

# EXHIBIT 2



US006803545B2

(12) **United States Patent**  
**Blake et al.**

(10) **Patent No.:** **US 6,803,545 B2**  
(45) **Date of Patent:** **Oct. 12, 2004**

(54) **ELECTRICALLY HEATED SMOKING SYSTEM AND METHODS FOR SUPPLYING ELECTRICAL POWER FROM A LITHIUM ION POWER SOURCE**

5,665,262 A \* 9/1997 Hajaligol et al. .... 219/553  
5,934,289 A 8/1999 Watkins et al.  
5,981,107 A 11/1999 Hamano et al.  
6,040,560 A \* 3/2000 Fleischhauer et al. .... 219/494  
6,246,217 B1 6/2001 Yoshida et al.

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**FOREIGN PATENT DOCUMENTS**

JP 2-100286 \* 4/1990  
JP 10-51962 A 2/1998  
JP 10-285813 A 10/1998  
JP 2002-240341 \* 8/2002

(73) Assignee: **Philip Morris Incorporated**, Richmond, VA (US)

**OTHER PUBLICATIONS**

PANASONIC, Overview of Lithium Ion Batteries, Jan. 2000, pp. 1–11.  
PANASONIC, Battery Packs, Nickel Metal Hrdride Handbook, Jul. 2001, pp. 42–46.  
TYCO/ Electronics, Raychem Circuit Protection, PolySwitch Resettable devices, Short-Form Catalog, Nov. 2001, pp. 1–12.  
Notification of Transmittal of International Preliminary Examination Report dated Apr. 19, 2004 for PCT/US03/15997.

(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 220 days.

\* cited by examiner

(21) Appl. No.: **10/161,639**

*Primary Examiner*—John A. Jeffery

(22) Filed: **Jun. 5, 2002**

(74) *Attorney, Agent, or Firm*—Burns, Doane, Swecker & Mathis, LLP

(65) **Prior Publication Data**

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(51) **Int. Cl.**<sup>7</sup> ..... **H05B 3/58**

(52) **U.S. Cl.** ..... **219/268**; 219/535; 219/492; 131/194

(58) **Field of Search** ..... 219/268, 262, 219/263, 260, 269, 492, 535; 131/194, 195

(57) **ABSTRACT**

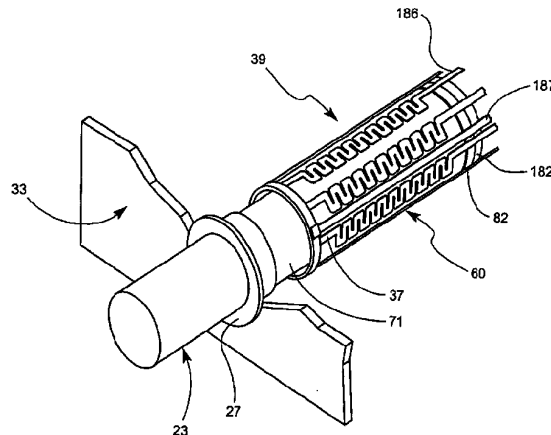
An electrically heating smoking system wherein tobacco smoke is generated by heating a portion of a cigarette with an electrical resistance heating element powered by lithium ion battery cells. The lithium ion battery cells supply current to the electrical resistance heating element with current up to 20 times greater than the recommended discharge rate. To prevent damage to the lithium ion battery cells under such high discharge conditions, the smoking system includes a controller which provides modulated pulses of electrical power from the battery cells to the resistance heating element during smoking of the cigarette.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

5,028,500 A 7/1991 Fong et al.  
5,060,671 A 10/1991 Counts et al.  
5,144,962 A \* 9/1992 Counts et al. .... 131/194  
5,342,711 A 8/1994 Tamura et al.  
5,388,594 A \* 2/1995 Counts et al. .... 131/329  
5,498,855 A \* 3/1996 Deevi et al. .... 219/553  
5,499,636 A 3/1996 Baggett et al.  
5,505,214 A 4/1996 Collins et al.  
5,591,368 A \* 1/1997 Fleischhauer et al. .... 219/535

**25 Claims, 4 Drawing Sheets**



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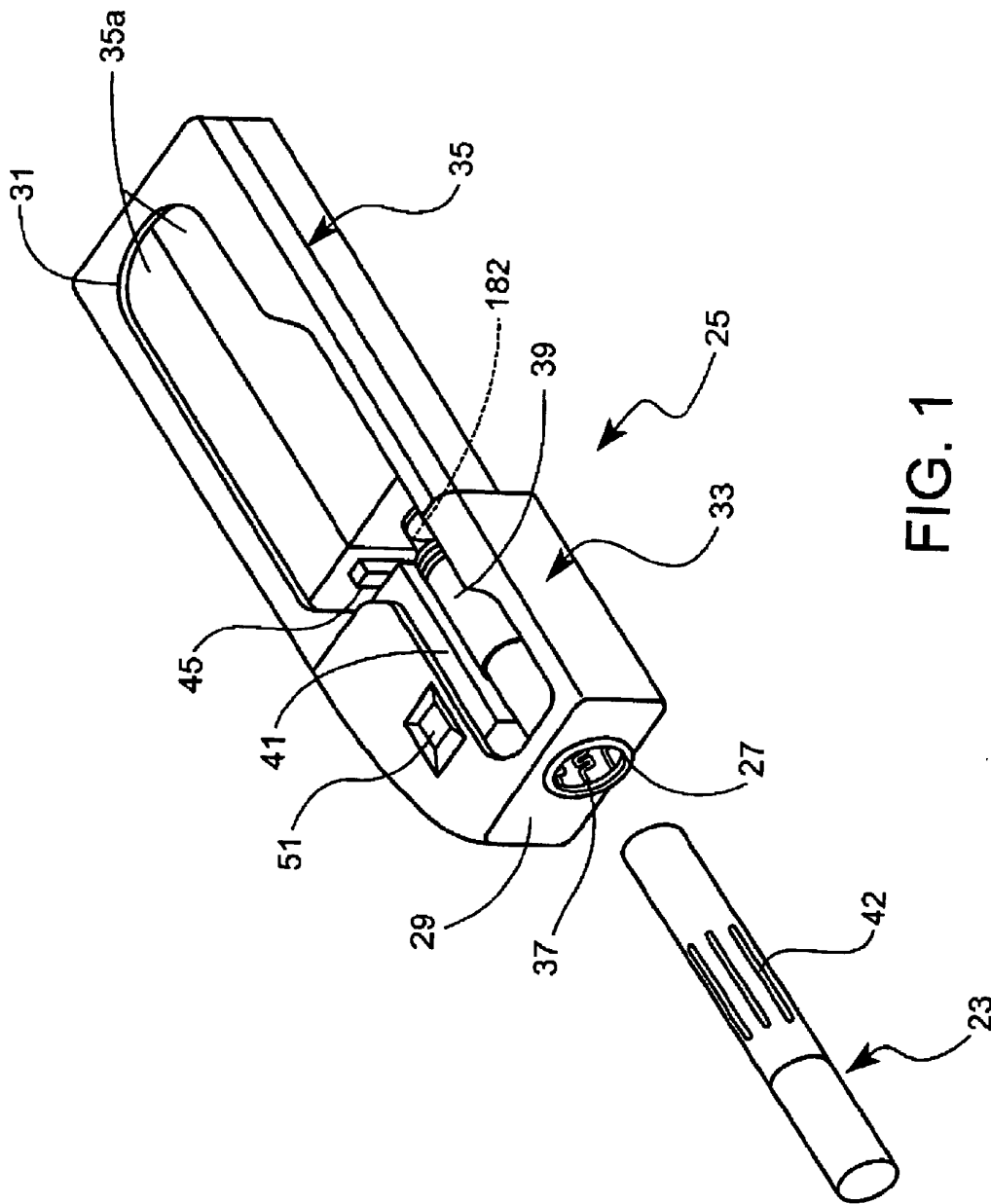


FIG. 1

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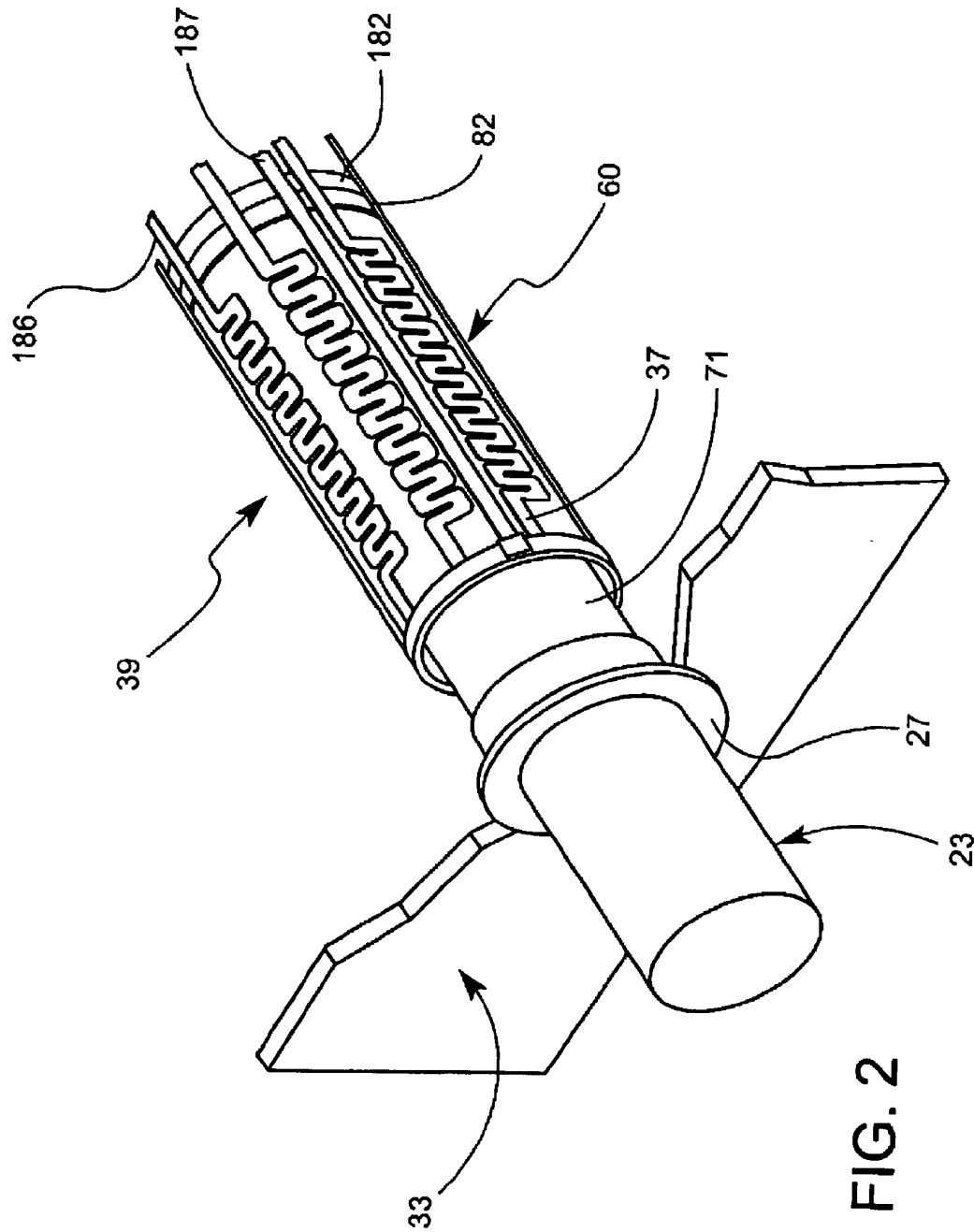


FIG. 2

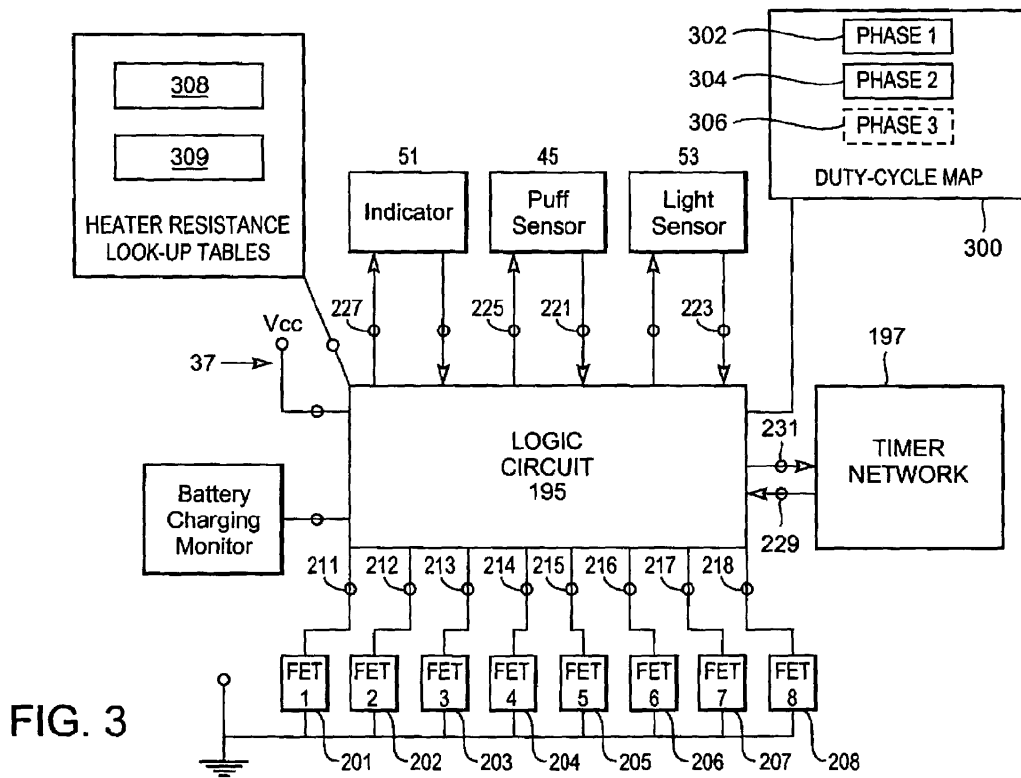


FIG. 3

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