BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

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File Number: T 121/89 - 3.2.3

Application No.: 82 302 124.1

Publication No.: 63 942

Title of invention: Delay detonator

Classification: F42B 3/16

D E C I S I O N
of 25 June 1991

Proprietor of the patent: E.I. Du Pont De Nemours & Company

Opponent: Nitro Nobel AB

Headword:

EPC Art. 56 EPC

Keyword: "Novelty (yes)" -
"Inventive step (no)"

Headnote

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number : T 121/89 - 3.2.3

D E C I S I O N
of the Technical Board of Appeal
of 25 June 1991

Appellant : (Opponent)
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Representative :
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Decision under appeal :
Decision of Opposition Division of the European Patent Office dated 22 December 1988 rejecting the opposition filed against European patent No. 63 942 pursuant to Article 102(2) EPC.

Composition of the Board :

Chairman : C.T. Wilson
Members : R. Gryc
W. Moser

Summary of Facts and Submissions

I. European patent No. 63 942 comprising seventeen claims, was granted to the Respondent on 31 July 1985 on the basis of European patent application No. 82 302 124.1 filed on 26 April 1982.

Claim 1 as granted reads as follows:

"1. A delay detonator comprising a tubular metallic detonator shell (1) integrally closed at one end (1a) and closed at the other end (1b) by an ignition assembly for igniting a train of charges in the detonator, the detonator containing, in sequence from its integrally closed end,
(a) a base charge (4) of a detonating explosive;
(b) a priming charge (5) of a heat-sensitive detonating explosive; and
(c) a pressed delay charge (6) of an exothermic-burning composition; characterised in that a loose pulverulent, flame-sensitive ignition charge (7) separates said delay charge from said ignition assembly to produce more uniform delay timing, said loose ignition charge (A) having a free surface (20) and (B) being adapted to be ignited in response to direct contact with flame emitted from the ignition of a charge (3) in said ignition assembly.

II. After an opposition filed by the Appellant had been rejected by a decision of 22 December 1988 of the Opposition Division, the Appellant lodged an appeal on 16 February 1989 and paid the relevant fee on 17 February 1989.

In its statement of grounds filed by telecopy on 2 May 1989 the Appellant requested that the patent be revoked on the ground of lack of novelty or inventive step of the

subject-matter of claim 1 as granted in view of the state of the art described in GB-A-1 587 960.

III. In a communication to the parties dated 13 February 1991, the Board invited the parties to comment on its provisional opinion which set out its doubts whether the subject-matter of claim 1 could be considered as inventive in comparison with the delay initiator depicted in Figure 2 of document US-A-3 021 786 cited in column 2, line 1 of the impugned European patent. In the communication the Board concluded its analysis in the following terms:

"Consequently, the only feature which could possibly be considered to distinguish the delay detonator of claim 1 of EP-A-63 942 from the above-mentioned state of the art seems to be the size of the constituent particles of the second ignition charge, which are described as "pulverulent" according to the invention rather than "preferably grained" for the known mixture.

However, since the use of pulverulent ignition mixtures appears to be common practice in the art (cf. US-A-2 604 044, US-A-2 761 386, US-A-3 173 367...), the Board has considerable doubts whether the subject-matter of claim 1 can be considered as inventive."

A period of two months was given to the parties to file observations on the provisional opinion of the Board.

IV. The Respondent (Patentee) did not reply at all and thus failed to take position on the specific points raised by the Board against the invention.

Reasons for the Decision

1. The appeal complies with Articles 106 to 108 and Rules 1(1) and 64 EPC and is admissible.

2. Interpretation of Claim 1

Only features recited in or deductible from the claims can be set forth to distinguish the invention from the state of the art. The examples cited in the description of a patent do not limit the scope of the claims unless they are explicitly mentioned in the claims.

In the present case, in the absence of explicit restrictions, the subject-matter of Claim 1 is thus not limited to delay detonators of the type used as examples in the description to describe in detail some ways of carrying out the invention claimed in application to Rule 27(1)(f) i.e. percussion-actuated or electric detonators. Likewise the statement in the description (cf. column 3, lines 26-30) that the invention provides an improvement in a detonator "adapted to be actuated electrically or by a percussive force applied to it..." should not be interpreted as a limitation of the invention to such detonators but as an indication that the improvement provided by the invention is particularly remarkable in said delay detonators.

Since, for the "charge" concept of the ignition assembly for igniting the train of charges of the claimed detonator, no more specific definition than "ignition composition" has been given in the description of the patent, this concept should not be considered as excluding an explosive gas composition.

As far as the expression "loose ignition charge" is concerned, a definition is given in the description of the patent (from column 6, line 60 up to column 7, line 20). Although the references to "Newtons" appear meaningless in the absence of any indication of the area over which these forces act, it is clear that the term "loose" can mean not only "uncompacted" (cf. column 6, lines 64, 65 and column 7, lines 1-6) but also "lightly pressed" (cf. column 7, lines 14,15).

The expression "free surface" according to the invention should be interpreted as "open surface", "not confined", "clear of obstructions", i.e. a free space intervenes between the loose ignition charge and the ignition assembly (cf. column 5, lines 21,22 and column 6, lines 25-27).

3. Novelty (Article 54 EPC)

The Board cannot agree with the Appellant's conclusion that the subject-matter of Claim 1 lacks novelty in comparison with the state of the art described in GB-A-1 587 960 for the following reasons:

- The metallic shell of the detonator according to Claim 1 is closed at one end by the ignition assembly and the loose ignition charge (7) is separated from the ignition assembly (i.e. from the explosive charge (3) in said assembly) by a free space which guarantees a free surface (20) to the loose ignition charge (7). On the contrary, the detonators according to the British document are of the type "which do not require an open space between the ignition charge and the plug closure member" (cf. page 1, lines 69-73 of this anticipation); and if the explosive gas mixture is to be regarded as the explosive charge of the ignition assembly of this

known detonator, no free space is provided between this explosive "charge" and the porous ignition charge (17) since, prior to initiation, the pores of charge (17) are charged i.e. filled with the explosive gas mixture (cf. page 3, lines 50-64).

- Moreover, the flame-sensitive ignition charge (7) according to Claim 1 is defined as "pulverulent" whereas in the detonator known from the British document, the corresponding charge should be porous and thus is not used in a pulverulent state but in a fragmentary state resulting from an agglomeration of particles with the fragments being screened to be free of fine particles and dust (cf. page 3, lines 10,11 and page 5, lines 36-46).

Therefore, the subject-matter of Claim 1 is novel having regard to GB-A-1 587 960.

Among all the other documents cited, either in the application as filed or during the proceedings, three of them i.e. US-A-3 021 786, US-A-2 604 044 and US-A-2 773 447 appear to be more relevant than GB-A-1 587 960. Nevertheless, the subject-matter of Claim 1 differs from the disclosure of the first and third documents in that the loose ignition charge (7) is defined as pulverulent and from the state of the art described in the second anticipation in that a pressed delay charge is provided.

Consequently, Claim 1 satisfies the conditions of the EPC as far as novelty is concerned.

4. The state of the art closest to the invention

Figure 2 of US-A-3 021 786 cited in the European patent (cf. column 2, line 1) discloses a delay detonator having an ignition assembly composed of the terminal end 8 of a length of LEDC, the core 10 of which constitutes a first ignition charge inside the detonator shell.

This primer charge 10 is separated by an air gap 7 (enclosed by a capsule 5 or open-ended tube, column 5, lines 38-52) from a second ignition charge 4 which may be a mixture of the same chemical composition as the loose ignition charge according to the invention, i.e. boron or silicon and red lead (compare column 4, lines 63-68 of the US patent and column 6, lines 50-52 of the European patent).

This known second ignition charge 4 is compacted to sufficient pressure to retain the composition in the shell (cf. column 5, lines 25-27 of the US patent), i.e. lightly pressed in the same way as the "loose ignition charge" according to the invention (see column 7, lines 14,15 of EP-A-63 942). It is also appreciated therein that the degree of compaction affects the delay period (see column 5, lines 19-21).

Therefore, as already stated under paragraph III of the present decision, since this US document teaches that the second ignition charge (i.e. exothermic-burning composition 4) should preferably be grained prior to use by the treatment of the boron-red lead composition with neoprene, the only feature which distinguishes the subject-matter of claim 1 from this closest state of the art appears to be the pulverulent state of the loose ignition charge (7).

5. Inventive step (Article 56 EPC)

Starting from the above-mentioned state of the art, the problem to be solved appears to consist of accelerating the burning of the exothermic-burning composition in order to increase the accuracy of the delay detonator without an addition in the delay time provided by the delay charge. The solution given in Claim 1 is the use of a flame-sensitive ignition charge in a loose pulverulent state. As already clearly expressed in the communication of the Board dated 13 February 1991 (cf. paragraph III supra), the use of pulverulent ignition mixtures appears to be common practice in the art and is described in many of the documents cited during the proceedings. Moreover, the skilled man knows in particular from US-A-3 021 786 that the delay period is dependent upon the amount of compaction of the burning composition (cf. column 5, lines 19-23). Consequently, no inventive step can be seen in the use of a loose powder instead of particles grained for example by a treatment with neophrene according to the US document.

6. The Respondent has failed to take position on this specific point raised by the Board in its communication, although the provisional conclusion of the Board at that stage was that considerable doubts exist with regard to the patentability of Claim 1.

The reasoned opinion indicated in said communication not being rebutted, the Board can see no valid reason for changing it, with the inevitable consequence that Claim 1 cannot be allowed on the ground of lack of inventive step (Articles 56 and 100(a) EPC) of its subject-matter in view of the teaching of US-A-3 021 786 together with the general knowledge of the person skilled in the art. Consequently, the patent in suit has to be revoked (Article 102(1) in connection with Rule 66(1) EPC).

Order

For these reasons, it is decided that:

1. The decision under appeal is set aside.

2. The European patent No. 63 942 is revoked.

The Registrar: **The Chairman:**

N. Maslin **C.T. Wilson**