

Exhibit 1024 - Claim Listing for U.S. Patent No. 11,376,971 B2

Claim 1

1[Pre]	A jumpstarter comprising:
1[a]	a battery connected to a voltage regulator, the battery capable of supplying power, via the voltage regulator, to at least one microcontroller, the battery also capable of supplying power to an automobile battery when the battery has at least one predetermined voltage;
1[b]	a load detector circuit to detect when the jumpstarter is correctly connected to the automobile battery;
1[c]	said at least one microcontroller generating, when the battery has said at least one predetermined voltage, an output signal; and
1[d]	switching circuitry, including at least one switch, to operatively connect the battery to the automobile battery when said at least one microcontroller generates the output signal to supply a charging current to the automobile battery.

Claim 2

2	The jumpstarter of claim 1, further comprising a battery voltage detector circuit to detect a battery voltage of the battery.
19	The jumpstarter of claim 18, further comprising a voltage detector circuit to detect a voltage of the internal power supply.

Claim 3

3	The jumpstarter of claim 1, wherein the at least one switch is one or more MOSFETs.
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Claim 4

4	The jumpstarter of claim 3, wherein the one or more MOSFETs [sic] are n-channel MOSFETs.
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Claim 5

5	The jumpstarter of claim 3, wherein the plurality of MOSFETs are connected in a series-parallel topology.
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Claim 6

6	The jumpstarter of claim 1, wherein there are a plurality of switches.
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Claim 7

7	The jumpstarter of claim 1, wherein the at least one switch is a plurality of MOSFETs and wherein the plurality of MOSFETs are connected in parallel.
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Claim 8

8	The jumpstarter of claim 1, further comprising a load detector to detect a reverse polarity connection to the automobile battery.
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Claim 9

9	The jumpstarter of claim 1, wherein said at least one [sic] microcontroller includes a standby mode where all outputs are closed.
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Claim 10

10	The jumpstarter of claim 9, wherein the jumpstarter is not in a standby mode when the battery has more than 10 volts.
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Claim 11

11	The jumpstarter of claim 1, further composing a start control module to stop supplying battery power when there is no load.
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Claim 12

12	The jumpstarter of claim 1, wherein the at least one switch switches a negative voltage and the at least one switch is connected to a negative battery terminal.
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Claim 13

13	The jumpstarter of claim 1, wherein the jumpstarter has a fast-charging function.
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Claim 14

14	The jumpstarter of claim 1, further comprising a voltage back-flow protection.
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Claim 15

15	The jumpstarter of claim 14, wherein the voltage back-flow protection is for an abnormal load.
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Claim 16

16	The jumpstarter of claim 1, wherein said at least one microcontroller determines whether a battery state is suitable for a heavy current power generation.
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Claim 17

17[Pre]	A jumpstarter comprising:
17[a]	a first battery connected to a voltage regulator, the first battery capable of supplying power, via the voltage regulator, to at least one microcontroller, the first battery also capable of supplying power to an automobile battery when the first battery has at least one predetermined voltage;
17[b]	a battery level detector to detect a level of the first battery;
17[c]	a load detector to detect a type of connection of a load;
17[d]	a microcontroller of said at least one microcontroller to generate an output signal only when the first battery has said at least one predetermined voltage; and
17[e]	switching circuitry, including at least one switch, to operatively connect the first battery to the automobile battery when the microcontroller generates the output signal to supply a charging current to the automobile battery.

Claim 18

18[Pre]	A jumpstarter comprising:
18[a]	an output port having a positive polarity output and a negative polarity output;
18[b]	an internal power supply connected to a voltage regulator, the internal power supply capable of supplying power, via the voltage regulator, to at least one microcontroller, the internal power supply also capable of supplying power to said output port when the internal power supply has at least one predetermined voltage;
18[c]	a load detection sensor connected in circuit with said positive polarity output and said negative polarity output, configured to detect presence of a vehicle battery connected between said positive polarity output and said negative polarity output;
18[d]	a reverse polarity sensor connected in circuit with said positive polarity output and said negative polarity output, configured to detect polarity of d vehicle battery connected between said positive polarity output and said negative polarity output and to provide an output signal indicating whether a positive terminal and a negative terminal of said vehicle battery are properly connected with said positive polarity output and said negative polarity output of said output port;
18[e]	a power switch connected between said internal power supply and said output port; and
18[f]	a microcontroller of said at least one microcontroller configured to provide an output signal to said power switch, such that said power switch is turned on to cause said internal power supply to be connected to said output port in response to signals from said load detection sensor and said reverse polarity sensor indicating the presence of a vehicle battery at said output port and proper polarity connections of the positive terminal and the negative terminal of said vehicle battery with said positive polarity output and said negative polarity output, and is not turned on when signals from said load detections sensor and said reverse polarity sensor indicate either the absence of a vehicle battery at said output port or improper polarity connections of the positive terminal and the negative terminal of said vehicle battery with said positive polarity output and said negative polarity output.

Claim 19

19	The jumpstarter of claim 18, further comprising a voltage detector circuit to detect a voltage of the internal power supply.
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Claim 20

20	The jumpstarter of claim 18, wherein there are a plurality of power switches.
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Claim 21

21	The jumpstarter of claim 18, wherein the load detection sensor and the reverse polarity sensor are the same sensor.
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Claim 22

22	The jumpstarter of claim 21, wherein the load detection sensor and the reverse polarity sensor are a voltage detector circuit.
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Claim 23

23	The jumpstarter of claim 22, wherein the power switch switches a negative voltage and the power switch is connected to a negative battery terminal.
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Claim 24

24	The jumpstarter of claim 18, wherein the microcontroller includes a standby mode where all outputs are closed.
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Claim 25

25	The jumpstarter of claim 24, wherein the jumpstarter is not in a standby mode when the internal power supply has more than 10 volts.
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Claim 26

26	The jumpstarter of claim 18, further composing a start control module to prevent supplying power when there is no load.
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Claim 27

27	The jumpstarter of claim 18, wherein the power switch switches a negative voltage and the power switch is connected to a negative battery terminal.
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Claim 28

28	The jumpstarter of claim 18, wherein the jumpstarter has a fast-charging function.
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Claim 29

29	The jumpstarter of claim 18, further comprising a voltage back-flow protection.
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Claim 30

30	The jumpstarter of claim 18, wherein the microcontroller determines whether a battery state is suitable for a heavy current power generation.
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