



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
08.05.2013 Bulletin 2013/19

(51) Int Cl.:
F42B 3/103 (2006.01) F42B 3/195 (2006.01)

(21) Application number: **12003022.6**

(22) Date of filing: **30.04.2012**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

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(30) Priority: **02.11.2011 CZ 201125059 U**

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(54) **High performance initiator**

(57) The initiator consists of a plastic body (8), electrical contacts (9), a cover (7), an outer container (5) containing a booster pyrotechnic material (6), an inner container (3) which contains a primary pyrotechnic material (4) and a holder (1) of said contacts (9), which towards front the initiator has a reduced diameter (2), where the inner container (3) is sealed over the circumference of

the reduced diameter (2) of holder, the inner container (3) being located within said outer container (5), the inner and outer container being hermetically sealed, preferably by laser welding (10a, 10b) to the holder (1) along their inner edges adjacent to the holder (1) of contacts where the adjacent outside edge of the outer container (5) is integrated into the plastic body (8) which carries also contacts (9) at the same time.

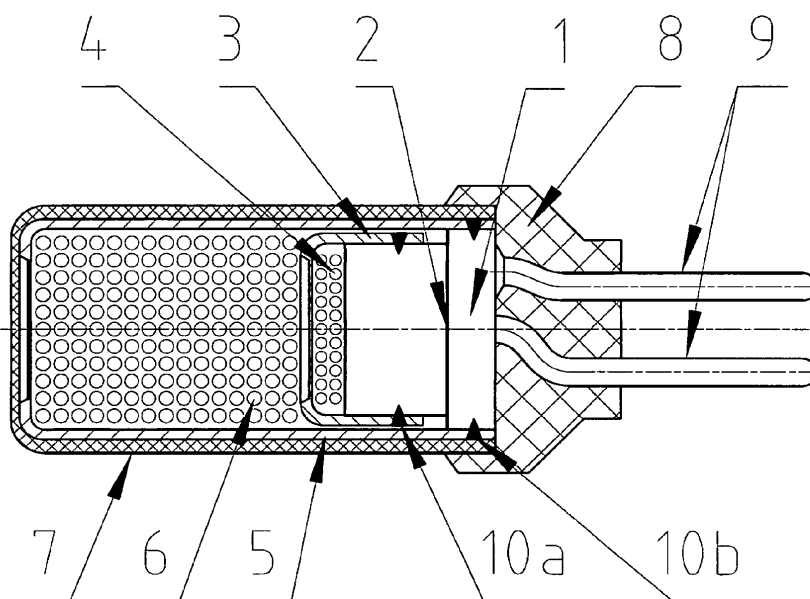


Figure 1

Description

Field of the Invention

[0001] The invention relates to a compact the high performance initiator for high loading of pyrotechnic material or other energetic materials which use separate sealed inner container for very sensitive primary pyrotechnic material and hermetically separated outer container for very high load of booster pyrotechnic material. It is intended to ensure the function of various security systems, especially in automotive safety systems.

Background of the Art

[0002] Currently there are advantageously used pyrotechnic initiators in the automotive industry or in other related industries for some applications.

[0003] Increasing demands on the ignition performance of pyrotechnic initiators, trends of simplifying products for automotive safety systems and operations and also their manufacturing processes cause that it is essential to insert higher amount of different energetic materials into these elements.

[0004] In reality, it is for standard well known designs of initiators currently solved by increasing length of a metal container into which the larger amount of pyrotechnic materials are filled. These booster pyrotechnic materials adversely affect sensitive primary pyrotechnic material due to its chemical composition, content of volatile substances and moisture. These negative impacts could lead to degradation of the product or in the worst case to the failure of the initiator. It means that the possibilities of increasing the performance of pyrotechnic initiators through a simple increase of the pyrotechnic materials amount are limited and they are practically already exhausted.

Summary of the Invention

[0005] The disadvantages and imperfections of the known high performance initiators, designated especially for the automotive industry, largely eliminates high performance initiator for high loading of pyrotechnic material or other energetic materials according to invention. Nature of the invention consists in the fact that the initiator contains the holder of contacts, which creates on its surface the reduced diameter of holder of contacts, on the said reduced diameter the inner container is put which contains primary pyrotechnic material and on its circumference is sealed with reduced diameter of holder of contacts, over the inner container outer container is placed, which contains booster pyrotechnic material and which is adjacent on its inner edge to the holder of contacts and sealed with it around the circumference, while the adjacent part of the holder of contacts with the edge of the outer container is integrated into the plastic body which supports also contacts at the same time.

[0006] High performance initiator for high loading of pyrotechnic material according to the invention has advantageously the circumference connection of the inner container and the reduced diameter of holder of contacts and/or connection of the outer container with the holder of contacts hermetic performed by laser weld. The volume of the outer container which contains booster pyrotechnic material is advantageously equal to 1 to 200 times the volume of the inner container containing primary pyrotechnic material. The outer container can be surrounded by an insulating cup edges of which are then integrated into the plastic body.

[0007] High performance initiator according to the invention is a compact initiator with arbitrarily large and hermetically separated outer container for very high loading of the booster pyrotechnic material which has hermetically separated sensitive primary pyrotechnic material from other used pyrotechnic materials or other energetic materials.

List of Drawings

[0008] Specific design of the high performance initiator for high loading of pyrotechnic material or other energetic materials according to the invention is shown in the attached drawings in which Fig. 1 represents the initiator in the axial cross-section.

Example

[0009] High performance initiator for high loading of pyrotechnic material or other energetic materials shown in Fig. 1 consists of the holder 1 of contacts, which is put at the reduced diameter 2 of holder and by the first laser weld 10a sealed to the metal inner container 3 containing the primary pyrotechnic material 4 (forms the GTMS subassembly), on the place of the holder 1 of contacts is the metal outer container 5 placed over the inner container 3, the said metal outer container 5 contains the booster pyrotechnic material 6 and by second laser weld 10b for the sealing of outer container 5 is performed with the holder 1 of contacts, and whole thus created subassembly is covered by insulated cover 7 surrounding the outer container 5 and holder 1 of contacts with the edge of the outer container 5 and the insulated cover 7 is surrounded by the plastic body 8, where contacts 9 go through this plastic body 8.

[0010] Purpose of the invention is achieved by adding the second independent metal inner container 3 which contains the primary pyrotechnic material 4. By this solution the primary pyrotechnic material 4 is hermetically separated from the booster pyrotechnic material 6 and, simultaneously, this booster pyrotechnic material 6 as well as primary pyrotechnic material 4 is hermetically separated from the surrounding environment. Thus, it is possible to substantially increase the loading of the booster pyrotechnic material 6 and the total volume of the outer container 5 without negative influence on the

primary pyrotechnic material 4, which is protected by the inner container 3. This initiator is used to create high power ignition energy.

Possibility of Industrial Application

[0011] High performance initiator for high loading of pyrotechnic material or other energetic materials according to the invention is applicable primarily in various safety systems, passive safety device of passengers of car or pedestrians, particularly for gas generator for airbags without the need for separate housing of booster pyrotechnic material. In addition, the invention can be used in the construction of automatic fire extinguishing systems for industry and household use.

List of designations:

[0012]

- | | |
|--|----|
| 1 - holder of contacts | 20 |
| 2 - reduced diameter of holder | |
| 3 - inner container | |
| 4 - primary pyrotechnic material | |
| 5 - outer container | 25 |
| 6 - booster pyrotechnic material | |
| 7 - insulated cover | |
| 8 - plastic body | |
| 9 - contacts | |
| 10a, 10b - first and second laser weld | 30 |

Claims

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|--|----------------------|
| 1. High performance initiator for high loading of pyrotechnic material or other energetic materials consisting of electrical contacts and contiguous closed space containing primary pyrotechnic material and booster pyrotechnic material, characterized by the fact it contains the holder (1) of contacts, which towards inside the initiator has reduced diameter (2) of the holder, where the inner container (3) is placed which contains primary pyrotechnic material (4) and over the circumference is sealed with reduced diameter (2) of holder, over the inner container (3) outer container (5) is inserted, which contains booster pyrotechnic material (6) and which on its inner edge is adjacent to the holder (1) of contacts with which it is sealed around the circumference, while the area of the holder (1) of contacts with the adjacent edge of the outer container (5) is integrated into the plastic body (8) which carries also contacts (9) at the same time. | 35
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| 2. High performance initiator for high loading of pyrotechnic material or other energetic materials according to the claim 1, characterized by the fact that the circumference connection of the inner container (3) | 55 |

with the reduced diameter (2) of the holder and/or circumference connection of the outer container (5) with the holder (1) of contacts is hermetic and is performed by first and/or the second laser weld (10a, 10b).

- | | |
|--|--|
| 3. High performance initiator for high loading of pyrotechnic material according to the claim 1, characterized by the fact that the volume of the outer container (5) which contains booster pyrotechnic material (6) is equal to 1 to 200 times the volume of the inner container (3) containing primary pyrotechnic material (4). | |
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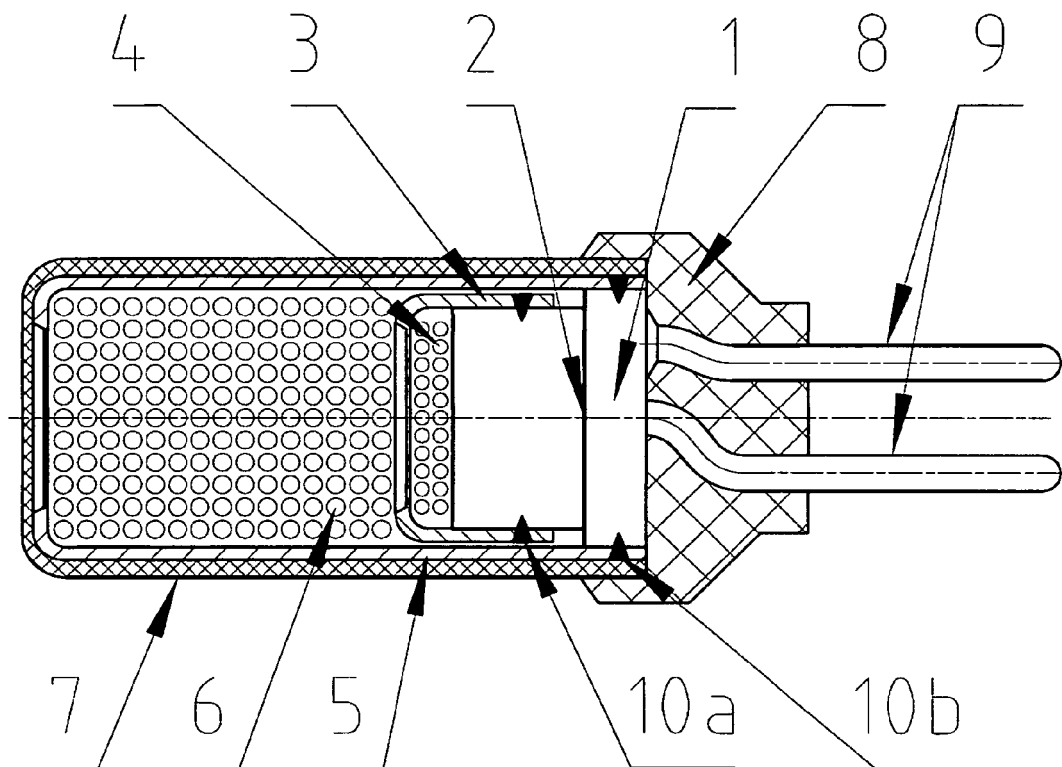


Figure 1