Title: HYBRID PANEL FASTENER WITH SNAP-ON CAP

Abstract: A two-piece panel fastener includes a barrel-shaped metal retainer (10) which holds a screw. The screw includes a threaded shaft and a plastic cap (6) which has longitudinally-extending resilient fingers (7) which engage the outer surface of the retainer to captivate the screw. The retainer has a chamfered top flange (13) along its top edge, a circumferential bulge area (16) around its outer surface approximately in the middle of its length, and a base (15) at its bottom. Two circumferential valley regions of reduced diameter are located along the outer surface of the retainer. The first valley region is located between the chamfered top flange and the bulge area and the second is located between the bulge area and the base. When the fingers occupy either of the valley regions, the screw is captively held at either of two stable positions of retraction or extension. The retainer is preferably rigidly affixed to a circuit board (5) by soldering a base flange at the bottom of the retainer to the top surface of the board.
**INTERNATIONAL SEARCH REPORT**

**A. CLASSIFICATION OF SUBJECT MATTER**

<table>
<thead>
<tr>
<th>IPC(7)</th>
<th>US CL</th>
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<td>F16B 21/18, 25/60, 39/03</td>
<td>411/458, 107, 916, 970, 999</td>
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</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. : 411/353, 107, 916, 970, 999, 359, 7

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>
</tr>
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<tbody>
<tr>
<td>A</td>
<td>US 6,079,923 A (Ross et al) 27 June 2000, see entire document.</td>
<td>1-14</td>
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<tr>
<td>A</td>
<td>US 5,094,579 A (Johnson) 10 March 1992, see entire document.</td>
<td>1-14</td>
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<tr>
<td>A</td>
<td>US 5,020,951 A (Smith) 04 June 1991, see entire document.</td>
<td>1-14</td>
</tr>
</tbody>
</table>

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 document published on or after the international filing date
- **L** document which may throw doubts on priority claims or which is cited to satisfy the obligation to cite at least two documents
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- **R** later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- **W** 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
- **Y** document of particular relevance; the claimed invention cannot be considered patentable even when the document is taken alone
- **A** document member of the same patent family

Date of the actual completion of the international search: 06 AUGUST 2002

Date of mailing of the international search report: 30 DEC 2002

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

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