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File Number: T 759/90 - 3.2.3  
Application No.: 82 107 386.3  
Publication No.: 0 073 385  
Title of invention: Multiple component penetrator projectile

Classification: F42B 13/04

D E C I S I O N  
of 24 June 1992

Proprietor of the patent: GTE Products Corporation  
Opponent: 01) Werkzeugmaschinenfabrik Oerlikon-Bührle AG  
02) Teledyne Firth Sterling  
03) Pechiney  
04) Pacific Technica Corporation

Headword:

EPC Art. 54(3), 56, 123

Keyword: "Novelty (yes) - Inventive step (yes)"



Case Number : T 759/90 - 3.2.3

**D E C I S I O N**  
of the Technical Board of Appeal 3.2.3  
of 24 June 1992

**Appellant :**  
(Opponent 04)

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**Respondent :**  
(Proprietor of the patent)

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Decision under appeal :

Interlocutory decision of the Opposition Division  
of the European Patent Office dated  
13 March 1990, issued 19 July 1990, concerning  
maintenance of European patent No. 0 073 385 in  
amended form.

Composition of the Board :

Chairman : C.T. Wilson  
Members : K.W. Stamm  
L.C. Mancini

**Summary of Facts and Submissions**

I. European patent No. 0 073 385 was granted on 12 November 1986 with four claims in response to European patent application No. 82 107 386.3, filed on 13 August 1982.

II. Notices of opposition were filed by  
Opponent I, received on 9 June 1987,  
Opponent II, received on 11 August 1987,  
Opponent III, received on 10 August 1987 and  
Opponent IV, received on 11 August 1987,

requesting revocation of the patent on the grounds according to Article 100(a) EPC.

The opposition was based, inter alia, on the following documents:

- D1: EP-A-0 051 375
- D3: FR-A-1 231 010
- D4: FR-A-75 765
- D5: GB-A-1 514 908
- D12: US-A-3 888 636.

III. The Proprietor submitted the following amended Claim 1, received on 28 February 1990:

"1. A multiple component penetrator projectile (10, 20, 30) comprising a nose component (18, 24, 38), a body component (12, 22, 32) and a tail component (14, 26, 34) joined to one end of said body component, said body component consisting of a frangible tungsten material selected from

tungsten alloys selected from the group consisting of  
98% W-2% Ni;  
97% W-2.1% Ni-0.9% Fe; and

tungsten doped with about 400 parts per million of nickel,

said tail component (14, 26, 34) consisting of a machineable two-phase, multi-component tungsten alloy containing nickel and at least one other metal and in which one phase is essentially tungsten and the other phase is a solid solution of nickel, tungsten and the other metal or metals, the density of said two-phase, multi-component tungsten alloy being at least 16.7 grams/cm<sup>3</sup>."

- IV. In its decision of 13 March 1990, issued on 19 July 1990, the Opposition Division maintained the patent in amended form.
- V. The Appellant (Opponent 04) filed a Notice of Appeal received on 20 September 1990 and paid the appeal fee at the same time. The Statement of Grounds was received on 28 November 1990. The Appellant is of the following view:
- (a) A projectile as defined by Claim 1 is substantially anticipated by document D1.
  - (b) The body component material is defined in D1 as frangible tungsten alloy which has a density in the range of 17 to 19 g/cm<sup>3</sup>. The material selection according to Claim 1, having a density of at least 16.7 g/cm<sup>3</sup>, is only a selection from that material. It is obvious to anybody skilled in the art that there is concerned the very same material quality of the same density range.

- (c) No qualifying test data are contained in the patent documents. Therefore, it can not be seen why or in which respect the claimed alloy components are superior with respect to others. No technical progress or inventive step can be seen with respect to a component rating e.g. 96% W-4% Ni or e.g. 99% W-1% Ni.
- (d) There are no results disclosed in the patent documents; if appreciable differences regarding technical properties are alleged, such properties should, however, have been disclosed in order to reproduce the technical advance.
- (e) The specific material rating cannot be claimed to have been "developed" since it is known according to documents D3, D4, D5 and D12.

VI. The Respondent (Proprietor) argues in his letter, received on 25 June 1991:

- (a) Document D1 is a document under Article 54(3) EPC and may not be used, therefore, in an assessment of inventive step.
- (b) D1 discloses, having regard to the body component, only a listing of desired physical properties of the material but no specific composition, whilst, in contrast, Claim 1 indicates specific chemical components. D1 is unable to anticipate the subject-matter of Claim 1.
- (c) The man skilled in the art was confronted with a plethora of possible materials for the body part. The specific compositions listed in Claim 1 are not the result of an obvious choice from the plethora of

possible materials mentioned or hinted at in the prior art documents.

- (d) The compositions listed in Claim 1 have not previously been known and consequently the results of the invention were not predictable.

VII. The Appellant requests to set the contested decision aside and to revoke the patent in full extent.

The Respondent requests to dismiss the Appeal and to confirm the appealed decision.

VIII. Opponents O1, O2 and O3, although having neither appealed nor filed any observations on the appeal, are parties to the appeal proceedings as of right (Article 107 EPC).

#### Reasons for the Decision

1. The appeal is admissible.

2. Amendments

The addition in amended Claim 1 of the words "a nose component" and of the specification concerning the material of the tail component correspond to originally disclosed features. The feature "annealed tungsten" in granted Claim 1 is deleted in the amended version; it was mentioned in the granted claim as one of several options. Deletion of optional features and addition of specifying ones does not extend the scope of protection of the claim as granted. The amendments in the description underlying the contested decision relate to the amended Claim 1 and to linguistic corrections. Thus, the amendments meet the requirements of Article 123(2) and (3) EPC; they are admissible.

3. Novelty

The opposed patent was filed on 13 August 1982 claiming priority of 31 August 1981. Document D1 however has a filing date of 15 October 1981, a priority date of 5 November 1980 and a publication date of 12 May 1982, so that Document D1 clearly comprises prior art according to Article 54(3) EPC. The document does not specify the composition of the material of the body component as defined in Claim 1; it cannot, therefore, anticipate the subject-matter of the claim.

The Appellant - who is the proprietor of document D1 - argues in his Statement of Grounds that D1 disclosed further features which had not been taken into account in the appealed decision. The Appellant mentions that not only "the body component being made of frangible material consisting of tungsten or tungsten and copper or equivalent material" was disclosed in D1, but also that the material is defined as a "frangible tungsten alloy which has a density preferably in the range of 17 to 19 g/cm<sup>3</sup>" (page 15, lines 4/4).

Even if it is assumed, as the Appellant concludes, that the subject-matter of Claim 1 would satisfy the above general density and material conditions, such general disclosure is nevertheless no sufficient factual anticipation of the specifically detailed composition defined in Claim 1.

The other cited documents are less close to the invention. The subject-matter of Claim 1 is, therefore, novel.

4. Prior art, technical problem and solution

4.1 Document D1, as mentioned, falls under Article 54(3) EPC. Since this document does not disclose the subject-matter of Claim 1, the further teaching of that document is not to be considered when assessing inventive step. It cannot, therefore, be used when establishing the problem to be solved.

4.2 According to document D4 the body component of a multiple component penetrator projectile consists of a high hardness metal, for instance sinter tungsten carbide, and the tail component consists of a high density metal, for instance sinter tungsten or uranium 238. Document D4 does not contain precise information regarding the composition of the materials.

In document D3 there is disclosed a multiple component penetrator projectile of which the tail component consists of tungsten alloy with a high content of tungsten or a material with at least the density of the body but less expensive and more machineable. It is suggested to use for the body component 80% of tungsten and preferably an alloy of Cu + W, Ni + W, Cu + W or Cu + Ni + W. No indications are given relating to the specific compositions defined in Claim 1.

According to the description it is the object of the invention to provide a multiple component penetrator projectile which provides flexibility in manufacture and overcomes some of the problems associated with the prior art and constitutes an advancement in the art.

4.3 The projectile according to Claim 1 uses material compositions in particular for achieving specific effects of frangible material upon impact of the body component together with machineable compositions for the tail

component. It appears sufficiently plausible that this combination of frangible and workable material achieves improvements in relation to each one of documents D3 and D4 and that this problem is solved.

5. Inventive step

5.1 Documents D3 and D4 do not present obvious information which would invite the skilled person to use frangible materials and the combination of features as claimed (cf. above under 4.2).

5.2 Document D5 refers to armour piercing projectiles of hardness sufficient to penetrate armour plating and of ductility sufficient to pass through the fractured armour without shattering. It is supposed that the unit passes through the fractured armour in a relatively unaltered condition.

The main body of the missile has one region formed from a sintered powdered metal composition possessing relatively lower overall hardness, high tensile strength and high modulus of rigidity and another region thereof formed from a sintered powdered metal composition possessing relatively lower overall hardness, higher ductility and lower tensile strength in comparison with the composition forming said first region, said two compositions forming an integral structure, having been processed together by a common powder metallurgical method to form an integral bond between the two compositions.

No reference is to be found as regards specific use of frangibility, this idea appearing incompatible with the given technical conditions, viz. the unit being supposed to pass the fractured armour in unaltered condition.

5.3 Document D12 relates to high density, high ductility, high strength tungsten-nickel-iron alloy. It is regarded as imperative that the penetrator remain integral upon impact if successful penetration of spaced armour layers is to be achieved. This is again a technical assumption leading in a direction opposite to the one in which the claimed solution lies.

5.4 None of the documents cited by the Appellant (except D1 which is to be neglected in the context of inventive step) could have invited the skilled man to suggest the material compositions defined in Claim 1 using in particular frangible materials as specified in the claim.

The remaining documents cited in the contested decision (i.e. D6 to D14) do not imply information which could alter this statement. D2 represents state of the art in the sense of Article 54(3) EPC only and is not relevant to the question of inventive step.

5.5 The subject-matter of Claim 1 is to be regarded, therefore, as involving an inventive step and is patentable.

Claims 2 to 4, dependent on Claim 1, remain valid also.

6. Hence the Appeal is not allowable.

7. Since this decision confirms, in substance, the decision of the first instance under appeal and since the Appellant has had ample opportunity to comment upon all substantive points referred to in this decision, the Board did not consider it to be necessary in this case for it to issue a provisional opinion as a communication under Article 110(2) EPC: such communication need only be issued if this is deemed necessary by the Board.

Order

For these reasons it is decided:

The Appeal is dismissed.

The Registrar



N. Maslin

The Chairman



C.T. Wilson

Jan 18.8.92  
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