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Oogami et al.

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(54) **STORAGE BATTERY WITH LAMINATED BATTERY ELEMENT**

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(75) Inventors: **Etsuo Oogami**, Kanagawa (JP); **Tatsuo Horiba**, Saitama (JP)

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(73) Assignees: **Nissan Motor Co., Ltd.**, Kanagawa (JP); **Shin-Kobe Electric Machinery Co., Ltd.**, Tokyo (JP)

* cited by examiner

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 159 days.

Primary Examiner—Carol Chaney
Assistant Examiner—Dah-Wei D. Yuan
(74) *Attorney, Agent, or Firm*—McDermott, Will & Emery

(57) **ABSTRACT**

A storage battery includes a rolled, laminated battery element made up of two groups of electrode materials composed of positive and negative electrode materials, laminated together through separators, an outer sheathing enclosing therein the laminated battery element, a spindle around which the laminated battery element is wound and rolled up so that the spindle and the laminated battery element are fixedly connected to each other. One axial end of the spindle is constrained in the axial direction of the laminated battery element by the bottom of the outer sheathing, while the other axial end of the spindle is elastically supported by an upper lid portion hermetically covering the opening end, so as to stably support the laminated battery element by the spindle and to prevent displacement of the laminated battery element from its set position even during application of vibrations to the storage battery.

(21) Appl. No.: **09/804,077**

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(65) **Prior Publication Data**

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(30) **Foreign Application Priority Data**

Mar. 15, 2000 (JP) 2000-071558

(51) **Int. Cl.**⁷ **H01M 6/10**

(52) **U.S. Cl.** **429/94; 429/96; 429/100**

(58) **Field of Search** 429/94, 96, 100

(56) **References Cited**

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9 Claims, 6 Drawing Sheets

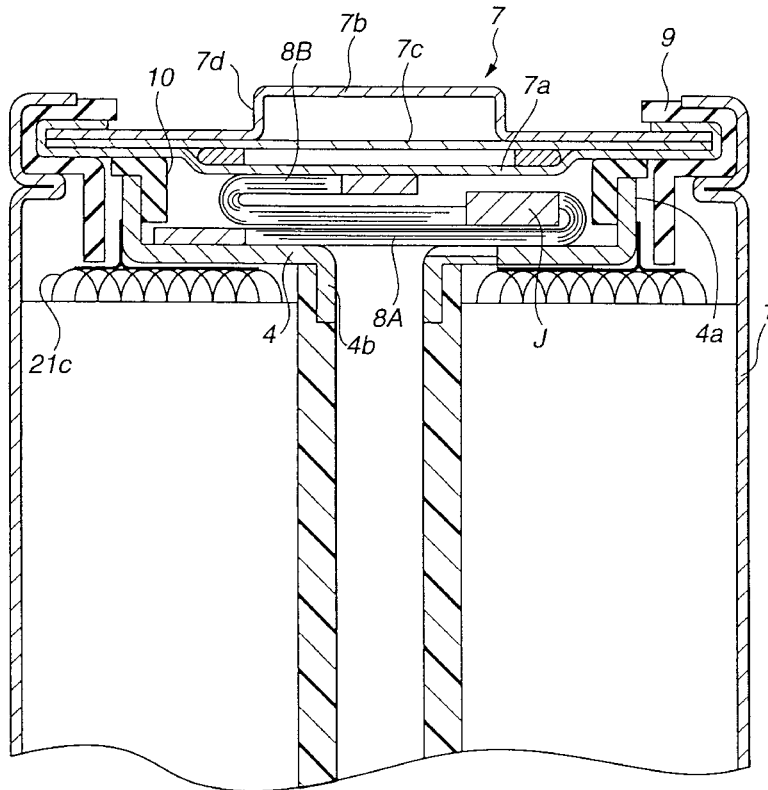


FIG. 1

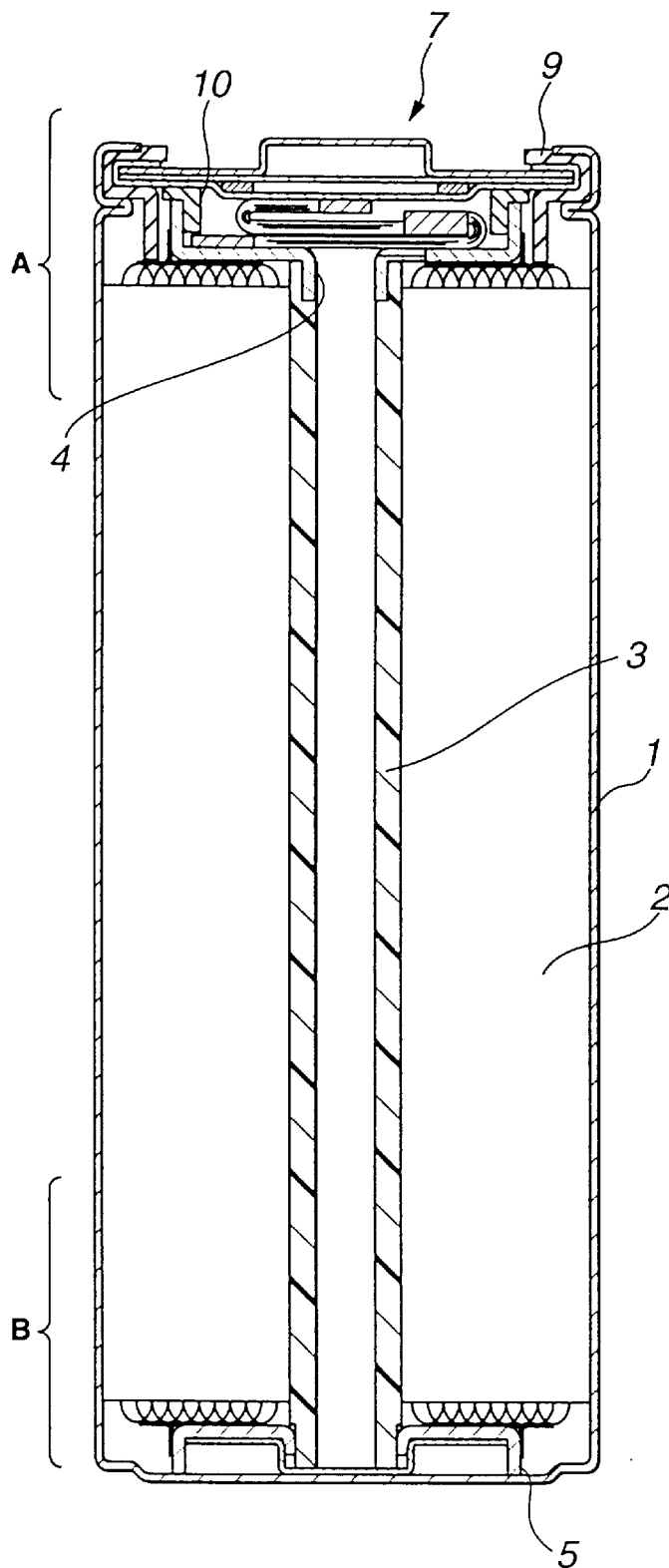


FIG.2

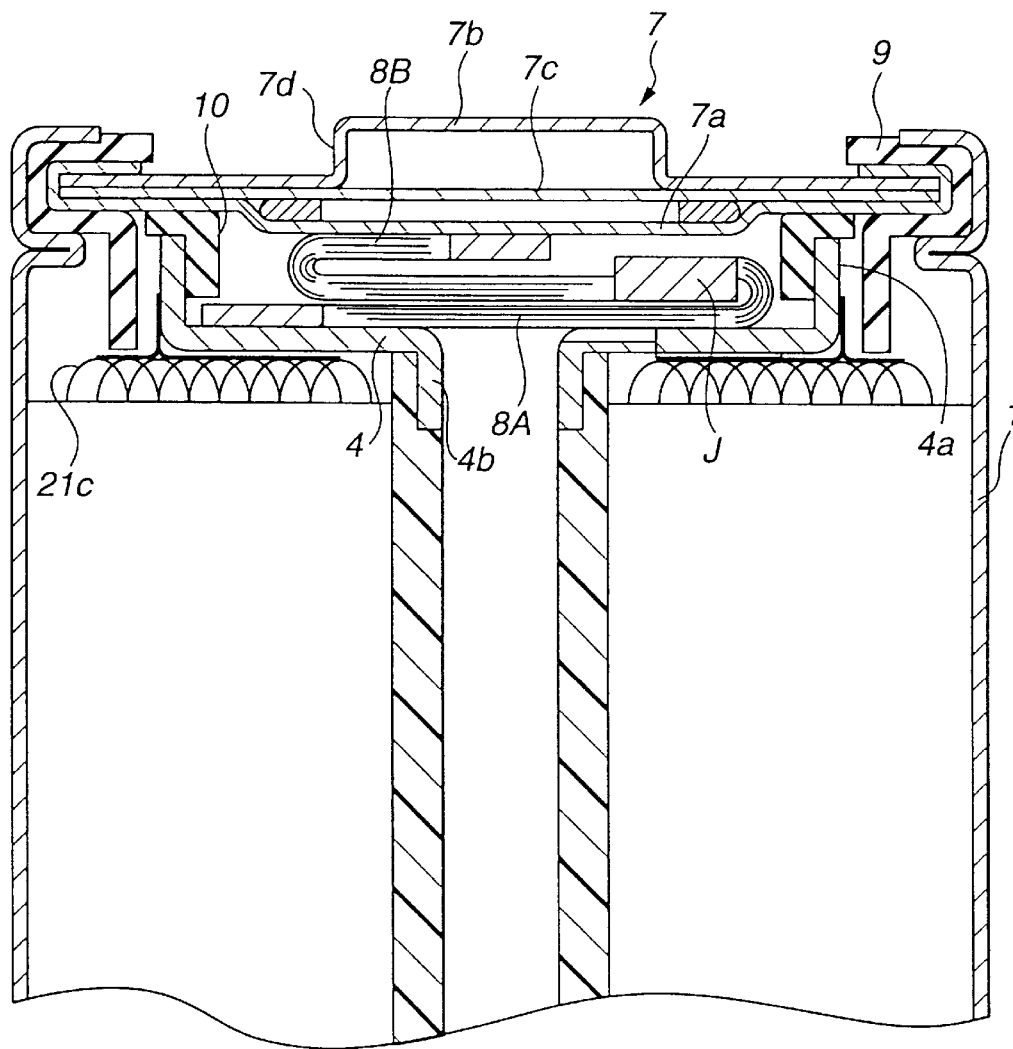


FIG. 3

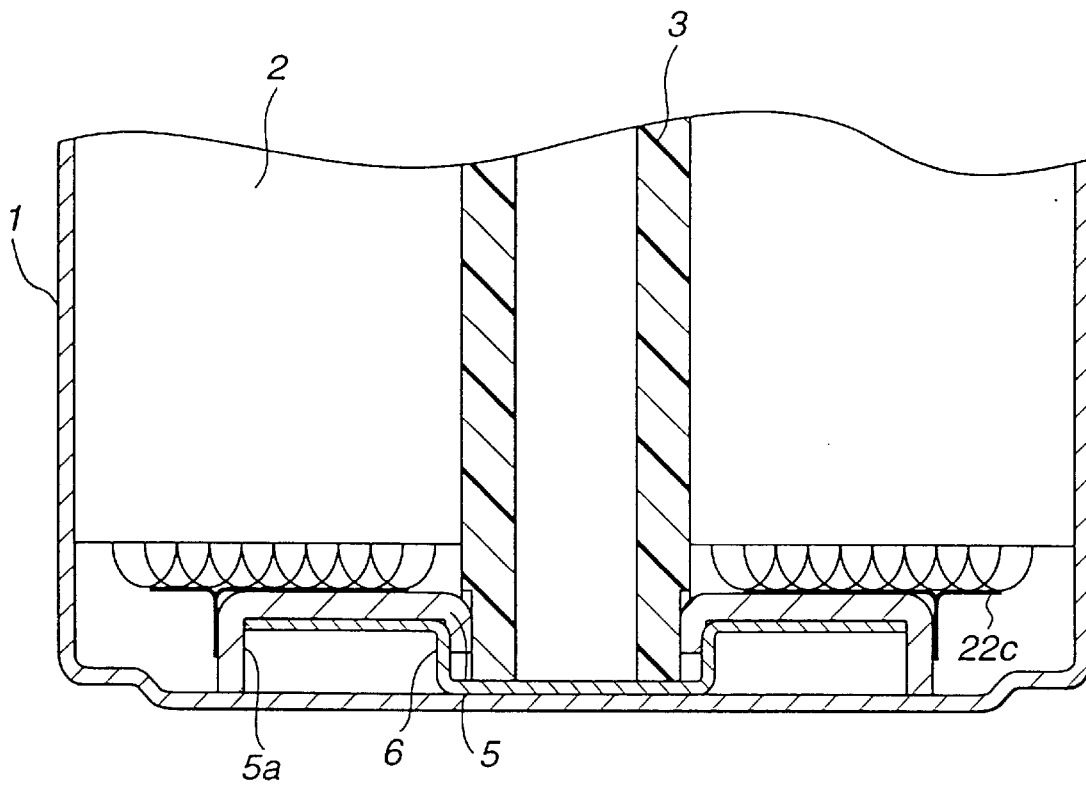
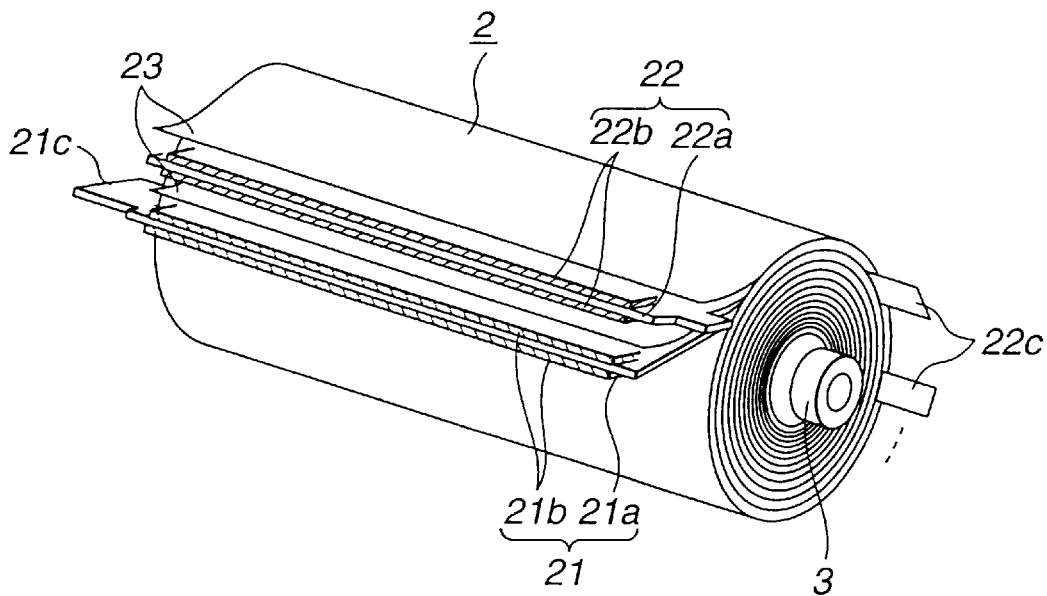


FIG.4



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