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**D E C I S I O N**  
**of 8 June 1994**

**Case Number:** T 0745/92 - 3.4.1

**Application Number:** 88201164.6

**Publication Number:** 0294901

**IPC:** H05B 41/30

**Language of the proceedings:** EN

**Title of invention:**  
Switching arrangement

**Applicant:**  
N.V. Philips' Gloeilampenfabrieken

**Opponent:**

-

**Headword:**

-

**Relevant legal norms:**  
EPC Art. 56

**Keyword:**  
"Inventive step (yes)"

**Decisions cited:**

**Catchword:**

Not obvious to combine the disclosures in two documents classified under the same IPC classification, even if the skilled person had considered them both together, having regard to the relevant objective problem to be solved.

**Case Number:** T 0745/92 - 3.4.1

**D E C I S I O N**  
**of the Technical Board of Appeal 3.4.1**  
**of 8 June 1994**

**Appellant:** N.V. Philips' Gloeilampenfabrieken  
Groenewoudseweg 1  
NL-5621 BA Eindhoven (NL)

**Representative:** Dusseldorp, Jan Charles  
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NL-5656 AA Eindhoven (NL)

**Decision under appeal:** Decision of the Examining Division of the European Patent Office dated 9 April 1992 refusing European patent application No. 88 201 164.6 pursuant to Article 97(1) EPC.

**Composition of the Board:**

**Chairman:** G. D. Paterson  
**Members:** Y. J. F. van Henden  
U. G. O. Himmler

## Summary of Facts and Submissions

- I. European patent application No. 88 201 164.6 (publication No. 0 294 901) was refused by decision of the Examining Division.
- II. The decision of the Examining Division is based on a single claim filed on 22 October 1991 and reading
- "a switching arrangement for ignition and operation with a stable discharge of at least one high-pressure discharge lamp, which arrangement is provided with ballast means stabilising the discharge during operation of the high-pressure discharge lamp and with at least two lamp connection points interconnected by a branch comprising a capacitor and a switching element, the capacitor also being connected to a charge voltage source, characterized in that the switching element is a gas-filled breakdown element."
- III. The Examining Division grounded its refusal substantially as follows:

Document

D2: EP-A-0 111 956

discloses an arrangement from which the subject-matter of the single claim on file merely differs in that the switching element is a gas filled breakdown element. Providing such an element in order to supply current from a capacitor very soon after breakdown of a discharge lamp whilst maintaining the use of a switching element is, however, disclosed in document

D1: FR-A-2 285 781.

Therefore, no exercise of inventive ingenuity is required from the skilled person to arrive at the claimed invention.

The Applicant's arguments, namely that (D1) would relate to a technical field remote from that of high pressure discharge lamps, and that a combination of the teachings given by (D1) and (D2) would not solve the technical problem underlying the invention, were not accepted. The Examining Division relied on the fact that documents (D1) and (D2) are classified in IPC main group H05B 41/00 and held that, when facing the problem which the invention seeks to solve, the skilled person would find both of them. Consequently, the claim filed on 22 October 1991 did not involve an inventive step.

- IV. The Applicant lodged an appeal against the decision of the Examining Division.
- V. The Board summoned the Appellant to attend oral proceedings, which were held on 8 June 1991.
- VI. The Appellant requested that the decision under appeal be set aside and that a European patent be granted on the basis of the claim refused by the Examining Division or, subsidiarily, on the basis of this claim with the insertion of ", and that the branch also comprises an impedance element in series with the capacitor" after the mention of a gas-filled breakdown element.

VII. In support of its requests, the Appellant argued essentially as follows:

The invention relates to a high pressure discharge lamp for general lighting, i.e. a lamp which operates in a continuous mode with a stable discharge. This, however, requires the provision of a ballast in the lamp's circuit, whereby the lamp's extinction is liable to occur during the take-over transition period. In contrast therewith, essentially non-stable discharges of short duration take place in flash lamps. The technical background of document (D1) is thus totally different from that of the application in suit. As a matter of fact, even if it were taken into consideration, (D1) would give no hint at the claimed invention. A first reason therefor is that the discharge tube (3) mounted in series with the flash tube (4) has to withstand high voltages. Furthermore, the time required according to (D1) for producing the flash discharge is longer than the take-over interval mentioned in the application. Finally, (D1) clearly teaches that the current supply from the pulse capacitor (2) should not be conducted via the secondary winding of a starting transformer. This, however, is not relevant to the present case for the latter does not involve any problem of delayed current supply via a transformer's secondary circuit.

VIII. At the conclusion of the oral proceedings, the decision was announced that the impugned decision is set aside and the case is remitted to the Examining Division with the order to grant a patent on the basis of the claim submitted on 22 October 1991.

## Reasons for the Decision

### 1. *Inventive step*

- 1.1 Document (D2) concerns circuits for ignition and operation of high pressure discharge lamps. According to the embodiment described there in relation with Figure 3 - see page 6, lines 10 to 32 - the terminals of a high pressure discharge lamp (3) are interconnected by a branch comprising a capacitor (5), an impedance element, namely the resistor (6), and a transistor switch (8) controlled by a command circuit (9). The capacitor (5) is also connected via a diode (4) to the voltage source (1) supplying current to the discharge lamp (3). When the voltage between the terminals of said source becomes lower than about 50V, the transistor (8) is rendered conductive, thereby allowing the capacitor (5) to discharge through the lamp (3) and thus enhancing the latter's re-ignition. Finally, a ballast means, namely the resistor (12) mounted in series with the lamp (3) limits the intensity of the current supplied by the source (1) and stabilises the discharge during operation of the lamp.

The technical problem which document (D2) addresses is that of maintaining, in a high-pressure discharge lamp energised by a rectified alternative current, a residual ionisation of the gas-filling when the voltage across said lamp approaches zero and increases again. To achieve this purpose, the re-ignition capacitor (5) of the arrangement disclosed in (D2) is connected to one of the lamp's terminals via a transistor switch (8) commanded by a control circuit (9).

The subject-matter of Claim 1 is distinguished over the switching arrangement known from (D2) in that the switching element is a gas-filled breakdown element instead of a transistor.

- 1.2 Document (D1) shows a circuit for operating a flash lamp, comprising a capacitor (2) which supplies a discharge current to a flash tube (4) when the emission of a flash is requested. Said capacitor is charged by a direct current source (1) and, since no spontaneous emission of a flash shall occur, the voltage of said source (1) is lower than the normal disruptive voltage of the flash tube (4). To command the discharge of capacitor (2), a plasma is produced within the discharge vessel by applying to the terminals of the flash tube (4) a high voltage pulse outputted by the secondary (7) of a transformer (6), which pulse is of shorter duration than the discharge of capacitor (2). To preclude a short-circuit of the starting pulse through the capacitor (2), document (D1) proposes to mount in the discharge path of said capacitor at least one further discharge tube (3) in series with the flash tube (4), which further discharge tube too is rendered conductive by the high voltage pulse from the transformer's secondary. This, however, is only achieved when the voltage across the secondary of the transformer (6) is already high.

- 1.3 The closest prior art to the claimed invention is clearly that disclosed in document (D2).

According to the application in suit, the problem underlying the claimed invention is that semiconductor elements generally switch comparatively slowly or, if

they are of a rapid switching type, are very expensive - see column 2, lines 45 to 49. This problem is solved, according to the claimed invention, by the use of a gas-filled breakdown element as a switching element, in place of the transistor switch (8) in document (D2).

- 1.4 When assessing inventive step, the disclosures of two prior documents (contained, for example, as in the present case, in the European Search Report) may only be combined so as to result in a finding of lack of inventive step in a claimed invention if, on an objective assessment, it would have been obvious for a skilled person, when seeking to solve the problem underlying the claimed invention but without knowledge of the claimed solution to that problem, so to combine them.

In the present case, as set out in paragraph III above, it appears that the Examining Division held that it would have been obvious to use a gas-filled breakdown element such as disclosed in document (D1) in place of a transistor switch as disclosed in the circuit of document (D2), primarily on the basis that both such documents were classified under the same section of the International Patent Classification (IPC), and without properly considering the points relied upon by the applicant to the effect that a skilled person would not have thought to combine the disclosures of documents (D1) and (D2) when seeking to solve the relevant objective problem underlying the claimed invention, even if he had considered them together.

- 1.5 In the present case, in the Board's view a skilled person who was starting from what is disclosed in



document (D2) and who was seeking to avoid the disadvantages associated with the use of switching transistors would not have taken document (D1) into consideration at all, for the reasons set out below.

- 1.6 In the circuit arrangement disclosed in document (D1), it is only after the voltage supplied by the secondary of transformer (6) has become superior to that of the dc source (1) that the discharge in the additional discharge tube (3) is initiated. Moreover, said additional tube is provided for precluding a discharge of the capacitor (2) through the secondary winding of the starting transformer (6), i.e. for solving a technical problem which, contrary to the Examining Division's opinion, is not the one underlying the present invention. Thus document (D1) does not give any hint concerning the claimed switching arrangement.

In the Board's judgment, the claimed invention goes away from routine measures by replacing a classical switching element, namely the transistor (8) of the circuit known from (D2), by a gas-filled breakdown element. Such an arrangement results in ignition circuits for high pressure discharge lamps which are both cheaper and more efficient, and thus solves technical problems which are a permanent concern of the person skilled in the art.

2. The claim submitted on 22 October 1991, therefore, involves an inventive step and is allowable - Article 52(1) EPC in conjunction with Article 56 EPC.
3. The case is remitted to the first instance. Before grant, the description should be brought into

conformity with the claim filed on 22 October 1991, by inserting the mention "with ballast means stabilising the discharge during operation of the high pressure discharge lamp" in the first paragraph of the description.

## **Order**

### **For these reasons it is decided that:**

1. The decision of the Examining Division is set aside.
2. The case is remitted to the first instance with the order to grant a European patent on the basis of the single claim filed on 22 October 1991.

The Registrar:

The Chairman:

M. Beer

G. D. Paterson