(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 180 175 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
28.04.2010 Bulletin 2010/17

(51) Int Cl.:
F02N 11/08 *(2006.01)*

(21) Application number: **09165932.6**

(22) Date of filing: **20.07.2009**

(84) Designated Contracting States:
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 SE SI SK SM TR
Designated Extension States:
AL BA RS

(30) Priority: **24.10.2008 TW 97140902**

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(54) Vehicle Starter Control System

(57) The present invention discloses a vehicle starter control system, which includes a power unit for supplying electric power, a main switch electrically connected to the power unit and a start switch electrically connected to the main switch, a motor relay, which is switched on by turning on the main switch and the start switch, and an electrically actuated motor, an engine set into operation by the motor, a generator which generates electric power once the engine is running, and an ignition device which controls ignition of the engine. Wherein, the vehicle starter control system is also provided with switching switches, which, after turning on the main switch and the start switch to establish electric conduction, enables temporarily disconnecting electric power from specific loads, such as the headlight, radiator fan, and the like (non-activated related components), installed on the vehicle, thereby enabling the power unit to have sufficient electric power to actuate the motor so as to start the engine. Moreover, when the start switch has not been activated, the power unit is able to supply power to the load.

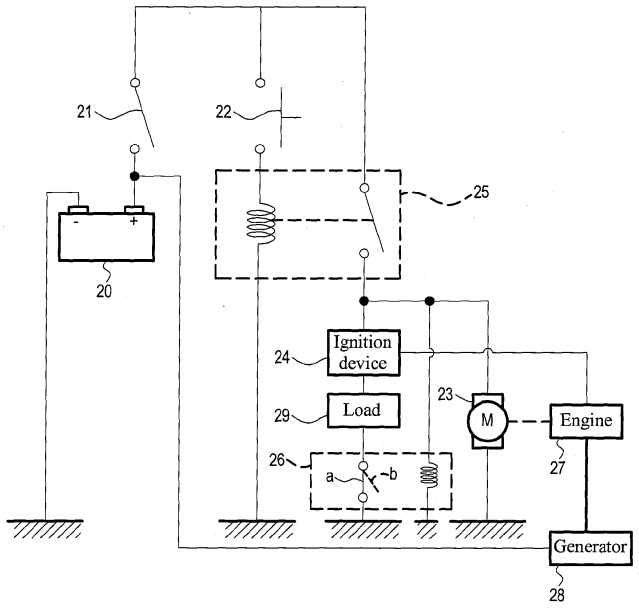

FIG. 2A

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Description

Claim for Priority

[0001] This application claims the benefit of Taiwan Patent Application No. 097140902, filed on Oct. 24 2008, which is hereby incorporated by reference for all purposes as if fully set forth.

BACKGROUND OF THE INVENTION

Field of Invention

[0002] The present invention relates to a control system, and more particularly to a vehicle starter control system which, when starting a vehicle, temporarily disconnects non-activated specific loads of the vehicle in order to facilitate starting the vehicle engine.

Related Art

[0003] The rapid development in science and technology and the demands of living have brought about the gradual increase in auxiliary electronic equipment on vehicles. However, this also means that, when starting a vehicle, the storage battery must provide greater electric power to simultaneously start the vehicle engine and the loads additionally installed on the vehicle, such that the electronic equipment can therefore be used after starting the vehicle.

[0004] Referring to FIG. 1, which shows a schematic view of a motorcycle starter system of the prior art, and as depicted in the drawing, a starter system for a general motorcycle is provided with a storage battery 10 and a key switch 11 used to control whether the storage battery 10 is switched on or not, a start switch 12 and a brake connecting switch 13. When these switches have been simultaneously activated to establish electric conduction, then a motor 14 of the motorcycle utilizes electric conduction caused by an electromagnetic effect of a motor relay 15 electrically connected to the motor 14 to establish an electric connection with the motor 14, thereby causing the motor 14 to start running and to actuate an engine 16 of the motorcycle. However, at the same time electric conduction is established with the motor 14, the storage battery 10 needs to additionally provide electric power to supply a load 17 electrically connected to the motor relay 15. Hence, under circumstances whereby power must be supplied to the motor 14 and the load 17, then problems of voltage drop in the storage battery 10 and inability to smoothly start the engine 16 will occur.

[0005] From the aforementioned it can be known that an increase in electronic equipment has brought about the need for the storage battery 10 to additionally provide electric power to the load 17 when starting the motorcycle, thereby making it even more difficult to start the engine 16. Under such circumstances, apart from creating inconvenience for the rider, the long cumulative effect will result in damage to the electronic devices of the motorcycle starter system..

SUMMARY OF THE INVENTION

[0006] The objective of the present invention lies in providing a vehicle starter control system which, when starting a vehicle, first temporarily disconnects related non-activated specific loads (such as lamps, radiator fan of the vehicle) from the vehicle starter system in order to facilitate starting the vehicle engine.

[0007] According to the aforementioned objective, the vehicle starter control system of the present invention comprises a power unit for supplying electric power, a main switch connected to the power unit and used to control whether or not the power unit supplies electric power and a start switch electrically connected to the main switch, a motor relay, which is switched on by turning on the main switch and the start switch, and an electrically actuated motor, an engine set into operation by the motor, a generator which generates electric power once the engine is running, and an ignition device which controls ignition of the engine. Wherein, the vehicle starter control system is also provided with at least one switching switch, which, after turning on the main switch and the start switch to establish electric conduction, enables temporarily disconnecting electric power from non-activated specific loads, such as the headlight, radiator fan, and the like, which are installed on the vehicle, thereby enabling the power unit to have sufficient electric power to actuate the motor so as to start the engine. Moreover, when the start switch has not been activated, the power unit is able to supply power to the load.

[0008] From the aforementioned it can be known that disposition of the switching switch enables, when starting the vehicle, first temporarily disconnecting the non-activated specific loads from the starter system, thereby enabling the power unit to have sufficient electric power to start the motor so as to easily start the engine.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The present invention will become more fully understood from the detailed description given herein below for illustration only, and thus are not limitative of the present invention, and wherein:

FIG. 1 is a schematic view of motorcycle starter system of the prior art;

FIG. 2A is a schematic view of a first embodiment depicting a vehicle starter control system of the present invention;

FIG. 2B is a schematic view of a second embodiment depicting the vehicle starter control system of the present invention;

FIG. 3 is a schematic view of FIG. 2B depicting using a lamp as a load; and

FIG. 4 is a flow chart depicting a vehicle start control method for FIG. 2B according to the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0010] To enable a further understanding of the specific structural features, effects and objective of the present invention, the brief description of the drawings below is followed by a detailed description of the preferred embodiments, wherein a motorcycle is taken as an example in the embodiments for representing a vehicle, but is not limitative to the invention.

[0011] Referring to FIG. 2A, which shows a schematic view of a first embodiment depicting a vehicle starter control system of the present invention, and as depicted in the drawing, the vehicle starter control system of the present invention comprises a storage battery 20, a main switch 21, a start switch 22, a motor 23, an ignition device 24, a motor relay 25, a switching switch 26, an engine 27, a generator 28, and a load 29.

[0012] The storage battery 20 provides electric power to the control system, the main switch 21 is electrically connected to the storage battery 20 is used to control whether or not the storage battery 20 supplies electric power, and the start switch 22 is electrically connected to the main switch 21. After power is turned-on, the motor 23 is used to bring the engine 27 into operation, whereupon running of the engine 27 simultaneously drives the direct current (DC) or alternating current (AC) generator 28 joined to the engine 27 to generate electric power, and the electric power produced by the generator 28 is stored in the storage battery 20 to supply the control system for use thereof. The ignition device 24 is used to control ignition of the engine 27. The motor relay 25 is electrically connected to the main switch 21, the start switch 22, the motor 23, the ignition device 24 and the motorcycle load 29 is connected in series to the ignition device 24, wherein the load 29 of the motorcycle is an electronic equipment which is often installed on motorcycles, such as the headlight, light bulbs, LED lamps, even a water cooled or air cooled radiator fan, and the like. The switching switch 26 is a relay, and the switching switch 26 is electrically connected to one end of the load 29. Moreover, when starting the motorcycle, the switching switch 26 is used to temporarily electrically disconnect the load 29 from the control system.

[0013] When a rider turns on the main switch 21, and simultaneously presses the start switch 22 (producing a conducting state), then the storage battery 20 is able to provide electric power to the control system and causes the motor relay 25 to switch into conduction. Moreover, through use of a special configuration, after switching into conduction, as a result of an electromagnetic effect, the switching switch 26 is electrically connected to the load 29 is transformed from an original normally closed connection a into a normally open connection b, thereby temporarily electrically disconnecting the load 29 of the motorcycle from the control system, and enabling the storage battery 20 to provide sufficient electric power to first actuate the motor 23 so as to start the engine 27. Furthermore, at the same time the engine 27 is started, the start switch 22 is in an OFF position, at which time the switching switch 26 loses the electromagnetic effect and returns to the original normally closed connection a from the normally open connection b, thereby enabling the load 29 to reestablish an electrical connection with the control system. After which, ignition control of the engine 27 is carried out through the ignition device 24 to actuate the motorcycle and enable forward movement thereof.

[0014] Referring together to FIG. 2B and FIG. 3, in which FIG. 2B is a schematic view depicting a second embodiment of the vehicle starter control system according to the present invention, and FIG. 3 is a schematic view of FIG. 2B using a lamp as the load. As depicted in the drawings, the vehicle starter control system of the present invention comprises a storage battery 30, a main switch 31, a start switch 32, a brake connecting switch 33, a motor 34, an engine 37, a generator 39, an ignition device 38, a motor relay 35, a switching switch 36 and a load 40.

[0015] The storage battery 30 provides electric power to the control system, and the main switch 31 is electrically connected to the storage battery 30 which is used to control whether or not the storage battery 30 supplies electric power. The start switch 32 is electrically connected to the main switch 31, and is further coupled to the brake connecting switch 33. After power is turned-on, the motor 34 is used to bring the engine 37 into operation, whereupon running of the engine 37 simultaneously drives the DC or AC generator 39 joined to the engine 37 to generate electric power, and the electric power produced by the generator 39 is stored in the storage battery 30 to supply the control system for use thereof. The ignition device 38 is used to control ignition of the engine 37. The motor relay 35 is electrically connected to the main switch 31, the start switch 32, the brake connecting switch 33, the motor 34, the ignition device 38, and the motorcycle load 40 is connected in series to the ignition device 38, wherein the load 40 of the motorcycle is an electronic equipment which is often installed on motorcycles, such as the headlight, light bulb, an LED lamp 400 (as depicted in FIG. 3), even a water cooled or air cooled radiator fan, and the like. The switching switch 36 is a relay, and the switching switch 36 is electrically connected to one end of the load 40. Moreover, when starting the motorcycle, the switching switch 36 is used to temporarily electrically disconnect the load 40 from the control system.

[0016] When a rider turns on the main switch 31, and simultaneously presses the start switch 32 and the brake connecting switch 33 (producing a conducting state),

then the storage battery 30 is able to provide electric power to the control system and causes the motor relay 35 to switch into conduction. Moreover, through use of a special configuration, after electrical conduction, as a result of an electromagnetic effect, the switching switch 36 is electrically connected to the load 40 is transformed from an original normally closed connection a into a normally open connection b, thereby temporarily electrically disconnecting the load 40 of the motorcycle from the control system, and enabling the storage battery 30 to provide sufficient electric power to first actuate the motor 34 so as to start the engine 37. Furthermore, at the same time the engine 37 is started, the start switch 32 and the brake connecting switch 33 are in an OFF position, at which time the switching switch 36 loses the electromagnetic effect and returns to the original normally closed connection a from the normally open connection b, thereby enabling the load 40 to reestablish an electrical connection with the control system. After which, ignition control of the engine 37 is carried out through the ignition device 38 to actuate the motorcycle and enable forward movement thereof.

[0017] Referring to FIG. 4, which shows a flow chart for the vehicle start control method of FIG. 2B according to the present invention, From the drawing it can be seen that when electrical conduction has been established through the main switch 31, the brake connecting switch 33 and the start switch 32 (step S 100, step S110 and step S120), then an electrical connection of the load 40 of the motorcycle to the control system is temporarily disconnected by the switching switch 36 (step S130), at which time the storage battery 30 is able to provide sufficient electric power. And switching into conduction of the motor relay 35 (step S 140) is used to first start the motor 34 (step S 150), and after step S 130 and step S150 are completed, then the ignition device 38 is used to control ignition of the engine 37, whereupon the engine 37 starts running (step S160).

[0018] From the aforementioned it can be known that the switching switch 36 is used to first enable temporary disconnection of the load 40, such as the headlight, light bulbs, LED lamps, even a water cooled or air cooled radiator fan, thus, when starting a motorcycle, the storage battery 30 is able to provide sufficient electric power to start the motor 34 and enable the engine 37 to be easily started.

[0019] It is of course to be understood that the embodiments described herein are merely illustrative of the principles of the invention and that a wide variety of modifications thereto may be effected by persons skilled in the art without departing from the spirit and scope of the invention as set forth in the following claims.

Claims

1. A vehicle starter control system, including a power unit for supplying electric power, a main switch (21, 31) electrically connected to the power unit and used to control whether or not power is supplied, a start switch (22, 32) electrically connected to the main switch (21, 31), a motor relay (25, 35), which is switched on by turning on the main switch (21, 31) and the start switch (22, 32), and an electrically actuated motor (23, 34), an engine (27, 37) set into operation by the motor (23, 34), a generator (28, 39) which generates electric power once the engine (27, 37) is running, and an ignition device (24, 38) for carrying out ignition control of the engine (27, 37), **characterised in that** :

the vehicle starter control system is further provided with at least one switching switch (26, 36), and a load (29, 40) electrically connected to the switching switch (26, 36), after the switching switch (26, 36) establishes electric conduction by turning on the main switch (21, 31) and the start switch (22, 32), then electric power to the load (29, 40) is temporarily disconnected, thereby enabling the power unit to have sufficient electric power to actuate the motor (23, 34) so as to start the engine (27, 37), moreover, when the start switch (22, 32) has not been activated, the power unit supplies power to the load (29, 40).

2. The vehicle starter control system according to claim 1, wherein the motor (23, 34) is electrically connected to the motor relay (25, 35) and the start switch (22, 32), and the motor relay (25, 35) is electrically connected to the switching switch (26, 36).

3. The vehicle starter control system according to claim 1, wherein the switching switch (26, 36) is a relay; after turning on the motor relay (25, 35) through the main switch (21, 31), while simultaneously activating the start switch (22, 32) to establish electric conduction, then the relay is switched from its original normally closed connection to a non-conducting state, thereby disabling the power unit from supplying power to the load (29, 40).

4. The vehicle starter control system according to claim 3, wherein another end of the motor relay (25, 35) is electrically connected to a brake switch, after turning on the motor relay (25, 35) through the main switch (21, 31), while simultaneously activating the start switch (22, 32) and the brake switch to establish electric conduction, then the relay is switched from its original normally closed connection to a non-conducting state, thereby disabling the power unit from supplying power to the load (29, 40).

5. The vehicle starter control system according to claim 1, wherein the power unit is a storage battery (20, 30).

6. The vehicle starter control system according to claim 1, wherein the load (29, 40) is a lamp (400) installed on a vehicle.

7. The vehicle starter control system according to claim 6, wherein the lamp (400) is a headlight installed on a vehicle.

8. The vehicle starter control system according to claim 6, wherein the lamp (400) is a light bulb installed on a vehicle.

9. The vehicle starter control system according to claim 6, wherein the lamp (400) is a LED lamp installed on a vehicle.

10. The vehicle starter control system according to claim 6, wherein the load (29, 40) is a radiator fan installed on a vehicle.

11. The vehicle starter control system according to claim 1, wherein the generator (28, 39) is an AC (alternating current) generator (28, 39) or a DC (direct current) generator (28, 39).

12. The vehicle starter control system according to claim 4, wherein the brake switch is a brake connecting switch (33).

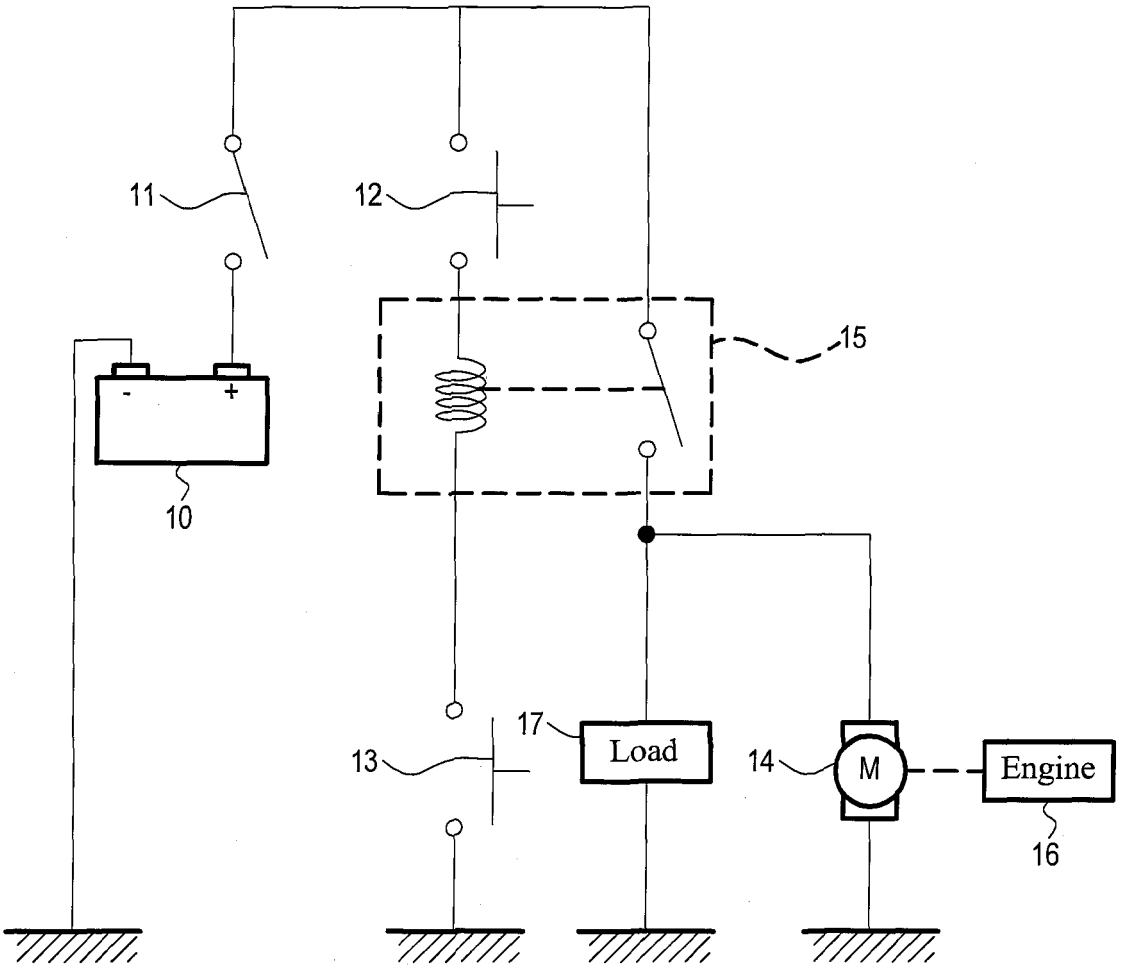

FIG. 1
(Prior Art)

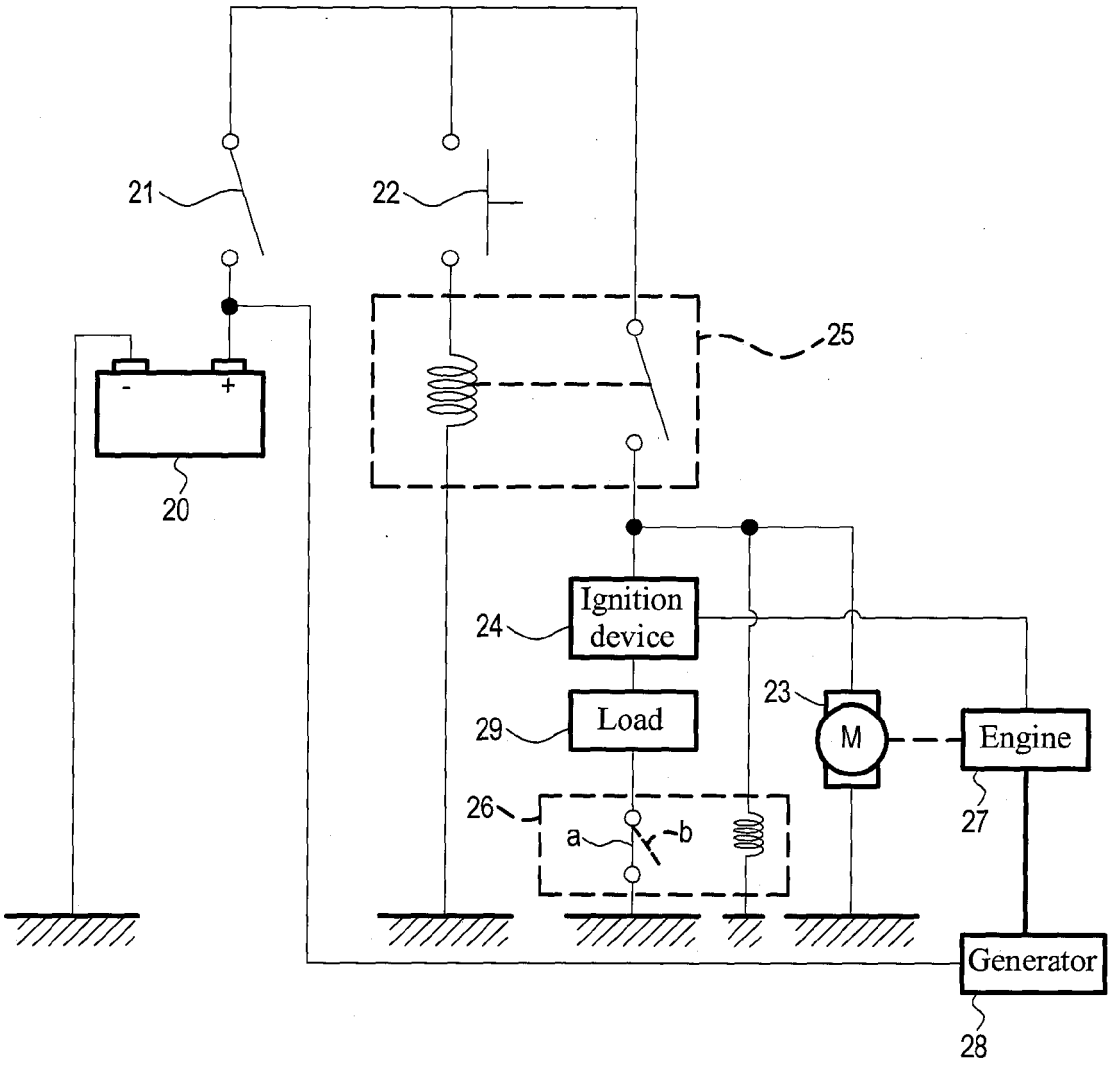
21
22
25
-
+
20
Ignition device
24
Load
29
23
M
Engine
27
26
a
b
Generator
28

FIG. 2A

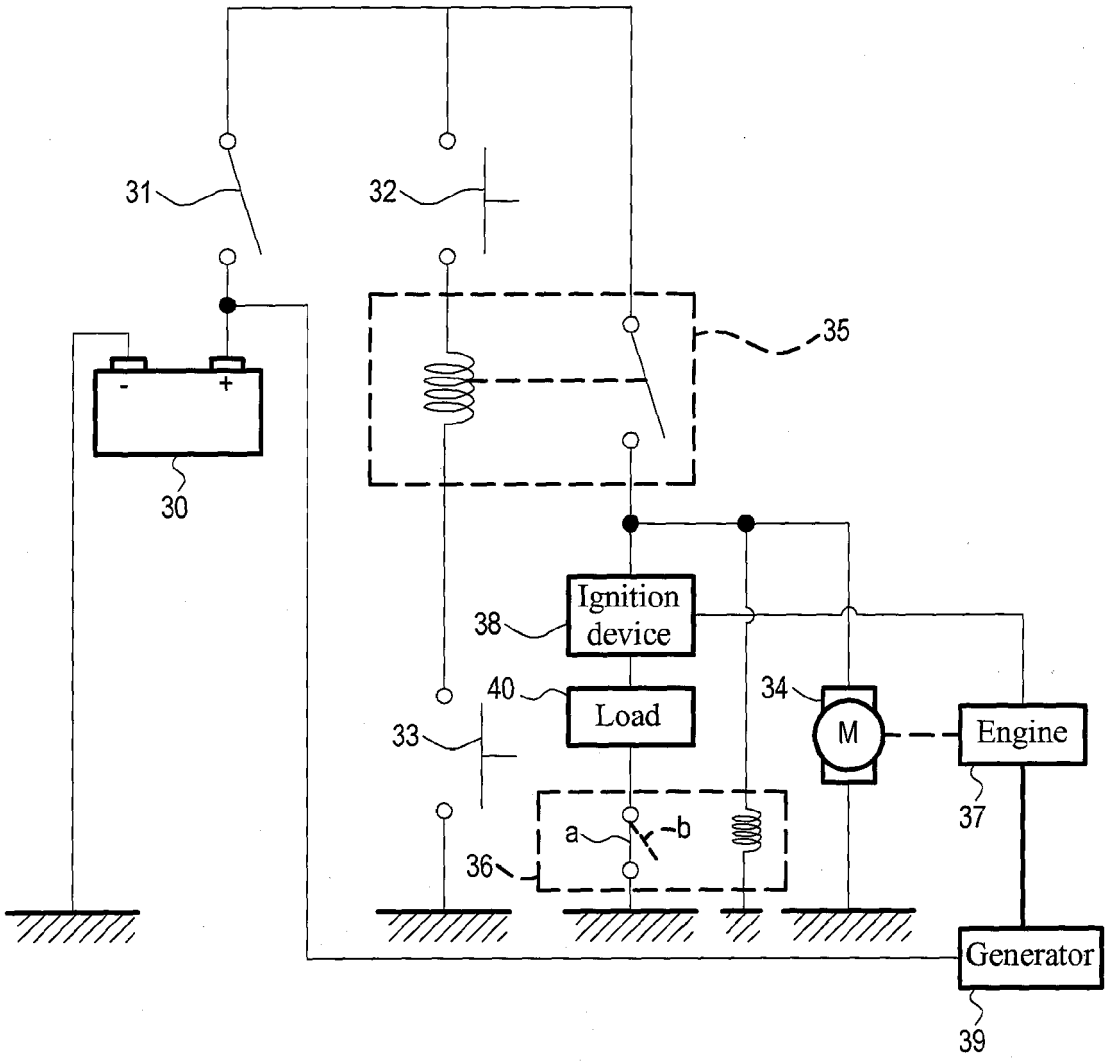
31
32
35
-
+
30
Ignition device
38
40
Load
34
M
Engine
37
33
a
b
36
Generator
39

FIG. 2B

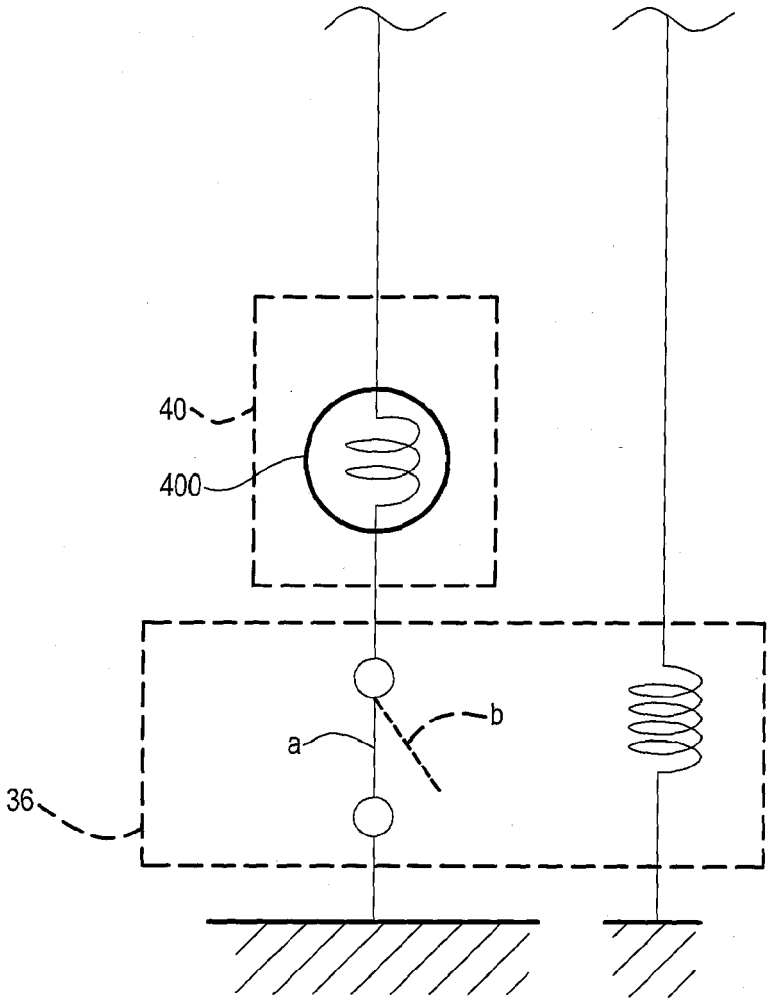

FIG. 3

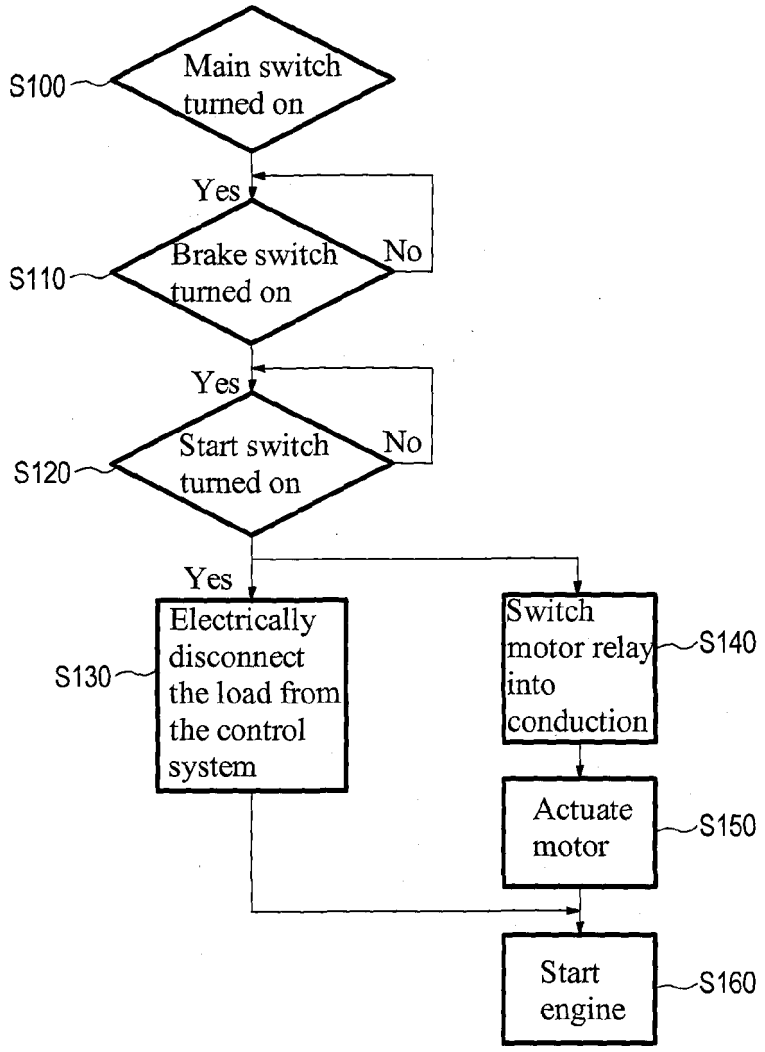
S100
Main switch turned on
Yes
No
S110
Brake switch turned on
Yes
No
S120
Start switch turned on
Yes
S130
Electrically disconnect the load from the control system
Switch motor relay into conduction
S140
Actuate motor
S150
Start engine
S160

FIG. 4

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- TW 097140902 **[0001]**