Paper No. 15

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte GERHARD GOESER,
MARK ELLIOTT, and DONALD PRESLAR

_____

Appeal No. 2000-1938
Application No. 08/940,467[1]

_____

ON BRIEF

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Before THOMAS, MARTIN and RUGGIERO, Administrative Patent Judges.

MARTIN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1-4, all of the pending claims, over prior art. We reverse.

A. The invention

The invention is a power output stage for inductive loads. The admitted prior art power output stage and Appellants' power output stage are depicted as follows in Appellants' Figures 1 and 2:

[1] Application filed September 30, 1997.

PRIOR ART

FIG 1

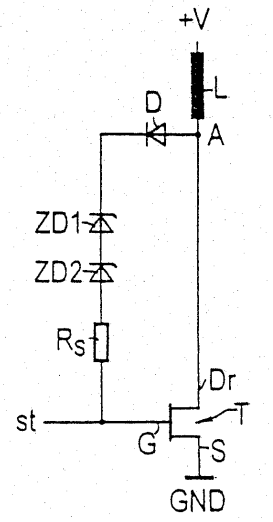
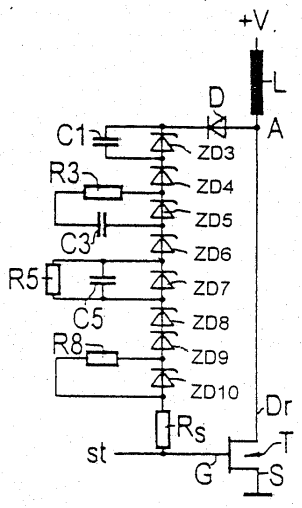


FIG 2



The zener diodes ZD1 and ZD2 in the prior art power output stage are provided to limit the voltage between drain Dr and gate G of switching transistor T. Specification at 1, lines 13-15.

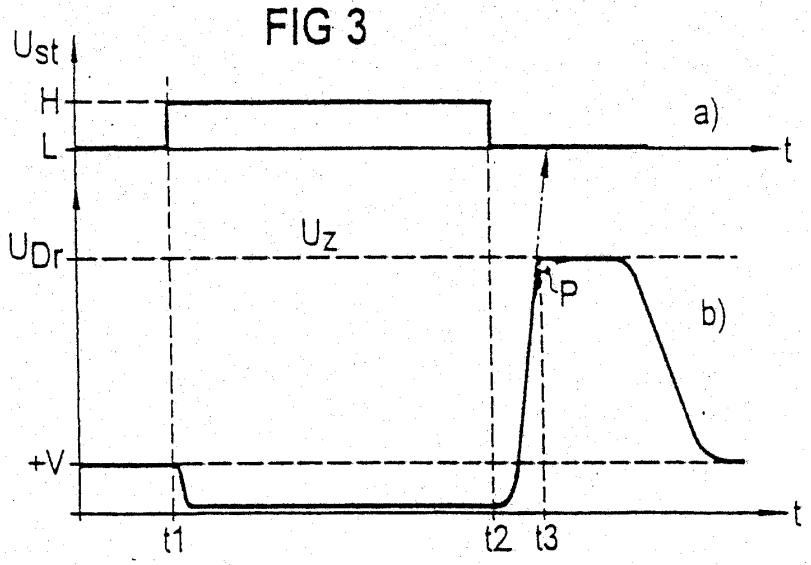
> When the Zener protection cuts in, a pronounced kink is produced in the time profile of the voltage. That may result in an excessive emission of electromagnetic radiation that can have a detrimental effect on the environment. That is to say other electrical or electronic systems, in automobiles, for example[] a car radio[,] may be detrimentally affected by the electromagnetic radiation emission.

Id. at 1, 11. 15-22.

Figure 3, reproduced below, shows how drain voltage U_{Dr} varies in response to control signal U_{st} in the circuits of Figures 1 and 2, the only difference occurring at time t3, which shows the above-noted kink or sharp transition in the drain

voltage U_{Dr} for the prior art circuit and a more gradual transition for Appellants' circuit, which transition the specification descibes as having a "polygonal" shape P (id. at 8, ll. 10-15).

FIG 3



Appellants' circuit provides the gradual transition P by employing eight lower-rated Zener diodes ZD3-ZD10 and connecting a resistor, a capacitor, a series combination of a resistor and capacitor, or a parallel combination of a resistor and capacitor in parallel with each of four of the zener diodes. The effect is

> to slightly time-delay the voltage which builds up across the Zener diode, depending on the rating of the

components. Therefore, the cut-in of the limitation of the drain voltage U_{Dr} to the Zener voltage U_Z takes place not with a pronounced kink, but, depending on the number of Zener diodes "delayed" in this way, with a polygonal shape P, and thus [is] more rounded, as represented by dashes in Fig. 3 at time t3. As a result, substantially less electromagnetic radiation interference is released than with the circuit according to Fig. 1.

Id. at 8, 11. 6-17.

B. The claims

Claim 1, which is representative, reads:

1. A power output stage for switching inductive loads, comprising:

a switching transistor having a drain, a gate and a source;

a load having a first end and a second end connected in series with said drain of said switching transistor;

a voltage source having a first pole and a second pole, the first end of the load connected to said first pole and said source of said switching transistor connected to said second pole;

a series connected circuit having a blocking diode and at least one Zener diode connected between the second end of the load and said gate of said switching transistor; and

a capacitor connected in parallel with said at least one Zener diode.

Claims 2-4 specify that the component(s) connected in parallel with the zener diode is or are a resistor (claim 2), a

series-connected capacitor and resistor (claim 3), or a parallel-connected capacitor and resistor (claim 4).

C. The references and rejections

The examiner relies on the following U.S. patents:[2]

Cooper et a al. (Cooper)	5,559,658	Sept. 24, 1996
Yasuda et al. (Yasuda)	5,629,586	May 13, 1997
Lebbolo et al (Lebbolo)	5,642,251	June 24, 1997
Fritschi et al. (Fritschi)	5,781,396	July 14, 1998
		(filed Jan. 19, 1996)

Claim 1 stands rejected under 35 U.S.C. § 103(a) for obviousness over the admitted prior art shown in Appellants' Figure 1 in view of Fritschi.

Claims 2 and 4 stand rejected under § 103(a) for obviousness over the admitted prior art in view of either Cooper or Lebbolo.

Claim 3 stands rejected under § 103(a) for obviousness over the admitted prior art in view of Yasuda et al.

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[2] The McCafferty et al. reference mentioned at page 6 of the Answer but not recited in the statement of a rejection will not be considered. "Where a reference is relied on to support a rejection, whether or not in a minor capacity, that reference should be positively included in the statement of the rejection." MPEP § 706.02(j)(quoting In re Hoch, 428 F.2d 1341, 1342 n.3, 166 USPQ 406, 407 n.3 (CCPA 1970)). Accord Ex parte Movva, 31 USPQ2d 1027, 1028 n.1 (Bd. Pat. App. & Int. 1993); Ex parte Raske, 28 USPQ2d 1304, 1304-05 (Bd. Pat. App. & Int. 1993); Ex parte Hiyamizu, 10 USPQ2d 1393, 1394 (Bd. Pat. App. & Int. 1988).

D. The rejection of claim 1

One of Appellants' arguments in response to the rejection is as follows:

> [T]he Examiner has alleged that one of ordinary skill in the art would have been motivated to make the alleged modification to reduce the rate of discharge occurring in the circuit shown in Fig. 1 of the application. It is believed that one would not have sought to reduce the rate of discharge because this would be contrary to the objective of protecting the switching transistor, and that no suggestion can be found in the prior art to modify the prior art circuit shown in Fig. 1 of the application such that the rate of discharge would have been reduced.

Brief at 12. To the extent Appellants are claiming to have discovered the problem solved by their invention (viz., the emission of detrimental electromagnetic radiation) or the problem's source (viz., the abrupt switching of the zener diodes), the argument is unconvincing because it is unsupported by the record before us. As explained in In re Wiseman, 596 F.2d 1019, 201 USPQ 568 (Fed. Cir. 1979):

> In [In re] Sponnoble, [405 F.2d 578, 56 CCPA 823, 160 USPQ 237 (CCPA 1969)], on the basis of extensive evidence recited in the opinion, we found "a clear indication that he [Sponnoble] discovered the source of the problem." 405 F.2d at 585, 56 CCPA at 833, 100 USPQ at 243. In contrast, in the present case we find only the reiterated statement of counsel that appellants discovered the source of the problem. There is, however, nothing of record to substantiate the assertion. The most we can find are the following two sentences in appellants' specification:

> When water is present in a brake disc assembly a substantial decrease in braking torque occurs. This decrease is the result of a loss of friction coefficient due to the build up of steam between the opposing brake discs.
>
> Appellants do not contend that the fact stated in the first sentence was their discovery. It is such a widely known phenomenon we could take judicial notice of it. The second sentence is a mere statement of fact without any indication of who discovered that fact. The specification does not say appellants discovered it. Counsel have seized upon it as the basis for their argument, but that is not enough; there must be some evidence of record by way of affidavits or declarations, or at least a clear and persuasive assertion in the specification, that the fact relied on to support patentability was the discovery of the applicants for patent. For all that appears from the record in this case, appellants were reciting a fact already known to those working in the art.

Wiseman, 596 F.2d at 1022-23, 201 USPQ at 661.

On the other hand, we do find ourselves in agreement with Appellants' argument (Brief at 11-12) that one skilled in the art would not have found in Figure 2 of Fritschi, which shows circuitry for controlling the pickup coil in an electromagnet having a pickup coil and a holding coil (col. 1, 11. 5-9), any suggestion of placing a capacitor in parallel with a zener diode in order to round off its kink point and thereby reduce its discharge rate, as contended by the examiner. Specifically, the examiner, apparently relying on the parallel connection of capacitor 19 and zener diode 20, contends that

> it is well-known in the art to use a zener/capacitor parallel combination as a breakdown protection circuit (note Fig. 2 of [Fritschi]) for the well-known purpose of being able to control the rate of breakover current when the zener breaks down, i.e., those skilled in the art know that without the parallel capacitor, the

> breakover current will be undesirably high, whereas with the capacitor, the rate the voltage and current discharge from the high side to the low side can be made more gradual.

Answer at 4. Fritschi does not contain such a teaching. Instead, Fritschi explains the function of capacitor 19 as follows: "The gate-source capacitor 19 with a time constant of Te is charged through the start-up load resistor 16. After at least one time constant the MOS-FET 11 is named [sic, turned?] on and switched to low resistivity." Column 4, lines 36-40. Subsequent conduction of NPN transistor 21 "discharges the gate-source capacitor 19, whereupon the MOS-FET 11 becomes highly resistive." Column 4, lines 61-65. Furthermore, under the circumstances described at column 5, lines 15-22, the gate-source capacitor 19 will be partially discharged as a result of leakage currents through Zener diode 20, NPN transistor 21, and MOS-FET 11 (col. 5, 11. 23-25).

In response to Appellants' criticism of Fritschi as not teaching that capacitor 19 rounds the kink point of a zener diode (Brief at 11), the examiner contends that

> [t]his argument is not persuasive because, as appellant is well aware, it is not necessary that the purpose of a claimed invention be the same as that of the prior art, and all that is necessary is some motivation for combining the teachings of the prior art so as to achieve the claimed invention, and such motivation can be the same as or different from that of the applicant.

Answer at 5. While this is a correct statement of the law, In re Beattie, 974 F.2d 1309, 1312, 24 USPQ2d 1040, 1042 (Fed. Cir. 1992), the examiner has not explained, and it is not apparent to us, what different motivation an artisan would have seen in Fritschi for adding a capacitor in parallel with one or each of

the zener diodes in the admitted prior art power output stage. In the absence of some motivation established by the references, a rejection based on obviousness cannot be sustained. See In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1316 (Fed. Cir. 2000) ("to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant. See In re Dance, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998)."). Furthermore, "deficiencies of the cited references cannot be remedied by . . . general conclusions about what is 'basic knowledge' or 'common sense.'" In re Lee, 277 F.3d 1338, 1344, 61 USPQ2d 1430, 1434-35 (Fed. Cir. 2002)(quoting In re Zurko, 258 F.3d 1379, 1385, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001)).

The rejection of claim 1 is therefore reversed.

E. The rejection of claims 2 and 4

Cooper's Figure 4 shows a crowbar circuit for quickly discharging the high voltage present on the anode of a CRT display 26 (col. 1, 11. 32-36). The examiner characterizes Figure 4 as teaching the use of a resistor in parallel with a zener diode "for the purpose of . . . changing the amount of allowable charge build-up at the high node which needs to be discharged (via the use of a bleed-resistor path, see Cooper et al)" (Answer at 4) and also "for the purpose of controlling the breakover rate of discharge current when the zener voltage is exceeded." Answer at 6. Neither of these characterizations accurately describe the combination of zener diode ZG and

resistor RG in component stages 102a-102n or the combination of zener diode ZG and resistors RG and RS in driver stage 104. Instead, Cooper explains that resistor RG and zener diode ZG in component stages 102a-102n

> are selected to prevent transistor conduction due to leakage current during biased-off operation, to generally protect the transistor from gate-to-source stress during biased-on operation, and to provide the desired gate-to-source voltage to turn the associated transistor on when a current path to ground is provided.

Column 5, lines 47-53. Regarding zener diode ZG and resistor RG in driver stage 104, Cooper explains that

> Zener diode ZG, connected between the gate of the transistor and ground, is sized to limit the voltage applied to the MOSFET gate. Resistor KG, connected across the transistor gate and source[,] is selected to provide sufficient gate-to-source voltage to turn the driver transistor on when an enable signal is received.

Column 6, lines 39-44. Furthermore, Cooper's description of the operation of the crowbar circuit (col. 6, l. 61 to col. 9, l. 64) makes no mention of any of the zener diodes ZG.

Consequently, to the extent the rejection of claims 2 and 4 is based on Cooper, it is reversed.

Lebbolo's Figure 4 shows a DC power supply protection circuit. Apparently relying on Zener diode Z2, capacitor C6, and resistor R11, all of which are connected in parallel, the examiner argues that Lebbolo teaches using a parallel-connected capacitor and resistor in parallel with a zener diode in order to "control the discharge rate" (Answer at 4) and "for the purpose of controlling the breakover rate of discharge current when the zener voltage is exceeded." Answer at 6. However, the only

specific discussion of these three components in the specification is to explain that they are part of control circuit 2 in Figure 3 (col. 4, 11. 27-29) and that "[t]he resistor R11 and the capacitor C6 are parallel-connected and connected to the terminals of the diode Z2" (col. 4, 11. 39-41). Furthermore, the discussion of the operation of control circuit 2 (col. 2, 1. 44 to col. 3, 1. 4; col. 4, 11. 44-60) does not suggest that capacitor C6 and/or resistor R11 function to control the discharge rate of the zener diode. Nor does Lebbolo appear to attribute such a function to capacitor C1, which is connected in parallel with zener diode Z1.

As a result, the rejection of claims 2 and 4 is also reversed to the extent is it based on Lebbolo.

F. The rejection of claim 3

Yasuda's Figure 6, on which the examiner relies, shows a circuit for energizing a fluorescent lamp FL. This circuit includes a series RC circuit (resistor 68 and capacitor 70) in parallel with back-to-back zener diodes 72 and 74. The examiner's characterization of Yasuda as teaching the use of a series RC circuit in parallel with a zener diode "for controlling the discharge rate of the high voltage side of the zener" (Answer at 5) is unsupported by Yasuda's specification, which has only the following to say about the zener diodes: "A pair of inversely connected zener diodes 52 [sic, 72], 74 is connected between the source and gate of the [FET] Q2" (col. 4, ll. 9-11). The rejection of claim 3 is therefore reversed.

REVERSED

JAMES D. THOMAS Administrative Patent Judge	)	
JOHN C. MARTIN Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
JOSEPH F. RUGGIERO Administrative Patent Judge	)	

JCM/sld

cc:

LERNER AND GREENBERG
POST OFFICE BOX 2480
HOLLYWOOD, FL 33022-2480