrichtung **300** einsteckt werden kann. Der Stecker **401** ist in einem Kabelpaar **402a** und **402b** integriert, und die Kabel sind jeweils mit den Batterieanschlussklemmen **403a** und **403b** mittels Ringanschlüssen **404a** und **404b** verbunden. Der Anschluss **303** und der Stecker **401** können so dimensioniert werden, dass der Stecker **401** nur in den Anschluss **303** in einer bestimmten Orientierung passt, wodurch gesichert ist, dass die Klemme **403a** einer positiven Polung entsprechen wird, und die Klemme **403b** einer negativen Polung entsprechen wird, wie darauf angegeben. Zusätzlich können die Ringanschlüsse **404a** und **404b** von den Klemmen getrennt werden und direkt mit den Anschlüssen der Fahrzeugbatterie verbunden werden. Dieses Merkmal kann nützlich sein, um beispielsweise die Kabel **402a** bis **402b** dauerhaft mit der Fahrzeugbatterie zu verbinden. Im Falle einer Erschöpfung der Batteriespannung könnte die tragbare Starthilfevorrichtung **300** durch Einstecken des Steckers **401** in den Anschluss **303** in sehr einfacher Weise passend mit der Batterie verbunden werden.

[0039] Die Erfindung, die auf diese Weise beschrieben wurde, wird dem Fachmann ersichtlich sein, so dass diese in vielen Arten variiert werden kann, ohne vom Umfang der Erfindung abzuweichen. Jede und alle solche Variationen werden innerhalb des Umfangs der folgenden Ansprüche erfasst.

WINPLUS Ex. 1003, p. 943

ZITATE ENTHALTEN IN DER BESCHREIBUNG

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WINPLUS Ex. 1003, p. 944

Patentansprüche

1. Vorrichtung zur Starthilfe eines Fahrzeugmotors, umfassend:
eine interne Spannungsversorgung (**32**);
einen positiv und negativ gepolte Ausgänge (CB–, CB +) aufweisenden Ausgangsanschluss (**303**);
einen Fahrzeugbatterie-Isolationssensor (**12**), der mit den positiv und negativ gepolten Ausgängen (CB–, CB+) in einer Schaltung verbunden ist, und zur Detektion des Vorhandenseins einer Fahrzeugbatterie (**32**), die zwischen den positiv und negativ gepolten Ausgängen (CB–, CB+) angeschlossen ist, konfiguriert ist;
einen Verpolungssensor (**10**), der in einer Schaltung mit den positiv und negativ gepolten Ausgängen (CB–, CB+) verbunden ist, und zur Detektion der Polarität einer Fahrzeugbatterie (**72**), die zwischen den positiv und negativ gepolten Ausgängen (CB–, CB+) angeschlossen ist, konfiguriert ist;
ein Spannungs-FET-Schalter (**15**), der zwischen der internen Spannungsversorgung (**32**) und dem Ausgangsanschluss (**305**) angeschlossen ist; und
ein Mikrocontroller (**1**), der zum Empfangen von Eingabesignalen vom Fahrzeug-Isolationssensor (**12**) und vom Verpolungssensor (**10**) und zum Bereitstellen eines Ausgabesignals an den Spannungs-FET-Schalter (**15**) so konfiguriert ist, dass der Spannungs-FET-Schalter (**15**) als Antwort auf Signale der Sensoren, die das Vorhandensein einer Fahrzeugbatterie (**72**) am Ausgangsanschluss (**303**) und die passende Polverbindung von positiven und negativen Anschlüssen der Fahrzeugbatterie (**72**) mit positiv und negativ gepolten Ausgängen (CB–, CB+) anzeigen, eingeschaltet wird, um die interne Spannungsversorgung (**32**) mit dem Ausgangsanschluss (**303**) zu verbinden.

2. Die Vorrichtung gemäß Anspruch 1, wobei die interne Spannungsversorgung (**32**) eine Lithiumionenbatterie umfasst.

3. Die Vorrichtung gemäß Anspruch 2, wobei die Lithiumionenbatterie eine Batterieeinheit aus mehreren Lithiumionenbatterien umfasst.

4. Die Vorrichtung gemäß irgendeinem der vorangehenden Ansprüche, wobei der Spannungs-FET-Schalter (**15**) eine Vielzahl von FETs in Parallelschaltung (**16**) umfasst.

5. Die Vorrichtung gemäß irgendeinem der vorangehenden Ansprüche, wobei der Fahrzeug-Isolationssensor (**12**) und der Verpolungssensor (**10**) optisch gekoppelte Isolationsphototransistoren umfassen.

6. Die Vorrichtung gemäß irgendeinem der vorangehenden Ansprüche, ferner umfassend eine Vielzahl von Spannungsdioden (**28**), die zwischen den Ausgangsanschluss (**303**) und der internen Spannungsversorgung (**32**) gekoppelt sind, um eine Rückaufladung der internen Spannungsversorgung (**32**) durch ein an den Ausgangsanschluss (**303**) angeschlossenes elektrisches System zu verhindern.

7. Die Vorrichtung gemäß irgendeinem der vorangehenden Ansprüche, ferner umfassend einen Temperatursensor (**20**) zur Detektion der Temperatur der internen Spannungsversorgung (**32**) und zum Bereitstellen eines Temperatursignals an den Mikrocontroller (**1**).

8. Die Vorrichtung gemäß irgendeinem der vorangehenden Ansprüche, ferner umfassend eine Spannungsmessungsschaltung (**24**), die zur Messung der Ausgabespannung der internen Spannungsversorgung (**32**) und zum Bereitstellen eines Spannungsmessungssignals an den Mikrocontroller (**1**) konfiguriert ist.

9. Die Vorrichtung gemäß irgendeinem der vorangehenden Ansprüche, ferner umfassend ein Spannungsregler (**42**), der zur Umwandlung der Ausgabespannung der internen Spannungsversorgung (**32**) in einen Spannungspegel konfiguriert ist, der geeignet ist, um internen Komponenten der Vorrichtung eine Betriebsspannung bereitzustellen.

10. Die Vorrichtung gemäß irgendeinem der vorangehenden Ansprüche, ferner umfassend einen USB-Ausgangsanschluss (**56**), der zum Bereitstellen einer Ladungsspannung der internen Spannungsversorgung (**32**) an eine USB-ladbare Vorrichtung konfiguriert ist.

11. Die Vorrichtung gemäß irgendeinem der vorangehenden Ansprüche, ferner umfassend einen USB-Ladeanschluss (**52**), der zum Bereitstellen einer Ladespannung von einer externen Spannungsquelle an die interne Spannungsversorgung (**32**) konfiguriert ist.

12. Die Vorrichtung gemäß irgendeinem der vorangehenden Ansprüche, ferner umfassend einen Blitzlicht-Schaltung (**36**, **45**), die zum Bereitstellen einer Lichtquelle für einen Nutzer konfiguriert ist.

13. Die Vorrichtung gemäß Anspruch 12, wobei die Lichtquelle mindestens eine LED ist.

14. Die Vorrichtung gemäß Anspruch 13, wobei der Mikrocontroller (**1**) zur Kontrolle der mindestens einen LED konfiguriert ist, um einen visuellen Alarm zur Anzeige einer Notsituation bereitzustellen.

15. Die Vorrichtung gemäß irgendeinem der vorangehenden Ansprüche, ferner umfassend eine Vielzahl von visuellen Anzeigen (**61**), die zur Anzeige

WINPLUS Ex. 1003, p. 945

des verbleibenden Kapazitätszustands der internen Spannungsversorgung (**32**) konfiguriert sind.

16. Die Vorrichtung gemäß Anspruch 15, wobei die Vielzahl von visuellen Anzeigen (**61**) eine Vielzahl von LEDs umfassen, die Licht verschiedener Farben ausgeben.

17. Die Vorrichtung gemäß irgendeinem der vorangehenden Ansprüche, ferner umfassend eine visuelle Anzeige (**63**), die zur Warnung eines Benutzers konfiguriert ist, wenn eine Batterie verpolt angeschlossen ist.

18. Die Vorrichtung gemäß irgendeinem der vorangehenden Ansprüche, ferner umfassend getrennte visuelle Anzeigen (**62**), die zur Anzeige des Spannung-An-Status der Vorrichtung und zur Anzeige des Status der Starthilfespannung der dem Ausgangsanschluss (**303**) bereitgestellten Spannung konfiguriert ist.

19. Die Vorrichtung gemäß irgendeinem der vorangehenden Ansprüche, ferner umfassend einen manuelle Starthilfeschalter, der zum Aktivieren eines manuellen Starthilfemodus konfiguriert ist, der es einem Benutzer ermöglicht, die Starthilfespannung mit dem Ausgangsanschluss (**303**) zu verbinden, wenn der Fahrzeugbatterie-Isolationssensor (**12**) das Vorhandensein einer Fahrzeugbatterie nicht detektieren kann.

20. Die Vorrichtung gemäß Anspruch 19, wobei der Mikrocontroller (**1**) zur Detektion der manuellen Starthilfeschaltung für mindestens eine vorbestimmte Zeitdauer vor dem Aktivieren des manuellen Starthilfemodus konfiguriert ist.

21. Die Vorrichtung gemäß irgendeinem der vorangehenden Ansprüche, ferner umfassend eine Starthilfekabelvorrichtung (**400**), die einen Stecker (**401**) umfasst, zum Einstecken in den Ausgangsanschluss, ein Kabelpaar (**402a**, **402b**), an dessen jeweiligem einen Ende der Stecker (**401**) integriert ist und zum Anschließen an die Anschlüsse einer Batterie an dessen jeweiligem anderen Ende konfiguriert sind.

22. Die Vorrichtung gemäß Anspruch 21, wobei das Starthilfekabel ferner ein Paar von Ringanschlüssen (**404a**, **404b**) umfasst, die zum jeweiligen Verbinden des Kabelpaars (**402a**, **402b**) an dessen anderem Ende mit einem Ende eines Batterieanschlusses oder einer Batterieanschlussklemme konfiguriert sind.

23. Die Vorrichtung gemäß irgendeinem der Ansprüche 21 oder 22, wobei der Ausgangsanschluss (**303**) und der Stecker (**401**) so dimensioniert sind, dass der Stecker (**401**) nur in einer bestimmten Orientierung in den Ausgangsanschluss (**303**) passt.

24. Eine Starthilfekabelvorrichtung (**400**), umfassend:
einen Stecker (**401**), der zum Stecken in einen Ausgangsanschluss (**303**) einer tragbaren Vorrichtung zur Batterieladestarthilfe (**300**) konfiguriert ist, die eine interne Spannungsversorgung aufweist;
ein Kabelpaar (**402a**, **402b**), das mit dem Stecker (**401**) an dessen einen entsprechenden Ende integriert ist;
wobei das Kabelpaar (**402a**, **402b**) so konfiguriert ist, dass es gesondert an Anschlüssen einer Batterie mit dessen entsprechend anderem Ende angeschlossen werden soll.

25. Die Starthilfekabelvorrichtung (**400**) gemäß Anspruch 24, ferner umfassend ein Paar von Ringanschlüssen (**404a**, **404b**), die zum jeweiligen Verbinden des Kabelpaars (**402a**, **402b**) an dessen anderen Ende mit einem Batterieanschluss oder einer Batterieanschlussklemme konfiguriert sind.

26. Die Starthilfekabelvorrichtung (**400**) gemäß irgendeinem der Ansprüche 24 oder 25, wobei der Ausgangsanschluss (**303**) und der Stecker (**401**) so dimensioniert sind, dass der Stecker (**401**) nur in einer bestimmten Richtung in den Ausgangsanschluss (**303**) passt.

Es folgen 13 Seiten Zeichnungen

WINPLUS Ex. 1003, p. 946

Anhängende Zeichnungen

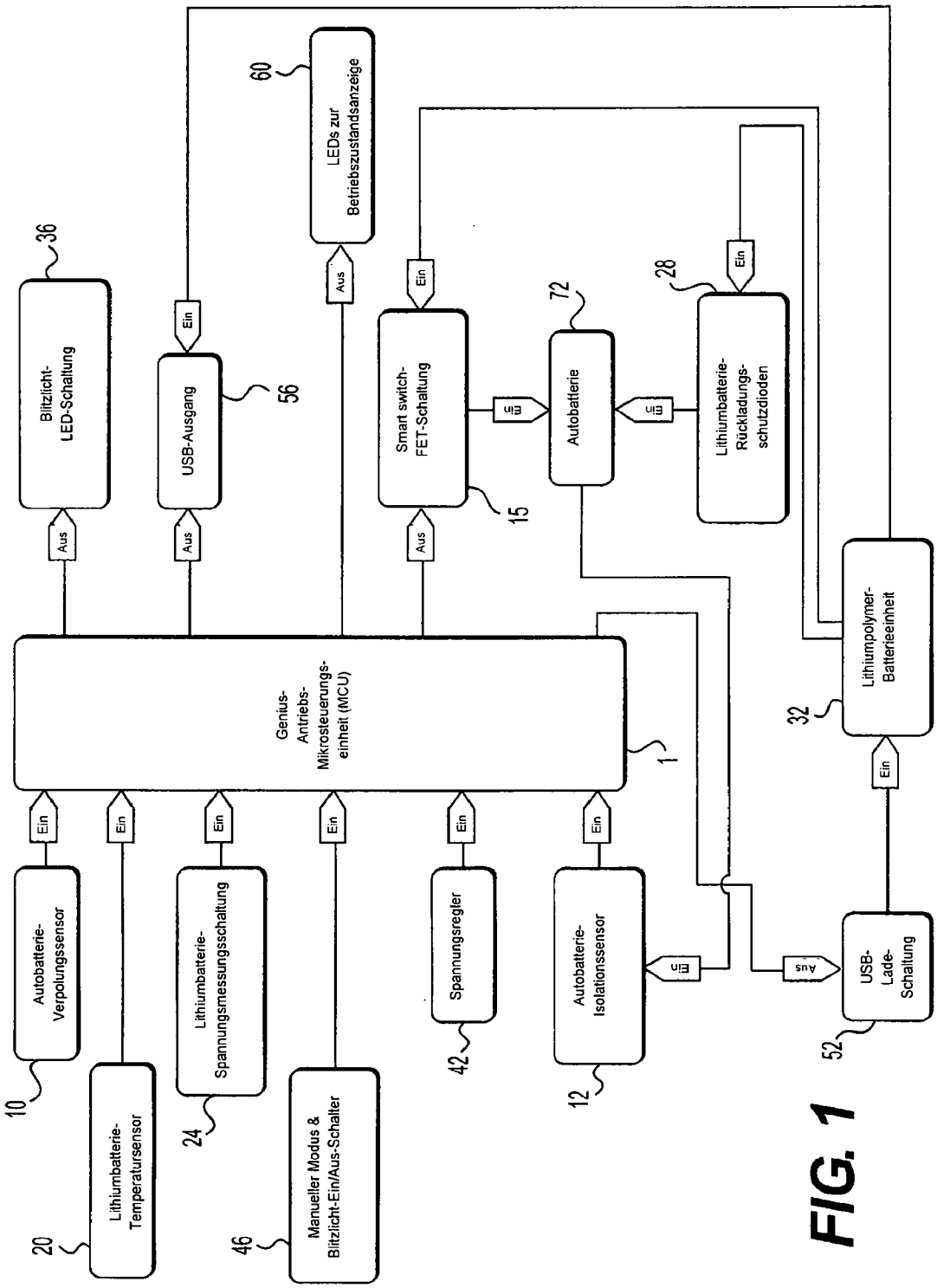


FIG. 1

 WINPLUS Ex. 1003, p. 947

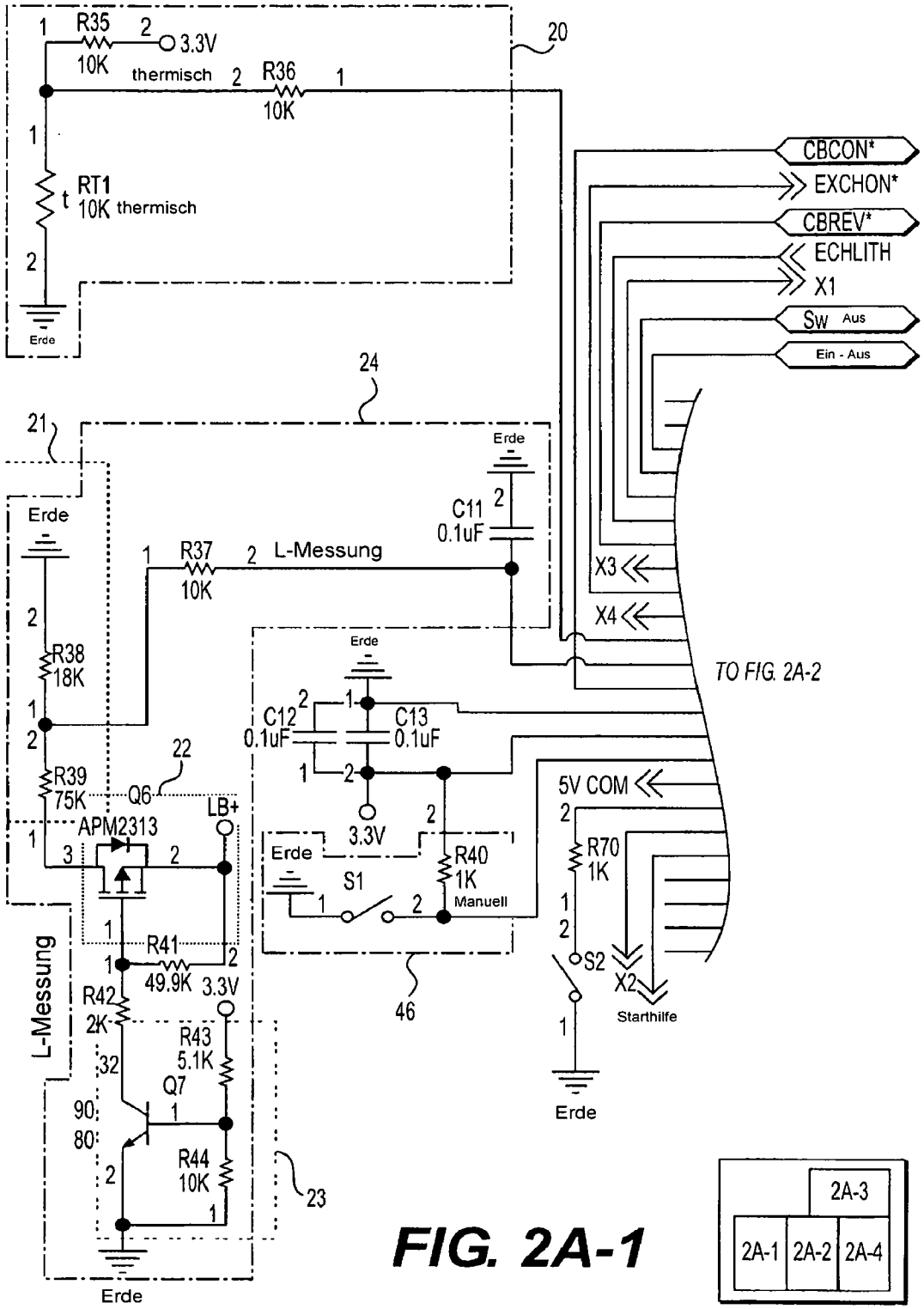

20
R35
10K
3.3V
thermisch
R36
10K
RT1
10K thermisch
Erde
CBCON*
EXCHON*
CBREV*
ECHLITH
X1
Sw Aus
Ein - Aus
24
21
Erde
C11
0.1uF
R37
10K
L-Messung
X3
X4
TO FIG. 2A-2
R38
18K
R39
75K
Q6
22
APM2313
LB+
C12
0.1uF
C13
0.1uF
3.3V
S1
R40
1K
Manuell
46
5V COM
R70
1K
S2
X2
Starthilfe
R41
49.9K
R42
2K
R43
5.1K
Q7
R44
10K
23
L-Messung
2A-3
2A-1
2A-2
2A-4

FIG. 2A-1

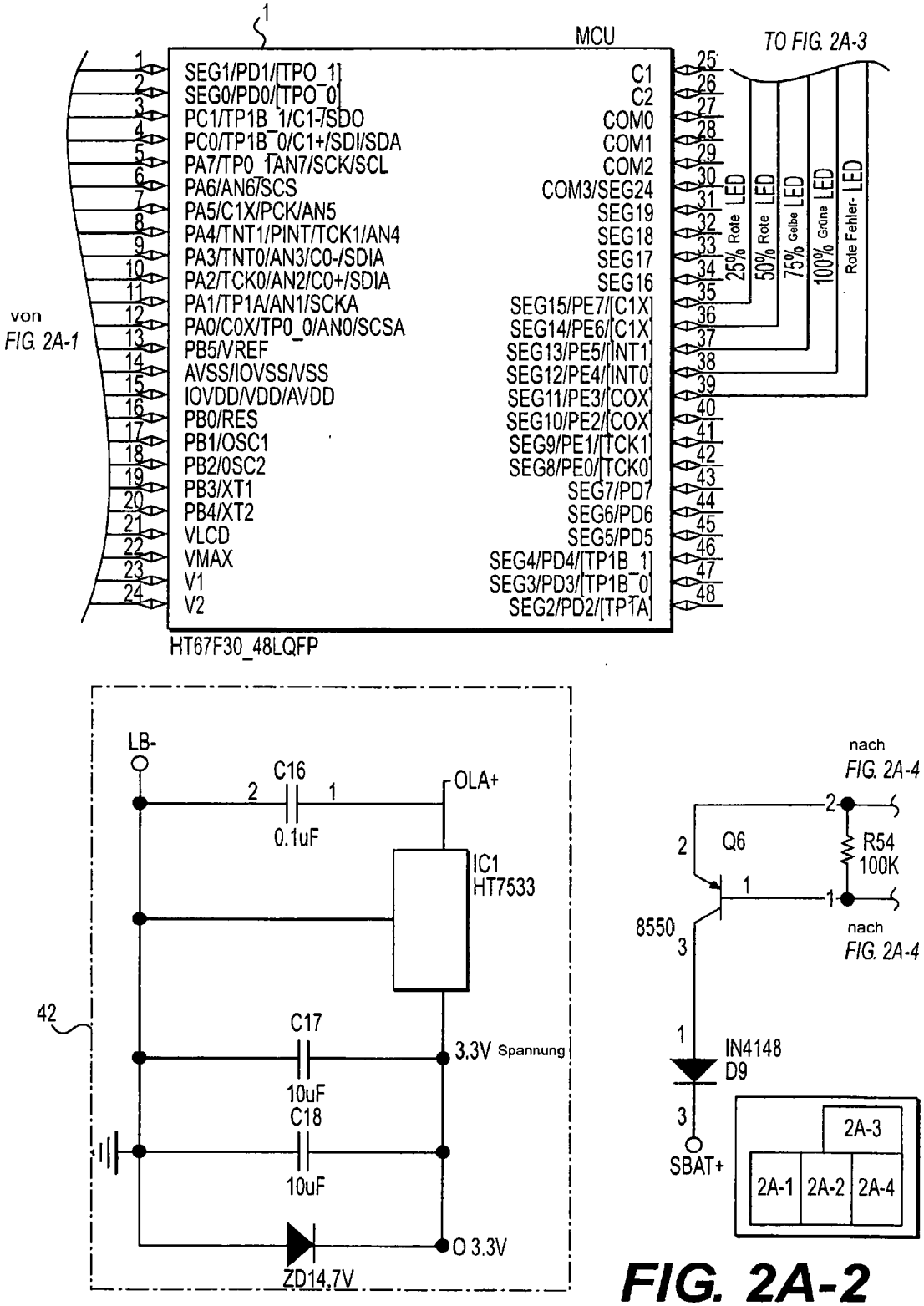

1
MCU
TO FIG. 2A-3
von
FIG. 2A-1
SEG1/PD1/[TPO_1]
SEG0/PD0/[TPO_0]
PC1/TP1B_1/C1-/SDO
PC0/TP1B_0/C1+/SDI/SDA
PA7/TP0_1AN7/SCK/SCL
PA6/AN6/SCS
PA5/C1X/PCK/AN5
PA4/TNT1/PINT/TCK1/AN4
PA3/TNT0/AN3/C0-/SDIA
PA2/TCK0/AN2/C0+/SDIA
PA1/TP1A/AN1/SCKA
PA0/C0X/TP0_0/AN0/SCSA
PB5/VREF
AVSS/IOVSS/VSS
IOVDD/VDD/AVDD
PB0/RES
PB1/OSC1
PB2/0SC2
PB3/XT1
PB4/XT2
VLCD
VMAX
V1
V2
C1
C2
COM0
COM1
COM2
COM3/SEG24
SEG19
SEG18
SEG17
SEG16
SEG15/PE7/[C1X]
SEG14/PE6/[C1X]
SEG13/PE5/[INT1]
SEG12/PE4/[INT0]
SEG11/PE3/[COX]
SEG10/PE2/[COX]
SEG9/PE1/[TCK1]
SEG8/PE0/[TCK0]
SEG7/PD7
SEG6/PD6
SEG5/PD5
SEG4/PD4/[TP1B_1]
SEG3/PD3/[TP1B_0]
SEG2/PD2/[TPTA]
25% Rote LED
50% Rote LED
75% Gelbe LED
100% Grüne LED
Rote Fehler- LED
HT67F30_48LQFP
LB-
C16
0.1uF
OLA+
IC1
HT7533
42
C17
10uF
C18
10uF
3.3V Spannung
O 3.3V
ZD14.7V
nach
FIG. 2A-4
Q6
R54
100K
8550
nach
FIG. 2A-4
IN4148
D9
SBAT+
2A-3
2A-1
2A-2
2A-4

FIG. 2A-2

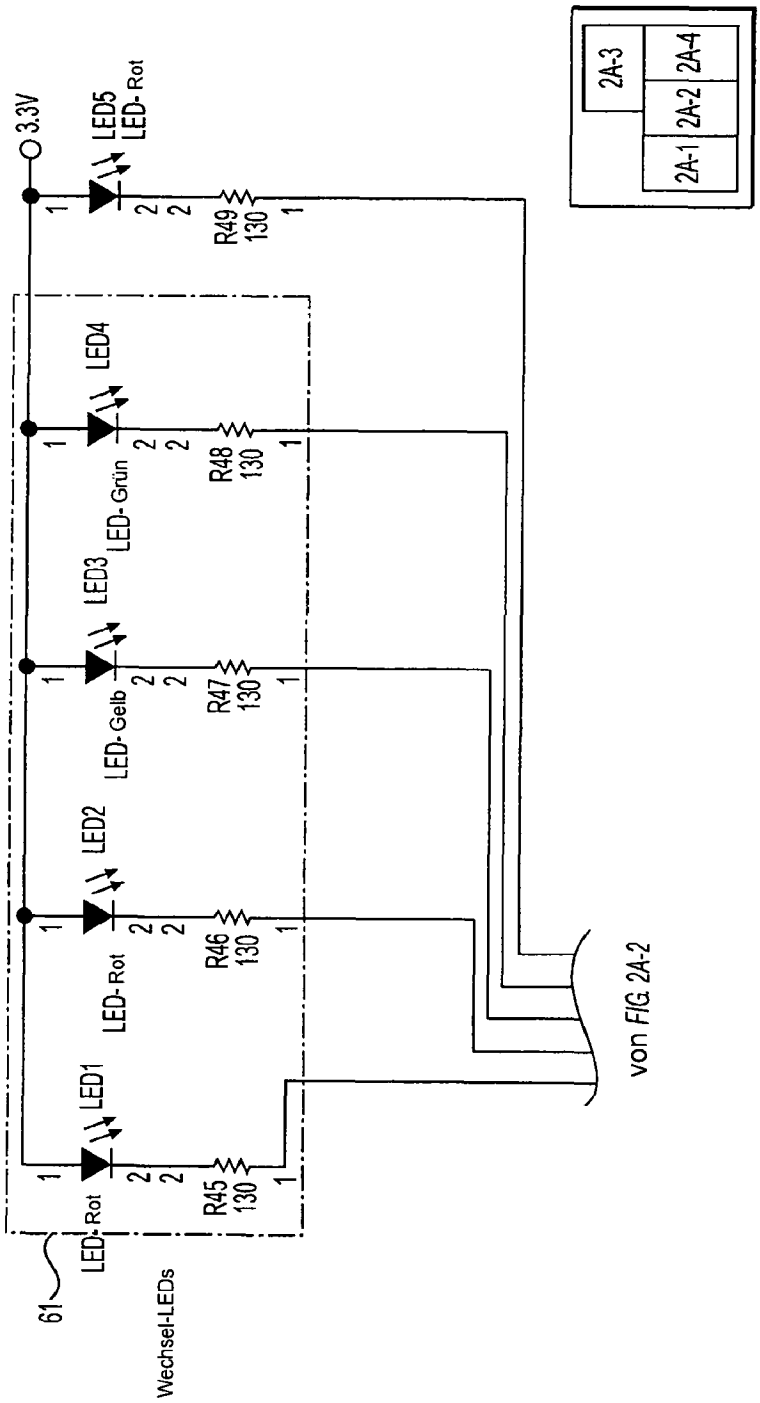


FIG. 2A-3

WINPLUS Ex. 1003, p. 950

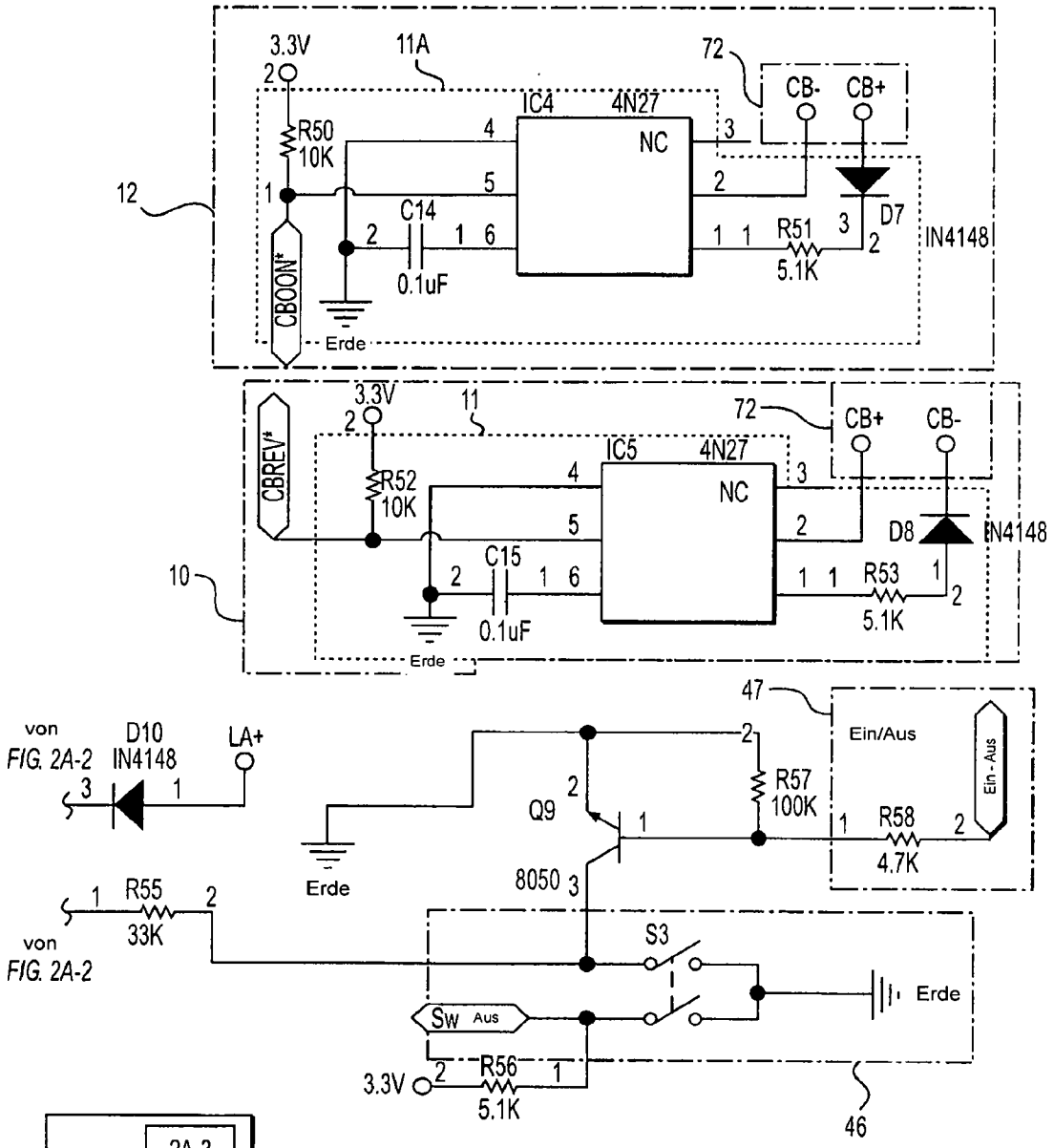

3.3V
11A
72
CB-
CB+
IC4
4N27
NC
R50
10K
12
C14
0.1uF
R51
5.1K
D7
IN4148
CBOON*
Erde
3.3V
11
CBREV*
IC5
4N27
R52
10K
C15
0.1uF
D8
R53
5.1K
10
47
Ein/Aus
Ein - Aus
von
FIG. 2A-2
D10
IN4148
LA+
Q9
R57
100K
R58
4.7K
8050
R55
33K
S3
Sw Aus
R56
5.1K
46
2A-3
2A-1
2A-2
2A-4

FIG. 2A-4

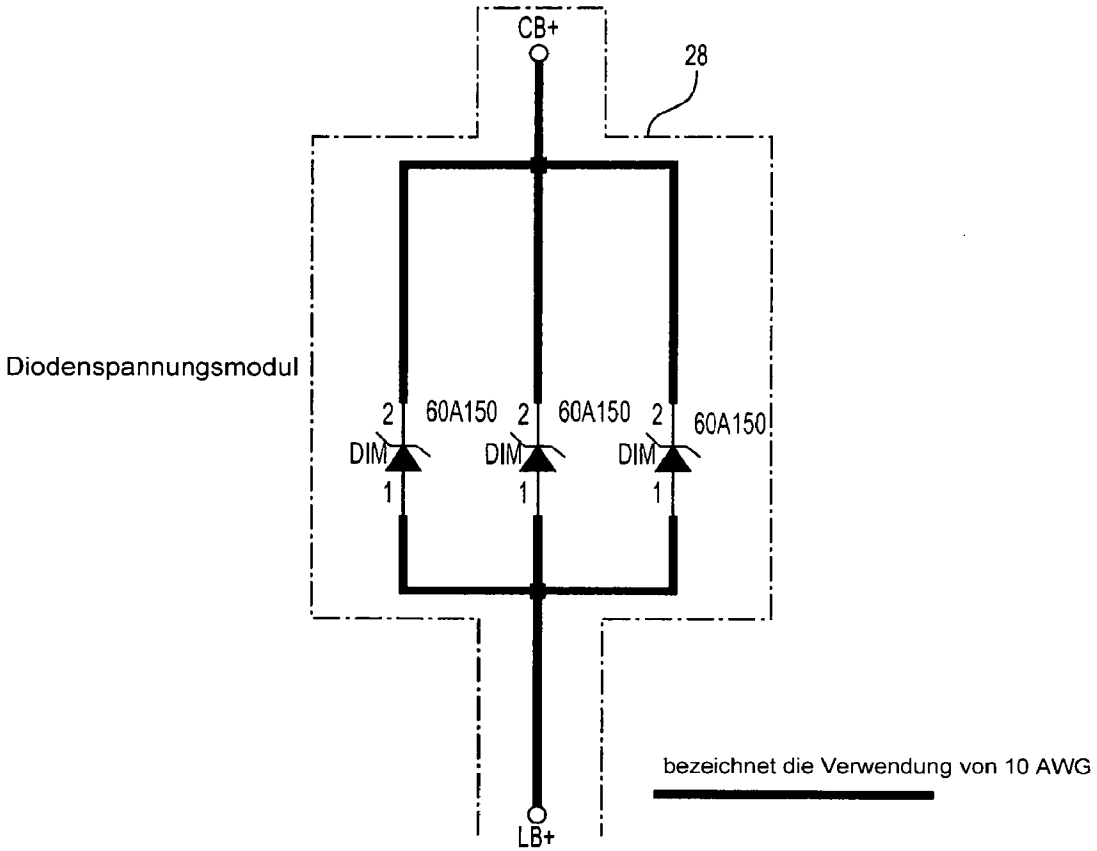
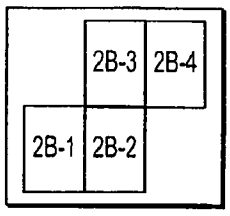


FIG. 2B-1



WINPLUS Ex. 1003, p. 952

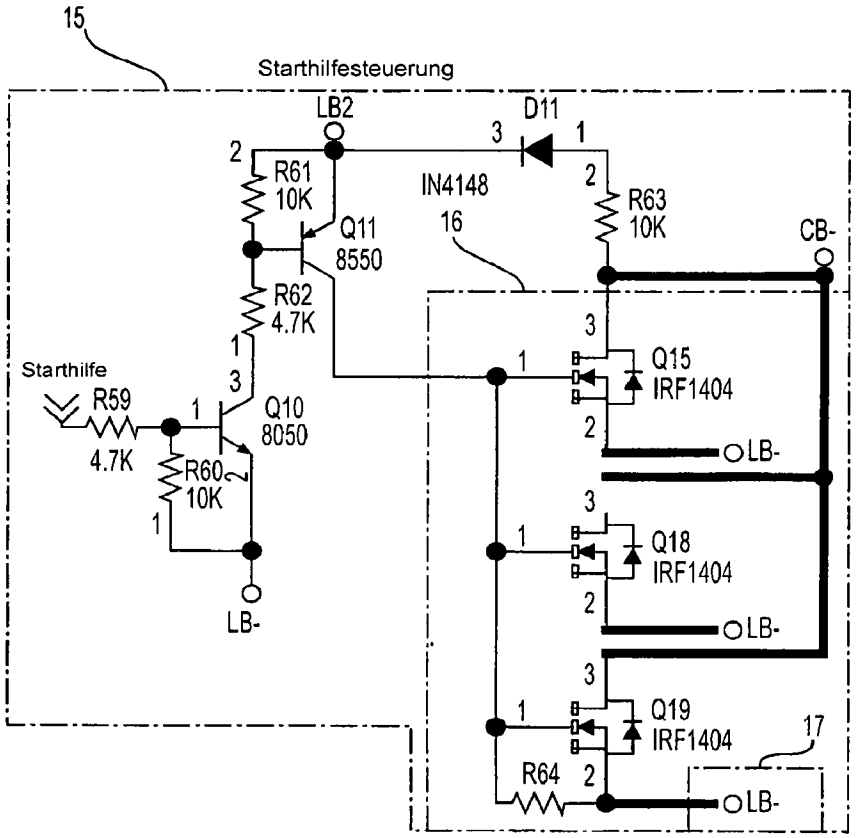
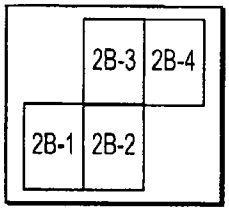


FIG. 2B-2



 WINPLUS Ex. 1003, p. 953

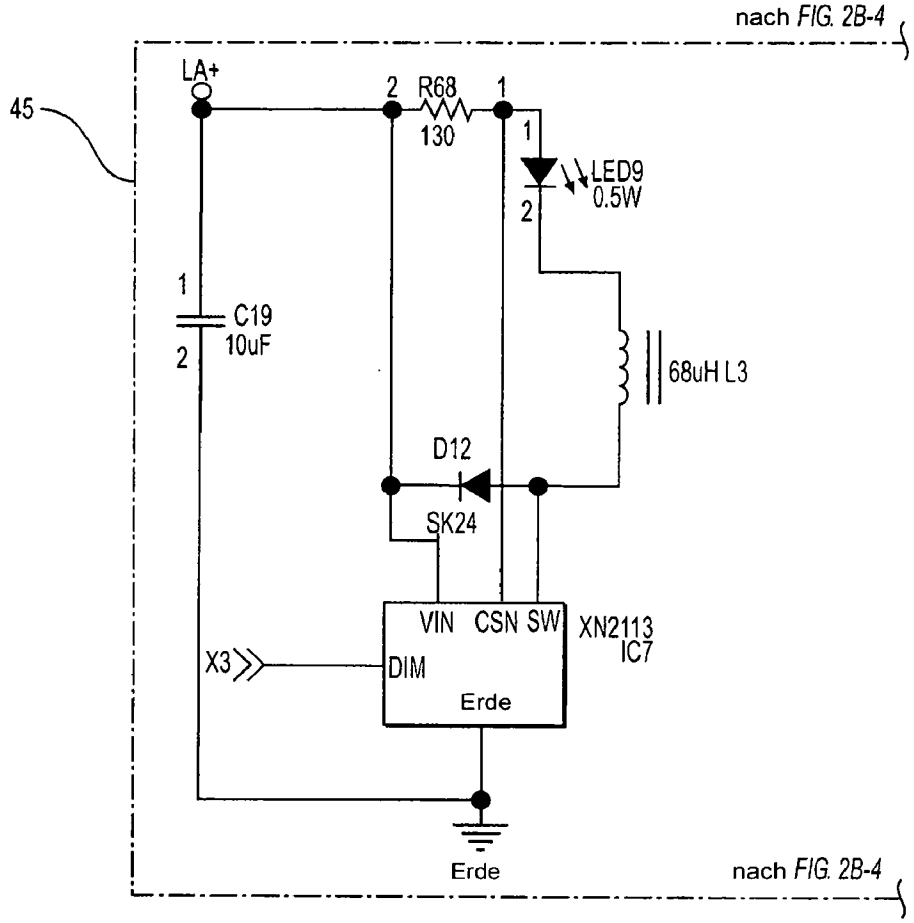
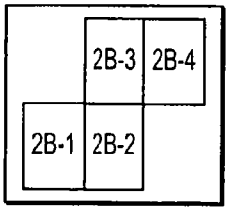


FIG. 2B-3



WINPLUS Ex. 1003, p. 954

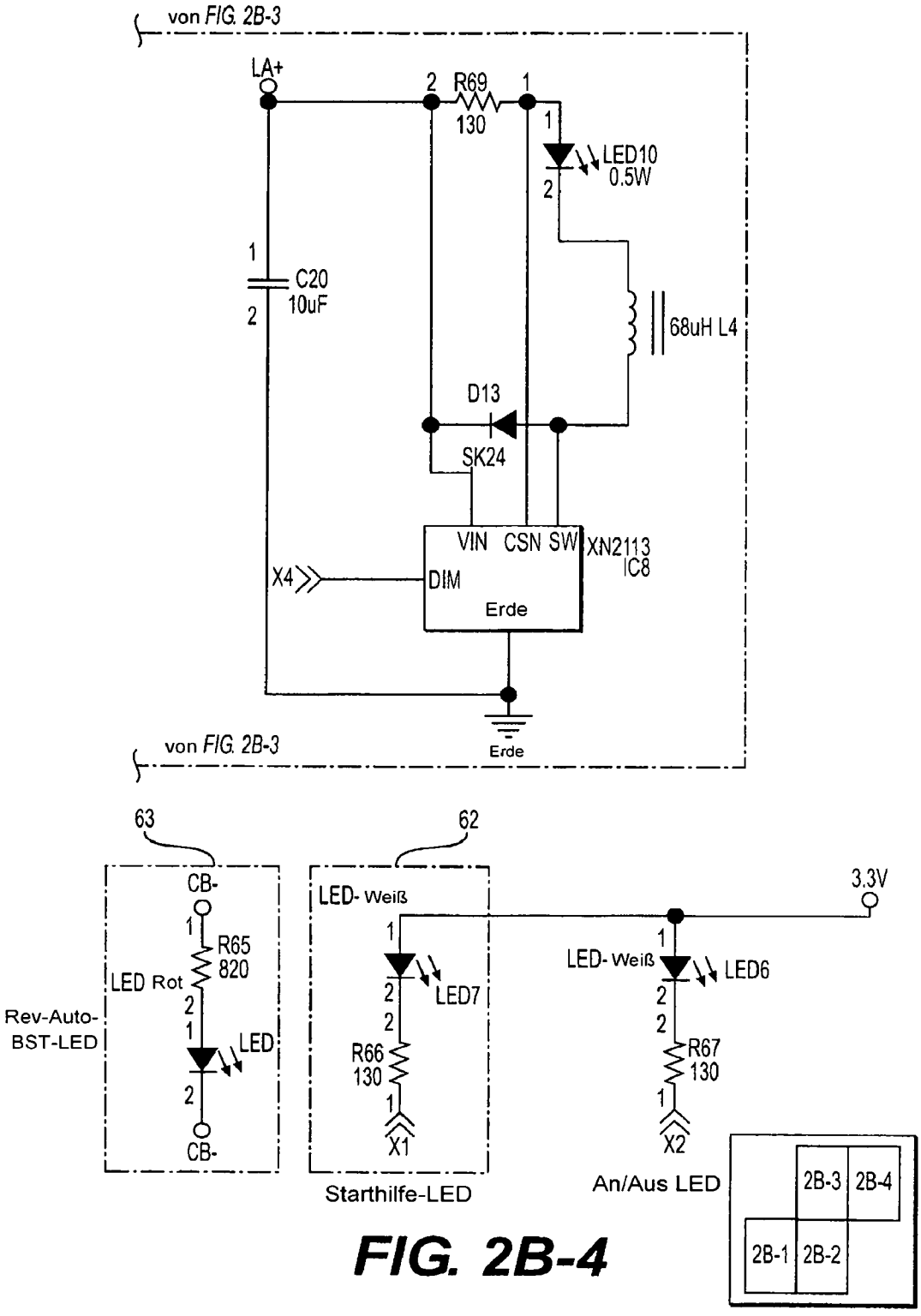


FIG. 2B-4

WINPLUS Ex. 1003, p. 955

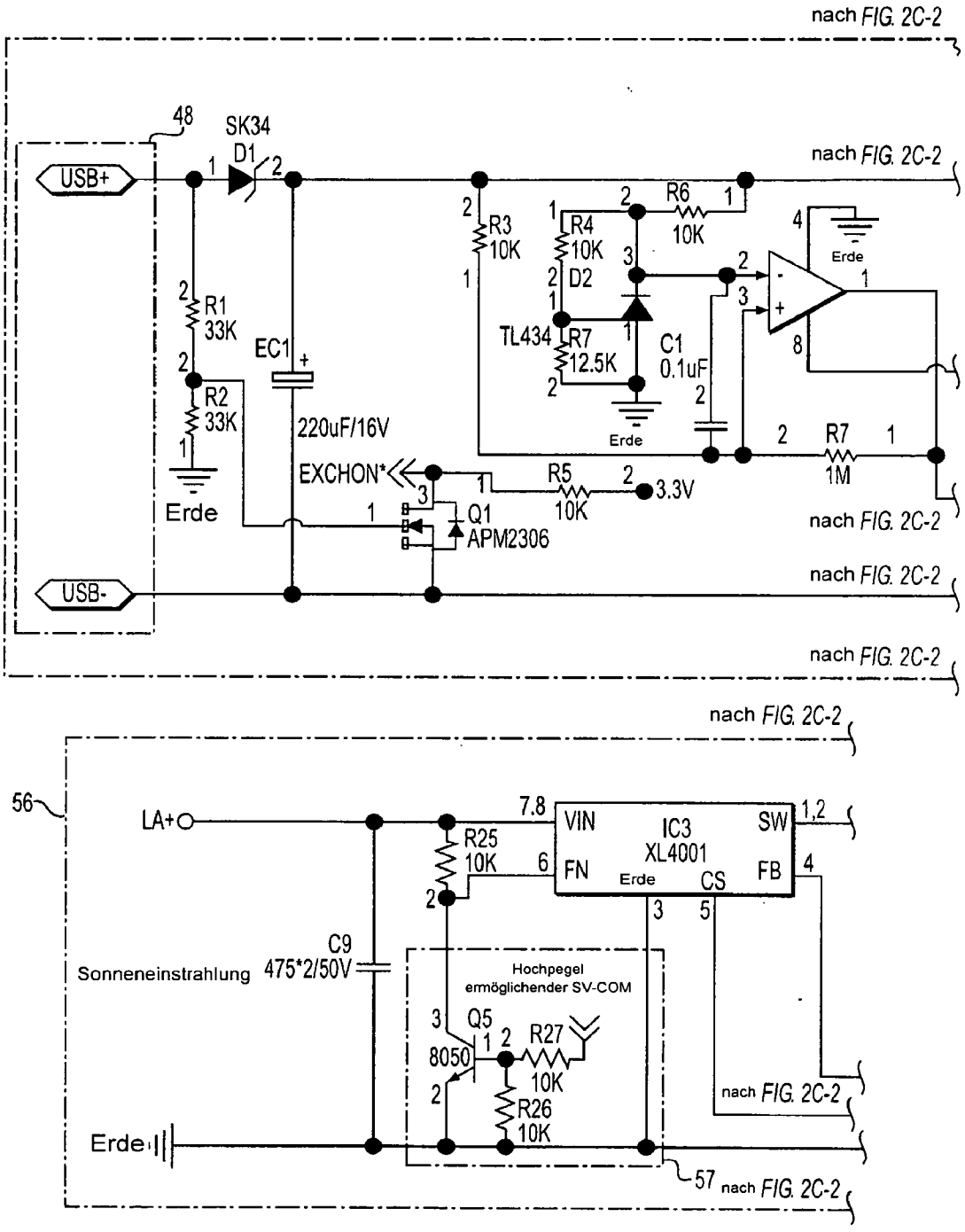
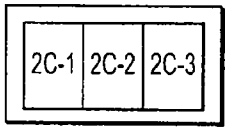

nach FIG. 2C-2
48
SK34
D1
USB+
USB-
R1
33K
R2
33K
EC1
220uF/16V
Erde
EXCHON*
Q1
APM2306
R3
10K
R4
10K
D2
TL434
R7
12.5K
R6
10K
R5
10K
3.3V
C1
0.1uF
R7
1M
56
LA+
R25
10K
IC3
XL4001
VIN
FN
CS
SW
FB
C9
475*2/50V
Sonneneinstrahlung
Hochpegel
ermöglichender SV-COM
Q5
8050
R27
10K
R26
10K
57

FIG. 2C-1


2C-1
2C-2
2C-3

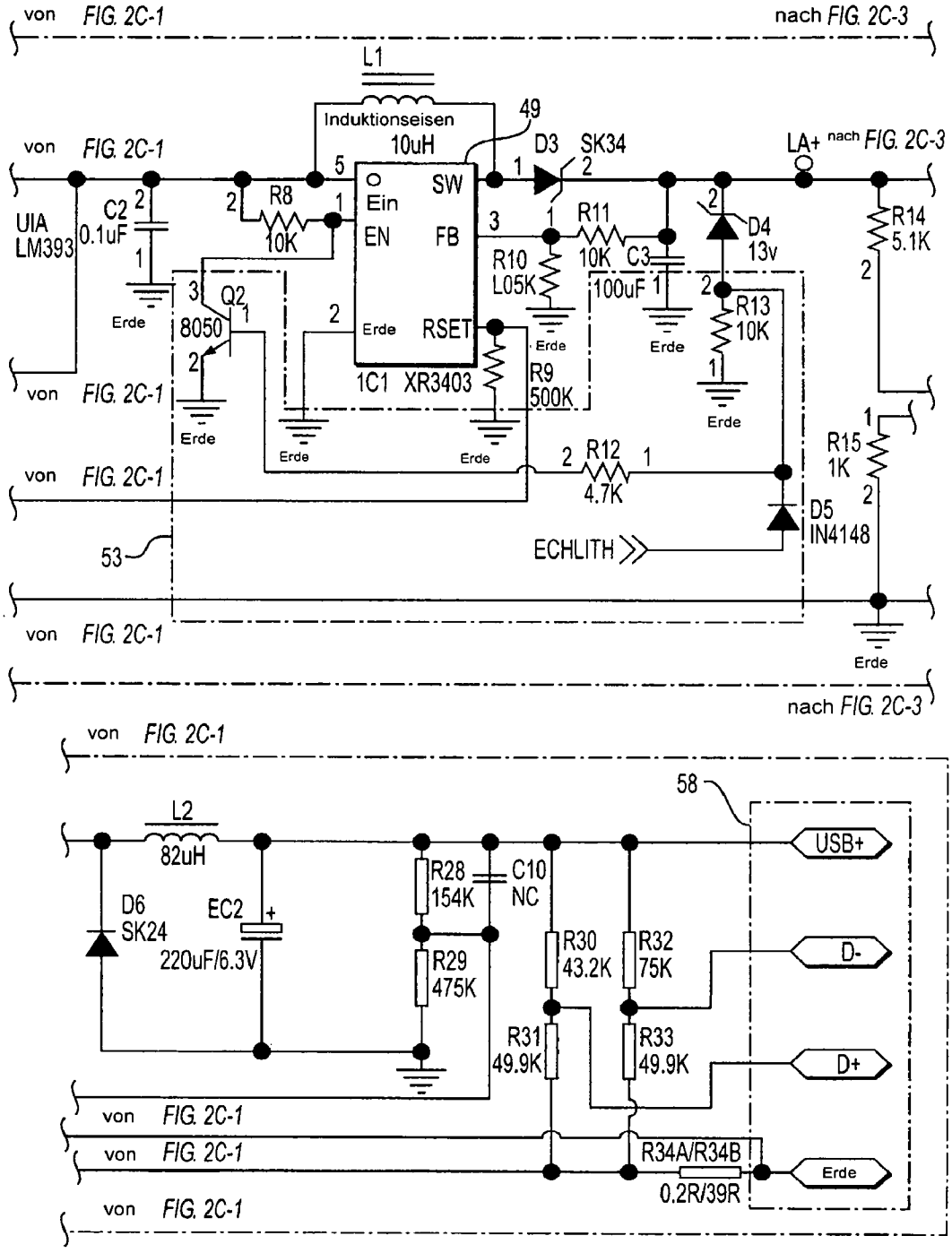
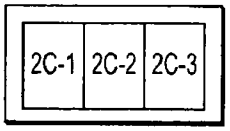
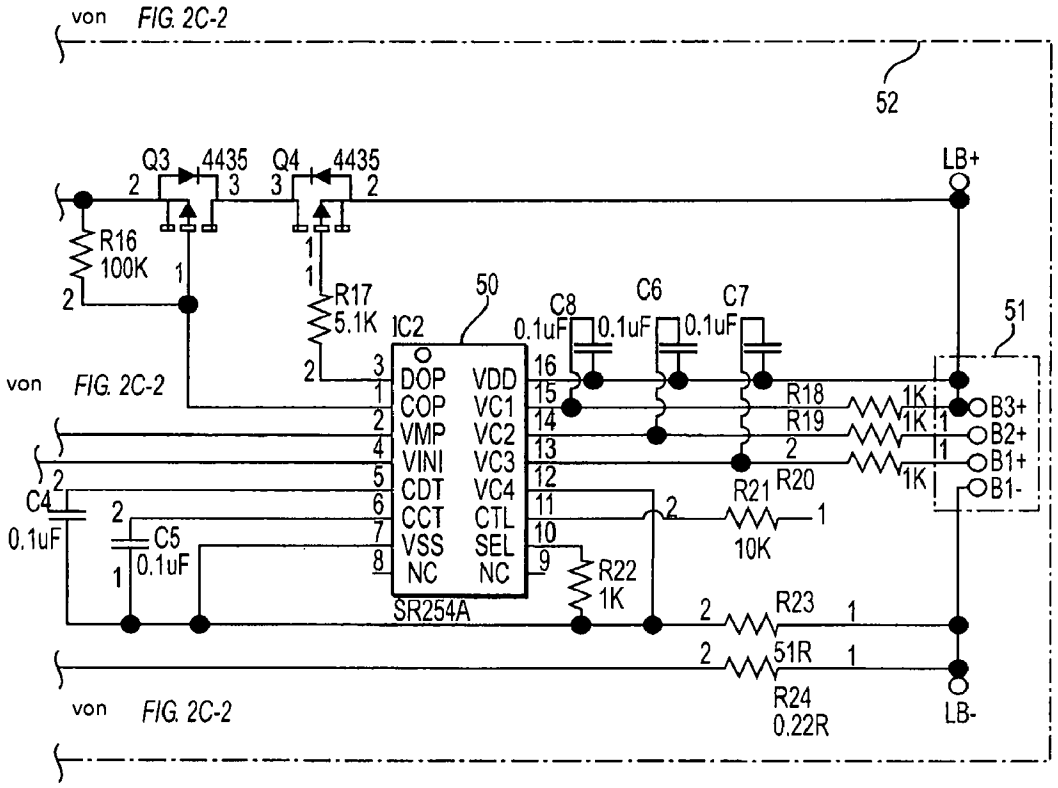

von FIG. 2C-1
nach FIG. 2C-3
L1
Induktionseisen
10uH
49
D3 SK34
LA+
nach FIG. 2C-3
UIA
LM393
C2
0.1uF
R8
10K
SW
Ein
EN
FB
R10
L05K
R11
10K
C3
100uF
D4
13v
R14
5.1K
Q2
8050
Erde
RSET
1C1 XR3403
R9
500K
R13
10K
R15
1K
R12
4.7K
D5
IN4148
ECHLITH
53
von FIG. 2C-1
nach FIG. 2C-3
L2
82uH
58
USB+
D-
D+
D6
SK24
EC2
220uF/6.3V
R28
154K
C10
NC
R29
475K
R30
43.2K
R32
75K
R31
49.9K
R33
49.9K
R34A/R34B
0.2R/39R
Erde

FIG. 2C-2


2C-1
2C-2
2C-3



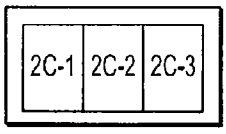


FIG. 2C-3

WINPLUS Ex. 1003, p. 958

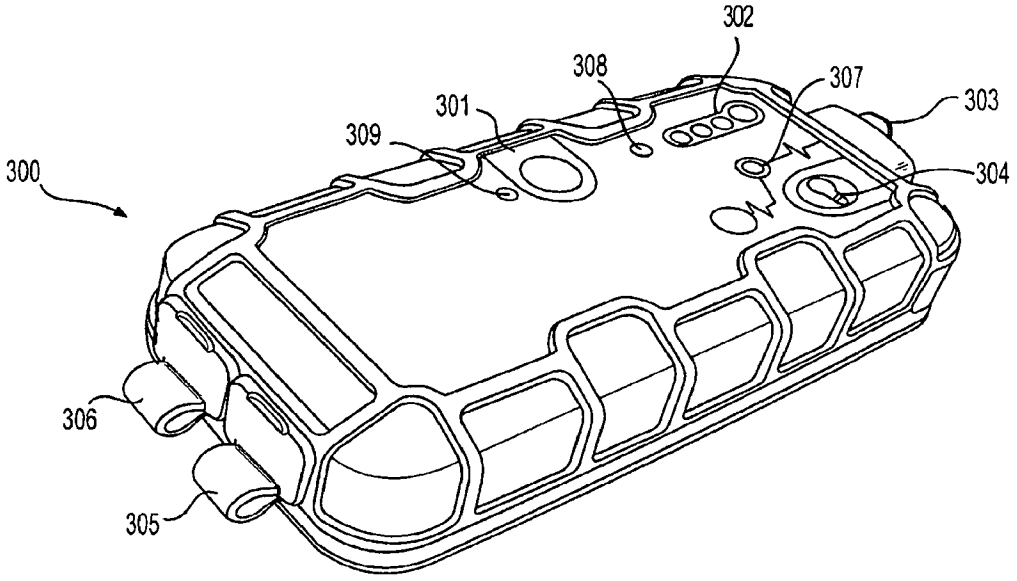

302
308
307
303
301
309
300
304
306
305

FIG. 3

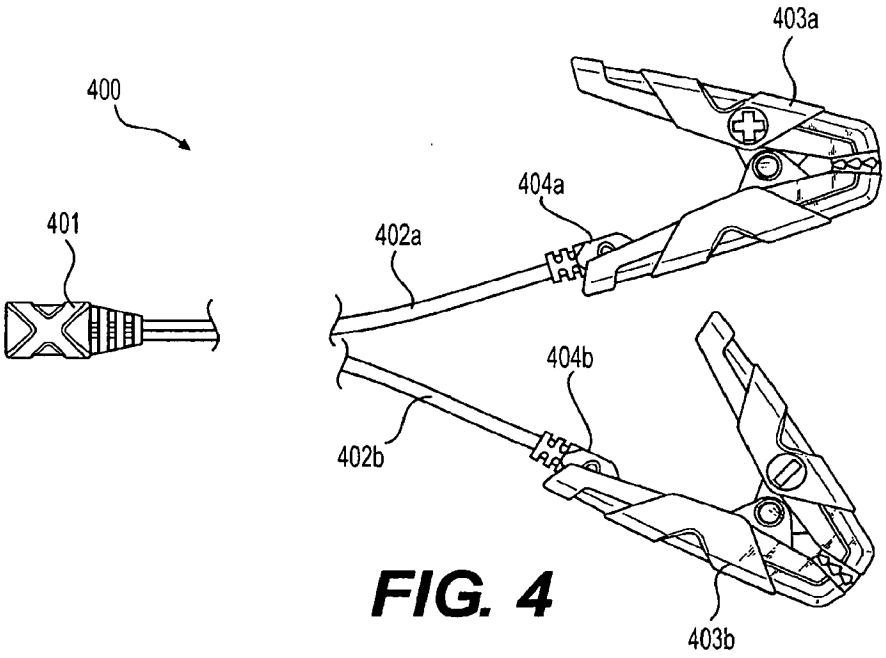

403a
400
404a
401
402a
404b
402b
403b

FIG. 4

Espacenet

Bibliographic data: DE102014114997 (A1) — 2016-01-07

Portable vehicle battery jump start apparatus with safety protection

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Applicant(s): NOCO COMPANY [US] ± (THE NOCO COMPANY)

Classification: **- international:*H02H3/18***
- cooperative: **H02J7/0034 (EP, GB); H02J7/0036 (EP, GB); H02J7/342 (EP, GB)**

Application number: DE201410114997 20141015

Priority number(s): WO2014US45434 20140703

Also published as: AU2015258229 (A1) AU2016269555 (A1) AU2016269555 (B2) AU2019201559 (A1) AU2019201559 (B2) more

Abstract not available for DE102014114997 (A1)
Abstract of corresponding document: GB2527858 (A)

A handheld device for jump starting a vehicle engine includes a rechargeable lithium ion battery pack 32 and a microcontroller 1. The lithium ion battery 32 is coupled to a power output port of the device through a FET smart switch 15 actuated by the microcontroller 1. A vehicle battery isolation sensor 12 detects the presence of a vehicle battery 72 connected between the positive and negative polarity outputs. A reverse polarity sensor 10 detects the polarity of a vehicle battery 72 connected between the positive and negative polarity outputs, such that the microcontroller 1 will enable power to be delivered from the lithium ion power pack 32 to the output port only when a good

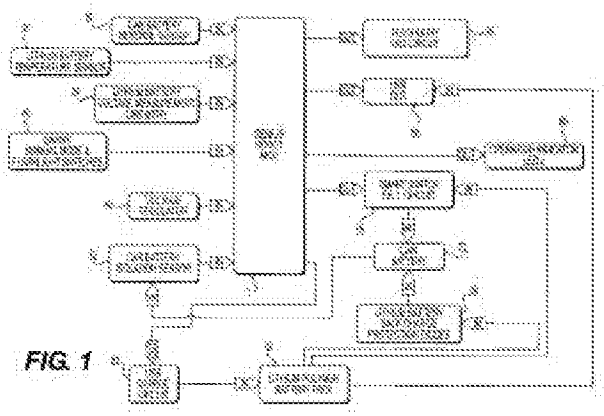

FIG. 1

battery is connected to the output port and only when the battery is connected with proper polarity of positive and negative terminals.

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DESCRIPTION DE102014114997

Background of the Invention

[0001]

The present invention relates generally to a jump start device for a vehicle that has a spent or discharged battery. In the prior art, devices are known that either have a pair of electrical connection cables that connect a fully charged battery of another vehicle to the vehicle starting circuit of the vehicle that contains the exhausted battery, or portable jump starters that have a fully charged battery, and which can be connected to the starting device of the vehicle engine via a pair of cables in a circuit.

[0002]

Problems have arisen in the prior art if either the jumper connections or terminals of the cables were mistakenly brought into contact with one another while the other ends were connected to a charged battery, or if the positive and negative connections with the connections of opposite polarity in the vehicle to be bridged connected, causing a short circuit that could result in sparking and potential battery damage and / or physical damage.

[0003]

Various attempts have been made to overcome these problems in the prior art.

US 6,212,054, issued 3 April 2001, discloses a battery starter that is sensitive to polarity and can detect mating or mismatched connections before providing a path for electrical charge flow. The device uses a set of LEDs connected to optical couplers aligned by a control circuit. The control circuit controls a coil arrangement that controls the path of a power current. The control circuitry allows power current to flow through the coil assembly only if the contact points of the jumper cable terminal connections have been properly applied.

[0004]

US 6,632,103, issued 14th October 2003, discloses an adaptive jumper cable connected by two pairs of terminals, the two pairs of terminals each being connected to two batteries to transfer power from one battery to another battery. The adaptive jumper cable contains a polarity detection unit connected to each terminal, a switching unit and a current detection unit, both of which are present between the two pairs of terminals. After the polarity of each terminal has been sensed by the polarity detection unit, the switching unit creates a suitable connection between the two batteries. Therefore, the positive and negative terminals of the two batteries are appropriately connected based on the detected result of the polarity detection unit.

[0005]

US 8,493,021, issued 23. July 2013, discloses a device that monitors the voltage of a vehicle battery, which is getting jump start, and the current supplied by the jump start batteries to determine whether a suitable connection has been made and to provide fault monitoring. The system can only be operated if the correct polarity is detected. The voltage is monitored to detect an open circuit, separate conductive terminals, shunt cable faults and coil fault conditions. The current through the shunt cable is monitored to detect the existence of a battery explosion risk and an overheating condition that may result in a fire. The system contains an internal battery to provide the voltage for the battery of the vehicle that is to be given jump start. As soon as the vehicle is started, the unit is automatically electrically isolated from the vehicle battery.

[0006]

US 5,189,359, issued 23. February 1993, discloses a jumper cable device having two bridge rectifiers for forming a reference voltage, a four-input decoder for recognizing which terminals to connect based on a comparison of the voltage at each of the four terminals with the reference voltage, and a pair of relays for Effect the appropriate connection depending on the recognition by the decoder. A connection will not be made unless only one connector of each battery has a voltage higher than the reference voltage to indicate "positive" terminals and one terminal has a lower voltage than the reference voltage so that "negative" Connections are displayed, and that therefore the two high-voltage connections and the two low-voltage connections can be connected. The current flows as soon as the corresponding relay device is closed. The relay device is preferably a metal oxide semiconductor field effect transistor (MOSFET), which is provided with a series arrangement of photodiodes that develop a MOSFET gate closing potential when the decoder output causes an LED to light up.

[0007]

US 5,795,182, issued March 18. August 1998, discloses a polarity-independent set of battery jump leads to bridge a first battery with a second battery. The device has a relative polarity detector to detect whether two batteries are arranged crosswise or in parallel. A three-point high voltage capacitance crossbar rotary switch responds to the relative polarity detector to automatically connect the plus terminal of the two batteries to one another and the minus terminals of the two batteries to one another, regardless of whether the detected arrangement is cross or parallel, and an undercurrent -Detector and a delay circuit for resetting the device to its initial and disconnected state after the device has been disconnected from one of the batteries. The crossbar rotary switch has two contact pairs and a rotating arm that rotates around two separate points in order to ensure full electrical contact between the contact pairs.

The invention can also be used to make a battery charger that can be connected to a battery regardless of battery polarity.

[0008]

US 6,262,492, issued July 17. July 2001, discloses a car battery starter cable for appropriately coupling an effective voltage source to a faulty or uncharged battery having a relay circuit circuit connected to the voltage source and the battery by two pairs of power lines. First and second voltage polarity detection circuits are respectively connected to the voltage source and the battery by a corresponding pair of voltage lines to detect the polarity of the voltage source and the battery. A logic detection circuit generates a control signal which is dependent on the polarity of the voltage source and the battery, and a driver circuit which is controlled by a control signal of the logic detection circuit drives the relay circuit circuit so that the two poles of the voltage source are accurately coupled to the two poles the battery is enabled.

[0009]

US 5,635,817 issued on 3 June 1997, discloses a vehicle battery charger that includes a control housing that contains cables and that includes a current limiting device for preventing a predetermined maximum charging current from about 40 to 60 amps from being exceeded. The control housing has a polarity detection device for checking the correct polarity of the connection of the terminals of the two batteries and for electrically isolating the two batteries in the event of incorrect polarity.

[0010]

US 8,199,024 issued 12. June 2012, discloses a safety circuit in a low voltage connection system that leaves the two low voltage systems disconnected until it determines that it is safe to establish a connection. If the safety circuit determines that there are no unsafe conditions and that it is safe to connect the two low voltage systems, the safety circuit can connect the two low voltage systems by a "soft start" that provides a connection between the two systems over a period of time that Reduces or

prevents induced voltage spikes on one or more of the low voltage systems. If a fully discharged battery is installed in one of the low voltage systems, a method is used for detecting the correct polarity of the connections between the low voltage systems. The polarity of the discharged battery is determined by sending one or more test currents through the discharged battery and by determining whether a corresponding voltage increase is observed.

[0011]

US 5,793,185, issued November 11, August 1998, discloses a portable jump starter having control components and circuitry to prevent overcharging and improper connection of batteries.

[0012]

While the prior art suggests solutions to the above problems as discussed above, each of the prior art solutions suffers from other deficiencies, either in terms of complexity, cost, or susceptibility to malfunction. Accordingly, there is a need in this technical field for further improvements to vehicle jump starters.

Summary of the invention

[0013]

According to one aspect of the invention, a device for starting a vehicle engine is provided, comprising: an internal voltage supply; an output connector with positive and negative polarized outputs; a vehicle battery isolation sensor connected to the positive and negative polarized outputs in a circuit and configured to detect the presence of a vehicle battery connected between the positive and negative polarized outputs; a polarity reversal sensor connected in a circuit to the positive and negative polarized outputs and configured to detect the polarity of a vehicle battery connected between the positive and negative polarized outputs; a voltage FET switch connected between the internal voltage supply and the output terminal; and a microcontroller configured to receive input signals from the vehicle isolation sensor and reverse polarity sensor and to provide an output signal to the voltage FET switch such that the voltage FET switch is responsive to signals from the sensors that indicate the presence of a vehicle battery on the output connection and the appropriate pole connection of positive and negative connections of the vehicle battery with positive and negative polarized outputs, is switched on to connect the internal voltage supply to the output connection.

[0014]

According to a further aspect of the invention, the internal voltage supply consists of a rechargeable lithium ion battery unit.

[0015]

According to yet another aspect of the invention, there is provided a jump start cable device having a plug configured to be plugged into an output port of a portable battery charger start assist device having an internal power supply; a pair of cables, at each end of which the plug is integrated; wherein the pair of cables is configured to be separately connected to the terminals of a battery at its respective other end.

Brief description of the drawings

[0016]

1 illustrates a functional diagram of a portable vehicle battery starting aid device according to an aspect of the present invention;

[0017]

2A-Fig.

2C are schematic circuit diagrams of an exemplary embodiment of a portable vehicle battery starting aid device according to an aspect of the present invention;

[0018]

3 illustrates a perspective view of a portable starting aid device in accordance with an exemplary embodiment of the present invention; and

[0019]

4 illustrates a top view of a jump start cable usable with the portable jump start device according to another aspect of the present invention.

Detailed description of the invention

[0020]

1 illustrates a functional diagram of a portable battery starting aid device according to an aspect of the present invention.

At the heart of the portable battery starting aid device is a lithium polymer battery unit 32 which stores enough energy to provide starting assistance to a vehicle engine supplied by a conventional 12 volt lead acid or valve regulated lead acid battery.

In an exemplary embodiment, a surge polymer battery unit has three 3.7V, 2666mAh lithium polymer batteries in a 3S1P configuration.

The resulting battery pack delivers 11.1 V, 2666 Ah (8000 Ah at 3.7 V, 29.6 Wh).

A continuous discharge current is 25 C (or 200 A) and a discharge current peak is 50 C (or 400 A).

The maximum charge current of the battery unit is 8000 mA (8 A).

[0021]

A programmable microcontroller unit (MCU) 1 receives various inputs and generates information and control outputs. The programmable MCU 1 also provides flexibility for the system by allowing updates to the functionality and system parameters without requiring hardware changes. According to an exemplary embodiment, an 8-bit microcontroller with a 2K × 15-bit flash memory is used to control the system. One such microcontroller is HT67F30, which is commercially available from Holtek Semiconductors Inc.

[0022]

A car battery reverse polarity sensor 10 monitors the polarity of the vehicle battery 72 when the portable battery starting device is connected to the vehicle electrical system. As explained below, the starting aid device prevents the lithium battery unit from being connected to the vehicle battery 72 when the terminals of the battery 72 are connected to the wrong terminals of the starting aid device. A car battery isolation sensor 12 detects whether or not a vehicle battery 72 is connected to the starter device and prevents the lithium battery unit from being connected to the output terminals of the starter device unless a good (e.g. B. rechargeable) battery is connected to the output terminals.

[0023]

A smart switch FET circuit 15 electrically switches the lithium battery of the portable battery starting aid device to the vehicle's electrical system only when it is determined that the vehicle battery is sensed by the MCU 1 (in response to one from an isolation sensor 12 provided detection signal) and connected with the appropriate polarity (in response to a detection signal provided by a polarity reversal sensor 10). A lithium battery temperature sensor 20 monitors the temperature of the lithium battery unit 32 to detect overheating due to high ambient temperature conditions and excessive power consumption during the jump start process. A lithium battery voltage measurement circuit 24 monitors the voltage of the lithium battery unit 32 to prevent the voltage potential from rising too high during a charge and falling too low during a discharge.

[0024]

Lithium battery recharge protection diodes 28 prevent any charge current supplied to the vehicle battery 72 from flowing back from the vehicle electrical system into the lithium battery unit 32. A strobe LED circuit 36 is provided to provide a strobe function to amplify the light under the vehicle hood in dark conditions, as well as to provide SOS and strobe light functions for safety reasons when a vehicle becomes unfit to drive in a potentially hazardous location. A voltage regulator 42 provides regulation of

the internal operating voltage for the microcontroller and the sensors. A manual mode and strobe on / off switch 46 allow the user to control the turning on of the portable battery charger starting aid device to control manual booster operation when the vehicle has no battery and to control the strobe function. The manual button only works when the booster is switched on.

This button allows the user to start vehicles that either lack a battery or whose battery voltage is so low that automatic detection by the MCU is not possible. When the user presses the manual jump start button and holds it for a predetermined time (e.g. B. three seconds) to prevent unwanted operation of the manual mode, the voltage of the internal lithium ion battery is switched to the vehicle battery connection terminal. The only exception to manual jump starting is when the car battery is reversed. If the battery is reversed, the voltage of the internal lithium battery should never be switched to the vehicle battery connection terminal.

[0025]

A USB charging circuit 52 converts a voltage from any of the USB charging voltage sources so that voltage and current for charging the lithium battery unit 32 are charged. A USB output 56 provides a portable USB charging device for charging smartphones, tablet computers (hereinafter referred to as tablet) and other rechargeable electronic devices. Operating status indicator LEDs 60 provide a visual indication of the lithium battery capacity status and an indication of the activation status of the smart switch (indicating that a voltage is being supplied to the electrical system).

[0026]

A detailed operation of the portable starting aid device is now carried out according to the schematic diagrams of FIG. 2A to Fig. 2C. As in Fig. 2A shown, the microcontroller unit 1 represents the center of all inputs and outputs. The battery polarity reversal sensor 10 comprises an optically coupled isolation phototransistor (4N27), which connects the connections of the vehicle battery 72 to the input pins 1 and 2 with a diode D8 in the conductor wire of pin 1 (which is connected to the negative connection CB−), so that, if the battery 72 is connected to the terminals of the jumper with the correct polarity, the LED of the optical coupler 11 will not conduct any current and is therefore switched off, the MCU 1 being provided with a "1" or a high output signal. The car battery insulation sensor 12 comprises an optically coupled isolation phototransistor (4N27) which is connected to the connections of the vehicle battery 72 at the input pins 1 and 2 to a diode D7 in the lead wire of pin 1 (connected to the positive connection CB +), so that, if the battery 72 is connected to the terminals of the jumper with the appropriate polarity, the LED of the optical coupler 11A will conduct current and therefore be turned on, providing the MCU with a "0" or a low output signal, and the presence of one Battery indicates via the jump starter output terminals of the portable jump starter.

[0027]

If the car battery 72 is connected to the portable jump start device with the wrong polarity, the LED of the optical coupler 11 of the polarity reversal sensor 10 will conduct the current, the microcontroller unit 1 being provided with a "0" or a low signal. Further, if no battery is connected to the portable jump starter, the LED of the optical coupler 11A of the isolation sensor 12 will not conduct current and will therefore be turned off, providing the MCU with a "1" or a high output signal indicating the absence of any with the portable jumper connected battery. Using these specific inputs, the microcontroller software of the MCU 1 can determine when it is safe to turn on the smart switch FET 15, thereby connecting the lithium battery unit to the jump start terminals of the jump start device. As a result, the MCU 1 can prevent the smart switch FET circuit 15 from being turned on, thus preventing sparks / short circuits of the lithium battery unit from being generated when the car battery 72 is either not connected to the starter device at all or is connected in reverse polarity.

[0028]

As in Fig. 2B shown, the smart switch FET 15 is controlled by a microcontroller output 1. The FET smart switch 15 has three FETs (Q15, Q18 and Q19) connected in parallel, which distributes the voltage of the lithium battery unit to the FETs. When this microcontroller output is driven to a logic low state, the FETs 16 are all in a high resistance state, so no current flow is allowed from the negative contact 17 of the internal lithium battery to the negative contact of the car battery 72. When the microcontroller output is driven to a logic high state, the FETs 16 (Q15, Q18, Q19) are in a low resistance state which allows free current flow from the negative contact 17 (LB-) of the internal lithium battery unit to the negative contact (CB-) of the car battery 72 permits. In this way, the microcontroller software controls the connection of the internal lithium battery unit 32 to the vehicle battery 72 in order to assist the vehicle engine.

[0029]

2A, the voltage of the internal lithium battery unit can be precisely measured using the circuit 24 and one of the analog-to-digital inputs of the microcontroller 1. The circuit 24 is provided to detect when the voltage of the main 3.3 V regulator 42 is switched on and the transistor 23 to switch on when the voltage of the regulator 42 is switched on. When transistor 23 conducts, it turns on FET 22, providing the positive contact (LB +) of the internal lithium battery with a conductive path to a voltage divider 21 that allows the microcontroller to be supplied with a lower voltage range for reading. Using this input, the microcontroller software can determine whether the lithium battery voltage is too low during the discharge process or too high during the charge process, and can take appropriate measures to prevent damage to the electronic components.

[0030]

Furthermore, according to FIG. 2A the temperature of the internal lithium battery unit 32 can be precisely measured by two devices 20 with a negative temperature coefficient (NTC). These are devices that decrease their resistance as their temperature rises. The circuit represents a voltage divider, which supplies the result to the two analog-to-digital (A / D) inputs to the microcontroller. The microcontroller software can then determine when the internal lithium battery is too hot to allow a jump start, thereby providing operational safety.

[0031]

The main voltage regulator circuit 42 is designed so that the voltage of the internal lithium battery is converted into a regulated value of 3.3 V, which is used by the microcontroller 1 and by other components of the starting aid device for the internal operating voltage. Three lithium battery protection diodes 28 (see FIG. 2B) are used to allow current to flow only from the internal lithium battery unit 32 to the car battery 72, and not from the car battery to the internal lithium battery. In this way, if the car's electrical system is charged from its alternator, the internal lithium battery cannot be recharged (and thereby damaged), providing a further level of operational safety.

[0032]

The main power switch 46 (Fig. 2A) is a combination that allows double-pole or two-way operation so that the product can be switched on with one press when it is in the off state, or can be switched off when it is in the on state. This circuit also uses a microcontroller output 47 to maintain voltage when the circuit has been activated by the on switch. When the switch is pressed, the microcontroller shifts this output to a high logic level to keep the voltage "alive" when the switch is released. In this way, the microcontroller remains in control when the power is turned off, when the on / off switch is reactivated, or when the lithium battery voltage becomes too low. The microcontroller software also has a timer that switches the voltage after a predetermined period of time (such as. B. 8 hours) when not in use.

[0033]

The flash light LED circuit 45 shown in Fig. 2B shown controls the operation of the flash LEDs. Two outputs of the microcontroller 1 are assigned to the two separate LEDs. Therefore, the LEDs for forming stroboscopes and SOS patterns can be controlled independently by software, which adds yet another safety feature to the jump-start device. LED indicators give the operator the feedback they need to understand what is happening to the product. Four separate LEDs 61 (Fig. 2A) are controlled by corresponding individual outputs of the microcontroller 1 in order to provide an indication of the remaining capacity of the internal lithium battery. These LEDs are controlled in a format comparable to that of a "fuel gauge" with 25%, 50%, 75% and 100% (red, red, yellow, green) capacity indicators. An LED display 63 (Fig. 2B) gives the user a visual warning if the vehicle battery 72 has been connected with the wrong polarity. Jump start and on / off LEDs 62 each provide visual indicators when the jump starter provides jump start voltage and when the jump start is turned on.

[0034]

A USB output circuit 56 (Fig. 2C) has a USB output for charging portable electronic devices, such as. B. Smartphones by the internal lithium battery unit 32nd A control circuit 57 of the microcontroller 1 allows the USB output 56 to be switched on or off by the software control in order to prevent the internal lithium battery from reaching a capacity which is too low. The USB output is routed to the exterior of the device using a standard USB connection 58, the standard USB connection 58 having the required standard voltage divider to enable smartphones to be supplied with a certain voltage that they require.

[0035]

The USB charging circuit 52 allows the internal battery unit 32 to be charged by a standard USB charging device. This voltage input uses a standard micro USB connection 48, which allows standard cables to be used. The potential of 5 V provided by the standard USB charging device is converted into 12.4 V DC voltage, which is required for charging the internal lithium battery unit using a DC-DC converter 49. The DC-DC converter 49 can be switched on and off by the circuit 53 by means of a microcontroller output 1.

[0036]

In this way, the microcontroller software can switch off the charging process if the battery voltage has been determined by the A / D input 22 to be too high. Additional operational safety is provided to remedy the overcharge of the internal lithium battery by using a lithium battery charge controller 50 that provides charge balancing of the internal lithium battery cells 51. This controller also provides redundant operational reliability to eliminate overcharging of the internal lithium battery.

[0037]

3 illustrates a perspective view of a portable device 300 according to an exemplary embodiment of the invention. 301 is a power switch. 302 shows the LED "fuel" indicators 61. 303 shows a 12 V output connection that can be connected to a cable device 400 described below. 304 shows a flash control switch for activating flash LEDs 45. 305 is a USB input port for charging the internal lithium battery, and 306 is a USB output port for other portable devices, such as a mobile phone. B. smartphones, tablets, music players, etc. to provide charge through the lithium battery. 307 shows a "jump start on" indicator that indicates that the voltage is being provided to the 12 V output terminal. 308 shows a polarity reversal indicator that indicates that the vehicle battery is incorrectly connected in terms of polarity. 309 shows a "power on" indicator that indicates that the device is up for operation.

[0038]

FIG. 4 shows a jump start cable device 400, which is designed in particular for use with the portable device 300. The device 400 has a plug 401 that is designed such that it can be inserted into the 12 V output connection 303 of the portable device 300. The connector 401 is integrated in a pair of cables 402a and 402b, and the cables are each connected to the battery connection terminals 403a and 403b by means of ring connections 404a and 404b. The connector 303 and the connector 401 can be dimensioned such that the connector 401 only fits into the connector 303 in a certain orientation, which ensures that the terminal 403a will correspond to a positive polarity and the connector 403b will correspond to a negative polarity as stated on it. In addition, the ring connections 404a and 404b can be separated from the terminals and connected directly to the connections of the vehicle battery. This feature can be useful, for example, to permanently connect cables 402a to 402b to the vehicle battery.

In the event of a depletion of the battery voltage, the portable starting aid device 300 could be connected to the battery in a very simple manner by inserting the plug 401 into the connection 303.

[0039]

The invention so described will be apparent to those skilled in the art so that it can be varied in many ways without departing from the scope of the invention. Any and all such variations are within the scope of the following claims.

QUOTES INCLUDE IN THE DESCRIPTION

[0040]

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CLAIMS DE102014114997

1.

A vehicle engine starting aid apparatus comprising: an internal power supply (32); an output terminal (303) having positively and negatively polarized outputs (CB-, CB +); a vehicle battery isolation sensor (12) connected to the positive and negative polarized outputs (CB-, CB +) in a circuit and for detecting the presence of a vehicle battery (32) connected between the positive and negative polarized outputs (CB- , CB +) is connected, configured; a polarity reversal sensor (10), which is connected in a circuit to the positively and negatively polarized outputs (CB-, CB +), and for detecting the polarity of a vehicle battery (72) which is connected between the positively and negatively polarized outputs (CB-, CB +) is connected, configured; a voltage FET switch (15) connected between the internal voltage supply (32) and the output terminal (305); and a microcontroller (1) configured to receive input signals from the vehicle isolation sensor (12) and the polarity reversal sensor (10) and to provide an output signal to the voltage FET switch (15) so that the voltage FET Switches (15) in response to signals from the sensors which indicate the presence of a vehicle battery (72) at the output connection (303) and the appropriate pole connection of positive and negative connections of the vehicle battery (72) with positively and negatively polarized outputs (CB-, CB +) display, is switched on in order to connect the internal voltage supply (32) to the output connection (303).

2.

The device of claim 1, wherein the internal power supply (32) comprises a lithium ion battery.

3.

The device of claim 2, wherein the lithium ion battery comprises a battery unit made of a plurality of lithium ion batteries.

4.

The device of any of the preceding claims, wherein the voltage FET switch (15) comprises a plurality of FETs in parallel (16).

5.

The device of any one of the preceding claims, wherein the vehicle isolation sensor (12) and reverse polarity sensor (10) comprise optically coupled isolation phototransistors.

6.

The device according to any one of the preceding claims, further comprising a plurality of voltage diodes (28) coupled between the output terminal (303) and the internal voltage supply (32) for recharging the internal voltage supply (32) by a to the output terminal (303) to prevent connected electrical system.

7.

The device according to any one of the preceding claims, further comprising a temperature sensor (20) for detecting the temperature of the internal voltage supply (32) and for providing a temperature signal to the microcontroller (1).

8.

The apparatus of any of the preceding claims, further comprising a voltage measurement circuit (24) configured to measure the output voltage of the internal power supply (32) and to provide a voltage measurement signal to the microcontroller (1).

9.

The device of any of the preceding claims, further comprising a voltage regulator (42) configured to convert the output voltage of the internal power supply (32) to a voltage level suitable for providing operating components to internal components of the device.

10.

The device of any of the preceding claims, further comprising a USB output port (56) configured to provide a charge voltage of the internal power supply (32) to a USB chargeable device.

11.

The device of any of the preceding claims, further comprising a USB charging port (52) configured to provide a charging voltage from an external voltage source to the internal voltage supply (32).

12.

The apparatus of any of the preceding claims, further comprising a flash circuit (36, 45) configured to provide a light source to a user.

13.

The device of claim 12, wherein the light source is at least one LED.

14.

The apparatus of claim 13, wherein the microcontroller (1) is configured to control the at least one LED to provide a visual alarm to indicate an emergency situation.

15.

The apparatus of any of the preceding claims, further comprising a plurality of visual indicators (61) configured to indicate the remaining state of capacity of the internal power supply (32).

16.

The apparatus of claim 15, wherein the plurality of visual displays (61) comprise a plurality of LEDs that emit light of different colors.

17.

The apparatus according to any one of the preceding claims, further comprising a visual display (63) configured to alert a user when a battery is reverse connected.

18.

The device of any of the preceding claims, further comprising separate visual indicators (62) configured to indicate the voltage on status of the device and the status of the jump start voltage of the voltage provided to the output terminal (303).

19.

The apparatus of any of the preceding claims, further comprising a manual booster switch configured to activate a manual booster mode that allows a user to connect the booster voltage to the output terminal (303) when the vehicle battery isolation sensor (12) is present a vehicle battery can not detect.

20.

The device according to claim 19, wherein the microcontroller (1) is configured to detect the manual starting aid circuit for at least a predetermined period of time before the activation of the manual starting aid mode.

21.

The device according to any one of the preceding claims, further comprising a jumper cable device (400) comprising a plug (401) for plugging into the output port, a pair of cables (402a, 402b), at each end of which the plug (401) is integrated and are configured to connect to the terminals of a battery at the other end thereof.

22.

The apparatus of claim 21, wherein the jumper cable further comprises a pair of ring terminals (404a, 404b) configured to connect the pair of cables (402a, 402b) at the other end thereof to one end of a battery terminal or a battery terminal.

23.

The device of any of claims 21 or 22, wherein the output port (303) and the plug (401) are dimensioned such that the plug (401) fits into the output port (303) only in a particular orientation.

24.

A jump starter cable device (400) comprising: a connector (401) configured to plug into an output port (303) of a portable battery charger starting aid device (300) having an internal power supply; a pair of cables (402a, 402b) integrated with the plug (401) at one end thereof; wherein the pair of cables (402a, 402b) is configured such that it is to be connected separately to connections of a battery with its corresponding other end.

25.

The jump start cable device (400) according to claim 24, further comprising a pair of ring terminals (404a, 404b) configured to connect the pair of cables (402a, 402b) at the other end thereof to a battery connector or a battery connector.

26.

The jump-start cable device (400) according to any one of claims 24 or 25, wherein the output connector (303) and the connector (401) are dimensioned such that the connector (401) only fits into the output connector (303) in one particular direction.

Espacenet

Bibliographic data: EP3407405 (A1) — 2018-11-28

BATTERY ASSEMBLY FOR A BATTERY JUMP STARTING DEVICE

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Classification: **- international:** ***F02N11/12; H01M2/30;*** *F02N11/08; F02N11/14; H01H59/00; H02J1/00*

- cooperative: **F02N11/12 (EP, GB); F02N11/14 (GB); F02N19/00 (GB); H01M2/30 (EP); H02J1/122 (EP); H02J7/00 (GB); H02J7/0032 (GB);** F02N11/087 (EP); F02N11/14 (EP)

Application number: EP20180181486 20170210 Global Dossier

Priority number(s): US201662294067P 20160211 ; WO2016US24680 20160329 ; US201615137626 20160329 ; US201662424297P 20161118 ; EP20170750799 20170210 ; WO2017US17289 20170210

Also published as: AU2017217661 (A1) AU2017217661 (B2) AU2019201081 (A1) CA3005971 (A1) CN108884801 (A) more

Abstract of EP3407405 (A1)

A rechargeable battery assembly for use in a rechargeable jump starting device having a positive cable with a positive battery clamp and a negative cable with a negative battery clamp, the rechargeable battery assembly comprising a rechargeable battery, a positive terminal conductor bar and a negative terminal conductor bar, wherein the rechargeable battery assembly is configured to maximize electrical conductivity from the rechargeable battery to a battery being jump started.

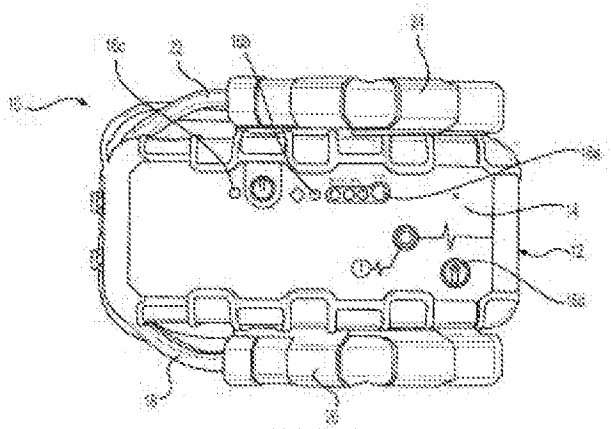

FIG. 1

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 3 407 405 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
28.11.2018 Bulletin 2018/48

(21) Application number: **18181486.4**

(22) Date of filing: **10.02.2017**

(51) Int Cl.:
H01M 2/30 *(2006.01)* ***F02N 11/12*** *(2006.01)*
F02N 11/08 *(2006.01)* *H02J 1/00* *(2006.01)*
H01H 59/00 *(2006.01)* *F02N 11/14* *(2006.01)*

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(30) Priority: **11.02.2016 US 201662294067 P**
29.03.2016 PCT/US2016/024680
25.04.2016 US 201615137626
18.11.2016 US 201662424297 P

(62) Document number(s) of the earlier application(s) in accordance with Art. 76 EPC:
17750799.3 / 3 286 429

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Remarks:
This application was filed on 03.07.2018 as a divisional application to the application mentioned under INID code 62.

(54) BATTERY ASSEMBLY FOR A BATTERY JUMP STARTING DEVICE

(57) A rechargeable battery assembly for use in a rechargeable jump starting device having a positive cable with a positive battery clamp and a negative cable with a negative battery clamp, the rechargeable battery assembly comprising a rechargeable battery, a positive terminal conductor bar and a negative terminal conductor bar, wherein the rechargeable battery assembly is configured to maximize electrical conductivity from the rechargeable battery to a battery being jump started.

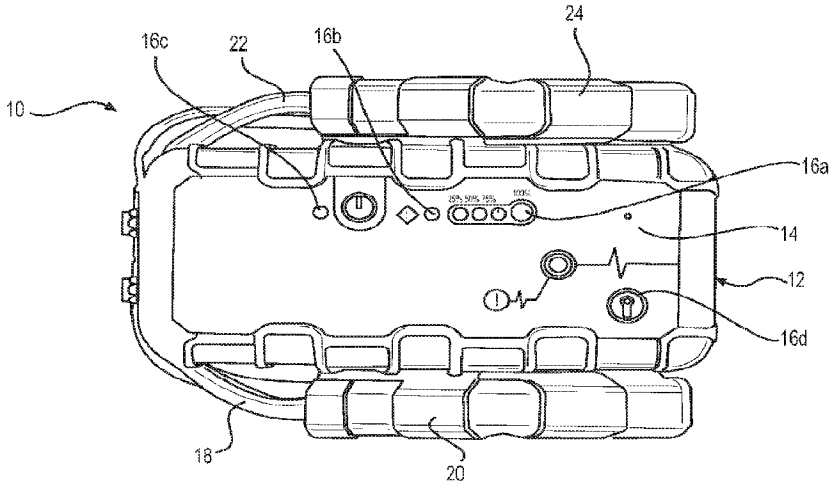

FIG. 1

EP 3 407 405 A1