

## Deckblatt Übersetzung

### Daten der Übersetzung:

Court/Gericht:	Bundesgerichtshof
Date of Decision / Datum der Entscheidung:	2018-12-20
Docket Number / Aktenzeichen:	X ZR 56/17
Name of Decision / Name der Entscheidung:	Schaltungsanordnung III

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**Arbeitskreis**  
**Patentgerichtswesen**  
in Deutschland e.V.



# FEDERAL COURT OF JUSTICE

IN THE NAME OF THE PEOPLE

## JUDGMENT

X ZR 56/17

Pronounced on:  
20 December 2018  
Anderer  
Judicial Secretary as  
clerk of the court  
registry.

in the patent nullity proceedings

Schaltungsanordnung III/  
Circuit arrangement III

IntPatÜbkG Art. II Sec. 6(1) No. 4

A patent claim may not be amended in nullity proceedings to include subject matter not covered by the granted version (confirmation of Federal Court of Justice, judgment of 14 September 2004 - X ZR 149/01, GRUR 2005, 145, 146 - elektrisches Modul).

Federal Court of Justice, judgment of 20 December 2018 - X ZR 56/17 –  
Federal Patent Court

The X. Civil Senate of the Federal Court of Justice, following the oral hearing on 20 December 2018, attended by the judges Dr. Bacher, Dr. Grabinski, Hoffmann and Dr. Deichfuß and the judge Dr. Marx

ruled that

The appeal against the judgment of the 6th Senate (Nullity Senate) of the Federal Patent Court of 22 February 2017 is dismissed at the defendant's expense.

By operation of law

Facts of the case:

- 1 The defendant is the proprietor of European patent 929 992 (the patent in suit), which was granted with effect for the Federal Republic of Germany and relates to a circuit arrangement for operating a semiconductor light source. The patent in suit, the application for which was filed on 16 July 1998 claiming the priority of a European patent application dated 1 August 1997, lapsed on 16 July 2018 due to the passage of time.
- 2 The patent in suit comprises eight claims. In its action for nullity, the plaintiff attacks only claims 1 to 3 and claims 7 and 8 in so far as they refer back to claims 1 to 3. In the version still defended by the plaintiff in the main application, patent claim 1 reads as follows in the language of the proceedings (amendments to the granted version of patent claim 1 are marked by underlining and strikethrough):

"A circuit arrangement suitable for operating a semiconductor light source (LB) and provided with

- input terminals (A, B) for connecting a supply voltage,
- input filter means (I) coupled to said input terminals (A, B),
- a converter (III) coupled to said input filter means (I), said converter (III) acts as a current generator for said  
semiconductor light source and ~~comprising~~ comprises a

- control circuit,
- output terminals (C, D) coupled to said converter (III) for ~~connecting~~ coupling with said the semiconductor light source (LB);
  - ~~characterized in that the circuit arrangement is provided~~ with voltage detection means (II), coupled to said converter (III) and to said output terminals (C, D), for voltage detection at the output terminals (C, D) so as to provide for the detection of a defect of said semiconductor light source (LB),
  - said semiconductor light source (LB) wherein said semiconductor light source (LB) is coupled to said output terminals (C, D) and where- in the semiconductor light source comprises a matrix of LEDs, which are electrically interconnected. "

3           The plaintiff has argued that the subject matter of the patent in suit is not patentable and goes beyond the content of the original application. Moreover, the patent in suit does not disclose the invention so clearly and fully. The defendant argued that the patent had been extended so that it could be carried out by a skilled person and that its scope of protection had been extended. The defendant defended the patent in suit in a limited manner with one main request ("auxiliary request I") and seven auxiliary requests.

4           The Patent Court declared the contested patent null to the extent challenged. The defendant's appeal is directed against this, in which it continues to defend the patent in suit with the main request made at first instance and four auxiliary requests. The plaintiff opposes the appeal.

Grounds of the decision:

5           The admissible appeal is not well founded.

6           A.     The action remained admissible even after the expiry of the patent in suit during the appeal proceedings.

7           If a patent has lapsed due to the passage of time, the plaintiff must have an interest worthy of protection in conducting nullity proceedings, since there is no longer an interest of the general public in reviewing the validity of the patent. According to the case law of the Senate, such a need for legal protection exists if the plaintiff has reason to fear that claims may be asserted against him under the patent for acts committed during the period before its lapse. This does not require that the plaintiff has been sued for infringement of the patent by means of a complaint or warning (Federal Court of Justice, judgment of 12 March 1981 - X ZB 16/80, legal notice no. 14 f.; judgment of 24 May 2016 - X ZR 28/14, legal notice no. 11). In contrast, there is no need for legal protection for an action against an expired patent if the patent proprietor has waived all claims under the patent (Federal Court of Justice, judgment of 9 September 2010 - Xa ZR 14/10, GRUR 2010, 1084 marginal no. 10 - Windenergiekonverter).

8           The patent in suit is listed in a licensing program of Defendants titled "EnabLED Licensing Program for LED Luminaires and Retrofit Bulbs," dated 17 November 2017, under the heading "Core Technologies for LED Lighting Systems" listed (BBK7-PHL2, p. 17). The plaintiff manufactures LED lighting fixtures. It has supplied control circuits in accordance with the pre-publication "Constant Current/Constant Power Circuits for TOPSwitch® Desogm Mpte DM14" (E3) to customers, including in Germany. The defendant did not reply to a letter from the plaintiff's legal representatives dated 28 November 2018, in which the plaintiff was requested to waive all claims arising from the patent in suit insofar as they are challenged in the present nullity action. In this initial situation, the plaintiff's concern that it will be held liable by the defendant for infringement of the patent in suit on account of its actions during the period before the patent in suit lapsed is not unfounded.

9           B.     The action is well founded.

10 I. The patent in suit concerns a circuit arrangement for operating a  
semiconductor light source.

11 1. According to the patent in suit, semiconductor light sources are  
increasingly used for signal lamps. Semiconductor light sources generally  
consist of a matrix of semiconductors, for example in the form of light-emitting  
diodes (LEDs), which are electrically interconnected. Operation as a light  
source is determined by the value of the current supplied by the  
semiconductor, and the transducer is therefore intended to act as a current  
generator.

12 This has the disadvantage that a very high voltage can occur at the  
output terminals in the event of a defective semiconductor light source. If  
operation is continued in such a state for a long time, there is a risk of a  
breakdown in the circuit arrangement, so that it becomes defective. The  
occurrence of short circuits with all the associated risks is also not unlikely.

13 The defect in one or some of the semiconductors leads to an increased  
impedance of the light source. Although the resulting increase in voltage at the  
output terminals need not be detrimental to the operation of the converter per  
se, the luminous flux of the light source may drop sharply so that a reliable  
signal lamp can no longer be operated.

14 2. The patent in suit describes the task of creating a circuit  
arrangement with which the disadvantages mentioned can be avoided.

15 3. The teaching protected in claim 1 in the versions of the main  
request and the auxiliary request III of the defendant can be structured as  
follows (changes in the version of the auxiliary request III compared to the  
main request are highlighted by underlining and strikethrough, the deviating  
structure in the first instance judgment is added in square brackets):

1. Circuit arrangement [a] suitable for operating a semiconductor  
light source (LB) comprising a matrix of electrically  
interconnected LEDs[b] and provided with [c].

1.1 *Input* terminals (A, B) for connecting a supply voltage [c-  
1],

- 1.2 *input filter means* (I) [c-2],
  - 1.2.1 coupled to the input terminals [c-2a],
- 1.3 a *converter* (III) [c-3a], which is
  - 1.3.1 is coupled to the input filter means (I) [c-3a],
  - 1.3.2 operates as a current generator for the semiconductor light source (LB) [c-3a] and
  - 1.3.3 comprises a control circuit [c-3],
- 1.4 *Output terminals* (C, D) [c-4],
  - 1.4.1 coupled to the transducer (III) [c-4],
  - 1.4.2 to couple it with the semiconductor light source (LB) [c-4a],
- 1.5 *Voltage detection means* (II) [d-1],
  - 1.5.1 the one with the transducer (III) [d-1a],
  - 1.5.2 and the output terminals (C, D) are coupled [d-1b],
  - 1.5.3 for voltage detection at the output terminals [d-2],
  - 1.5.4 to enable detection of a semiconductor light source (LB) defect [d-2a],
  - 1.5.5 which generate a signal S when a voltage obtained at the output terminals (C, D) is higher than a *threshold voltage*  $V_{uD}$  [d-3].
    - 1.5.5.1 the threshold voltage is chosen to allow detection of a defect in the case of a partially defective semiconductor light source [d-3a].
- ~~1.6 — the *semiconductor light source* (LB) [e]~~
  - ~~1.6.1 — coupled to the output terminals (C, D) [e-1] and~~
  - ~~1.6.2. — comprises a matrix of LEDs which are electrically connected together [e-2].~~

16            4.     Figure 2 reproduced below is taken from the document in dispute and shows an example of the circuit diagram of a voltage detection means according

to the invention:

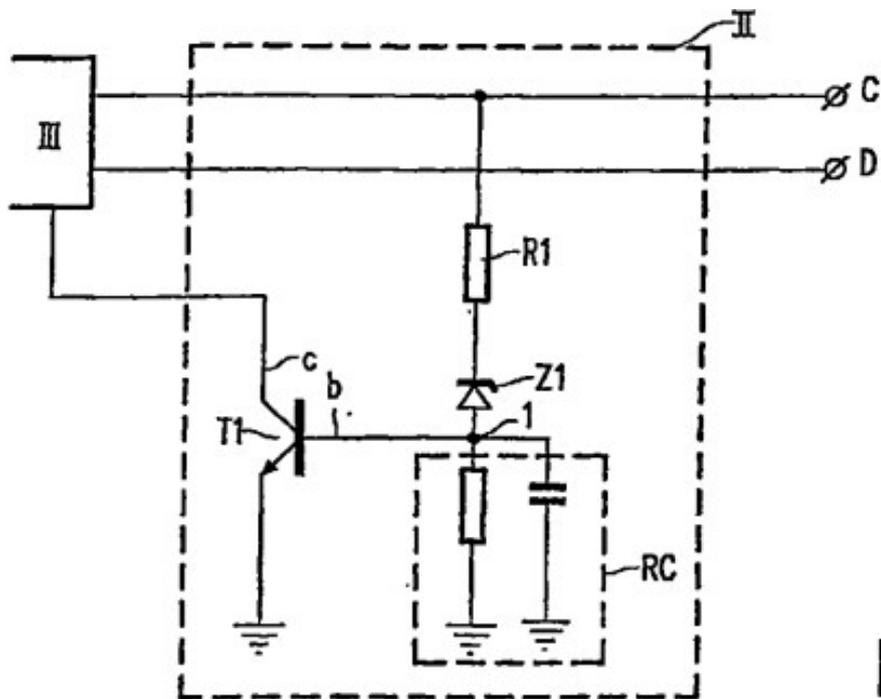


FIG. 2

17           5.       According to the correct observations of the Patent Court, a skilled person is to be understood as a graduate engineer specializing in electrical engineering who designs driver circuits for semiconductor light sources.

18           6.       The teaching according to the invention, from the point of view of such a skilled person, is to be further explained as follows:

19           a)       According to feature group 1.3, the circuit arrangement is provided with a converter which comprises a control circuit. The converter operates as a current generator for the semiconductor light source, i.e. it supplies the latter with a constant current intensity and a variable voltage required to achieve this current intensity.

20           b)       According to feature group 1.5, the circuit arrangement is provided with means which detect the voltage at the output terminals and thereby enable the detection of a defect in the semiconductor light source.

21           aa)      It is not necessary that the circuit arrangement actually makes use of the possibility of fault detection. On the other hand, it is insufficient if the circuit arrangement merely comprises components, which are suitable for

monitoring the voltage in the manner described. Rather, means must be present which actually perform the function of voltage detection.

22           bb)    The type of defect to be detected by the voltage detection means is not specified in characteristic 1.5.4. According to the description, such a defect may consist of a failure of components of the semiconductor light source resulting in damage to the circuit arrangement (paragraph 2). However, the failure of only one or a few LEDs within a matrix and the resulting reduction in luminous flux, so that a signal light can no longer reliably perform its function, for example, is also mentioned as a possible defect (paragraph 5).

23           cc)    It is also not specified which measures are to be taken if a defect of the semiconductor light source has been detected. Insofar as it is explained in more detail in the description that, when a threshold voltage  $V_{uD}$  is exceeded, switch-off means are activated in order to switch the converter into an operating state in which the voltage  $V_u$  is again lower than the threshold value  $V_{uD}$  (paragraphs 6, 15 f.), this is merely an example of an embodiment which does not restrict the teaching of patent claim 1.

24           dd)    Feature 1.5.5. added in patent claim 1 in the version of auxiliary claim III further specifies the teaching according to the invention to the effect that the voltage detection means generate a signal S if a voltage obtained at the output terminals is higher than a threshold voltage  $V_{uD}$ . The signal S must be such that an appropriate response to the detected defect is possible. No other requirements are imposed on the nature of the signal.

25           ee)    According to feature 1.5.5.1. it is provided that the threshold voltage is selected in such a way that a defect can also be detected in the case of an only partially defective half-conductor light source.

26           II.     The Patent Court gave the following main reasons for its decision - insofar as it is still of interest in the appeal proceedings:

27           1.     The scope of protection of the patent in suit in the version of the main request ("auxiliary request 1") is extended by the fact that patent claim 1 in the version of the main request, compared to the granted version, not only extends to a circuit arrangement for operating a semiconductor light source,

but additionally to the semiconductor light source.

28           2.       The subject matter of claim 1 is also known from the international application WO 96/02970 (E17). Voltage detection means are disclosed which enable the detection of a defect in the semiconductor light source. If a defect occurs in the semiconductor light source of E17, in particular a total failure in which both branches of the semiconductor light source 405 are highly resistive, this leads to a permanent switching through of the Z-diode 510 which absorbs the entire current, which the skilled person can interpret as an indication of a defect in the semiconductor light source.

29           Moreover, on the priority date, the skilled person was aware of circuit arrangements which had the effects claimed by the defendant as its invention and which would therefore in principle also have been suitable for operating semiconductor light sources, such as from E3. The knowledge that the circuit arrangement known from E3 could be used to operate not only battery chargers or electric motors, but also semiconductor light sources, as an alternative to the circuit arrangement according to E17, was not to be regarded as inventive step.

30           The subject matter of the patent in suit was also obvious, since in the circuit according to E17 it was readily possible for the skilled person to select the response voltage of the Z-diode 520 in such a way that it was reached not only in the event of a total failure, but also in the event of a partial failure of the LED array 405.

31           III.       The judgment of the Patent Court withstands the appeal in the result.

32           1.       The scope of protection of the patent in suit in the versions of the main request and of the auxiliary requests I, II and IV is inadmissibly extended compared to that of the patent in suit as granted.

33           a)       According to the case law of the Senate, the subsequent inclusion of subject matter not protected by the patent in suit in the granted version in a patent claim leads to an extension of the scope of protection of the patent in suit. The patent nullity proceedings give the patent proprietor the

possibility to defend the property right in a restricted version. However, it does not serve the further purpose of shaping the patent. This function is rather assigned to the patent granting procedure alone. Therefore, a patent claim may not be amended in nullity proceedings in such a way that it includes subject matter not covered by the granted version (Federal Court of Justice, judgement of 14 September 2004 - X ZR 149/01, GRUR 2005, 145, 146 - elektronisches Modul).

34           b)    b) In the case in dispute, patent claim 1 as granted protects a circuit arrangement for operating a semiconductor light source. Thus, the circuit arrangement must only be suitable for operating a semiconductor light source, whereas the semiconductor light source in its spatial-physical configuration does not belong to the subject matter of patent claim 1. This is not altered by the fact that Figure 1, according to the description, is intended to show "a schematic of the circuit arrangement" and in addition to the supply source VB, the connection terminals A and B, the input filter means I, the current limiting network IV, the converter III, the voltage detection means II and the output terminals C and D, the semiconductor light source LB is also shown therein. This is because the scope of protection of a patent is determined by the patent claim, according to which the circuit arrangement is intended to have the suitability for operation of a semiconductor light source, but not to belong to it. Only patent claim 7 has as its object a signal lamp comprising both the circuit arrangement according to the invention and the semiconductor light source.

35           c)    Patent claim 1 in the versions of the main request as well as of the auxiliary requests I, II and IV shows the semiconductor light source as an additional subject matter compared to patent claim 1 in the granted version. Thus, as the Patent Court has already correctly recognized, the scope of protection is extended to circuit arrangements with a semiconductor light source.

36           This is also not in conflict with the case law of the Boards of Appeal of the European Patent Office, according to which the insertion of a further feature in the granted patent claim does not lead to an extension of the scope of protection if this feature interacts functionally with the subject matter of the

granted patent claim (see EPO, TBK of 12 July 2016 - T 57/12 - 3.2.06, paras. 4.9, 4.14). In the case in dispute, the granted patent claim already provides that the circuit arrangement is to be suitable for operating a semiconductor light source. However, there is no functional interaction between the circuit arrangement and the semiconductor light source added by the amended claim versions, since the latter serves to generate light and is therefore not related to the circuit arrangement.

37           2.       The subject matter of claim 1 as amended by auxiliary claim III is not patentable because it was obvious to the skilled person at the priority date on the basis of his knowledge of the subject matter and E3.

38           a)       E3 addresses current control circuits used to precisely control the output current of a power supply. The disclaimer identifies battery chargers as the largest single application for current regulated power supplies that require either constant current or constant power output characteristics. It also mentions motor driver applications that may also require regulated output current power supplies.

39           Figure 1 of E3, reproduced below, shows a 7.5 V power supply circuit which is operated in constant current mode at a low output current and switches to constant voltage mode when the current increases.

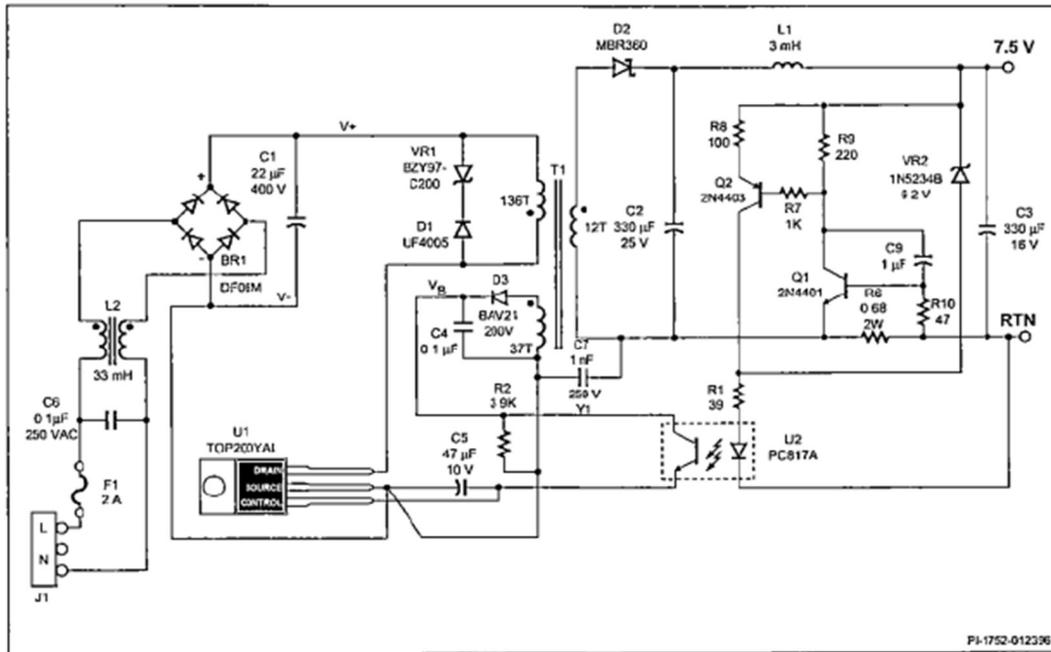


Figure 1. Simple, Low Cost Constant Voltage/Constant Current 7.5 V, 1A Supply Using the TOP200

- 40 In constant voltage mode, the output voltage is determined by the voltage drop across the Z-diode VR2 and the LED inside the optocoupler U2. The Z-diode VR2 ensures that the output voltage remains constant. The output voltage is measured by the resistor R6. If the voltage drop across R6 becomes sufficiently large, the transistors Q1 and Q2 are switched. Then current flows through the optocoupler U2 and the output voltage decreases. The Z-diode VR2 no longer conducts and the output current remains constant (E3, p. 2, left column).
- 41 The circuits shown in Figures 5 and 11 of E3 operate accordingly. There, too, the output current is monitored by means of a resistor R6 and current is passed through an optocoupler U2 when a certain value is reached (E3, p. 6, l. column; p. 13, r. column).
- 42 b) Thus disclosed is a circuit arrangement which has all the features of claim 1 in the version of auxiliary claim III with the exception of feature 1.5.5.1.
- 43 aa) The circuit arrangement has input terminals, input filter means, a converter and output terminals according to the features 1.1. to 1.4.1. of the teaching of the patent in suit, which is not disputed between the parties.



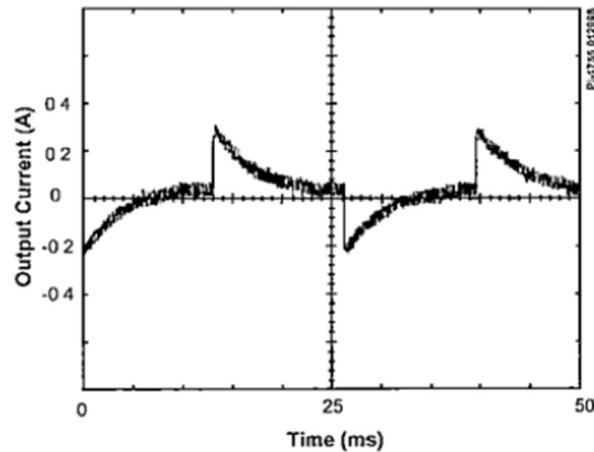


Figure 4 Output Current Transient Response for Simple, Low Cost Current Control Circuit

48 The E3 explains that Figure 4 shows the response to a stepped resistive load connected to the output of the power supply when operating in a current control mode so that the resulting output current can be observed using a DC probe (E3, p. 4, r. sp.). On the other hand, there is no indication in the E3 that, as the defendant argued at the oral hearing, current fluctuations during switch-on, even in the negative range, occur from Figure 4, which could contradict the suitability of the circuit arrangement disclosed in the E3 for the operation of a semiconductor light source.

49 cc) The Z-diode VR2 disclosed in Figure 1 of E3 limits the rise of the output voltage to a nominal value. The limitation of the voltage requires its detection. The Z-diode reacts to an impending rise in voltage by counteracting it. In this way, damage to the circuit arrangement and the connected load due to excessive voltage can be avoided, as is also the aim of the patent in suit. The Z-diode VR2 is thus a voltage detection means in the sense of features 1.5. and 1.5.3.

50 This is not contradicted by the fact that the Z-diode VR2 limits the output voltage only when the transistors Q1 and Q2 are switched off due to a low current flow through the resistor R6. For even according to the teaching of the patent in suit, it is only necessary to monitor the voltage when the current flowing through the semiconductor light source drops due to a defect. What is decisive is what function Z-diode VR2 has in the circuit disclosed in E3 during

the constant voltage mode, but not what triggers this function. The fact that Z-diode VR2 no longer conducts current in constant current mode is irrelevant.

51           dd)    The fact that the Z-diode VR2 is not directly connected to the output terminals on both sides does not prevent the realization of feature 1.5.2. According to the invention, such a direct connection is not necessary. In the example of the invention shown in Figure 2 of the patent in suit, the Z diode Z1 is connected on one side to the output terminal C and on the other side to an RC network and is thus likewise not directly connected to the output terminal.

52           ee)    Also disclosed is feature 1.5.4. according to which the voltage detection means is intended to enable detection of a defect. In the circuit arrangement shown in Figure 1 of E3, the Z-diode VR2 prevents the voltage from rising above the nominal value when the current drops. This is a sensible reaction to a defect that occurs, and is suitable for preventing damage to the circuit arrangement and the semiconductor light source. The fact that this reaction differs from the reaction in the embodiment example of the patent in suit, in which the detection of a defect leads to the semiconductor light source being switched off, does not prevent the feature from being realized, since the teaching of patent claim 1 leaves open which measure is to be taken when a defect is detected.

53           ff)    Characteristic 1.5.5. is also fulfilled. As explained, the signal S need only be such as to allow an appropriate response to the detected defect of the semiconductor light source. According to the parties' over- agreed submission, an increase in voltage results in an increased current flow through the Z-diode VR2 and the optocoupler U2, causing the voltage supplied by the input circuit to decrease. This is a measured response.

54           gg)    As explained, the E3 mentions battery chargers or motor driver applications as possible applications of the disclosed control circuit, but not the use for operating a semiconductor light source. Accordingly, the citation also does not disclose tuning the threshold voltage to the case of a partial defect of a semiconductor light source. Such a relationship does not readily follow from the mere disclosure of a nominal output voltage of 7.5 volts with respect to the embodiment example shown in Figure 1, and a nominal value of 15 volts for

each of the embodiment examples shown in Figures 5 and 9.

55           c)       However, the use of the circuit arrangement disclosed in E3 for  
operating a semiconductor light source was obvious to the skilled person.

56           aa)       Based on his expertise in the field of developing driver circuits for  
semiconductor light sources, he was aware that circuit arrangements for  
operating semiconductor light sources have a current generator as an energy  
source which supplies a constant current intensity. If light sources of the  
semiconductor light source are defective, this can lead to very high voltages at  
the output terminals and cause a short circuit and possibly damage or  
destruction of the circuit arrangement, as was also known to the skilled person  
(cf. patent in suit, para. 3 f.).

57           The skilled person was thus faced with the problem of finding an  
arrangement for circuit arrangements for operating a semiconductor light  
source, with which a strong voltage rise due to a defect of light sources is  
avoided.

58           bb)       In seeking a solution to this problem, he was also interested in  
E3 as it deals with control circuits for accurately controlling an output current of  
a power supply.

59           It is true that E3 mentions battery chargers as the largest single  
application of the control circuits, because these require either a constant  
current or a constant power output characteristic, and motor drives as a further  
application, because these require power supplies with controlled output  
current (E3, p. 1, first column). For the skilled person, however, this non-  
exhaustive list and the information on the mode of operation gave reason to  
consider the control circuits also in other application situations in which a  
control circuit with constant current or constant power mode or a power supply  
with controlled output current offers advantages.

60           Such an advantageous application situation also exists when using the  
control circuits for semiconductor light sources disclosed in E3. First of all,  
such a control circuit makes it possible to supply the semiconductor light  
source with current at a constant level. Should the skilled person consider the

current fluctuations shown in Figure 2 to be problematic for the operation of semiconductor light sources, it will be made clear to him, as already mentioned, by the further diagrams in Figures 6 and 12, which show a smaller fluctuation range, that such a fluctuation can be reduced by a suitable design of the circuit.

61 In addition, the Z-diode VR2 has the effect of preventing the voltage from rising above a certain threshold value when the current drops. In this respect, the constant voltage mode is not superfluous even when the control circuit disclosed in E3 is used, and there was no reason for the skilled person to discard the arrangement disclosed in E3 in the search for a control circuit for semiconductor light sources which avoids a sharp voltage rise due to a defect of light sources, or to think about a modification of the circuit arrangement in the sense of relying on the constant voltage mode.

62 cc) The skilled person will select the threshold value at which the voltage should not rise further as a result of a drop in the current value through the Z-diode VR2 according to the probability of the occurrence of a defect. Depending on the intended use, there may be a reason to set the threshold voltage - as provided for in characteristic 1.5.5.1 - to a value which already corresponds to the occurrence of a partial defect and not only to the occurrence of a full defect of the semiconductor light source.

63 This is also not contradicted by the fact that the circuit in the embodiment of the patent in suit reacts to the detection of a defect or partial defect by switching off the semiconductor light source (paras. 6, 15 f.), whereas E3 provides for a limitation of the operating voltage as a reaction; for, as already explained, the teaching of patent claim 1 does not specify which measure has to be taken when the voltage detection means has detected a defect or a partial defect of the semiconductor light source.

64 IV. The decision on costs is based on Sec. 121(2) Patent Act and Sec. 97(1) Code of Civil Procedure.

Bacher

Grabinski

Hoffmann

Deichfuß

Marx

Previous instance:

Federal Patent Court, decision of 22.02.2017 - 6 Ni 7/15 (EP) -