**Title:** WIRE CARRIER PERFORATING GUN

**Abstract:** A perforating gun (10, 210, 310, 410) is provided for retaining a plurality of explosive charges (16, 16') in an angular phased array with the discharge ends (16a, 16a') of each succeeding explosive charge (16, 16') disposed at a selected angular orientation relative to the other explosive charges (16, 16') as determined by the configuration of an undulating path defined by support wires (14, 14') or wire pairs (19a, 19b). The perforating gun (10, 210, 310, 410) comprises a plurality of support wires (14, 14') disposed about a common longitudinal axis (L-L) and extending in an undulating path so as to define a wire carrier or cage in which the explosive charges (16, 16') are retained by securing the discharge ends (16a, or the initiation ends (16b), or both, to support wires (14, 14'). The undulating path of the support wires (14, 14') disposes the explosive charges (16, 16') in the angular orientation selected by selecting the pitch of the spiral-twisted support wires (14) of the retainer cage.
# INTERNATIONAL SEARCH REPORT

**A. CLASSIFICATION OF SUBJECT MATTER**

<table>
<thead>
<tr>
<th>IPC(7)</th>
<th>E21B 29/00</th>
</tr>
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<tr>
<td>US CL</td>
<td>89/1.15; 166/55.2; 102/312</td>
</tr>
</tbody>
</table>

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.: 89/1.15; 166/55.2; 102/312

**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

<table>
<thead>
<tr>
<th>Category*</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<tr>
<td><strong>A</strong></td>
<td>US 6,167,957 A (FRAZIER) 2 January 2001 (2-1-2001), see entire document.</td>
<td>1-19</td>
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<tr>
<td><strong>A</strong></td>
<td>US 2,889,774 A (ALLEN) 9 June 1959 (9-6-1959), see entire document.</td>
<td>1-19</td>
</tr>
<tr>
<td><strong>A</strong></td>
<td>US 2,819,673 A (CECIL et al) 14 January 1958 (14-01-1958), see entire document.</td>
<td>1-19</td>
</tr>
</tbody>
</table>

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

### See patent family annex.

* Special categories of cited documents
  - "D" document defining the general state of the art which is not considered to be of particular relevance
  - "E" earlier document published on or after the international filing date
  - "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
  - "O" document referring to an oral disclosure, use, exhibition or other means
  - "P" document published prior to the international filing date but later than the priority date claimed
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**Date of the actual completion of the international search**

19 NOVEMBER 2001

**Date of mailing of the international search report**

28 DEC 2001

**Name and mailing address of the ISA/US Commissioner of Patents and Trademarks**

Box PCT

Washington, D.C. 20231

**Facsimile No.**  (703) 505-5280

**Authorized officer**  WOODROW EDMUND

**Telephone No.**  (703) 505-4151

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