UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte NOEL B. DEQUINA, DONALD R. PRESLAR, and
PAUL K. SFERRAZZA

Appeal 2008-3292
Application 11/091,843
Technology Center 2800

Decided: September 29, 2008

Before KENNETH W. HAIRSTON, ROBERT E. NAPPI, and
CARLA M. KRIVAK, *Administrative Patent Judges*.

KRIVAK, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134 from a final rejection of claims 15, 16, 19, and 20. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

STATEMENT OF CASE

Appellants' claimed invention is directed to an over-voltage protection circuit and method, and particularly, to the insertion of an over-voltage protection resistor between the common phase node and a gate input of a lower MOSFET.

Independent claims 15 and 19, reproduced below, are representative of the subject matter on appeal.

> 15. An over-voltage protection apparatus for generating a regulated DC output voltage at an output node which is arranged to be coupled to a device powered thereby comprising:
>
> a DC-DC converter which is operative to generate a regulated output voltage derived from a supply voltage, said DC- DC converter having a pulse width modulation (PWM) generator which generates a PWM switching signal that switchably controls operation of a switching circuit containing first and second electronic power switching devices coupled between a power supply terminal to which said power supply voltage is coupled and a reference voltage terminal to which a reference voltage is coupled, said first and second electronic power switching devices having a common node therebetween coupled through an inductance to said output node; and
>
> a by-pass circuit, having an input connected to said common node and an output connected to a control input of said second electronic power switching device, and being operative, in response to detecting a voltage at said common node indicative of an effective short circuit through said first switching device between said power supply terminal and said common node, to turn on said second electronic power switching device, so as to provide a by-pass current flow path from said common node to said reference voltage terminal, and thereby prevent an over-voltage from being applied to said output node and said powered device.
>
> 19. A method for controlling the operation of a DC-DC converter, which is operative to generate a regulated DC output voltage derived

> from a supply voltage, said DC-DC converter having a pulse width modulation (PWM) generator which generates a PWM switching signal that switchably controls operation of a switching circuit containing first and second electronic power switching devices coupled between a power supply terminal to which said power supply voltage is coupled and a reference voltage terminal to which a reference voltage is coupled, said first and second electronic power switching devices having a common node therebetween coupled through an inductance to said output node, said method comprising the steps of:
>
> (a) monitoring, at said common node, the voltage at said common node for the occurrence of a voltage indicative of an effective short circuit from said power supply terminal through said first switching device to said common node; and
>
> (b) in response to detecting, at said common node, said voltage indicative of said occurrence of an effective short circuit through said first switching device, providing a by-pass through said second switching device to said reference voltage terminal, and shut-down of the power supply, so as to protect electronic circuitry powered thereby from said over-voltage.

REFERENCE

Holt	US 6,731,486 B2	May 4, 2004

Claims 15, 16, 19, and 20 stand rejected under 35 U.S.C. § 102(e) based upon the teachings of Holt.

Appellants contend Holt does not teach that the by-pass circuit is connected to a common node (Br. 9)

ISSUE

Does Holt teach all the features of claims 15, 16, 19, and 20, including a by-pass circuit connected to a common node, as maintained by the Examiner as anticipating under 35 U.S.C. § 102(e)?

FINDINGS OF FACT

1. Appellants' invention teaches an over voltage protection apparatus that includes a DC-DC converter 10 and a by-pass circuit (over protection resistor) 50 having an input connected to a common node 5 and an output connected to a control input of a power switching device LFET 4 (Fig. 2). Another power switching device UFET 3 and the power switching device LFET have a common node therebetween coupled through an inductance 6 to the output node (cl. 1).

2. Holt teaches a voltage protection circuit 220,230 having an input connected to an output node 104. Transistors 110 and 120 are connected at a common node. An inductor 131 has one end connected to the common node and the other end connected to the output node and one of the outputs of the voltage protection circuit (Fig. 1).

PRINCIPLES OF LAW

Anticipation

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros., Inc. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987). The inquiry as to whether a reference anticipates a claim must focus on what subject matter is encompassed by the

claim and what subject matter is described by the reference. As set forth by the court in *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 772 (Fed. Cir. 1983), it is only necessary for the claims to "'read on' something disclosed in the reference, i.e., all limitations of the claim are found in the reference, or 'fully met' by it."

ANALYSIS

The Examiner rejected claims 15, 16, 19, and 20 as anticipated by Holt. We address this issue below with respect to independent claims 15 and 19.

Claims 15 and 16

The Examiner contends that Holt teaches all the features of claim 15 including a "by-pass circuit (220,230) having an input connected to the common node via inductance (131) and an output (the output of element 230) coupled to a control input of the second electronic power switching device (120)" (Ans. 3).

Claim 15 recites an over-voltage protection apparatus that includes a DC-DC converter and a by-pass circuit (over-voltage protection resister 50). Appellants assert that claim 15 "employs an overvoltage protection resistor 50 that is inserted between the common or phase node 5 and the gate input LGATE of the lower MOSFET 4" (Br. 4; Fig. 2). This allows the over-voltage protection resistor to cause the lower MOSFET (LFET) to immediately turn off and thus provide a by-pass path to ground (Br. 4). Appellants' maintain that Holt, however, has an input of a voltage protection circuit connected to the output node, not the phase node between the upper

transistor 110 and the lower transistor 120 (Br. 10), as does Appellants' claimed invention. We agree.

Figure 2 of Appellants' invention shows the by-pass circuit connected directly to the common node as recited in claim 15. Figure 1 of Holt shows the input of the by-pass circuit connected directly to the output node. The common node is connected between the output node and inductor 131. There is no direct connection between the by-pass circuit and the common node. Thus, Holt does not teach "a by-pass circuit, having an input connected to said common node" (cl. 15).

Because not all limitations of Appellants' claim 15 are found in Holt, we find that Holt does not anticipate claim 15.

Claim 16 depends from claim 15 and further recites that the by-pass circuit is a sense resistor. Since this feature is not taught by Holt, we also find that Holt does not anticipate claim 16.

Claims 19 and 20

The Examiner states that Holt teaches all the features of claim 19 including showing a method for controlling the operation of a DC-DC converter by "monitoring (with the by-pass circuit 220, 230) at said common node, the voltage at said common node" (Ans. 4).

Appellants assert claim 19 teaches monitoring the voltage at the common node for a voltage indicative of an effective short circuit from the power supply terminal through the first switching device to the common node (Br. 16-17). Further, Holt, in contrast, teaches monitoring the voltage at an <u>output node</u>, not detecting a voltage indicative of a short circuit

through the first switching device at the common node (emphasis added), as recited in claim 19, as pointed out above with respect to claim 15.

Because not all limitations of Appellants' claim 19 are found in Holt, we find that Holt does not anticipate claim 19.

Claim 20 depends from claim 19 and further recites that step (b) includes connecting an over-voltage sense resistor to the common node and to the control input of the second electronic power switching device. Since this feature is not taught by Holt, we also find that Holt does not anticipate claim 20.

CONCLUSION

We therefore conclude that the Examiner erred in rejecting claims 15, 16, 19, and 20 under 35 U.S.C. § 102(e).

DECISION

We reverse the Examiner's decision in rejecting claims 15, 16, 19, and 20.

REVERSED

eld

FOGG & POWERS LLC
10 SOUTH FIFTH STREET
SUITE 1000
MINNEAPOLIS, MN 55402