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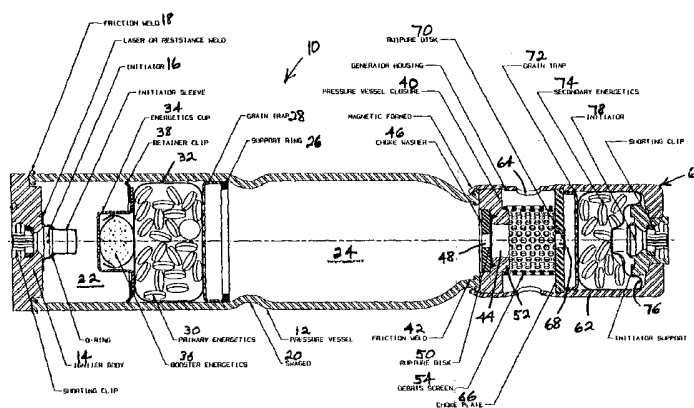
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[Continued on next page]

(54) Title: COMPACT MULTI-LEVEL INFLATOR



Multiple Level Inflator

(57) Abstract: A multi-level inflator for an air bag or other safety restraint device, comprising an elongated pressure vessel having a primary gas generating portion with a first open end and a gas storage portion (24) with a second open end. The primary gas generating portion has a primary initiator (16) and primary gas generating energetics (30) disposed therein, the initiator being mounted on an igniter body secured to and closing the pressure vessel at the first open end thereof. A pressure vessel closure (40) is secured to the second end of the pressure vessel, the closure having an aperture therethrough and a primary rupture disk (50) secured thereto to close the aperture. The gas storage portion has an inert gas therein under a predetermined pressure. A secondary inflator of the all-pyro type is secured to the pressure vessel and closure at the second end thereof. The secondary inflator comprises a secondary housing having a secondary initiator and secondary gas generating energetics disposed therein. A choke plate (66) having an opening therethrough is positioned between the secondary energetics and the pressure vessel closure. A secondary rupture disk (70) is secured to the choke plate to close the opening therein.



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INTERNATIONAL SEARCH REPORT

International application No.

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A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : B60R 21/26, 21/28
US CL : 280/737, 740, 741, 742

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 280/737, 740, 741, 742

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6,189,922 A (PARKS et al) 20 February 2001 (20.02.1991), see entire document	1-15, 18, 19
X		16, 17
Y	US 5,813,694 A (JEONG) 29 September 1998, <i>see entire document</i>	20

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

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"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

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Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claim Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐
☐

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.