

# United States Patent [19]

Brooks et al.

[11] Patent Number: **4,947,874**

[45] Date of Patent: **Aug. 14, 1990**

- [54] **SMOKING ARTICLES UTILIZING ELECTRICAL ENERGY**
- [75] Inventors: **Johnny L. Brooks; Donald L. Roberts**, both of Winston-Salem; **Jerry S. Simmons**, Rural Hall, all of N.C.
- [73] Assignee: **R. J. Reynolds Tobacco Company**, Winston-Salem, N.C.
- [21] Appl. No.: **242,086**
- [22] Filed: **Sep. 8, 1988**
- [51] Int. Cl.<sup>5</sup> ..... **A24D 1/00; A24F 1/00; A24F 47/00; A61M 16/00**
- [52] U.S. Cl. .... **131/329; 131/273; 131/194; 128/202.21; 128/203.26; 128/203.27; 128/204.21**
- [58] Field of Search ..... **131/329, 194, 273; 128/202.21, 202.27, 203.12, 203.13, 203.15, 204.21, 203.17, 203.26, 203.27, 204.13, 204.23**

[56] **References Cited**

**U.S. PATENT DOCUMENTS**

- |           |         |                   |         |
|-----------|---------|-------------------|---------|
| 1,771,366 | 7/1930  | Wyss et al. .     |         |
| 1,968,509 | 7/1934  | Tiffany .         |         |
| 2,057,353 | 10/1936 | Whittemore, Jr. . |         |
| 2,104,266 | 1/1938  | McCormick .       |         |
| 2,974,669 | 3/1961  | Ellis .           |         |
| 3,200,819 | 8/1965  | Gilbert .         |         |
| 3,889,690 | 6/1975  | Guarnieri .       |         |
| 3,918,464 | 11/1975 | Kolodziej .       |         |
| 3,943,941 | 3/1976  | Boyd et al. ....  | 131/359 |
| 4,133,318 | 1/1979  | Gross et al. .    |         |
| 4,141,369 | 2/1979  | Burruss .         |         |
| 4,164,230 | 8/1979  | Pearlman .        |         |
| 4,193,411 | 3/1980  | Faris et al. .    |         |
| 4,246,913 | 1/1981  | Ogden et al. .    |         |
| 4,303,083 | 12/1981 | Burruss, Jr. .    |         |
| 4,523,589 | 6/1985  | Krauser .         |         |
| 4,564,748 | 1/1986  | Gupton .          |         |
| 4,580,583 | 4/1986  | Green, Jr. .      |         |

- |           |         |                   |
|-----------|---------|-------------------|
| 4,708,151 | 11/1987 | Shelar .          |
| 4,714,082 | 12/1987 | Banerjee et al. . |
| 4,735,217 | 4/1988  | Gerth et al. .    |
| 4,756,318 | 7/1988  | Clearman et al. . |
| 4,771,796 | 9/1988  | Myer .            |

**FOREIGN PATENT DOCUMENTS**

- |            |         |                        |
|------------|---------|------------------------|
| 174645     | 3/1986  | European Pat. Off. .   |
| 186280     | 7/1986  | European Pat. Off. .   |
| 212234     | 3/1987  | European Pat. Off. .   |
| 2653133    | 5/1978  | Fed. Rep. of Germany . |
| 2704218    | 8/1978  | Fed. Rep. of Germany . |
| 3300992    | 7/1984  | Fed. Rep. of Germany . |
| 2128256    | 10/1972 | France .               |
| 48-8231    | 3/1973  | Japan .                |
| WO86/02528 | 5/1986  | PCT Int'l Appl. .      |
| 197946     | 4/1924  | United Kingdom .       |

**OTHER PUBLICATIONS**

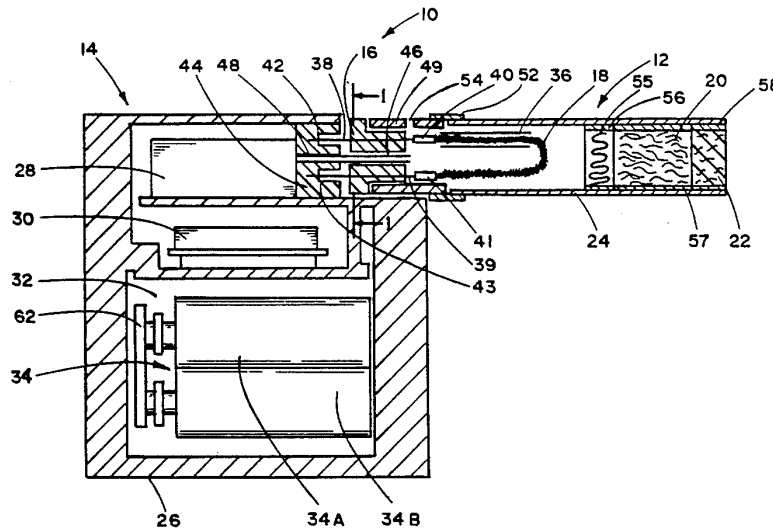
*Tobacco and Tobacco Smoke*, Wynder et al., pp. 482 and 522 (1967).

*Primary Examiner*—V. Millin

[57] **ABSTRACT**

Smoking articles employ an electrical resistance heating element and an electrical power source to provide a tobacco-flavored smoke or aerosol and other sensations of smoking. The smoking articles advantageously comprise a disposable portion and a reusable controller. The disposable portion, which may be a cigarette, normally includes (i) an air permeable resistance heating element having a surface area greater than 1 m<sup>2</sup>/g, which usually carries an aerosol forming material, and (ii) a charge or roll of tobacco. The reusable controller normally includes a puff-actuated current actuation means, a time-based current regulating means to control the temperature of the heating element, and a battery power supply.

**202 Claims, 8 Drawing Sheets**



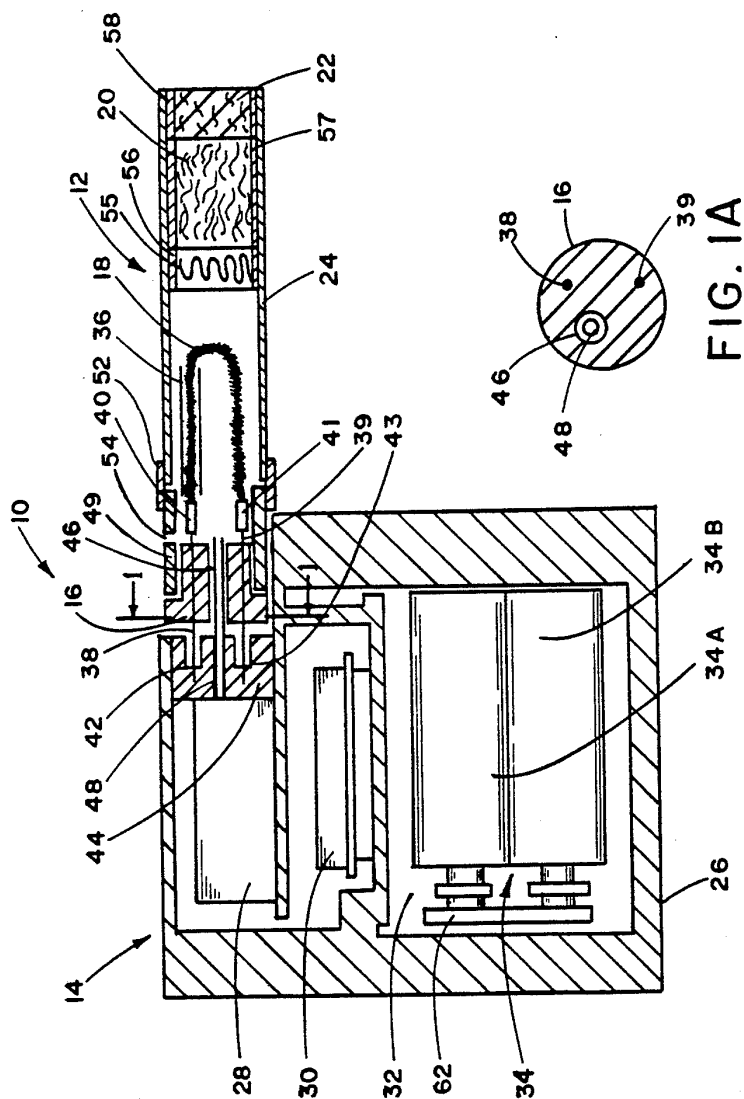


FIG. 1

FIG. 1A

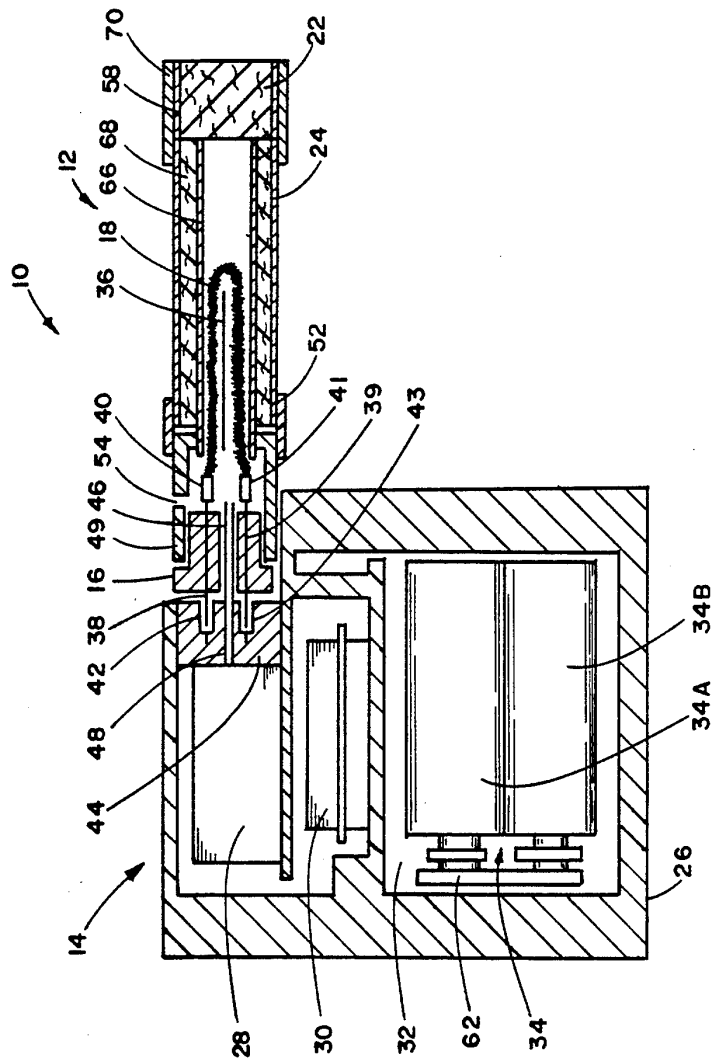


FIG. 2

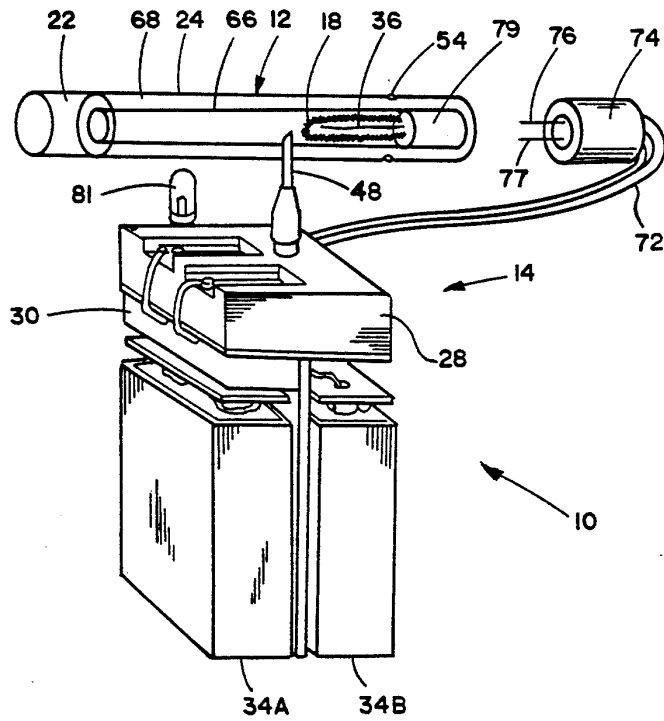


FIG. 3

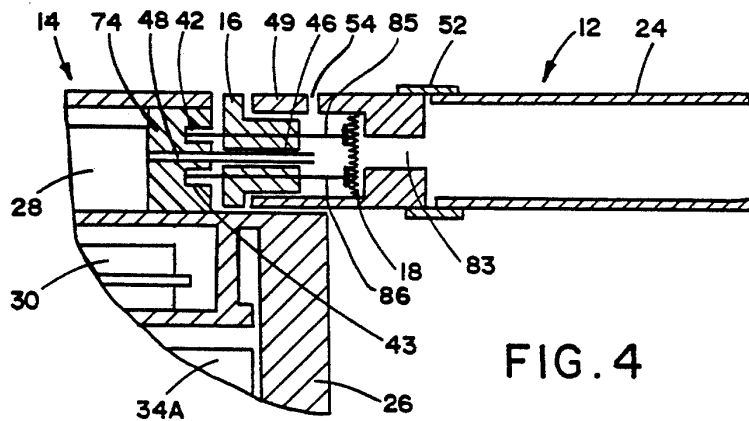


FIG. 4

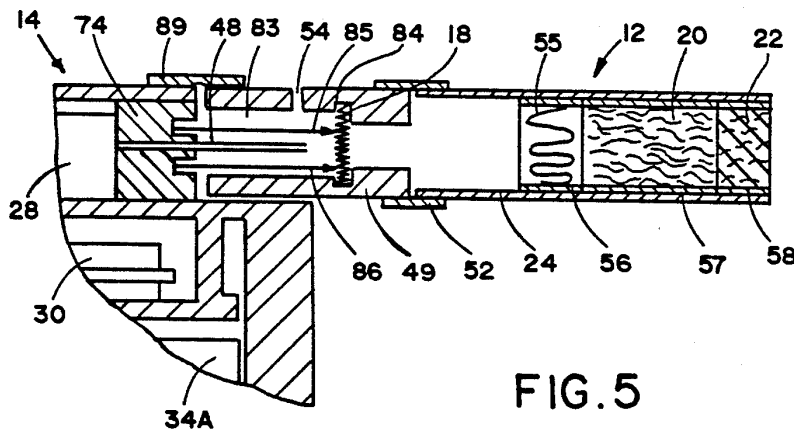


FIG. 5

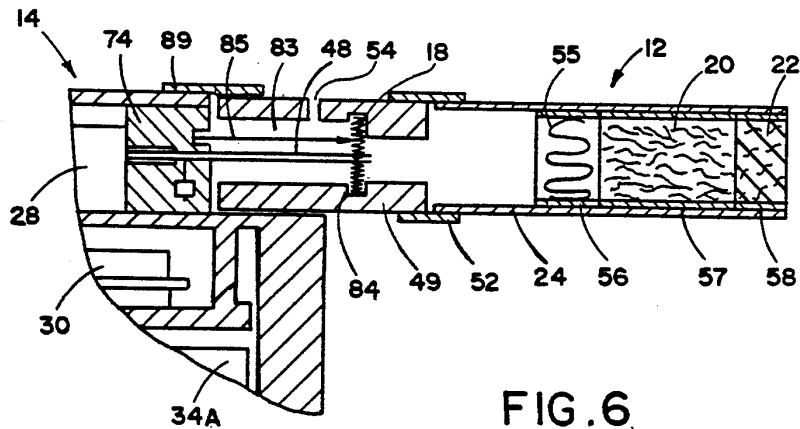


FIG. 6

# Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

## Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

## Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

## Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

## API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

## LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

## FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

## E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.