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**D E C I S I O N**  
**of 22 September 1999**

**Case Number:** T 0889/96 - 3.3.5

**Application Number:** 89311790.3

**Publication Number:** 0372733

**IPC:** C06D 5/06

**Language of the proceedings:** EN

**Title of invention:**

Pyrotechnic gas generating mixture for inflating airbags

**Applicant:**

Automotive Systems Laboratory Inc.

**Opponent:**

Dynamit Nobel Aktiengesellschaft

**Headword:**

Inflating airbags/AUTOMOTIVE SYSTEMS

**Relevant legal provisions:**

EPC Art. 123(2), 56

**Keyword:**

"Amendments - allowable"

"Addition of product claims in examination procedure - yes"

"Inventive step - yes"

"Non-obvious mixture of known components"

**Decisions cited:**

T 0122/90, T 0187/91, G 0007/95

**Catchword:**

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Boards of Appeal

Chambres de recours

Case Number: T 0889/96 - 3.3.5

**D E C I S I O N**  
**of the Technical Board of Appeal 3.3.5**  
**of 22 September 1999**

**Appellant:** Dynamit Nobel Aktiengesellschaft  
(Opponent) Kaiserstrasse 1  
53840 Troisdorf (DE)

**Representative:** -

**Respondent:** Automotive Systems Laboratory Inc.  
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**Representative:** Woods, Geoffrey Corlett  
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**Decision under appeal:** Interlocutory decision of the Opposition Division  
of the European Patent Office posted 30 July 1996  
concerning maintenance of European patent  
No. 0 372 733 in amended form.

**Composition of the Board:**

**Chairman:** R. K. Spangenberg  
**Members:** G. J. Wassenaar  
M. B. Günzel

## Summary of Facts and Submissions

I. The appeal is from the decision of the Opposition Division to maintain European patent No. 0 372 733 in amended form with claims 1 to 5 according to the auxiliary request filed during oral proceedings on 12 June 1996. The appellant's main request, rejection of the opposition and maintenance of the patent as granted, was refused on the grounds of non compliance with Article 123(2) EPC; opposition ground under Article 100(c) EPC.

Claim 1 as granted reads as follows:

"A non-toxic, non-azide pyrotechnic material suitable for use in generating a gas on combustion to inflate an automobile or aircraft safety crash bag, said material comprising:

(a) at least one tetrazole or triazole compound containing hydrogen in the molecule; in admixture with

(b) ammonium perchlorate and alkali metal nitrate as oxidiser compound; and

(c) a combustion rate modifier."

II. The Opposition Division's reasons for regarding claim 1 as granted as infringing Article 123(2) EPC can be summarized as follows.

The claims as originally filed related to a process for inflating a safety crash bag, whereby the primary gas, generated by combusting the pyrotechnic material, was

diluted with air aspirated through a venturi. The original application consistently disclosed that only through the dilution step did the contemplated pyrotechnic composition yield a gas mixture which was sufficiently non-toxic to be used in a safety crash bag. The dilution step was thus an essential feature of the invention and could not be left out of the claims and the description without infringing Article 123(2) EPC.

III. In the statement of the grounds of appeal the appellant (proprietor) argued essentially as follows.

The original application was directed to the use of pyrotechnic material in a method of inflating a safety crash bag. Although the pyrotechnic material according to claim 1 as granted was not claimed in the application as originally filed it was clearly disclosed in the original application. By claiming the material the scope of protection was broadened, which was allowable under Article 123(2) EPC. The original technical teaching, however, remained unchanged. Moreover, according to the original disclosure, the claimed pyrotechnic material was "particularly" but not "exclusively" suitable in conjunction with a system in which outside air was aspirated to dilute the combustion products. With the present invention two problems were solved. The claimed material solved the problem of toxicity and instability of prior art pyrotechnic material itself, while the method including the dilution step reduced the concentration of toxic combustion gases. The pyrotechnic material could also be considered as an intermediate product in the process of inflating the safety crash bag. The application as

originally filed disclosed a process comprising separate steps to inflate the safety crash bag; manufacture of the pyrotechnic material, combustion of it and dilution of the combustion products. The pyrotechnic material itself was produced at the end of the first step and formed a stable product. In analogy to the case considered in T 122/90, a later claim for an originally disclosed stable intermediate product could not be considered as introducing new matter.

- IV. The respondent did not make any observations during the appeal stage. The respondent's arguments put forward before the Opposition Division with respect to the product claims as granted can be summarized as follows.

With respect to Article 123(2) EPC:

According to the original application the invention was presented as an improved method for inflating a safety crash bag and the claims were drafted accordingly. There was no indication that the pyrotechnic material itself was an invention, so the public could not expect that, later in the granting procedure, the scope of protection would be extended by claims directed to such material, independent of the process. The aim of the invention was the reduction of toxic gases during inflation. In the original application it was indicated that pyrotechnic material known in the art could be used which generated a primary gas containing toxic gases and that only through the aspiration of outside air according to the claimed process were the toxic gases reduced to an acceptable level. The amendments implied, in contradiction to the application as filed, that only the now claimed pyrotechnic material was

suitable for the claimed process. Even in the patent in suit it was indicated that the material alone did not solve the problem of providing a gas with an acceptably low level of toxic species.

With respect to inventive step:

Component (a) of claim 1 was disclosed in

D1: US-A-4 370 181.

The oxidisers according to component (b) of claim 1 were equivalent to the oxidiser mentioned in D1; their choice was arbitrary. The use of a combustion rate modifier, component (c), was obvious to the skilled person and did not contribute to the solution of the problem of reducing toxic gases.

- V. The appellant requested that the decision under appeal be set aside, the opposition be rejected and the patent be maintained as granted.

### **Reasons for the Decision**

1. The appeal is admissible.
2. *Amendments* (Article 123(2) EPC)
  - 2.1 Claim 1 has no direct counterpart in the claims as originally filed but it is uncontested that its subject matter has been disclosed in the application as originally filed (pages 5 to 6, pages 9 to 11 and

examples 3 to 6). According to Article 123(2) EPC an application may not be amended in such a way that the amended application contains subject matter which extends beyond the content of the application as filed. Within the meaning of Article 123(2) EPC the contents of the application as originally filed comprises all the technical elements which have been disclosed in the original application as invention. It is not necessary, in the Board's judgement, that the original claims comprised all these elements. For an amended claim to be allowable under Article 123(2) EPC it is, in the Board's judgement, sufficient that the skilled person can see that the technical features of the amended claim belong to the invention as originally described (see also Schulte, Patentgesetz mit EPÜ, 5. Auflage, page 468, under 6(c) and T 187/91, OJ EPO 1994, 572).

The Board further considers that in many cases claims in more than one category are necessary to obtain adequate protection (see e.g. Guidelines for Examination in the EPO, C-III, 3.1). If a method to obtain a desired technical effect requires the use of a product which is specifically designed for the method it is generally allowable not only to direct claims to the method but also to the product used in the method provided that the product has been sufficiently disclosed. By the same token if such a product claim has been omitted in the application as filed, it follows from the above that it may be added later.

- 2.2 The Opposition Division's reasons for rejecting claim 1 are not convincing. The Board agrees that the dilution step is an essential feature of the process as originally disclosed and that deletion of this feature



from a process claim would violate Article 123(2) EPC. The dilution step is, however, not a feature of the product claim. The product as it stands contains all the essential features for the use of the product in the claimed process so that the argument that an essential feature is missing cannot be used against the product claim.

- 2.3 This finding is consistent with decision T 122/90 of 19 November 1990, not published in OJ EPO (see in particular point 3.2), where it was held that a claim to an intermediate product used in a process for preparing an end product can be added without infringing Article 76(1) EPC, although it lacks the additional essential features of the said process. The Board agrees with the Appellant in that the present situation is similar, because the definitions of what constitutes prohibited added matter are the same in Article 76(1) EPC and in Article 123(2) EPC.
- 2.4 The respondent's argument that, on the basis of the original application, the public could not expect claims directed to the pyrotechnic material itself, is not relevant with respect to Article 123(2) EPC. This Article is silent about the scope of protection. In contrast to Article 123(3) EPC, which does not allow extension after grant to the scope of the protection conferred after granting, ie during opposition proceedings, the Board considers that it is generally recognised that under Article 123(2) EPC the scope of protection can be extended and that subject-matter which was originally presented as part of the invention can additionally be claimed during the grant procedure. There is no legitimate expectation derivable from

Article 123(2) EPC that no protection would be sought for subject-matter originally disclosed but not claimed in the application as filed.

2.5 The fact that the claimed pyrotechnic material alone does not solve the problem indicated in the original application is also not relevant with respect to Article 123(2) EPC. It was never pretended in the original application that it could solve the problem alone. Therefore, the addition of a claim directed to a particular pyrotechnic composition is not contradictory to the content of the original application nor does it create any new technical information. It cannot, therefore, be objected to under Article 123(2) EPC.

2.6 The objections under Article 123(2) EPC raised against the patent in suit are thus not founded and the Board holds that the amendments in the patent in suit are in conformity with the said article.

3. No novelty objection has been raised against the patent in suit. Therefore, novelty is not at issue in this appeal (see G 7/95, OJ EPO 1996, 626).

4. *Inventive step*

4.1 It is undisputed that D1 represents the closest prior art. This document discloses pyrotechnic material comprising compound (a) of claim 1 and oxygen containing oxidisers such as potassium perchlorate. In the same document these mixtures were, however, regarded as unsuitable for generating gas for the inflation of safety crash bags because they tend to form various toxic species such as hydrogen cyanide,

nitrogen oxides and carbon monoxide. To overcome this disadvantage D1 proposes replacing the oxygen-containing oxidiser with oxidisers which contain no oxygen in the molecule such as sulphur, molybdenum disulphide and chromium trichloride (column 2, lines 35 to 55). In the patent in suit a completely different solution to the problem of avoiding, or at least reducing, the amount of toxic species in the inflating gas is presented, comprising the choice of a particular combination of oxygen comprising oxidisers (component (b)), the use of a combustion modifier (component (c)) and diluting the primary gas obtained by combusting the pyrotechnic material with air. This solution, embodied by the process of claim 6, was, in the decision under appeal, considered to involve an inventive step. Indeed, D1 does not contain any pointer to compositions of matter according to claim 1, comprising a combination of ammonium perchlorate and alkali metal nitrate as oxidiser compound (component (b)). In the absence of any other document pointing to the claimed selection of compounds, the product of claim 1 cannot be derived in an obvious manner from the state of the art.

- 4.2 The respondent's argument that the composition of claim 1 did not involve an inventive step because component (b) was equivalent to potassium perchlorate mentioned in D1 and its choice was therefore arbitrary, cannot be accepted. Although the reasons for its preference over potassium perchlorate are not expressly explained in the patent in suit, it can be inferred therefrom that the claimed combination of nitrogen containing compounds generates on ignition highly desirable nitrogen gas which potassium perchlorate

cannot generate. For the present purpose the combination of ammonium perchlorate and sodium nitrate is therefore not equivalent to the use of potassium perchlorate. The selection is thus not arbitrary but a purposeful choice to optimise the amount of gas for inflating the safety crash bag. The Board, therefore, holds that the pyrotechnic material of claim 1 is specifically adapted for use in generating a gas on combustion to inflate a safety crash bag and, not being obvious in view of the available prior art, involves an inventive step.

4.3 Claims 2 to 5 are dependent upon claim 1. The inventive step of their subject-matter follows from their dependency upon an inventive product. Claim 6 is equivalent to claim 1 of the auxiliary request accepted by the Opposition Division in the decision under appeal. Since no appeal was lodged against that part of the decision claim 6 must stand.

5. The Board observes that the description of the patent in suit is not properly adapted to the claims as granted and that not all the examples are in conformity with the granted claims. These deficiencies are, however, not related to a ground of opposition so that the Board has no power to require their removal.

## **Order**

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

1. The decision under appeal is set aside.

2. The patent is maintained as granted.

The Registrar:

The Chairman:

S. Hue

R. Spangenberg